

RAF/92/G32 - POLLUTION CONTROL AND OTHER MEASURES TO
PROTECT BIODIVERSITY IN LAKE TANGANYIKA

Progress Report No. 15

September 1999 - November 1999

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1. Project Co-ordination Unit

1.1 Project Co-ordinator and Scientific Liaison Officer

1.1.1 Introduction

The Project Coordination Unit would like to take this opportunity to wish all those associated with LTBP a most prosperous, successful and above all peaceful New Year and to thank you for your continuing support.

Owing to the tragic events of Tuesday 12 October the UN security rating for the whole of Burundi was raised from three to four pending a full investigation expected to take three to four weeks. Consequently it was necessary for all project expatriate staff to leave Bujumbura. Prior to her departure on 25 October the SLO met with each of the National SS Coordinators and their teams in both Burundi and DR Congo to discuss the implications of this suspension and what, if any activities, they would be able to pursue under these conditions. The SLO, facilitators, SS coordinators and national staff are doing everything possible to maintain project momentum in Burundi and DRC.

1.1.2 General summary

The principal event of this quarter was the regional workshop held in Arusha to review the legal Convention and bring together into a single harmonised version the work completed at the two sub-regional meetings. The meeting was largely successful but it was felt that it could have been more so had the delegations from some of the participating countries been stronger and prior consultations more comprehensive. More detail is given in the Legal special study section of this report where it is noted that key participants were missing from some delegations and others had new participants who had difficulty contributing at this late stage in the process. The importance of continuity and appropriateness of personnel at project workshops has been stressed by the Steering Committee on several occasions in the past and will remain of crucial importance to the end of the project. It is, however, gratifying to note that FAO sent a representative to the workshop thus formalising the links that have been established between this component of LTBP and the LTR project over the past few years. The current state of the convention and next steps will be an important item on the agenda at the next Steering Committee meeting to be held in March 2000.

Another key event this quarter was the regional socio-economic working group meeting held in Kigoma on 9-12 November 1999. It had been suggested that that progress reports and the results of work undertaken following the informal SE meetings held in Burundi be presented at a working group meeting and subsequently critiqued. Consequently the first formal, transboundary SE working group meeting was held. The principal aim was to achieve a co-ordinated understanding of the SE work programme across the four riparian countries and to facilitate the exchange of ideas and information of the four national SE teams. Specific objectives included the development of plans for the remainder of the project and identification of directions for action regarding the SESS contribution to the Strategic Action Programme. SE co-ordinators

and colleagues attended from all four countries the meeting being facilitated by the NRI SE co-ordinator and the Regional Facilitator. The meeting was a great success and agreed activities will soon be underway.

The Scientific Liaison Officer visited the Kigoma and Mpulungu Stations, meeting with all SS teams to discuss progress and remaining work plans. She visited the Dar es Salaam Office as well to discuss budgets, project wrap-up and prepare for the Steering Committee Meeting to be held in early December.

UK-based members of the LTBP consortium held a Management Meeting on 1 September 1999 to coincide with the Scientific Liaison Officer's layover in UK before going on home-leave. Agenda items included: scientific inputs to the SAP, formats for special studies final reports, project wrap-up.

Unfortunately the GIS implementation/training visit by Alan Mills planned for November has had to be postponed until the new year owing to the enhanced UN security status in Burundi.

Volume three of the project newsletter "Lakeside" had been produced and distributed.

1.2 Strategic Action Plan

1.2.1 The Draft Outline Strategic Action Programme.

The draft outline SAP document has been translated into French. French and English versions were included in the materials distributed for the Extraordinary Steering Committee Meeting – Arusha 2-3 December.

1.2.2 Post-Project Funding

In response to requests at the May SCM, the project prepared discussion papers on possible funding mechanisms for an interim project phase, during which an interim lake management body would develop budgeted project components for donor support and financing and co-financing within the SAP framework.

These documents – Moving Forward – were sent to UNOPS and GEF for comment.

1.2.3 SAP Completion Timetable

Due to delays in the arrangements for the Extraordinary Steering Committee Meeting, the first SAP drafting workshop was postponed to the next quarter. Although originally proposed for the first part of December, the SAP workshop is now scheduled for January 2000.

In view of the constant problems in arranging four country meetings, the timetable for the rest of the project period has been proposed. The proposed dates will be discussed in the December SCM.

1.2.4 Goals for the Next Quarter

The main activity in the next quarter will be the Regional SAP Workshop. The workshop will benefit from summary reports from the Special Studies, which will guide the workshop in developing an appropriate table of contents for possible management interventions.

The key task will be to propose an Interim Lake Management Authority, and to review mechanisms for funding the body.

2. Reports of Special Study groups

2.1 Progress Report: September 1999 – November 1999 for "Biodiversity" Special Study and "Conservation Activities"

2.1.1 Overall Summary of Progress

The emphasis in all four countries during the quarter has been on the identification and selection of potential long-term monitoring sites. This process has been carried out in consultation with SEDSS, POLSS and FPSS and a provisional list of sites has been drawn up. It is hoped that by the end of January the other special studies will be in a position to confirm these sites. Nevertheless, BIOSS intends to carry out a full test run of the monitoring programme in December. The possible exception may be Burundi where owing to the deterioration in the security situation, the opportunities to conduct fieldwork are very limited. After the Biodiversity Special Study ends, it is hoped that the monitoring programme will be continued by local institutions at quarterly intervals.

Additional field work has been carried out by all the national BIOSS teams, using BIOSS sampling techniques modified after the Mahale and Nsumbu surveys and detailed in an updated version of the Standing Instructions. In Burundi, in spite of the restrictions on fieldwork, the team has conducted a mollusc survey of Rusizi National Park. Non-dive sampling methods were employed owing to the poor visibility in the Rusizi delta and the presence of dangerous animals such as crocodiles and hippopotami. The results from this survey will be incorporated into the report already submitted on the vegetation, terrestrial fauna and fish communities of the park. Using the manta tow technique, the Congolese team succeeded in mapping the underwater habitats from the border with Burundi to Cap de Govi, approximately 35 km south Uvira.

The Tanzanian team conducted a dive survey of the molluscs in Gombe Stream National Park. Census dives were carried out at 12 sites along the park shoreline. The Zambians have completed the last round of their routine monitoring, which has been running since August 1999, prior to commencing the long-term monitoring programme next quarter. The habitat modification experiment off Mbita Island carried out jointly with Sedimentation Special Study continued. In addition, habitat mapping by manta tow has been done in the area of Nsumbu Bay (North of the park) and Cameron Bay. The team plans to complete a survey of approximately 5 sites in Cameron Bay in December.

All four teams have now submitted initial drafts of their contributions to the technical report of the Mahale National Park Survey. The Zambian team has also prepared a draft of their report of the Nsumbu National Park survey. Each team has produced maps from their habitat mapping surveys, which have been forwarded to NRI for incorporation into the TANGIS system. It is intended that 1: 50,000 scale substrate maps of sections of the coastline will be generated based on this data, which will constitute a valuable aid for planning future survey work on the lake.

At the end of December, the field component of the Biodiversity Special Study will draw to a close after the first round of quarterly monitoring has been carried out. The emphasis during the coming quarter will shift to the Survey and Literature Databases, the final versions of which will be installed in all four stations in December. The priority will be to complete the input of the data collected during the BIOSS field programme and from the available literature on the Biodiversity of the lake. For the Literature Database the task is considerable, owing to an unfortunate loss of a quantity of data which had been entered during the previous five months. The best options for recouping this loss are currently being considered. The BIOSS Working Group, which was due to

take place in December was postponed, owing to the involvement of key members of the regional BLOSS team in the Steering Committee Meeting, the dates of which changed at short notice. The BLOSS working group meeting will now take place in February 2000.

2.1.2 Chronology of Activities

Sep-Oct:	Zambian team continue routine monitoring and habitat modification experiment in conjunction with SedSS team.
Sep-Oct	Congolese carry out habitat mapping of the coast from the border with Burundi to Cap de Govi.
Sep - Nov:	All regional teams involved in identifying and selecting sites for the long-term monitoring programme.
Oct	Habitat maps sent to NRI for incorporation into TANGIS system
Oct	Zambian team habitat mapping of Nsumbu Bay.
Oct – Nov	Submission of draft technical reports for Mahale NP and Nsumbu NP surveys
Nov:	Burundian team conducts mollusc survey of Rusizi National Park.
Nov	Tanzanian team carries out mollusc survey of Gombe Stream National Park.
Nov	Zambian team habitat mapping of Cameron Bays.

2.1.3 Staffing Schedule

2.1.3.1 Burundi

Dr Gaspard NTAKIMAZI, Burundian Co-ordinator
Robert KUMANA, Responsable de la Base de donnees.

2.1.3.2 DR Congo

Dr Muderhwa NSHOMBO, Directeur Général, C.R.H. – Uvira

Regional Dive Team:

Burundi	Celestin	BIGIRIMANA	Kamnyosha Secondary School	PADI Advanced open water
	Terence	HAKIZIMANA	Cibitoka Secondary School	PADI Advanced open water
	Libére	NDAYISENGA	LTBP – Bujumbura	BSAC-sport
	Félix	NICAYENZI	DEPP – Bujumbura	BSAC-sport
	Albéric	RUGIRABIRORI	IECN – Bujumbura	BSAC-sport
	Bernard	SINUNGUKA	Univ Bu – Bujumbura	BSAC-sport
Congo	Constantin	AMUNDALA	CRH – Uvira	BSAC-sport
	Byeragi	BAHANE	CRH – Uvira	PADI Open water
	Alexis	BASHONGA	CRH – Uvira	BSAC-sport
	Patrick	BUDA	CRH – Uvira	BSAC-sport
	Donatien	MUZUMANI	CRH – Uvira	BSAC-sport
	Igundji	WATUNA	CRH – Uvira	PADI Advanced open water
Tanzania	Robert	KAYANDA	TAFIRI – Kigoma	PADI Advanced open water
	Bakari	MNAYA	TANAPA – Gombe	PADI Advanced open water
	Robert	WAKAFUMBE	TAFIRI – Kigoma	BSAC-sport
Zambia	Charles	LUKWESA	DoF – Mpulungu	BSAC-sport
	Maybin	MWENDA	DoF – Mpulungu	BSAC-sport
	Reuben	SHAPOLA	DoF – Mpulungu	BSAC-sport
	Robert	SINYINZA	DoF – Mpulungu	PADI Open water
	Isaac	ZULU	DoF – Mpulungu	PADI Advanced open water

2.1.3.3 International

Dr Ian Payne, MRAG Ltd, BLOSS Director
Dr Eddie Allison, MRAG Ltd, BLOSS Co-ordinator
Vicki Cowan, MRAG Ltd, BLOSS Management

Richard Paley MRAG Ltd, BIOSS Facilitator
John Pearce, Crag Jones, MRAG Ltd, BIOSS IT specialists

2.1.4 Main Outputs and Achievements

- Selection of provisional long-term monitoring site completed.
- Habitat mapping of DRC coast from border with Burundi to approx. 36 south of Uvira and of Cameron and Nsumbu Bays in Zambia.
- Mollusc surveys of Gombe Stream National Park, Tanzania and Rusizi National Park, Burundi.
- Revisions to the BIOSS sampling techniques detailed in the Standing Instructions completed and distributed to regional teams.
- Submission of initial draft technical reports for the Mahale NP and Nsumbu NP surveys
- Technical upgrade of both survey and literature databases largely completed

2.1.5 Main Objectives for the Next Quarter

- Conduct first quarterly monitoring in all riparian countries
- Final versions of Literature and Survey Databases installed in each of the field stations and data input completed.
- Technical reports for protected area surveys completed
- BIOSS Working Group meeting, final data analysis and draft final reports produced

2.2 Progress Report: September 1999 – November 1999 for Fishing Practices Special Study

2.2.1 Overall Summary of Progress

This quarter has seen the completion of the Regional Facilitator's familiarisation tour of all 4 riparian countries. A Congolese FPSS team has been established at CRH in Uvira. Their work programme has four main components:

- Weekly sampling at the 2 fish markets of Uvira to ascertain the species and numbers of littoral fish entering the commercial fish trade.
- Sampling of the catch of various common gears to ascertain the species mix and maturity of the species caught by the gears.
- A beach survey of the coast of Congo from the Burundi frontier to 3°30'S to ascertain the numbers and types of gears being used.
- An in depth study of Kilomoni village in the Rusizi Delta area to confirm the results of the beach survey and provide an estimate of numbers of lesser known or studied gears (pole & line, traps, scoop nets etc).

In addition to this, the Congolese National Coordinator for FPSS is surveying the fisheries monitoring and enforcement capability of the relevant authorities in Congo.

In Burundi, a counterpart to the FPSS facilitator was identified and began a similar beach survey programme in the accessible parts of Burundi – these being the villages between the frontier with Congo and Kibenga to the south of Bujumbura. Kibenga was chosen for an in-depth study since this was conveniently located, and was not too large for the size of the FPSS team employed. Included in the Burundi programme is an in-depth survey of the gears available, and their prices, in Bujumbura town, the source of most gears in the Northern Part of the lake. No sampling of the catch for maturity was programmed, though sampling of the species mix in the various gears was envisaged. A report on the capabilities of the Department of Fisheries to monitor and control the fishery is included in this work programme.

In Tanzania a catch sampling programme had been in operation for 2 years in Kigoma, Luiche, Malagarasi Delta and Gombe Stream National Park. This sampling was terminated at the end of October 1999. In November and December the FPSS team began inputting the data to databases for interpretation. The analysis of this data will give catch per effort data for beach seines, gill nets, encircling gill nets and lift nets in these areas. In addition a list of the species captured by the various methods surveyed has already been produced, as well as mesh selectivity data for the species caught and gears surveyed. The purveyors of gear in Kigoma also to be surveyed.

A visit to Gombe Stream National Park by the FPSS facilitator and the Tanzanian FPSS team in November was made to update a previous survey, which had been carried out before the ban on beach seining was implemented (Mid 1998). This recent visit served to highlight the conflicts still extant between the park authorities and fishermen operating on the beaches within the park.

A survey of gears in use in the Kigoma region was initiated, though, for geographical, time and budgetary reasons, not as thorough a beach survey as carried out in Burundi & Congo. The gear survey has however identified the major gears used and has given a general idea of numbers in the various villages in the district, and the variation of gear type with biotope.

Zambia has been extensively surveyed by FPSS in 1996 and 1997 with several joint SESS and FPSS reports giving a good outline of the fisheries there. A gears survey carried out in October/November by the FPSS team there, with the facilitator on most visits, covered all the various biotopes in the fairly limited coastline and has enable a list of the gears presently used in Zambia to be drawn up.

2.2.2 Chronology of Activities

September	Congolese and Burundian FPSS teams established and work programmes in each country agreed Beach surveys begun in DR Congo (between Uvira and border with Burundi) and Burundi Congolese market monitoring begins
October	Congolese and Burundian programmes ongoing Tanzanian gear species selectivity data collection completed and stopped. Tanzanian data input to database & spreadsheets begun Zambian survey of fishing gears, related to biotope begun
November	Congolese and Burundian programmes ongoing Zambian survey of fishing gears in use completed Zambian FPSS team visits to Nsumbu NP to assess conflicts in park completed Tanzanian survey of fishing gears in use completed and data entry continues Tanzanian FPSS team visit to Gombe National Park to assess conflicts with fishermen there undertaken

2.2.3 Staffing Schedule

Tanzanian Team

Mr Omari Kashushu (TAFIRI, Kigoma)
Mr Hamza Maboche (Community Development)

Zambian Team

Mr Leonard Mwape, National Co-ordinator (DoF, Mpulungu)
+ representatives from DoF, Mpulungu

Burundian Team

Ir Antoine Kiyuku, National Co-ordinator, LTBP

Congolese Team

Mr Mulimbwa, National Co-ordinator, CRH

Gear and beach survey	Mwendanababo Mkila, CRH Muyenga Wadmbo, CRH Milenge Mayembe, CRH
Market survey	Byeragi Bahane, CRH Matesi
Gear selectivity and species maturity	Alexis Bashongo, CRH

International team

Dr Ian Payne, MRAG Ltd, FPSS Director
Mr Robert Lindley, MRAG Ltd, Regional Facilitator
Ms Vicki Cowan, MRAG Ltd, FPSS Management
Dr E Allison, MRAG Ltd, FPSS consultant

2.2.4 Main Outputs and Achievements

- FPSS teams operational and work programmes operational in Congo and Burundi (within constraints presented by current security situation)
- Interpretation of catch & effort data in Tanzania started
- Survey of fishing gears in use in all 4 riparian countries complete
- Identification of conflicts in Nsumbu and Gombe National Parks completed

2.2.5 Main Objectives for the Next Quarter

- Completion of interpretation of data from the Tanzanian data collection and the Congo data collection
- Preparation of the country reports on the fishing gears in use on the lake, and the collation of this data into a draft final report.
- The data on catches and species selectivity by the various gear in use collected in Tanzania and Congo to be collated and interpreted
- Visit to Mahale National Park in Tanzania to assess fishing activity in communities adjacent to the park. The results of this visit to be included with the results of the already completed visit to Gombe NP in a country report for Tanzania and amalgamated with the reports from Burundi (Rusizi) and Zambia (Nsumbu) into a final report on National parks and fisheries.
- Production of country reports for the riparian countries on the capability of the various institutions to monitor and control the fishery. These country reports to be collated into a final report.

2.3 Progress Report: September 1999 – November 1999 for Legal and Institutional Component

2.3.1 Summary of Progress

The review of the draft Convention at the regional workshop held this quarter finalised the formal consultation process for this document within the current project. All four riparian countries were represented, although some key participants from the earlier working groups did not attend this final project workshop for the legal component. In addition to reduced delegations in some cases, the involvement of some new participants at this stage of the consultation made it difficult for them and the workshop. Furthermore, it transpired that consultations on the earlier drafts had not taken place in some of the countries (or if they had then no-one in the delegation was aware of them) although the procedures for this had been endorsed at the sub-regional workshop. Nor does it appear that the harmonised third draft, containing the amendments proposed at both of the sub-regional workshops, had been widely circulated in some of the countries. Overall, this was really rather disappointing, considering the importance of this gathering and the fact that the date had been set well in advance and that the harmonised third draft had prepared and released to the four countries within the tight timetable agreed at the sub-regional workshops. This all has implications for the effectiveness of the process by which the document is taken forward and discussed in national institutions – a critical step in the path towards ratification. An FAO representative at the workshop formalised the links that have been established between this component of LTBP and the LTR project over the past few years.

When commenting on the draft Convention, reviewers from UNEP raised the importance of establishing interim arrangements prior to and during the first meeting of the Conference of Parties. This point when considered alongside the imminent end of the current GEF project, led the workshop to make the following resolution:

to request the Regional Steering Committee of the Lake Tanganyika Biodiversity Project to urgently request UNEP and the GEF to provide funding and assistance to enable the riparian States to take the measures necessary to arrange and prepare for the first meeting of the Conference of the Parties and to establish the institutions envisaged in the draft Convention agreed at the Workshop.

The quarter ended as both language versions of the draft Convention were being edited and harmonised for re-issue after the discussions and instructions from the regional workshop. These documents will be presented to the Regional Steering Committee of LTBP at the first meeting planned for next year (date in 2000 to be confirmed). It is hoped that the Steering Committee would then recommend that the draft convention be signed in order to provide an appropriate legal and institutional framework for the cooperative and sustainable management of Lake Tanganyika. Thereafter, the responsibility for negotiating, agreeing, signing and ratifying the Convention would lie with the Governments of the four countries. It should be noted that the project will support this process, where possible, until the project ends in August 2000.

2.3.2 Chronology of Activities

September	Drafts edited from sub-regional workshops and translated.
October	Workshop documents circulated, including external comments on the Convention received from UNEP and the LTR project.
November	Regional workshop, 1 st -5 th November held in Arusha, Tanzania

2.3.3 Current Staffing Schedule

Members of the national delegations attending the final regional workshop:

2.3.4 Tanzania

1. Ms. Verdiana Macha - Senior State Attorney- AG's Chamber
2. Mr Rajab H Rajab - National Environment Management Council (NEMC)

2.4 Progress Report: September 1999 – November 1999 for Special Study on Sediment Discharge and Its Consequences

2.4.1 Overall Summary of Progress

All teams completed a questionnaire during this period to be compiled as a preliminary report for the SAP meeting in January 2000. This report will be due in early December 1999.

Zambia : Dr Sichingabula (National Sedimentation Special Study Co-ordinator for Zambia, UNZA) and Mr Sikazwe (Department of Water Affairs, Lusaka) travelled to Mpulungu area in October to carry out river monitoring on 5 Zambian rivers at the beginning of the rainy season. This visit was part of the 5 month extension period of the work programme agreed between the Project and Dr Sichingabula and the Department of Water Affairs in order to complete a full year of measurements at the 5 hydrometric stations in Mpulungu area. A report of the activities was produced at the end of November by Dr Sichingabula and Mr Sikazwe including recommendations for the river monitoring programme to be carried on by the Department of Water Affairs (Northern Province) after the life of this project.

To ensure that long-term data collection required for further development in the Southern Lake Tanganyika basin beyond the life of this project is maintained, OD jointly with Dr Sichingabula sent out a letter to the Provincial Water Engineer, Northern Province (Mr Mwansa) for the possible transfer of the 6 gauges readers contracted by the project to the Department of Water Affairs.

Mr Mwansa has received the letter and it is expected that a response will be received in the next quarter.

During this quarter, the SedSS team at Department of Fisheries, Mpulungu has continued their work on suspended matter and granulometry analysis and impacts of sediments on biota (especially invertebrates). Dr Erik Verheyen (Royal Belgian Institute of Natural Sciences) visited Mpulungu station at the end of Sept. to initiate the second phase of the field experiment (off Mbita Island) aiming to measure the impact of sediments on biota. The monitoring of this site was carried out by SedSS and BioSS teams twice a week in October and then on a monthly basis after that. Ian Donohue (student from University of Dublin, Ireland) visited Mpulungu for a 7 week period to carry on work on the impacts of sediments on biota.

The aquarium facility is (for the work to be initiated by Dr Ken Irvine in next January) close to completion in the LTBP storage room at Department of Fisheries, Mpulungu (final fittings for the pumping system need to be completed). This experimental work to be carried out by SedSS team will aim to assess behaviour of some specific invertebrates when their environment is impacted by an excess of sediments.

Burundi : DGGM - IGEBU teams continued their work program but due to security problems in some parts of the country field work was limited to Bujumbura area only. This has reduced the field activities carried out by DGGM as part of their programme. The IGEBU team was able to complete the river monitoring activities despite the security problems. DGGM - IGEBU produced at the beginning of November the last quarterly report for their field activities as part of the work programme. The field activities came to an end at the end of Oct. The teams are now concentrating on the production of the final report for Burundi due end of Dec. OD sent to DGGM by email examples of GIS maps that can be incorporated in the Burundian final report. M. Sebahene (National Sedimentation Special Study Co-ordinator for Burundi) organised a meeting on 16 September with the 3 teams (DGGM - IGEBU and University of Burundi) to review

and comment the progress of the work. DGGM - IGEBU teams filled the questionnaire sent out by GP in Oct. which was then translated into English by OD.

In Sept. GP sent out a letter to Dr Evariste Nzeyimana (University of Burundi) after completion of the field work programme to suggest to him that the project could support further field work activities but without payments of PRA. Unfortunately Dr Nzeyimana decided not to go with field work activities.

Tanzania : Dr Nkotagu (National Sedimentation Special Study Co-ordinator for Tanzania, University of Dar es Salaam) after having travelled to Kigoma area in September is now undertaking the final report writing for Tanzania which was due for completion at end of November. Mrs Mbwambo (Tanzanian Bureau of Standards) continues her work on water analysis. Mr Rubabwa after completion of field work activities at Gombe National Park has returned to University of Dar es Salaam to completed his thesis for his Master degree and to contribute to data analysis for the final report. OD sent by email examples of GIS maps that can be incorporated in the Tanzanian final report. Mr Mpyalimi (Water Department, Kigoma) has completed the field work activities at Gombe National Park and Mwongogo village at the end of Nov.

The LARST station at Kigoma has been dismantled until its future location is decided. A possibility is re-installation at the Tanzanian Meteorological School as this currently seems to be the best option for sustainability of regional data measurements after the life of the project.

DR Congo : As the security situation around Uvira permitted field work during the whole of this quarter, the SedSS team at CRH Uvira continues the monitoring of the 3 rivers and river mouths and carried out analysis in the labs according to the workplan. Bombi Kakogozo (National Sedimentation Special Study for DR Congo) and the team produced monthly report for each month and two quarterly progress reports (May to July, and August to Oct.) of the work. The team provided a cost estimation for the installation of the 3 hydrometric stations on the rivers around Uvira and after approval the work has started and is close to completion at the end of this quarter. The records of river water levels undertaken by the team members has started during Nov. A simple current meter has been provided to the team during this period, however this equipment seems unreliable and may cause discharge measurements errors. The team goes on discharge measurements with the floatter method for comparison of data.

Dr Robert Duck (University of Dundee) reviewed the methodology of the analysis of sediments with regards to the new lab equipment now installed at CRH. OD translated the loss on ignition methodology developed by Dr Duck and presented to the team (by email) for incorporation in the lab analysis. OD sent by email examples of GIS maps that can be incorporated in the Congolese final report.

2.4.2 Chronology of Activities

1 - 10 Sept. : OD worked with GP at NRI. Review of work done, strategy till the end of the study, planning of a possible final Sedimentation conference, establishment of a questionnaire then sent to all participants of the special study. Work also with Alan Mills and Valerie Obsomer (GIS component) to incorporate SedSS data into TANGIS.

16 Sept. : A national sedimentation working group meeting initiated by M Sebahene (DGGM) took place in Bujumbura.

18 Sept. : GP sent out to all participants of the SedSS a slightly modified proposition for the SedSS wrap-up conference and a questionnaire to be filled by the teams to summarise findings and recommendations for incorporation in the SAP of the project.

22 Sept. - 5 Oct. : Dr Erik Verheyen visited Mpulungu to initiate the second part of the field experiment off Mbita island to investigate the impact of sediments on biota.

22 Sept. - 10 Nov. : Ian Donohue (student from Univeristy of Dublin, supervised by Dr Ken Irvine) visited Mpulungu to carry on the study on the impact of sediments on biota.

23 Sept. : OD met with Dr Sichingabula at UNZA, Lusaka. Preparation and planning of the field trip of the Lusaka team to Mpulungu.

11 - 25 Oct. : Dr Sichingabula and the Lusaka team (RA from UNZA and MR Sikazwe from Department of Water Affairs, Lusaka) and the Water Affairs team from Kasama carried out discharge measurements at the 5 hydrometric stations installed by LTBP on the Zambian part of the lake Tanganyika catchment.

End of Oct - Beginning of Nov : The 4 regional teams completed the questionnaire sent out by GP in Sept. and submitted their work to him.

17 Nov. : The UNDP Resident Representative for Zambia visited briefly Department of Fisheries and LTBP station in Mpulungu during her familiarisation tour of the Northern Province.

End of Nov. : OD sent to Alan Mills (GIS component, NRI) the first version of the river monitoring database (with data from Burundi and DR Congo).

2.4.3 Staffing Schedule

Main staffing changes over this quarter are listed below.

Following the temporally dismantlment of the LARST station in Kigoma, the Tanzanian Meteorological Department team stopped their activities carried out on behalf of the project.

The complete staff list at the end of this quarter for the SedSS is given below with institutional affiliation.

2.4.3.1 Local staff

Person	Institutional affiliation (or project direct employee)
Dr Hudson Nkotagu	University of Dar es Salaam
Mr. C. Rubabwa	University of Dar es Salaam
Mr. T. Mpyalimi	Tanz Water Dept.
Mr. H. Mdangi	TANAPA
Mr Shaban Shemdoe	Gauge reader – Project (Tanz.)
Mr George Shimba	Gauge reader – Project (Tanz.)
Mr Anatase Baletse	Gauge reader – Project (Tanz.)
Mr Shaban Haruna	Gauge reader – Project (Tanz.)
Ms K. Mbwambo	Tanz. Bureau of Standard
Ms E. Msaky	Tanz Petroleum Dev. Corp
M. Mathias Sebahene	DGGM (Geomines), Burundi
M. Tharcisse Songore	DGGM (Geomines), Burundi
M. Manassé Nduwayo	IGEBU, Burundi
M. Gerard Ntungumburanye	IGEBU, Burundi
M. Bombi Kakogozo	Project (DRC)
M. N'djunga Kahindo	CRH (DRC)

M. Banamwezi Mwenyemali	CRH (DRC)
Mrs Mujinga	CRH (DRC)
Dr Henry Sichingabula	University of Zambia
Mr. Mugandi Nasitwitwi	University of Zambia
Miss Lucy Muwowo	University of Zambia
Mr. Happy Sikazwe	Zambian Water Affairs Dept.
Mr. Sunday Ng'ambi	Zambian Water Affairs Dept.
Mr J C Chama	Zambian Water Affairs Dept.
Mr J B Chipasha	Zambian Water Affairs Dept.
Miss Prisca Chakumanda	Gauge reader – Project (Zambia)
Mr Labson Mpepo	Gauge reader – Project (Zambia)
Mr Daniel Paka Matebele	Gauge reader – Project (Zambia)
Mr Edward Chifunda	Gauge reader – Project (Zambia)
Mr Alfred Mpondela	Gauge reader – Project (Zambia)
Mr Abram Mbao	Gauge reader – Project (Zambia)
Mr. Robert Sinyinza	Zam Fisheries Dept.
Mr. Mutanga Syapila	Zam Fisheries Dept.
Mr Whiteford Chomba	Zam Fisheries Dept.
Mr Kennedy Kaoma	Zam Fisheries Dept.
Mr Gideon Zulu	Zam Fisheries Dept.

2.4.3.2 International staff

Person	Institutional affiliation	Other non-regional support to these institutions (not listed above)
Dr G. Patterson	NRI	SS co-ordinator
Mr Olivier Drieu	NRI	SS facilitator
Dr Andrew Cohen	Department of Geology, University of Arizona	Dr A. Cohen, Dr M. Palacios-Fest, Dr D. Dettman, Dr D. Livingstone, Dr K. Lezzar, Mr J. McGill, Dr C Scholz and Dr B McKee
Dr Robert Duck	Department of Geography, University of Dundee.	Dr S Wewetzer
Dr Ken Irvine	Department of Zoology, Trinity College, Dublin	Mr Ian Donohue, Dr P. Tierney, Dr E Verheyen
Dr Leo Goeyens	Department of Chemistry, Vrije Universiteit Brussels.	Dr N. Brion, Dr W Baeyens
Dr Martin Wooster	Department of Geography, Kings College London.	Dr N Drake, Elias Symeonakis, Xiaoyang Zhang, Ross Bryant, R. Loftie

2.4.4 Main Outputs and Achievements

The main objectives for this quarter were given in the previous quarterly report (June 1999 – August 1999) as follows :

SedSS team from the CRH, Uvira to install 3 hydrometric stations on the rivers around Uvira (if security situation permits).

Tharcisse Songore (DGGM) to finalise (report) with Dr Kelly West and Dr Ntakimazi (University of Burundi) their findings and data on the impacts of excess of sediments on the biodiversity of the Lake at sites identified by DGGM.

Ian Donohue (student University of Dublin) to travel to Mpulungu for the next phase of the study on the impacts of sediments on biota (for a 7 week period starting at the end of September).

Erik Verheyen (Royal Belgian Institute of Natural Sciences) to travel to Mpulungu to initiate the second phase of a field experiment survey to measure the impact of sediments on biota (for a 2 week period starting at the end of September).

Dr Sichingabula (UNZA) to travel to Mpulungu for the monitoring of Zambian rivers as part of the extension programme in Zambia (mid-October).

Mr Rubabwa (student at University of Dar es Salaam) to complete his hydrological study on Gombe National Park area by end of October.

Dr Nkotagu (University of Dar es Salaam) to produce the Tanzanian final report of the SedSS by the end of November.

OD to install the aquaria facility at Mpulungu station.

OD to finalise with Dr Sichingabula, the Director of Water Affairs, Lusaka and the Provincial Water Engineer, Kasama the future of the stations and the gauge readers possible employment by Water Affairs after the life of the project.

GP and OD to further formulate plans for a windup meeting and reporting format for the Special Study.

All the objectives for this quarter were achieved though the Tanzanian final report is expected soon and the installation of the hydrometric stations in DR Congo should be completed early in Dec.

Due to the security difficulties occurring in the two Francophones countries, OD was not able to travel to Bujumbura nor Uvira during this quarter.

2.4.5 Main Objectives for the Next Quarter (December 1999 – February 2000)

As the Sedimentation Special Study is coming close to completion in the riparian countries, most of the field work carried out by the riparian local teams on behalf on the project will end at the end of December 1999. The team based at Department of Fisheries, Mpulungu will operate with a team reduced to 3 members. The team based at CRH, DR Congo will go on their work programme until March 2000. The Tanzanian, Burundian and Zambian (UNZA and Water Affairs) will concentrate their efforts on production of draft of final reports.

Dr Ken Irvine to visit Mpulungu station (Jan 2000) to work on the impact of excess of sediments on biota, to initiate the experimental study with the aquarium facility and to discuss possible future monitoring programme to be carried out by the SedSS team at Department of Fisheries.

Dr Sichingabula and Mr Sikazwe to produce (end of January 2000) the final report for the sediment monitoring activities in the Southern Lake Tanganyika basin, including analysis of the data collected during the extension period and annexes of all data collected during the work period, and research proposal for further work on sediment monitoring in the Zambian catchment.

The Water Affairs vehicle (GRZ 429 BE) to be handed over to the Department of Water Affairs, Kasama at the end of Dec. 99.

Mr Mwansa to formally provide an answer regarding the transfer of the 6 gauge readers from LTBP to the Department of Water Affairs.

OD to finalise with Dr Ken Irvine future monitoring programme for the SedSS team, and to liaise with Dr Kelly West and the other regional facilitators for the future monitoring programmes for the teams.

Dr Nkotagu to produce the draft of the Tanzanian final report early during the next quarter.

DGGM - IGEBU team to produce the draft of the Burundian final report by end of Dec. 99.

OD to travel to Kigoma with members of the Congolese team to train them on data analysis security permitting.

OD to complete the river monitoring database for its incorporation into TANGIS, in collaboration with Alan Mills

9-12 Jan : GP to attend IDEAL meeting in Malawi to discuss wider issues of African Great Lake conservation

Final reports of all SS groups to be circulated as soon as possible (target for last reports end of April 2000)

13 Dec 99 - 4 Jan : OD will be on leave.

2.5 Progress Report: September 1999 – November 1999 for Special Study on Pollution and its Effects on Biodiversity.

Owing to absence of SS co-ordinator held over to next quarter.

2.6 Progress report: September 1999 – November 1999 for Socio-economics and Environmental Education components

2.6.1 Overall summary of progress

Over the past quarter all four national teams have completed their preparations for field work, and in Congo, Tanzania, and Zambia, detailed socio-economic studies of lakeshore communities have commenced, with reports due imminently.

The first SESS Working Group Meeting (WGM) was held in Kigoma, Tanzania between 9 and 12 November. All four National Socio-economics Co-ordinators (NSECs) attended, along with an additional member from each national team, and the SESS Co-ordinator and Facilitator. The main aim of the workshop was to achieve a co-ordinated understanding of the SESS work programme across the four countries, and to facilitate the exchange of ideas and information.

Specific objectives were:

- to share knowledge gained to date on current livelihood strategies and socio-economic practices around the lake and in the catchment area;
- to share knowledge to improve the survey work, particularly data collection, data analysis and report writing;
- to produce national workplans for the remainder of the Special Study; and
- to identify directions for action regarding the SESS contribution to the Strategic Action Programme.

Methods included formal individual and team presentations, participatory group discussions, and team/individual discussions with the SESS Co-ordinator and Facilitator. The meeting was extremely successful, especially in fostering an SESS team spirit, and developing a regional network and capacity. Preliminary results from the surveys undertaken to date were presented and discussed, which provided interesting regional insights, as well as identifying new areas for study. Experiences were shared and each individual contributed to capacity building by sharing his or her area of expertise, be it as an academic sociologist, or lakeshore based extension worker. Each team presented its proposed workplan, which was then critiqued by the group, and modified accordingly. Initial SESS contributions to the SAP were discussed, but it was decided to meet again in March 2000 to report and critique final survey results, and to formulate the SESS' recommendations for the SAP.

Burundi

The first NSEC prepared interview guidelines and selected a team and trained them in the methods to be used, as well as undertaking reconnaissance trips along the length of the Burundian lakeshore to stratify and identify study sites, and to sensitise local authorities. Data collection will commence in Gatumba, near the border with Congo, as soon as security permits. In November, the first NSEC was offered another position overseas, and left the project. Dr Oda Sindayizeruka, formerly the Assistant NSEC, replaced him, and attended the WGM in her new capacity.

Congo

The NSEC has, with the SEF, trained the team selected in the methods to be used, and has undertaken reconnaissance trips in the area around Uvira to identify study sites and to sensitise local authorities. A four day pilot study was conducted in Kigongo village, south of Uvira; the data are currently being analysed and the report written.

Tanzania

The NSEC has selected and trained a team, and prepared interview guidelines. Using existing knowledge and experience, he has also stratified and identified study sites along the length of the Tanzanian lakeshore. A three-day pilot study was conducted in Mwamgongo village, north of Kigoma. Approximately forty detailed household interviews were conducted; these focussed on household composition and livelihood/survival strategies and provided quantitative socio-economic data that are currently being analysed. Preliminary results indicate that the economy of Mwamgongo is heavily dependent on fishing, and that most households are involved

in fishing in some way, most commonly through male hired crew members. Cultivation of cassava is very much a secondary economic activity; although there are severe problems with erosion on the steep slopes of the escarpment, little is currently done to combat this. There is a small but very prosperous minority who are the owners of the fishing gear and are also involved in trade, shop keeping, transport, and the cultivation of oil palms as a cash crop. Poorer households include those composed of elderly couples who are dependent on their children and grandchildren, or on begging, young couples starting out in life, or very recent arrivals, many of whom have come from Burundi. Almost all households have adequate food security, and regularly consume fish, although several instances of protein deficiency in recently weaned toddlers were recorded. Other economic activities apart from fishing, fish processing, and cultivation are limited, but include the processing of palm oil, baking, and sewing. A few individuals also have full time paid employment, usually as government officers (teacher, health worker, etc.). Despite strong Islamic leadership, the village has terrible sanitation problems, and local bylaws governing the use of water resources are not enforced, resulting in frequent and often serious outbreaks of diseases such as cholera and typhoid.

Zambia

The NSEC and lakeshore based Survey Co-ordinator have selected a team and, with the SEF, prepared interview guidelines and trained the team in the methods to be used; using existing knowledge and experience, they have stratified and identified study sites along the length of the Zambian lakeshore. A three day pilot study was conducted in Chisanza village, near the border with Tanzania. Methods used included participatory community meetings, as well as smaller themed meetings with groups of village elders and leaders, fishers, farmers, and women. PRA tools such as mapping and transect walks and timelines and seasonal calendars were used to explore both spatial and temporal/historical aspects of village life, and villagers defined their criteria for wealth and well being. Approximately forty detailed household interviews were conducted; these focussed on household composition and livelihood/survival strategies, and provided more quantitative socio-economic data. These are currently being analysed and the report written, but preliminary results indicate that Chisanza is a diverse community primarily composed of cassava farmers and fishers, but also including prosperous cross border traders and land owners who use hired agricultural labour; interestingly, some of these are former fishing gear owners who have diversified as catches have declined locally in recent years. Poorer households included those composed of elderly couples or widows, many of whom were largely dependent on their children and grandchildren. Some households had complex economies, with members undertaking a variety of income generating activities, such as brewing traditional local beers, baking, or sewing; a few individuals also had full time paid employment, such as bricklaying, or as a chef in a nearby tourist lodge.

2.6.2 Chronology of activities

7 -8 September	training course for Congolese team at CRH, Uvira
15 - 17 September	training course for Burundian team at CURDES, Bujumbura
9 October	training course for Zambian team at DoF, Mpulungu

11 – 13 October	data collection in Chisanza village, Zambia
18-21 October	data collection in Kigongo village, Congo
25 October	training course for Tanzania team at TAFIRI, Kigoma
26 – 28 October	data collection in Mwamgongo village, Tanzania
9-12 November	first SESS WGM, Kigoma

2.6.3 Staffing schedule

The national teams in each of the four riparian nations are made up of officials from relevant government departments, national universities and research institutions, and local NGOs, and are primarily lakeshore based.

Burundi

Dr Andre Muhirwa	CURDES	NSEC (September & October)
Dr Oda Sindayizeruka	CURDES	NSEC (November)
Dr Sr Christine Ngendakuriyo	CURDES	
M Sc Prudence Ndayishimiye	CURDES	
M Mattias Kinezero	CURDES	
M Ferdinand Bararuzunza	CURDES	

Congo

M Gerard Kitungano	CRH	NSEC
M Kwibe Assanji	CRH	
M Byaya Kalondji	CRH	
M Mukirania Muke	CRH	
M Olivier Nshombo	CRH	
M Bulambo Mutete	CRH	

Tanzania

Dr Claude Mung'ong'o	IRA	NSEC
Mr Bartholomew Tarimo	NEMC	
Mr Omari Kashushu	TAFIRI	
Mr Hamza Mabochi	DoCD	
Mr Amani Kingu	TACARE	
Mr Moshi Sanze	TACARE	

Zambia

Mr George Mushimbwe Chitalu	ECZ	NSEC
Mr Frighton Ng'andu	DoF	Survey Co-ordinator
Mr W Chomba	DoF	
Mr J Chimanga	DoF	
Mr E Chipulu	DoF	
Mrs O Chisala	DoA	
Mrs Mlutula	DoE	
Mr Mugala	DoE	

International

Dr Kate Meadows	NRI	SESS Co-ordinator
Ms Karen Zwick	LTBP	SESS Facilitator

2.6.4 Main outputs and achievements

- Team preparation and training in all four countries
- Data collection at pilot sites in Congo, Tanzania, and Zambia, first analysis of data and report drafts
- First SESS WGM
- National workplans for all four countries to the end of the SS

2.6.5 Main objectives for the next quarter

- Submission and review of first reports from Congo, Tanzania, and Zambia
- Studies at one site in each country planned, undertaken, and reported in December (including a pilot study in Burundi)
- Studies at one site in each country planned, undertaken, and reported in January
- Studies at one site in each country planned, undertaken, and reported in February

2.6.6 SESS Facilitator activities

1 – 9 Sept	BUJ/UVR	Support to Burundian and Congolese NSECs Training in Congo
10 Sept – 5 Oct	KGM	Station administration Preparation and planning of Zambian survey work
6 – 18 Oct	MPU	Support to Zambian NSEC and Survey Co-ordinator Training in Zambia Data collection in Zambia
19 Oct – 8 Nov	KGM	Preparation and planning of Tanzanian survey work Support to Tanzanian NSEC Training in Tanzania Data collection in Tanzania Preparation for SESS working group meeting
9 –12 Nov	KGM	SESS WGM
13-19 Nov	KGM	Work with SESS Co-ordinator
20 – 30 Nov	KGM	Review of report drafts Preparation and planning of upcoming survey work.

2.7 Progress Report: September 1999 – November 1999 for GIS and database management.

2.7.1 Overall Summary of Progress

The GIS was due to be implemented in the region this quarter. Initial agreement on the mode of implementation of the GIS at the MINATE GIS centre in Bujumbura has been reached, and discussions have advanced this quarter on how to integrate the GIS outputs from LTBP with other MINATE activity. However, due to the situation in Burundi, the proposed installation of the metadatabase and database in Bujumbura was not possible in November. Despite this, work has continued to ensure a complete installation and training programme will be possible when the situation permits. Translation of the GIS interface into French and the preparation of user and database management manuals and training courses have been completed.

A complete data audit was completed for the database and a new series of catalogues will be published on the web site soon. A new edition of the GIS newsletter has been created and will be posted to the web site soon.

More progress has been made for the integration of datasets from the Special Studies (SS) into the GIS, with the development of a draft Sedimentation river monitoring database.

2.7.1.1 Datasets

NRI has created new data or enhanced existing datasets, several datasets being obtained during the visit to the region.

- Substrate maps for Mahale Park from the Biodiversity SS have been digitised into TANGIS. Further digitising of survey work in Congo (Uvira), Tanzania (Gombe) Burundi (entire coastline) and Zambia (SW lake) is under way.
- A demonstration Sedimentation River Monitoring Database has been created and forwarded to the region for assessment. It has utilised existing data for Congo and Burundi.
- A map has been created delimiting the three main basins of the lake, based on the available bathymetry data.

2.7.1.2 Programming.

The entire TANGIS interface has been translated into French.

2.7.1.3 Other activities

The LARST station will remain at TAFIRI and discussions are continuing to look at its long term future within TAFIRI and utilised by the Meteorological Training Centre in Kigoma.

2.7.2 Chronology of Activities

September - writing of user and database manual

October - preparation of training materials

October - postponement of training and installation visit to region.

October- Translation of TANGIS interface into French.

November - development of databases and substrate datasets

2.7.3 Staffing Schedule

UK (NRI)

Alan Mills, Geographer; GIS developer

Anne Jackson, Data liaison officer

Valerie Obsomer, GIS specialist and trainer

Rupert Loftie – LARST co-ordinator

2.7.4 Main Outputs and Achievements

Complete translation of the TANGIS interface into French.

Completion of manual and training materials

Preliminary agreement for the installation of the metadatabase and database in Bujumbura

Further linkages between the GIS and Special Study databases completed.

2.7.5 Main Objectives for the next quarter (December 1999 to February 2000)

Due to the postponement of the training and installation visit to the region in the current quarter, these activities have been rescheduled.

1. Installation of TANGIS database and metadatabase in region (February)
2. Transferral of TANGIS laptop PC to MINATE in Burundi (February), with prospect of future transfer of PC to Burundi by project end.
3. Training courses and presentations in region (February)
4. Appointment of metadatabase manager, agree locations national data assimilation centres and transfer of metadata responsibility to region (February).