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Progress Report No 9

March - May 1998

Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika (RAF/92/G32) Lutte contre la pollution et autres mesures visant à protéger la biodiversité du Lac Tanganyika (RAF/92/G32)

Le Projet sur la diversité biologique du lac Tanganyika a été formulé pour aider les quatre États riverains (Burundi, Congo, Tanzanie et Zambie) à élaborer un système efficace et durable pour gérer et conserver la diversité biologique du lac Tanganyika dans un avenir prévisible. Il est financé par le GEF (Fonds pour l'environnement mondial) par le biais du Programme des Nations Unies pour le développement (PNUD)''

The Lake Tanganyika Biodiversity Project has been formulated to help the four riparian states (Burundi, Congo, Tanzania and Zambia) produce an effective and sustainable system for managing and conserving the biodiversity of Lake Tanganyika into the foreseeable future. It is funded by the Global Environmental Facility through the United Nations Development Programme.

Burundi: Institut National pour Environnement et Conservation de la Nature
D R Congo: Ministrie Environnement et Conservation de la Nature
Tanzania: Vice President's Office, Division of Environment
Zambia: Environmental Council of Zambia

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

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1. Project Co-ordination Unit

1.1 Project Co-ordinator and Scientific Liaison Officer

1.1.1 General Summary

Good progress has been made on several fronts during the last quarter in all four riparian states. The Strategic Action planning process has taken off with preliminary meetings of the National Working Groups taking place in Zambia and Tanzania; similar meetings are now confirmed for Burundi and DR Congo in June and July respectively. See section 1.1.2 below. Reports from these meetings are given in Appendix 1 in order to assist full integration across special studies and countries. Comments from any recipients of these reports are more than welcome.

The four facilitator posts agreed at the TPR/SCM in January were advertised in the international journal *New Scientist*, on the internet and in the national press or radio in the four riparian states. Interviews will be held in the second week of July.

The in-depth training needs assessment exercise also agreed at the TPR/SCM has been initiated. A two person mission will visit all the capitals and lake shore bases during May and June to assess the training already done or underway and future training needs in order to develop an integrated programme of training activities on which the project can act with the minimum of delay.

Related to the projects current training activities three university students from each of the riparian nations were selected to participate on the Nyanza Project in Kigoma from 1 June – 10 July 1998. The students will join an intensive training course on the geology, limnology and biology of lakes and complete independent research projects in one of these domains under the guidance of a team of international scientists.

The Scientific Liaison Officer visited Bujumbura and Uvira Stations twice during this quarter, 17-27 March and 15-29 May and Mpulungu Station 1-8 May and her move to Bujumbura is now confirmed for mid-June. Refurbishment of office and lab space provided by GoB in Bujumbura for the project is complete and an effective project presence is now established.

During visits to DR Congo, the SLO took further steps to complete the contract for refurbishing the Centre de Recherche en Hydrobiologie-Uvira with the contractor chosen from the earlier evaluation undertaken by the director of CRH, the Project Coordinator and the SLO. Final contractual matters and a process for quality control of the work will be established shortly and the 12-week refurbishment will begin in July 1998.

Also during the SLO's visit to DR Congo, courtesy calls were made and attestations were obtained for duty-free importation of equipment that is beginning to arrive for Congo, including: the project vehicle (which had been blocked in transit in Kigoma for more than a year because of the revolution), dive gear, microscopes and computer equipment.

In Bujumbura, the Sedimentation Special Study Leader met with national institutions to push forward activities, the BIOSS team completed their study of Ruzizi Park and have now begun habitat mapping, biodiversity censuses and profiles along the Burundian

coast, and the Pollution Special Study Leader recruited a team and began sampling and analyses in Bujumbura Bay and its influent rivers, some of the most heavily polluted sites on the lake. Plans for the technical BLOSS workshop in Bujumbura have been finalised

Dr. Francis Chale made links with the University of Dar es Salaam and the Tanzanian Pesticides Research Institute for heavy metals and pesticide analyses and has rejoined the PSS team in Kigoma for a 1 year tour. Mr. Bart Tarimo (National EE Coordinator) planned an environmental education initiative to celebrate World Environment Day, 5 June 1998, and travelled to Kigoma to establish a WED committee and action plan.

Paul Tierney travelled to Mpulungu to push forward activities for the SSS and check on progress of the BLOSS team. Nikki Wiltshire was in Mpulungu at this time working with the PSS. During the Scientific Liaison Officer's trip to Mpulungu Station, the SSS, PSS and BLOSS teams plus Tierney and Wiltshire had a meeting to integrate some of the special studies sites.

David Silverside, the lead person taking over the financial management of the project within NRI visited the PCU office in Dar es Salaam.

1.1.2 Steering Committee Meeting

The date for the next meeting of the Regional Steering Committee meeting has been fixed for August 12 1998 the will be followed on 13 August by a meeting of the Technical Advisory meeting to discuss its role in the Strategic Planning process. Both meetings will take place in Arusha, Tanzania.

1.1.3 Strategic Action Plan

In April the project contracted Jean-Paul Ledant to work as facilitator for the SAP in the francophone countries; Nicholas Hodgson will continue to support the anglophone countries and the overall regional SAP development.

The first stage of the agreed process was to convene the National Working Groups, for a planning meeting in each country, with the objective of defining the information requirements and participants that would be required to carry out national commitments to the development of the regional SAP.

Planning meetings have been held during this quarter in Zambia and Tanzania, and similar meetings will be held in Burundi on 30 June and in DR Congo on 14 July. The francophone facilitator also participated in the Zambia meeting.

1.1.3.1 National Working Group Planning Meeting - Zambia

The first planning meeting was held in Lusaka on 27/28 April 1998. The meeting set dates for the two national workshops. The National Sectoral Problem Review workshop will be from June 29 to July 3, and the National Environmental Strategies and Priorities Review from August 31 to September 4.

The National Working Group has assigned tasks to specific individuals in key institutions to prepare background materials for the first workshop. The meeting expanded the normal membership of the working group, for the development of the SAP to include representatives from the communities, the private sector, local and international NGOs, the University, and international aid organisations.

1.1.3.2 National Working Group Planning Meeting - Tanzania

The first planning meeting was held in Dar es Salaam on 26/27 May 1998. The meeting set dates for the two national workshops. The National Sectoral Problem Review workshop will be from July 27 to 31, and the National Environmental Strategies and Priorities Review from September 21 to 25.

The National Working Group has assigned tasks to specific individuals in key institutions to prepare background materials for the first workshop, and as in Zambia, the meeting expanded the normal membership of the working group, for the development of the SAP to include representatives from the communities, the private sector, local and international NGOs. The National Working Group will hold an interim meeting, bringing together all those contributing backgrounds, on June 16.

1.1.3.3 Reports

Following these meetings, reports have been prepared in each country on the conclusions of the meetings (Appendix 1) as well as a report proposing Objectives, Background and Guidelines for the National Sectoral Problem Review, (Appendix 2) The objective of the first workshop in each country is to define from a national perspective:

“...the main biodiversity problems of the lake, identifying the sectoral causes of those problems; and to review the priority management actions that (the country) can take to resolve those problems.”

1.1.4 Goals for Next Quarter

The project has confirmed dates for three further steps in the development of the SAP for the next quarter, as follows:

- June 29 National Sectoral Problem Review Workshop Zambia
- July 27 National Sectoral Problem Review Workshop Tanzania
- August 31 National Environmental Priorities and Strategies Review Zambia

The project will prepare national reports following these meetings. In addition the project expects to hold the Regional Steering Committee Meeting back to back with the first Technical Advisory Committee Meeting on August 12/13. At this meeting the membership of the TAC will be reviewed and adapted for the purposes of carrying out the regional Transboundary Diagnostic Analysis and drafting the SAP. The meeting will also confirm dates for the proceedings, which are expected to involve meetings in October/November 1998 and January 1999.

1.2 Technical Officer

IT Equipment: All remaining IT equipment and VHF radios were installed in all riparian stations (except Uvira, ETA June 98). HF radio units for all four stations have been ordered and shipped.

Special Study Group Equipment: Scuba gear arrived and has been deployed to the Bujumbura and Uvira Stations. Microscopes arrived at all four riparian stations.

Vehicles: One Toyota 4-wheel drive pickup is in transit to the Bujumbura Station. The Uvira vehicle was transported from Kigoma to Bujumbura in transit to Uvira in early June.

Generators: The 44kVa generator is now fully operational at the Kigoma Station. A routine maintenance program now exists for all generators at the Kigoma Station.

Boats: Plans for the refitting of the R/V Silver Shoal at the Mpulungu station were finalised. Outboard motors arrived for the Bujumbura, Kigoma, and Uvira Stations. A regular maintenance program for outboard motors now exists at all riparian stations. Rigid inflatable boats are in transit to the Bujumbura and Uvira stations. Three 22 foot fibre glass boats and engines were ordered and are for use by the special studies.

Inventory: A complete inventory of all stations was undertaken and integrated into the Master Inventory. The 9-page Microsoft Excel file is still under construction, but is available from the PCU.

Newsletter/Website: The 1st edition of *Lakeside*, LTBP's newsletter went to the printers. Work on the next edition has begun. Website housing and CD-ROM issues are still under investigation, but should be resolved in July. LTBP provided a brochure detailing our web site for the 1st meeting of the UNDP/GEF IW:LEARN Advisory Panel in June. A copy of this brochure is available from the PCU.

Training: Bujumbura Station staff were taught how to install and use computer equipment. Bilingual instruction on the use and care of IT and radio equipment will be held at the Kigoma Station in June and at the Bujumbura, Mpulungu, and Uvira Stations in July and August.

The TO's base of operation has been reassigned to Bujumbura as of 1 May 1998 in order to facilitate the rapid completion of the Bujumbura and Uvira Stations.

Duty - Travel: The TO spent three weeks at the Bujumbura Station, 3 days at the Uvira Station, 7 days at the Mpulungu Station and 10 days in transit.

1.2.1 Goals for Next Quarter:

1. Installation of the HF radio communications network;
2. Arrival of vehicles at the Bujumbura and Uvira Stations;
3. Training at all four stations in the usage and maintenance of IT and communications equipment;
4. Identification and training of one person from each station who will be in charge of maintaining IT/Communications equipment into the future;
5. The website will be on-line and CD-ROM production will begin;
6. Coordination of LTBP's participation in the UNDP/GEF IW:LEARN initiative will continue;
7. The LTBP newsletter Vol. 1 Issue No. 2 will be published and distributed.

1.3 Kigoma Station

Renovations of an old, dilapidated "fish-shaped" storehouse at TAFIRI were completed and the Scientific Liaison Officer and her administrative assistant moved into these new quarters. In addition to office space for the SLO and the administrative assistant, the facility includes a documentation centre, a communal work area with computers, a meeting room and a reception area.

Mr. Bart Tarimo visited Kigoma to make plans for World Environment Day, 5 June 1998. A local committee was formed to coordinate activities, a schedule of events was planned, and courtesy calls were paid to local officials to inform them of the proposed program. The committee worked diligently throughout the months of April and May to

prepare publicity and exhibitions and coordinate educational activities and cultural events.

Dr. Francis Chale visited the University of Dar es Salaam and Tanzanian Pesticides Research Institute to make arrangements for the analyses of heavy metals and pesticides and then returned to Kigoma for a one-year contract to oversee activities for the PSS.

The Fishing Practices special study continued with their analyses of fishing gears and catches at Ujiji, Luiche, Katonga and Gombe.

Preparations were made for the Nyanza Project, an intensive six week training course on geology, limnology and biology of African Lakes slated from 1 June – 10 July 1998 hosted at Kigoma Station. LTBP is sponsoring 12 African students from Lake Tanganyika's riparian nations for this event.

1.4 Mpulungu Station

1.4.1 General

The major achievements during this quarter were:

- Progress was made in setting up, expanding and continuing sampling programs for the Pollution, Sedimentation and Bioass Studies, including a draft integrated program
- Office IT equipment has been installed and is working
- Microscopes have arrived and are being used
- The EE program has constituted the stratum committees and is ready for the education component to begin

1.4.2 Visits

The following visited Mpulungu Station during the quarter

- Paul Tierney, who started up the sedimentation sampling program, advised on a program of work for the Bioass team and planned an integrated program
- Kelly West, who made her first contact with Mpulungu station, and worked successfully to bring administrative procedures in line with Kigoma and other new stations
- Jerod Clabaugh, who installed the IT equipment
- Nikki Wiltshire, who checked on the progress of the pollution studies, and has now moved here full time as pollution co-ordinator for Zambia and Tanzania
- Shadreck Nsongela, first to participate in the debate on the Strata committees, and secondly to lead the National Working Group visit
- Mlotha Damaseke, who participated both in the debate and the election of strata committees
- Patrick Chipungu who led the elections of the strata committees
- Monique Trudel and Rachel Roland, who were undertaking a consultancy on training needs
- Tony Bailey-Watts, monitored progress with the pollution study, and expanded the sampling schedule
- Many local visitors, including Senior Chief Tafuna, and the Ethnologist from Moto-moto museum, who were renewing contact in order to monitor progress, or making contact for the first time.

1.4.3 Activities

Office and equipment

The facilities of the station continue to grow with the arrival of new computers, microscopes and a grab, which expand the project's capacity to carry out its work program.

There have been continuing delays in rehabilitation of Silver Shoal, caused by delays in acquiring time on a commercial slipway. Failure to repair the DoF welding machine rules out the possibility of doing most of the work in situ.

The National Working Group visited the station to acquaint themselves with Lake Tanganyika, which was unfamiliar territory for most of the members.

E.E Program

Two seminars were held, one in Mpulungu and one in Nsumbu, to discuss the composition and procedures of creating the strata committees, and a tour of the lake was made to formalise these committees. Since then some of the committees have met, but there is a great and urgent need to initiate a program of training for these committees, for the promised materials to be made available, and a program of environmental debate to be initiated.

BIOSS Program

During a storm early in the quarter, a previously rocky shore was buried under a layer of sand and the former rocky shore fish vacated the coast. Since then, the rock has been re-exposed and the original species are coming back. The Bioss team is monitoring these changes in species and substrate composition.

A program of routine Bioss monitoring was designed, but has not yet started to be implemented.

Pollution Assessment Program

Following the initiation of this work, routine weekly sample collections and analysis are proceeding smoothly. The number of sites has been expanded from three to six during the course of the quarter.

Sedimentation Study

A routine sampling and analysis program was designed and began to be implemented during the quarter.

Integrated Study

A monthly sampling program integrating the pollution, sedimentation and Bioss studies has been designed, and is due to start implementation next month. This involves the pollution team and the Bioss team joining the sedimentation teams for their monthly sampling program, which for a number of days will be more thorough than routine.

1.4.4 Goals for next Quarter

1. Initiate sampling and analysis work monitoring program for trained staff in BIOSS and Integrated studies.
2. Continue routine programs in sedimentation and pollution
3. Start an education program for the Strata Committees
4. Make a delayed start on the SE program
5. Rehabilitate Silver Shoal,
6. Collect and launch Utility boats
7. Finalise the letter of agreement with "DoF"

8. Obtain blanket authority for travel of local staff on project activities
9. Procure a comprehensive spares supply for Silver Shoal and outboard engine

2. Reports of Special Study groups

2.1 Progress Report: March 1998 - May 1998 for "Biodiversity" Special Study and "Conservation Activities"

2.1.1 Overall Summary of Progress

The development of the BIOSS workplan into a working document at the beginning of this quarter, proved to be a useful approach. The activities carried out to date can be seen clearly against appropriate objectives and the status of various outputs is clarified. Anticipate that the workplan will regularly be developed and updated throughout the course of the SS: it will be distributed within the project as a working document for discussion and information sharing.

Plans for the technical BIOSS workshop in Bujumbura have been finalised. The approach for this workshop is participatory, with less emphasis on formal teaching sessions and more on developing capacity to carry out an integrated programme of research. In addition to the four international experts attending the workshop, regional researchers (themselves often experts in the field) will present sessions. Dr E. Allison will facilitate several round-table discussions on survey design and strategy, database management and analysis, and conservation strategies. Many of the workshop participants attended the dive and survey training in Kigoma (Sept 97). Therefore, this workshop will be an important follow-up to this earlier training as it provides a chance to reassess the field craft developed with the teams and discuss/assess future training needs. The BIOSS field survey database being developed at MRAG to support the field programme will be presented at the workshop. Various BIOSS technical reports and documents, as noted in last report, continue to be prepared. Deadline for these is set for the Bujumbura workshop.

The completion of the Biodiversity database (literature-based) was a significant milestone for BIOSS this quarter. The database is a tool for BIOSS to review current levels of biodiversity - the first of BIOSS's objectives. Technical comments have been sought from Dr K West (LTBP, SLO) and researchers from the SIAL group in Belgium. It is expected that the database will be sent to Bujumbura soon and the activities necessary to identify key data from both published and unpublished sources can begin. Dr Ntakimazi and another Burundian researcher will travel to Europe and discuss data availability with several research groups.

Both Burundi and Zambia continue to make good progress in their field programmes. The Burundian team have carried out extensive surveys of the coast adjacent to Ruzizi National park, expanding their team to include a botanist and terrestrial biologist. They have mapped the area and are able to compare these results with previous work carried out in the region. The next area for the team's attention is Bujumbura Bay. The recent overlap between SEDSS and BIOSS field teams in Zambia is particularly significant in terms of integrating the special studies. By sampling the same sites on the same days the two field teams will exchange information and skills and therefore develop their ideas on the impacts sediments have on biodiversity. This is an important first step in building the capacity of regional researchers to assess their resource and provide information that should improve management decisions about the lake.

The Tanzanian BIOSS team is not well established and so no programme is operational. However, the two trained divers have been involved in other SS's (POLSS) and

associated project activities. The Congolese team have been involved in limited ways with survey activities in Burundi while waiting for their equipment to arrive. Recently the Congolese dive team posted a work plan proposal to London. Dr Allison will review this proposal with the team during the workshop. Their initiative in this respect is welcomed, and it is anticipated that the Congolese field programme will be rapidly established after the workshop.

A reporting schedule has been agreed between UK (VC/EA) and Bujumbura (Prof. Ntakimazi) so that the BIOSS team can contribute directly to these progress reports. It is anticipated that eventually, all established field teams will report in this manner. Therefore, reports such as this one will provide a regional synthesis of BIOSS progress and will be submitted to the PCU and the national teams.

2.1.2 Chronology of Activities

- March BIOSS workplan updated and disseminated within LTBP and to external advisors.
- March Plan for DR Congo cruise which BIOSS has agreed to support (September 1998) received from Dr E Verheyen, SIAL group representative, Belgium. Discussions on logistics continue with SLO/PCU.
- April Extensive report of activities (Dec97-Feb98) received from Dr Ntakimazi, BIOSS coordinator, Burundi. Translated from French by MRAG. Unfortunately missed deadline for that time period but has informed this report - see below.
- April To address issues raised by delay of second dive course for Anglophone parks staff (see previous report for background/justification) an email summarising events and issues was sent to LTBP staff for comment (VC). Important issue for LTBP to address as directly relevant to meeting one of the final LTBP outputs, namely establishing underwater reserves. Discussion ongoing throughout quarter.
- April Additional BIOSS field sampling equipment identified for general SS equipment order.
- April Presentation (VC) to MSc students about LTBP, particular reference to BIOSS. MSc course in Taxonomy and Biodiversity run jointly by The Natural History Museum and Imperial College, London. Workplan made available to students who were interested to see practical application of their technical knowledge.
- April-May Survey database for BIOSS developed in line with forms and draft standing orders documents.
- April-May Plans for international experts to attend BIOSS technical workshop for Francophone countries advanced.
- May Overlap between BIOSS and SEDSS established in Zambia with joint consultancy for Dr P Tierney (one of dive trainers). Integrated work programme set with joint sites.
- May Dr E Allison to Belgium to discuss overlap between SIAL researchers and BIOSS. Specifically, BIOSS plans to support SIAL DR Congo cruise, Belgian scientists training regional researchers during analysis of cruise data (Europe), SIAL group hosting Burundian scientists in the development of the biodiversity database.
- May Biodiversity database finalised and set to SIAL/SLO for technical comment.
- May BIOSS updated workplan sent to Dr R Lowe-McConnell (UK) and Dr G Coulter (NZ). VC meeting with Dr Lowe-McConnell to discuss document.
- May Terms of Reference written for BIOSS coordinator for DR Congo, SLO to follow-up.

- May Literature request from BLOSS team in Zambia sent to London, investigations made on availability and list being compiled with help from SIAL team, Belgium and Dr Lowe-McConnell.
- May Information requested from Zambia on the state of regular sampling of deep water. Dr M Pearce, sent a costed appraisal to MRAG for consideration. MRAG requested update on regional budget from NRI so financial feasibility of plan can be assessed.
- May Congolese dive team have posted a suggested workplan to London. Included proposed list of sites under the following headings: pristine, impacted by sedimentation, impacted by fishing practices and impacted by pollution, river mouths. Estimate of time and equipment requirements noted.
- March-May Burundian team's activities (as reported by Prof. Ntakimazi and Mr F Niyicayenzi):
 - Identification of relevant literature from sources in Bujumbura, namely: Prof. Ntakimazi's private collection (University of Bujumbura); INECN library; FAO library; FAO/FANNIDA library;
 - received the diving material and began survey work;
 - finalised the map of the delta of the Ruzizi; and,
 - starting to plan survey work in Bujumbura Bay, which is considerably impacted by sedimentation, fishing and pollution.
- March-May Zambian team's activities (as reported by Dr Tierney)
 - joint field sampling with SEDSS
 - reviewed equipment requirements, and submitted formal request
 - regional teams' reports reviewed by international consultant (Dr Tierney)
 - work plan developed with Dr Tierney including sampling joint sites with SEDSS,
 - extensive mapping of Zambian coast, initiating joint sampling with other SS's.

2.1.3 Staffing Schedule

Burundi

Dr Gaspard Ntakimazi. Professor at the University of Burundi, Co-ordinator of the BLOSS team in Bujumbura, working for the project part time.

M. Felix Nicayenzi. Biologist and diver, head of field team, working for the project full time.

M. Benoît Nzigigahera. Manager and research biologist with INECN.

M. Nestor Nigarura. Manager and research biologist with INECN.

M. Bernard Sinunguka. Technician in the Department of Water and Forestry, Ministry of Agriculture, diver, responsible for the maintenance of the diving equipment.

M. Libère Ndayisenga. INECN agent based at Ruzizi Delta National Park, diver.

M. Albéric Rugirabirori. Technician in the Department of Biology at the University of Burundi. Diver.

The BLOSS teams in the remaining three countries are based around the trained divers as listed in following table. A draft terms of reference has been prepared for Dr Mboko to take responsibility for co-ordinating the SS in DR Congo. The SLO is taking these discussions forward. The dive team in Zambia is operational, at this stage with no formal coordinator in position. This situation will be reviewed when the BLOSS

facilitator is in post, with the potential for formal responsibilities being assigned in Zambia. The status of the Tanzanian team is expected to improve with the training of further divers and the appointment of the BIOSS facilitator.

Regional Dive Team:

Tanzania		
Robert Mwakafumbe	TAFIRI	BSAC-sport
Fadhili Kimambo	TANAPA - Gombe National Park	BSAC-sport
Zambia		
Rueben Shapola	DoF	BSAC-sport
Charles Lukwesa	DoF	BSAC-sport
Maybin Mwenda	DoF	BSAC-sport
DR Congo		
Constantin Amundala	CRH	BSAC-sport
Patrick Buda	CRH	BSAC-sport
Donatien Muzumani	CRH	BSAC-sport
Alexis Basonga	CRH	BSAC-sport
Burundi		
Alberic Rugabirori	University Burundi	BSAC-sport
Bernard Sinunuoka	Dept. Water and Forestry	BSAC-sport
Libére Ndayisenga	Ruzizi National Park	BSAC-sport
Felix Nicayenzi	LTBP	BSAC-sport
International		
Dr Ian Payne, MRAG Ltd, BIOSS Director		
Dr Eddie Allison, MRAG Ltd, Field Team Leader		
Vicki Cowan, MRAG Ltd, BIOSS Management		
John Pearce, Simon Holden, MRAG Ltd, BIOSS IT specialists		
Special Advisors		
Dr Rosemary Lowe-McConnell (Independent)		
Dr George Coulter (Independent)		

2.1.4 Main Outputs and Achievements

- Biodiversity workplan updated in light of field progress in previous months. The working document was circulated within the project and to special advisors.
- Working relationship established between UK and Burundian BIOSS team. Two way flow of reports (technical and progress) and information developed between Dr Ntakimazi (BIOSS coordinator) and Vicki Cowan/Eddie Allison (UK). Credit must go to Mamert Maboneza, the office administrator in Bujumbura for efficient management of the email.
- Plans for technical BIOSS workshop finalised: international consultants agreed to contribute and agenda developed.
- Biodiversity database circulated to international experts for technical comments.
- Burundian team operational with sampling in Ruzizi well advanced and expansion of surveying to Bujumbura Bay being planned.
- Overlap between BIOSS and SEDSS initiated in Zambia. Sampling at joint sites initiated with updated Zambian work programme for BIOSS divers.
- Relationship between SIAL researchers and BIOSS further clarified.

- Work in partnership with SLO to establish roles for key staff in DR Congo, ToR drafted for BIOSS co-ordinator in DR Congo.

2.1.5 Main Objectives for the Next Quarter

- Full time BIOSS coordinator identified and in place
- Francophone BIOSS technical workshop held in Bujumbura (2 weeks, June/July98).
- Receive comments on biodiversity database and pass to regional researchers during BIOSS workshop in July.

Advance plans for Dr Ntakimazi and researcher to travel to UK and Belgium to gather relevant literature and data.

- Plans for dive training of Anglophone parks staff modified in light of comments received on general project approach to dive training. Training underway.
- Plans for surveying of National parks by regional (i.e. all 4 riparian countries working together) BIOSS team advanced.

2.2 Progress Report: March 1998 - May 1998 for Fishing Practices Special Study

2.2.1 Overall Summary of Progress

The establishment of the Tanzanian team with roles and responsibilities agreed among the team in Kigoma, the PCU and London is the primary source of progress for this quarter. The core team in Kigoma is three individuals from three different institutions (Dept of Fisheries, TAFIRI and Dept for Community Development). Each team member has taken responsibility for different components of the Tanzanian work plan.

The team have commented on the Tanzanian work plan and prepared an extensive report of their activities in time for inclusion in this quarterly report. The team have shown good skills in presenting and synthesising data and very importantly they have undertaken their field work independently of the daily support previously provided by an international consultant. They have promoted the project when working in rural areas using the Kiswahili version of the LTBP brochure. The team have used their initiative in carrying out activities not specifically listed in the workplan, such as their involvement in World Environment Day. This is a valid use of their time and cannot be planned from London; this initiative is welcomed. The fieldwork overlap with SESS in Tanzania is well established and the team continues to plan joint missions with SESS. In lieu of the full time FPSS facilitator currently being advertised, planning support is being provided from London and the SLO. The team have adapted well to this long distance management, seeking well defined support and providing relevant information promptly.

Further opportunities to establish links between SESS and LTR have been pursued by London. It is expected that developing these overlaps in the region will be a key role for the full term FPSS facilitator. The appointee will also be instrumental in establishing a method of expanding the FPSS work programme in the Francophone countries.

A consultancy report of the FPSS trip to Gombe (Oct 97) has been received (author, Dr P Petit) and will be incorporated into a joint BLOSS/FPSS report of the trip.

2.2.2 Chronology of Activities

- **March 1998:** Tanzanian team held a meeting in Kigoma with the SLO and VC sent draft workplan for the team's comment. Team agreed the logistics of their plan with SLO and an effective line of communication has been established between Kigoma and London.
- **March/April:** Meeting with Dr Geoff Griffith, SESS coordinator (NRI) to brief on overlap between SS's in the field (VC). Plans were made for a joint trip to establish SESS and FPSS in Francophone countries, EE consultants were also to take part. Unfortunately, the trip was cancelled due to problems in providing support for mission and Dr Griffith leaving the project.
- **April:** Contacted Dr Jim Kapetsky, FAO, Rome and subsequently, Dr G Hanek, Bujumbura, regarding LTR reports (VC). The overlap between LTR and LTBP (FPSS) has always been recognised and many of their reports are complimentary to the aims of FPSS. GH is sending an index of LTR reports to London, so that a selection of reports can be requested from FAO, Rome.

- April: Contacted Steve Evison (SESS consultant worked jointly with FPSS in Tanzania, 1997) for copies of his SESS consultancy report (VC). SESS (NRI) also contacted by VC to establish exchange of consultancy reports between SS leaders in London.
- May: Contacted Martin Pearce and SLO regarding potential overlap between BIOSS and FPSS in Zambia (VC).
- March -May: Tanzanian team's activities:
conducted regular sampling of catches in Ujiji, Katonga, Malagarasi;
followed up previous work in Gombe National Park;
discussed recent beach seine banning by Tanzanian government with affected communities, compliance was encouraged by the team;
reports written (including sending the first quarterly report to London for inclusion in this overall FPSS quarterly report for the project); and,
involved in preparations for World Environment Day in Kigoma 5 June.

2.2.3 Staffing Schedule

Regional team

Tanzanian Team

Mrs Beatrice Marwa, FPSS Coordinator (Department of Fisheries, Kigoma)

Mr Omari Kashushu (TAFIRI, Kigoma)

Mr Hamza Maboche (Department for Community Development, Kigoma)

Zambian Team

Mr Joseph Chimanga (Department of Fisheries, Mpulungu)

Mr Whiteford Chumba (Department of Fisheries, Mpulungu)

Mr Charles Lukwesa (Department of Fisheries, Mpulungu)

Mr Isaac Zulu (Department of Fisheries, Mpulungu)

The Zambian team has been involved in joint SESS/FPSS appraisals and attempts to link them to BIOSS activities in Zambia are continuing. There are no formal FPSS responsibilities assigned and it is anticipated that this will be reviewed by the FPSS facilitator when appointed.

There are no established FPSS teams in either Burundi or DR Congo at this stage. It is anticipated that the overlap between FPSS and SESS will be equally important, if not more so, when developing field programmes in these countries. Given the constraints facing Francophone riparian communities, a different approach to that used in the Anglophone countries may have to be considered. For example, it may be more effective to work in partnership with recognised organisations who are actively involved with riparian communities (NGO's etc.) to develop the understanding of current fishing practice needed for FPSS.

International team

Dr Ian Payne, MRAG Ltd, FPSS Director

Dr E Allison, MRAG Ltd, FPSS consultant

Ms Vicki Cowan, MRAG Ltd, FPSS Management

Dr P Petit, MRAG Ltd, FPSS consultant

Dr Rosemary Lowe-McConnell Specialist advisor

Dr George Coulter Specialist advisor

2.2.4 Main Outputs and Achievements

- Tanzanian workplan drafted, commented on by FPSS team. Team decided who should take responsibility for different components of the plan and agreed logistics with SLO. All team members will be involved in each component, but main responsibility taken as follows:
 - overall co-ordination, Mrs B Marwa;
 - management of field based sampling and missions, Mr O Kashushu;
 - development of a FPSS information centre with displays etc, Mr H Maboche.
- Line of communication between London and Kigoma well established
- Tanzanian team contributing directly to quarterly reports
- Consultancy reports received from Dr Philippe Petit: Gombe trip (Oct97), preliminary synthesis of Tanzanian findings
- Contact between LTR and LTBP (FPSS) initiated regarding availability of reports.

2.2.5 Main Objectives for the Next Quarter

- Full time FPSS facilitator to manage field programme in all four countries identified and in post.
- Develop the potential to forge links between BIOSS and FPSS team in Zambia. Tanzanian BIOSS team not yet well enough established to overlap with FPSS, Kigoma.
- Continue synthesis of Tanzanian findings * Tanzanian team continue regular sampling, report writing etc. Potentially join SESS mission to Rukwa - decision still being taken.
- Francophone field programme developed, in association with SESS and BIOSS.

2.3 Progress Report: March 1998 - May 1998 for Legal and Institutional Component

2.3.1 Summary of Progress

This quarter's activities have involved following up the significant progress made last quarter: the first regional legal and institutional workshop was held in February. Final editorial changes to the recommendations were made according to instructions from delegates in the last session of the workshop. A 'document pack' collated all papers distributed and produced at the workshop; a brief introduction set the context of the workshop within the wider frame of the project. It was agreed between MRAG and NRI that this pack should be sent to UNDP and UNOPS for their files. Planning for the remainder of this component, given the course of action recommended by the workshop, has begun. Final dates remain to be set for the course of regional workshops requested as they have to be scheduled against SAP workshops and SCM's as many of the senior individuals in the region are involved in all of these activities. It is expected that the preparation of the draft Treaty will begin in the next quarter.

2.3.2 Chronology of Activities

March: Consultants' briefing Dr Payne on regional legal and institutional workshop of previous quarter.

March: Editorial changes requested by workshop delegates made to final workshop recommendations.

April: Collation of papers from legal workshop into a 'document pack' to ensure dissemination of progress. Copies lodged with NRI (Dr John Rogers, coordinator, and N Hodgson, SAP), UNOPS (P Julienne) and UNDP (J Hough).

May: Meeting between MRAG, legal consultants and Nick Hodgson (NRI, SAP) to discuss overlap between the processes to draft and international agreement and development of the strategic action plan.

May: Workplan established by the workshop delegates assessed in terms of consultant availability, budget, overlap with SAP and workshop/meeting schedules in the region.

May: Financial support for the workshops requested by workshop delegates has been sought from alternative budgets in the project.

May: Copy of final recommendations circulated to National Coordinators with letter discussing potential timing of future workshops.

2.3.3 Current Staffing Schedule

Regional Lawyers and Policy makers

See previous quarterly report for institutions of the regional participants listed below.

Burundi

M. Jean Bechmans Manirakiza (NC)

Benoit Bihamiriza

Ir. Roger Kanyaru[PARA]Ir. Etienne Kayengeyenge
Prof. Didace Nimpagaritse
M. Damien Nindorera DR Congo
Mr. Amule Pascal Mady (NC)
Dr. Lunpungu Kalanbay
Mr. Ndembe Kumbu
Mme. Gode Mbombo-Mangangi
M. Ngamani Mbusu
Dr. Muderhwa Nshombo

Tanzania

Mr. Rawson Piniel Yonazi (NC)
Mr. Peter Kambona Chisara
Ms. Verdiana Macha Macha
Ms. Alicia Bosensera Magabe
Mr. Andy Ackim Mwandembwa

Zambia

Mr. James Simoko Phiri (NC)
Mr. Hangoma Gordon Mudenda
Mr. Aven Muvwende
Mrs Chanda J. Lubasi Punabantu
Mr. Davy Siame

International

Dr Ian Payne, MRAG Ltd, Component Director
[PARA]Mr Cormac Cullinan, MRAG Ltd (Legal Specialist, Anglophone)
[PARA]Mr Stephen Hodgson, MRAG Ltd (Legal Specialist, Francophone/Anglophone)
[PARA]Ms Caroline Blatch (Legal Specialist, Francophone/Anglophone)
[PARA]Ms Vicki Cowan, Component Manager

2.3.4 Main Outputs and Achievements

- Workshop documents collated for dissemination.
- Burundian institutional diagram produced (UK) from notes made by Burundian delegation at workshop. Circulated to Bujumbura and PCU. Refinements and comments from Bujumbura incorporated and redistributed. Tanzanian diagram prepared by delegation, faxed to PCU. Zambian diagram remains outstanding (VC to do) and no information was provided by Congolese delegation.
- Overlap with SAP process made explicit; legal consultants to attend January SAP workshop. Document exchange between SAP and L&I processes established.
- National co-ordinators received final recommendations with an update on anticipated timing of future workshops.
- Tentative timing proposed as following: Francophone and Anglophone workshops before Christmas 1998, Regional workshop ~May99, present to SCM July99. Subject to confirmation from PCU and regional participants.

2.3.5 Main Objectives Next Quarter

Finalisation of timing of workshops (Francophone, Anglophone, regional and presentation to a Steering Committee Meeting) * Complete Zambian institutional diagram and seek structure from Congolese.

Drafting of international agreement begun.

2.4 Progress Report: March 1998 - May 1998 for Special Study on Sediment Discharge and Its Consequences

2.4.1 Overall Summary of Progress

The main objectives for this quarter were given in the previous quarterly report as follows:

- Current programmes continue to run and are actively supported by the Special Study co-ordination.
- G. Patterson (GP) to visit Burundi and DR Congo to set up ToRs for active participation of National Institutions in the Special study and particularly to assess general needs for refurbishment of the CRH laboratory in Uvira, DRC. Principal institutions which will be involved with the Sediment work will be:

Burundi: Géologie et Mines (GEOMINES), Institute Geographique du Burundi (IGEBU), University of Burundi (Depts of Chemistry, Geology and Agriculture)

Democratic Republic of Congo: CRH (Uvira) and Institute of Natural Sciences (Bukavu)

- GP to visit Tanzania to establish protocols for the involvement of Tanzanian Bureau of Standards (Mrs Mbwambo) and the terms of their co-operation with the Gombe Hydrological work (managed by Nkotagu of the University of Dar es Salaam).
- Emma Msaky of Tanzanian Petroleum Development Corporation, Tharcisse Songore of Géologie et Mines (Burundi) and Gaspard Bikwemu of University of Burundi to be incorporated into long-term programme with University of Arizona on analysis of sediment cores.
- Follow up on efforts to establish the requirements of Dept of Geology, University of Burundi with respect to x-ray diffraction analyser. Visit to Burundi by GP should assist.
- Tierney to visit Zambia.
- It is hope to commence a training period at VUB for Evariste Nzeyimana of Dept. of Chemistry , University of Burundi during this quarter.

Overall progress on these activities throughout the quarter was satisfactory. More detail is provided in below.

2.4.2 Chronology of Activities

This section lists one-off activities and does not take count of ongoing activities such as workplan development and field monitoring activities.

15 - 26 March 1998 - GP visited Burundi and Democratic Republic of Congo. Final leg of trip to Tanzania was cancelled due to robbery of GP's travel documents in Nairobi on 25 March. Back-to-office report available.

17 April 1998 - GP visited Brussels to agree protocols for the programme between Dept of Chemistry, Vrije Universiteit Brussel (VUB) and the Department of Chemistry, University of Burundi (UoB). Leo Goeyens, Willie Baeyens and Natacha Brion of VUB were present as well as Evariste Nzeyimana of the UoB. A draft letter of co-operation resulted from this meeting.

20 April -14 May 1998 - Paul Tierney visited Mpulungu, Zambia in order to initiate the sampling programme at the Dept. of Fisheries Laboratory. Back-to-office report available.

28 May 1998 - GP met with Andy Cohen (University of Arizona) as he passed through UK on his way to participate in the Nyanza course - a training programme operating with part LTBP support.

28 May 1998 - Contract agreed between the project and Kings College London (M. Wooster) to work with the Department of Meteorology, Tanzania, in the production of erosion estimates from the Lake Tanganyika catchment using a combination of remotely sensed imagery (from the project receiver in Kigoma), meteorological and soils data.

2.4.3 Staffing Schedule

Though all staff involved in the Sediments Special study have been introduced in previous quarterly reports, this section gives a fuller summary of staff currently involved in the project. The 'Lead National' has a role as the focal point for the Special Study in each country; it is not meant to imply that other nationals are not conducting independent work.

Tanzania - Lead National Hudson Nkotagu, Dept of Geology, University of Dar es Salaam

Institution	Principal participants	Programme and linkages
Dept of Geology, University of Dar es Salaam	Dr Hudson Nkotagu	Nkotagu head of programme - Isotope hydrology of Gombe catchments. Technical advice from Dr D. Dettman, University of Arizona.
Tanzanian Water Department	Mr. C. Rubabwa Mr. T. Mpyalimi	Working with Nkotagu (above).
Tanzanian Parks Authority	Mr. H. Mdangi	Working with Nkotagu (above).
Tanzanian Bureau of Standards	Ms K. Mbwambo	Working with Nkotagu (above).
Tanzanian Petroleum Development Corporation	Ms E. Msaky	Pollen analysis of sediment cores with Dr A. Cohen of University of Arizona.
Meteorology Department	Mr. Gerva Shayo	Working with Kings College London - production of erosion model for L. Tanganyika catchment.

Burundi - Lead National Mathias Sebahene, Directeur General, Géologie et des Mines

Institution	Principal participants	Programme and linkages
Géologie et des Mines	M. Mathias Sebahene M. Tharcisse Songore	River monitoring in Burundi. Hydrology and sediment load. Also assisting with collection and analysis of core samples from the lake in co-operation with Dr Andrew Cohen of University of Arizona.
Institute Geographique du Burundi	M. Manassé Nduwayo M. Gerard Ntungumburanye	River monitoring in Burundi. Hydrology and sediment load. Also assisting with collection and analysis of core samples from the lake in co-operation with Dr Andrew Cohen of University of Arizona.

Department of Chemistry, University of Burundi	Dr Evariste Nzeyimana	Impacts of suspended sediments on nutrient cycles - in conjunction with Vrije Universiteit Brussel.
Department of Agriculture, University of Burundi	Dr Gaspard Bikwemu	Proposed linkage to programme on pollen analysis of sediment cores.
Department of Geology, University of Burundi	Dr Louis Nahimana	Proposal to perform mineralogical analysis of lake sediments using x-ray analysis.

Democratic Republic of Congo - lead national not known (recent departure of M. Bombi Kakogozo from CRH/Uvira has left the Special study without a lead - Dr Nshombo, the director of CRH, has been requested to nominate a replacement).

Institution	Principal participants	Programme and linkages
Centre Recherche de Hydrobiologie (Uvira)	M. Bombi Kagogozo (recently left) M. Kalala Tshibangu M. Mavula Mbemba M. N'djungu Kahindo M. Banamwezi Mwenyemali	Programme to gauge rivers in region of Uvira.
Institute of Natural Sciences	M. Mudala	Proposed as associate with above programme

Zambia - lead national Dr Henry Sichingabula, Dept of Geography, University of Zambia

Institution	Principal participants	Programme and linkages
Department of Geography, University of Zambia	Dr Henry Sichingabula	To establish a river monitoring programme to examine sediment inputs to Lake Tanganyika from the Zambian catchment. Technical advice from Dr Duck, University of Dundee.
Department of Water Affairs	Mr. Happy Sikazwe Mr. Sunday Ng'ambi Mr. Mugandi Nasitwitwi	Working with Sichingabula (above)

Department of Fisheries, Mpulungu	Mr. Robert Sinyinza Mr. Mutanga Syampila	Working with Nkotagu (above) Also with Dr Irvine of University of Dublin on programme to assess impact of sedimentation on biota Also with Dr Duck of University of Dundee to assess the spatial distribution of substrates using side scan sonar
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International Institutions:

The linkages of these International Institutions with Regional Institutions are given above. The principal link person at the participating International Institution is given below, though others may be participating from that institution.

Natural Resources Institute, University of Greenwich. Dr Graeme Patterson (Special Study Co-ordinator)

Department of Geology, University of Arizona. Dr Andrew Cohen (analysis of sediment cores and primary production studies)

Department of Geography, University of Dundee. Dr Robert Duck (lake substrate analysis and river discharge)

Department of Chemistry, Vrije Universiteit Brussel. Dr Leo Goeyens (impacts of suspended sediments on nutrient cycles)

Department of Geography, Kings College London. Dr Martin Wooster (catchment-wide erosion assessment)

Department of Zoology, Trinity College, University of Dublin. Dr Ken Irvine (impact of sediments on biota)

2.4.4 Main Outputs and Achievements

GP made a successful trip to Burundi and DRC and developed work plans for a number of national institutions in these countries (see above).

It was not possible for GP to go to Tanzania - necessary outputs proposed from the visit to Tanzania were successfully performed by correspondence through the Project Co-ordinators office in Dar es Salaam.

The visit of Paul Tierney (on behalf of Irvine's team) to Mpulungu was highly successful. The sampling programme there is now operational and will be developed over the coming months.

Agreement was reached with Tanzanian Petroleum Dev. Corporation for Mrs Msaky to be released to travel to US for a minimum of six months to be principal scientist working on pollen analysis of cores collected during the cruise of January 1998.

Evariste Nzeyimana commenced his training programme at VUB. This will establish the sampling protocols for commencement of the programme to examine the impact of sediments on nutrient cycling.

Monitoring Programmes described in previous reports in the Zambian catchment, the Gombe river system (hydrology and primary production) and the Luiche River are providing data and reports. Further quarterly reports were received from H. Nkotagu and H. Sichingabula as team leaders.

Sediment cores from the January cruise were transported to Arizona and work has started on their analysis. A further quarterly report was received from UoA.

There still remains insufficient information regarding the XRD system at the University of Burundi to send an engineer without risk of him being unable to install the apparatus. Dept. of Geology at present are unable to provide the installation manual provided with the apparatus though there still is hope this can be recovered from the estate of the deceased technician. GP has contacted an ex Philips engineer at the University of Greenwich UK and it may be possible to send him to Burundi to attempt installation. This is still being investigated

2.4.5 Main Objectives for the next quarter (June 1998 - August 1998)

Maintain the data flow and reporting schedule from operational monitoring programmes.

Emma Msaky of TPDC to travel to Arizona early June 1998 to start her programme of pollen analysis at the University.

M. Wooster of Kings College London will travel to Tanzania to initiate the programme of sediment survey in co-operation with the Tanzanian Meteorology Department.

Rob Duck and Silke Wewetzer (University of Dundee) are proposing to travel to Zambia during August 1998 to carry out a side-scan sonar survey with the staff of the Zambian Fisheries Department.

Evariste Nzeyimana will complete his period of training at VUB late in June 1998 and it is proposed that work will commence in Burundi soon after his return to the University.

GP, K. Irvine and S. Wewetzer will meet with Henry Sichingabula during July (HS in UK for a conference) to co-ordinate sample sites in Zambia for the work on impact of sediments on biota and the side-scan sonar survey.

GP aims to produce a document/questionnaire to aim to establish protocols for reporting and data deposition for all active participants in the special study in order to ensure the quality and value of outputs from the special study and their co-ordination with the reporting structure of the final strategic plan.

The regional co-ordinator of the Sediments Special study will be appointed during this quarter and hopefully will be in the field towards the end of the quarter. The logical base for this co-ordinator will be Mpulungu. They will, however, have to spend a great deal of their time travelling throughout the region. As soon as the regional co-ordinator

is available to travel then GP will travel to the region together with him/her to assist with introduction to the various project teams.

Catherine O'Reilly will complete her work programme on impact of sediments on production that has been proceeding with the Tanzanian Fisheries Research Institute. She will present her findings at the triennial meeting of the International Limnological Society (SIL) in Dublin in August 1998.

GP will also present a paper on Conservation of Biodiversity in Lake Tanganyika at the SIL meeting in Dublin (co-authored by Kelly West - the Project Scientific Liaison Officer).

2.5 Progress Report: March - May 1998 for Special Study on Pollution and its Effects on Biodiversity.

2.5.1 Overall summary of progress

The Pollution Special Study (PSS) continues to maintain its focus on *'ascertaining the nature and (where possible) the extent of pollution on biodiversity, and develop the human and equipment resources that will allow the work to be sustained after the end of this particular Project'*. Significant progress with the PSS as a whole has been made during the last 3 months with visits by the PSS Co-ordinator to Burundi and Congo and the appointment of personnel to this Special Study. In addition, the National Co-ordinators of these countries have facilitated important meetings between Congolese and Burundian researchers and trainees.

1. The Centre Recherche d'Hydrobiologie (CRH, Uvira) and the National Institute of the Environment and Conservation of Nature (INECN, Bujumbura) as the lead institutions for the PSS in the Congo and Burundi respectively. Work plans have also been drawn up in collaboration with myself by the recently appointed PSS Co-ordinators - Kalala Tshibangu in Uvira and Gabriel Hakizimana in Bujumbura. In common with the strategies adopted for Tanzania and Zambia, the initial focus is on a shipping port and a selection of adjacent and more remote stretches of inshore and open water, and the mouths of rivers and streams of varying pollution status. Sampling sites, frequencies and the suite of determinands to be included for assessing pollution status and the nature of the lower biota have been agreed. Nevertheless, achievement of the full spectrum of activities on a routine basis is unlikely in the short term for three principal reasons. Firstly, a consignment of equipment from UK has yet to arrive. Secondly, arrangements with various authorities for frequent and unquestioned access to land, lake and river sites have still to be finalised. Thirdly, personnel still need at least some training. For example, INECN's strengths lay mainly in the assessment of river waters and effluents that are characteristically high in concentrations of particulates and solutes. A major focus of this Special Study is also the lake itself, in which much lower levels can be expected. The latest visit has been especially valuable in providing the opportunity to discuss algal techniques.
2. The PSS teams in Mpulungu (Zambia) and Kigoma (Tanzania) are both monitoring approximately 10 GPS-fixed sampling points – including mainly open water sites but some feeder water stations in addition. Weather parameters are recorded continuously at the Kigoma and Mpulungu laboratories. Water for chemical and phytoplankton analysis and biological are taken weekly or fortnightly in the case of the Kigoma and Mpulungu areas. Farther afield, at at Gombe and Nsumbu, the sampling is presently monthly and quarterly respectively.

Some 10 field condition factors (e.g. water movement and clarity) and basic probe readings (e.g. pH, temperature and dissolved oxygen) are recorded at each site. Samples for the determination of dissolved and particulate fractions of nitrogen and phosphorus, dissolved silica, chlorophyll_a and phytoplankton species diversity have also been taken in duplicate. Analysis of all of these samples has progressed well. The performance and appropriateness of the methods used in all aspects of the work are being monitored continuously. Particular attention has been paid to becoming familiar with the field and laboratory analytical techniques - and particularly the problems arising from the very low concentrations of e.g. phosphorus and chlorophyll_a (*ca* 2 µg l⁻¹) that prevail at most of the lake sampling stations in both countries. Feeder stream levels of both phosphorus and silica differ markedly according to whether storm water drainage or sewage effluent dominates.

The trainees have started to copy the data from field and laboratory notebooks to EXCEL files, and made some progress with the handling and analysis of the data.

2.5.2 Brief chronology of activities and visits

1. Dr Bailey-Watts visited the region from **14 May to 15 June**. Meeting with Lake Victoria Environment Management Plan personnel **15 May** in Nairobi. Meeting and appointing Congolese and Burundian staff, and selecting sampling sites in Bujumbura and Congo **16-28 May**. Visiting the LTBP Kigoma and Mpulungu stations respectively **29 May to 4 June** and **5-15 June** assessing - along with Dr Francis Chale (Freshwater Ecologist from Dar es Salaam and the PSS National Coordinator in Tanzania) and Miss Nicola Wiltshire (PSS Trainer in Kigoma and Mpulungu) - progress and modifying schedules for environmental recording, water sampling, chemical and biological analysis, data recording and checking.

2. Dr Chale joined the PSS on **30 May** having submitted in **mid-April** a report on his 8-week assignment to the LTBP – a combination of desk studies (e.g. identifying major point sources of pollutants), institutional visits (e.g. TPRI to assess pesticide and heavy metal analytical capacity) and field and laboratory work.

2.5.3 Current staffing schedule

In Burundi: Mr Gabriel Hakizimana (PSS Coordinator in Burundi), (INECN) Mr Wilondja Kamalebo, (LTBP) Ms Musanisoni, (LTBP) and Mrs Aline Irimbere (INECN).

In Congo: Dr Tshibangu (PSS Coordinator in Congo); Mukungilwa Kamalebo and two other persons are to be assigned for CRH.

In Tanzania: Dr Chale (PSS Coordinator in Tanzania) and Ms Lyoba, D, and Ms Salome; Messrs Lyoba, E., Mfilinge, Muhoza, Tegulilwa, Kadula, Wakafumbe.

In Zambia: in Mpulungu: Messrs Makassa and Zulu; and Chimanga, Chombe, Kaweme, Lukwesa, Mwape, Syapila. Messrs Sinyinza, Shapola and others contributing to the Biodiversity and Sediment Pollution Special Studies are associated with the PSS for the purposes of synchronising sampling activities. In Lusaka (ECZ): Shadreck Nsongela and Christopher Kashinga are involved as facilitators for the PSS.

International staff:

Dr Bailey-Watts (Special study coordinator) IFE,(U.K)

Dr Chris Foxall UEA (U.K)

Miss N Wiltshire, (Kigoma)

Mr Kirika. IFE (UK)

2.5.4 Main objectives for next quarter (June to August 1998)

1. To see the projected 4-person teams in both Uvira and Bujumbura executing routine sampling, recording and laboratory analytical programmes paralleling those now established in Kigoma and Mpulungu.
2. To have fully analysed, interpreted and reported on the physical, chemical and biological results available at mid-June 1998.
3. To see a substantial increase in attention to assessing pesticides, heavy metals and hydrocarbons in lake water and biota as appropriate.
4. To have estimated some pollutant loadings (e.g. in rain and river runoff) to the lake.
5. To present at the forthcoming International Congress of Limnology (Eire, August 1998) a paper comparing phytoplankton species diversity in Loch Leven (Scotland) and Lake Tanganyika; authors are from Mpulungu and Kigoma along with the PSS Co-ordinator.

2.6 Progress report: March - May 1998 for Socio-economics and Environmental Education components

[Held over until next quarter]

2.7 Progress Report: December 1997 - May 1998 for GIS and database management.

2.7.1 Overall Summary of Progress

Progress during the period December 1997 - May 1998 has focused on the establishment of a GIS (provisionally called TANGIS) and database shell that will be utilised to store and retrieve the disparate datasets collected by the special studies thus far. The project is at a stage where much data are being generated but are not centrally catalogued or available to all collaborators.

A metadatabase has been created that will document all the datasets available to LTBP. The metadatabase serves two main functions. Firstly, it ensures that a record of all the data created by the study can be centrally held and accessed by all users. To this end, a data liaison officer, Anne Jackson, has been appointed at NRI who is the first contact for people needing information on the data held. The electronic database has also allowed a data catalogue to be produced in two formats; a short form giving summary information about the datasets held, and a long form giving details of data extent, copyright, and attributes fields available for each dataset. This will be soon available to all users both in the region and more widely.

The second purpose of the metadatabase is to store the vital geographical information needed for the data to be used easily within TANGIS. The philosophy of TANGIS is of an open database. We accept all data, but we need to catalogue it effectively so that users are clear as to its quality, scale or resolution, projection and its source and processing history.

The GIS interface holds not only data in GIS format (Arcview Shapefiles, coverages and GRIDS) but can also handle, without conversion, database information (e.g. the Biodiversity database), satellite and other images, photographs, georeferenced text information (e.g. GPS points) and non-geographically referenced text data.

TANGIS can be run in two modes. One is the default tool for all users, which allows simple viewing and query of data. The second is a version for a specific user which can be used to store personal geographical documents (called views), tables, charts and layouts prepared for printing, and could be used for analysis or modelling work. This also retains the enhanced functionality of the default TANGIS.

No decision has been made on the utility of GIS processes in the special studies. The prime objective this half has been to set up a framework from which we can gather existing data. The next stage is to understand the potential of GIS methodology for each of the Special Groups and to consider the implementation of an operational GIS in the region.

2.7.2 Chronology of Activities

December: NRI receives desktop and portable equipment, including ArcView and Mapinfo GIS software.

December - Prototype metadatabase created and tested, prototype interface created to show and query data.

Mar-May - Assessment of currently available datasets at NRI.

Mar-May - Preliminary investigation of special study datasets in preparation for visits to UK Special Study groups

2.7.3 Staffing Schedule

UK (NRI)

Dr Chris Sear, GIS supervisor

Alan Mills, Geographer; GIS developer

Anne Jackson, Data liaison officer

2.7.4 Main Outputs and Achievements

1. TANGIS metadatabase developed in readiness for all new datasets.
2. Prototype TANGIS to show and query information created.
3. Questionnaire prepared for interviews with Special Study Groups.

2.7.5 Main Objectives for the next quarter (June 1998-August 1998)

1. Interviews to be held with all Special Study groups in UK to determine available datasets, data gaps, the need for and uses of GIS technology in LTBP, particularly in-region need, possible management tool development.
2. Enhancing the functionality of TANGIS to include the recommendations of the Special Study groups.
3. Expanding the database of information in TANGIS to include the collected datasets and enhancing the quality of data (adding attributes to data and checking accuracy).
4. Data searches to fill in gaps in database not covered, but requested, by Special Study groups.
5. Investigation of broadening the metadatabase to include non-digital data and methods of updating metadatabase.

APPENDIX 1.

Conclusions from National Working Group Planning Meetings in
Zambia and Tanzania.

APPENDIX 2

The National Sectoral Problem Review: Objectives, Background and Guidelines

(For Tanzania only as this is a background document only and that for Zambia is very similar)