

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

Progress Report No. 10

June - August 1998

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1. Project Co-ordination Unit

1.1 Project Co-ordinator and Scientific Liaison Officer

1.1.1 General Summary

June through August has been a very active period with a number of important project activities taking place including the third meeting of the Project Steering Committee in August.

The quarter began with several large events. LTBP sponsored a week's worth of activities in and around Kigoma to commemorate World Environment Day, the 5 June 1998. Co-ordinated by Mr. Bart Tarimo (Environmental Education Co-ordinator for Tanzania) and a local steering committee of Kigoma-based authorities, the project visited six villages in and around Kigoma to: show videos promoting Lake Tanganyika and environmental awareness, sponsor clean-up activities and promote local improvement initiatives. The weeks' activities culminated on the 5 June 1998 with a large procession of more than 700 schoolchildren, members of the community and local authorities who attended cultural activities and speeches in honour of World Environment Day.

An international training course, The Nyanza Project resided in Kigoma from 1 June – 10 July 1998. An intensive introduction to the geology, limnology and biology of African lakes, nine African undergraduate students representing all four of Tanganyika's riparian nations attended the course with sponsorship from LTBP. The students attended lectures and laboratory sessions, participated on field trips and conducted independent or group research projects under the supervision of a team of international experts in the fields of geology, limnology and biology of Tropical Great Lakes.

From 2-10 July 1998, Bujumbura hosted a BIOSS workshop for francophone affiliates. More than twenty Burundian and Congolese participants attended lectures covering a range of topics including: "What is Biodiversity and Why Should We Conserve It?", various aspects of the biology and ecology of the Tanganyika ecosystem, establishing and conserving biological collections, the merits of various diversity indices and managing biological databases. Field exercises reinforced the participants' previous training (Aug-Oct 1997) in habitat mapping and faunal censuses using SCUBA. The participants strengthened their skills in the taxonomy and identification of Tanganyikan fish and invertebrates through field and laboratory activities. The workshop delegation was welcomed to Rusizi National Park in Burundi where they received a tour and discussed both local and global conservation issues.

In addition; renovations began on the Centre de Recherche en Hydrobiologie in Uvira, RD Congo. The station also received a project vehicle (Toyota dual cab pick-up), a semi-rigid inflatable boat with engine, and some laboratory and field equipment, including dive gear. Other equipment destined for the station is in store in Bujumbura awaiting completion of the renovations. Unfortunately in early August the rebellion in eastern D.R. Congo swept the town of Uvira. Project activities at the Centre de Recherche en Hydrobiologie, including renovation of the Centre and field activities by BIOSS and PSS teams were suspended. We have news from our affiliates in Uvira, however, that all our Congolese colleagues are well and the LTBP losses are currently negligible.

Although the process of selecting the four special study facilitators has taken longer than anyone would have wished, we are now able to report that from a broad range of applicants from within and outside the region the selection and UNOPS approval process is complete and all but the socio-economist will be coming to the region in early October to take up their posts. The socio-economist will follow in December. The selected individuals are:

Dr Richard Paley	Biodiversity, to be based in Kigoma
Dr John Adam Dorr	Fishing Practices, to be based in Bujumbura
Dr Olivier Drieu.	Sedimentation, to be based in Mpulungu
Mr David Hoyle	Socio-economics and Environmental Education, base to be determined but will start in Bujumbura.

Within the region an assistant to the National Co-ordinator for Zambia has been selected, Mr Godfrey Chitalu, who will combine this post with that of Socio-Economic Co-ordinator. Tanzania will advertise for an assistant to the National Coordinator shortly.

The Bujumbura Station recruited a Burundian national full time with the principal task of translating project documents (French-English, English-French) for the project. Owing to the quite large volume of documents now being generated by the project this is the most cost effective means of getting the work done.

As planned the SLO moved her base of operations from Kigoma, Tanzania to Bujumbura, Burundi in an effort to push forward activities in the francophone countries.

The first issue of *Lakeside*, LTBP's newsletter, was finally printed and distributed and work has begun on the second issue

1.1.2 Training Needs Assessment Report

The report of the Training Needs Assessment (TNA) exercise was received in August. This is a comprehensive working document based on extensive consultation by the consultants with project staff and stakeholders in all four riparian states. It lays out a strategy and guide-lines for activities that fit in well with the project purpose and philosophy, stressing as it does the need for all training initiatives to address one or more of the following priorities: (not necessarily in this order)

PRIORITY	TRAINING WHICH:
1	refers directly to the Project Goal and Objectives be regarded as a priority
2	enhances communications within the LTBP Team and between Key Stakeholders. Thus regional workshops between stakeholder groups of one type, and national workshops between several stakeholder groups, where experiences are shared and management actions are planned, should be seen as a priority. Short courses and workshops on training and communication skills will also contribute to this priority.
3	provides knowledge and understanding of Lake issues. There is an urgent need to inform and involve the key stakeholders in the LTBP project and SAP since they cannot be expected to be committed to sustainable management of the Lake unless they are aware of the way that the Lake works and the way in which their actions may affect it.

4	enables research (SS) teams to be able to complete the research cycle. The technical and research teams need to look at their research in a broad way to gain a concept of why they are carrying it out and how the results might be significantly used in Lake management.
5	enables research to be translated into policy and management activities. This translation of scientific findings must be conducted by the researchers together with the Socio-economic and EE team in order to build a meaningful awareness programme for Primary Stakeholders and decision makers and to build an environmental education policy and strategy which includes realistic activities.
6	helps the establishment of a core group of people who will be working at the lakeshore in each country and who will feel responsible for the management of the Lake and the sustainability of its biodiversity. Workshops and Short Courses of Training of Trainers will ensure a multiplier effect and the fostering of key partners at all levels who have the capacity to act without external direction.

The document has now been translated and will be distributed widely for comment but as directed by the Steering Committee, action to implement the proposed work plan will start immediately.

1.1.3 Regional Steering Committee meeting

The third meeting of the project Steering Committee took place in Arusha, Tanzania at the International Conference Centre (AICC) on the 12th August 1998. Delegations from all four countries attended although unfortunately owing to last minute commitments only two delegations were represented at the Principal Secretary level. Full minutes of the meeting have been distributed and are available from the National Co-ordinators.

Suffice it to report here that the meeting was most productive and a number of important resolutions were agreed upon. Of particular importance to the delegates was the need for the delayed mid-term evaluation to take place as soon as possible in order that the need for an extension of the project period be considered. The need for a one year extension expressed at the Steering committee meeting in January was reiterated at this meeting.

The meeting also reviewed its own terms of reference and those of the National Working Groups in light of the terms of reference of the proposed National Steering Committee that were also formulated at this meeting.

In addition and taking cognisance of the recommendations of the TNA report the committee agreed that a Regional Training and Communications Facilitator be employed, from within the region, as soon as possible and that the assisting Country Training Liaison Officers be drawn from existing project personnel.

1.1.4 Strategic Action Plan (SAP)

The process of developing the SAP has continued with a series of national preparatory meetings and workshops and with the regional Technical Advisory Committee (TAC) Strategic Planning Team meeting, held in Arusha.

The programme is effectively on schedule and can be expected to develop the first draft of the SAP at the proposed January 1999 workshop, for presentation to the SC in March 1999.

However, the present conflict in DR Congo, may limit the full incorporation of the DR Congo in the first draft of the SAP. As the situation is resolved, the incorporation of DR Congo could become the trigger for the second iteration of the SAP planning process, which would also take note of the research outputs that would have taken place following the preparation of the draft SAP in January 1999.

1.1.4.1 Workshop Progress

The programme is following the seven steps endorsed by the Steering Committee in January 1998:

National Working Group Planning Meetings; National Sectoral Problem Review; National Environmental Priorities and Strategies Review; Regional TAC SAP Planning Meeting; Transboundary Diagnostic Analysis; Preparation of the Draft SAP; Presentation of the Sap to the Steering Committee.

	B	D	T	Z	R
	u	R	a	a	e
	r	C	n	m	g
	u	o	z	b	i
	n	n	a	i	o
	d	a	n	a	n
	i	g	i		a
		o	a		l
National Working Group Planning Meetings;	Yes	Yes	Yes	Yes	
National Sectoral Problem Review			Yes	Yes	
National Environmental Priorities and Strategies Review				Yes	
Regional TAC SAP Planning Meeting					Yes
Transboundary Diagnostic Analysis					
Preparation of the Draft SAP					
Presentation of the Sap to the Steering Committee					

1.1.4.2 Zambia

The first five day planning workshop “The National Sectoral Problem Review” was held in Lusaka from 29 June to 3 July. The meeting was attended by representatives from 17 different national and local institutions.

The meeting prepared an outline matrix of Specific Problems, grouped under the three general action areas of “Reducing fishing pressure; controlling pollution; and controlling sedimentation”. The matrix included a series of actions to counteract each specific problem, and identified the key agency and indicated whether there were time or resource conflicts in implementing these actions¹.

Following on from this initial meeting, a second workshop was held between 31 August and 3 September. This meeting reviewed the progress that had been made at the first meeting, and incorporated additional points in the matrix relating to review or revision of regulatory tools such as policy, legislation and regulations. The final output of the national consultation process was to prioritise – from a national perspective – the

¹ Conclusions of the National Sectoral Problem Review – Guidelines for the National Environmental Strategies and priorities Review; Zambia July 1998.

specific problems within each general action area, effectively defining a national strategy to addressing the lake related problems².

Background papers covering various aspects of the lake management and policy and regulation were prepared for the meetings. The meetings were facilitated by Nicholas Hodgson, with the support of Andy Menz and in the second workshop Jean Paul Ledant.

1.1.4.3 Burundi

The National Working Group Planning meeting was held as a one day event on 30 June. The meeting adopted the process of developing the SAP as endorsed by the Steering Committee in January 1998³.

The meeting identified key individuals and institutions that would be expected to be involved in the process, and set dates for the two proposed meetings. The meeting was facilitated by Jean Paul Ledant with the support of Kelly West.

1.1.4.4 DR Congo

The National Working Group Planning Meeting was held in Kinshasa on 13/14 July. The meeting agreed on a national consultation timetable, on individual and institutional representation in the consultation in the national development process, and on subjects and authors for the background papers for the first workshop⁴. The meeting was facilitated by Jean Paul Ledant, with the support from Nicholas Hodgson.

However, the outbreak of renewed fighting in DR Congo on August 2 may limit the full involvement of DR Congo representatives in developing the Transboundary Diagnostic Analysis and the Draft Strategic Action Plan. It will not, however, delay the preparation of the SAP.

As a result of the initial national meetings held in Kinshasa it is clear that their range of problems and the potential responsive actions are similar to those of the three other riparian countries. The overall SAP programme is therefore not likely to preclude any interventions that DR Congo would require.

If full involvement of DR Congo is not possible for the first iteration of the SAP, then it is clear that the SAP will have to include agreed procedures for the future inclusion of DR Congo when the situation has normalised. DR Congo would then become fully involved in the future iterations of the SAP and the future management of the lake and national and regional LTBP related development programmes.

It should be noted, however, that every effort is being made to hold a national problem review workshop for Congo in spite of the current circumstances. Currently we are hoping bring representatives to Dar es Salaam and hold the meeting there.

² Conclusions of the National Consultation Process for the Regional Strategic Action Plan; Zambia September 1998. APPENDIX 1.

³ L'Analyse Diagnostique Nationale: objectifs, fondements et directives; Bujumbura July 1998. Conclusions de la réunion de la planification du Groupe de Travail National; Bujumbura July 1998. APPENDIX 3

⁴ Conclusions de la réunion de la planification du Groupe de Travail National – Préparation de l'atelier d'Analyse Diagnostique Nationale; Kinshasa July 1998. APPENDIX 4

1.1.4.5 Tanzania

The National Sectoral Problem Review workshop was held at the Kilimanjaro Hotel in Dar es Salaam from 28 to 31 July. The National Co-ordinator, Mr R P Yonazi, chaired the workshop, with participants from National and local government institutions, from NGOs and from the private sector.

Background papers were presented by the participants and discussed before the workshop went into a detailed review of the lake management problems. The Tanzanian participants adopted the format developed at the Zambian workshop for a three level "Analytical Problem Matrix". The basic matrix was completed at the workshop and the objectives for the second meeting defined⁵.

The workshop identified areas of policy, legislation and regulation that would be reviewed in background papers prior to the second workshop, scheduled for September.

The workshop was facilitated by Nicholas Hodgson, with the support of Jean Paul Ledant and Andy Menz.

1.1.5 The Regional TAC SAP Planning Meeting

This one day meeting followed on from the Steering Committee held on 12 August in Arusha. The meeting was chaired by Mr Maembe (Director of Fisheries – Tanzania). The meeting was taken through the concepts of the SAP and procedures that had been agreed in January and endorsed by the January Steering Committee.

The main objective of the meeting was to agree on an appropriate date and venue for the October/November TDA workshop and the January Draft SAP workshop. The second objective was to get the four countries to agree to a balanced representation of qualified individuals who would represent them in the regional consultation and negotiation process, and who would be able to carry the process forward, preferably with few changes in team composition.

In addition, the national preparation needs were also discussed, as a preliminary exercise that would have to be carried out in advance of the TDA.

The TORs of the TAC were agreed and amended to the following: Carrying out the TDA review; Establishing priorities for action; and Drafting the SAP.

The TDA was proposed for October 12 to 16 and the Draft Sap for 18 to 22 January 1999. Both meetings were to be held in Arusha.

The meeting was facilitated by Nicholas Hodgson, with the support of Andy Menz and Kelly West.

Reports of meetings held to date are given at Appendices 1. - 4

1.1.6 Goals for the Next Quarter

The specific goals for the next quarter include:

September 7 Burundi National Sectoral Problem Review
September 14 Congo National Sectoral Problem Review
September 21 Tanzania National Sectoral Problem Review
October 12 Regional TDA
November 16 Congo National Sectoral Problem Review
November 23 Burundi National Sectoral Problem Review

⁵ Conclusions of the National Sectoral Problem Review - Guidelines for the National Environmental Strategies and Priorities Review; Dar es Salaam July 1998 APPENDIX 2

The project will prepare reports following each national meeting and will be preparing a full report on the TDA.

1.2 Technical Officer

IT Equipment: HF radio communications equipment for all four riparian stations arrived in Dar es Salaam and have now cleared customs but are still awaiting licensing. Work continued on clearance of VHF radios for use by the Bujumbura Station. Purchase of a Sun UNIX workstation computer for the purposes of hosting the website was pursued. A CD-Recordable drive was deployed to the Bujumbura Station for purposes of CD-ROM publishing.

SSG Equipment: Laboratory equipment and chemicals arrived in Bujumbura for onward delivery to the Uvira Station.

Vehicles: Vehicles were successfully delivered to the Bujumbura and Uvira Stations.

Boats: Rigid inflatable boats and motors were received and delivered to the Bujumbura and Uvira Stations. Three 22 foot fibreglass boats and engines are still awaiting customs clearance.

Newsletter/Website: The first issue of *Lakeside*, LTBP's newsletter, was printed and distributed — work has begun on the second issue. The website is very close to completion. Website hosting and CD-ROM issues have been resolved.

Duty Travel: The TO spent 15 days at the Kigoma Station, 55 days at Bujumbura Station, and 5 days on duty-travel to the UK and 15 days on vacation.

NB: The TO can now be reached at BP 1119; Bujumbura, Burundi; Tel:+257 21 05 97; Fax: +257 21 99 60; Email: lakeside@cbinf.com

Goals for Next Quarter:

1. Installation of the Codan HF radio units at all four field stations, if possible;
2. Mini-seminars to be conducted at each field station on the use and maintenance of all IT and radio equipment;
3. Identification and training of one person from each station who will be in charge of maintaining IT/Communications equipment into the future;
4. Website to be on-line and CD-ROM copies to be delivered to the region;
5. Issue No. 2 of *Lakeside*, LTBP's newsletter, to be printed;
6. Co-ordination of LTBP's participation in the IW:LEARN initiative will continue.

1.3 Station reports

Owing to movements and changes of personnel individual reports of activities in each of the stations are not presented this quarter. Nevertheless all activities in the various stations are of course reported in relevant sections throughout the report.

2. Reports of Special Study groups

2.1 Progress Report: June - August 1998 for "Biodiversity" Special Study and "Conservation Activities"

2.1.1 Overall Summary of Progress

The technical workshop for the BIOSS Francophone teams was held in Bujumbura, the anglophone BIOSS teams had participated in a joint SS workshop in Kigoma in 1997. This was an important occasion to discuss the field programme strategy and activities with senior staff from the relevant institutions: the Francophone divers had been involved in discussions during their training in Kigoma (1997). It was clear from the workshop that both Burundi and DR Congo have the personnel to undertake the BIOSS field programme.

Several improvements to current sampling practice were proposed by the consultants contracted for the workshop. Many of these have been implemented in Burundi and this information will be disseminated to the other operational teams by the regional facilitator when in post. It is generally agreed that as the historical fish surveys of Burundian waters are very comprehensive, additional intensive BIOSS surveys as planned in the regional field programme are unnecessary in these waters. Dr de Vos has generously made his catch data from a previous project (CRRHA) available to the project; it will be an important contribution to the BIOSS literature database.

The consultants, after discussion with BIOSS teams, proposed additional activities to support the existing BIOSS work programme. Some of these proposals are being investigated, namely:

- a research project to be carried out by one of the BIOSS team (probably in Zambia) to investigate the taxonomy and ecology of shrimp, a group largely unstudied in Lake Tanganyika;
- a research project to be carried out by one of the BIOSS team (from Burundi) on macro-invertebrate-based biotic indices for the affluent rivers and streams;
- a guide to the fishes of Rusizi national park (links to training programme and environmental education will be investigated as this kind of material is important to National parks); and,
- collating a comprehensive photographic database of key species, this work will draw on the personal resources of many international and regional scientists.

Other proposals will require outside funding, for example it is suggested that we edit a book on the fishes of the lake basin as the existing literature is out of date.

Opportunities to seek additional funding will be investigated.

The recruitment process for the BLOSS regional facilitator is close to completion. Final project authorisation procedures are underway and it is hoped the candidate will be in post early in the next quarter.

The information management aspect of BLOSS has been advanced, with the ongoing development of the survey database as sampling protocols are finalised. The database is currently going through a period of refinement. A plan to train a regional IT specialist in data management for BLOSS was developed in discussions between MRAG and Dr West. The link between BLOSS and TANGIS was discussed with colleagues from NRI. Location data from the field programmes requested by NRI was sought directly from each of the teams: this was an opportunity to reinforce the regional perspective of data management to each of the national teams.

2.1.2 Chronology of Activities

June-August: Applications for BLOSS regional co-ordinator assessed and discussed. MRAG discussed applications closely with PCU and colleagues from other SS's and other parts of the project. A short list was drawn up and the top three candidates were interviewed (Panel: Dr Ian Payne, Dr E Allison, Ms V Cowan, Dr Menz and Dr West). CV of selected candidate forwarded to UNOPS for approval, which was granted.

June: Plans for BLOSS technical workshop for Francophone teams refined in Bujumbura and UK. Terms of reference and contracts for international consultants prepared and agreed.

June: MRAG information technology experts and VC met with GIS team from NRI. MRAG demonstrated BLOSS literature and survey databases and discusses data structures including codes and requirements for data location information. NRI presented both the meta-database and TANGIS (Lake Tanganyika GIS). The current and anticipated capability of all systems were discussed.

Late June/Early July: Francophone Technical workshop successfully held in Bujumbura (2 weeks). Dr E Allison led the international team of Dr Koen Martens (invertebrate specialist), Dr Luc de Vos (non-cichlid ichthyologist), Dr Gashagaza (cichlid ichthyologist) and the SLO, Dr Kelly West (gastropod specialist). Training included lab-based identification techniques, underwater survey skills were observed and refined, BLOSS team members presented work and led some discussion. Wider issues of biodiversity and conservation were introduced and discussed. The participants have been added to the staffing schedule below.

July: Dr Kelly West (SLO) taken through BLOSS databases developed by MRAG while in UK. Dr West agreed to identify candidate for MRAG to train in information management so take over maintenance of BLOSS survey and literature databases for the region. Discussed technical approaches for MRAG to deliver the databases in

French and English. Dr West to organise regional translation of database forms, MRAG will develop the facility to enable users to choose either language.

July: An MRAG briefing on co-ordinating sampling programmes throughout the region was sent to BIODIVERSITY field teams in Burundi, DR Congo and Zambia. This was one of the outcomes of the GIS meeting in June. Maps generated from TANGIS were sent to teams for comment on the division of coast into main areas (Burundi 3, DR Congo 5, Tanzania 4 and Zambia 3). Current information on location of survey sites was requested from field teams to assist in the development of TANGIS.

July: Proposals for various activities associated with BIODIVERSITY prepared and submitted to NRI for budgetary consideration. The activities identified as needing additional support include: second round of dive and underwater surveying training (targeted at Parks staff); a parks workshop to draw together all SS's and conservation experts to develop a strategy for conservation in Lake Tanganyika; training for users of BIODIVERSITY survey database and data management so MRAG can hand over maintenance of regional literature and survey databases; support for Zambian researchers to continue Coulter's gill net surveys (10 year intervals); and, support for cruise of DR Congo (assessment of potential protected areas).

August: Back to Office reports from consultants who participated in Bujumbura workshop received. The recommendations for additional activities were assessed in light of BIODIVERSITY strategy and budget requirements: several recommendations will be added to the field work programme.

August: Data from recent survey work in Burundi and progress report received from Dr Ntakimazi, BIODIVERSITY co-ordinator.

2.1.3 Staffing Schedule

2.1.3.1 Bujumbura

Dr NTAKIMAZI, Burundian Co-ordinator

Benoît NZIGIGAHERA, cadre et biologiste chercheur à l'INECN.

Nestor NIGARURA, cadre et biologiste à l'INECN.

Ladislav HABONIMANA, Guide touristique P. Rusizi, I.N.E.C.N

Kamalebo WILONDJA Chercheur LTBP – Bujumbura

2.1.3.2 DR Congo

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

M. N'sibula MULIMBWA, Directeur Scientifique C.R.H. – Uvira

M. Diamani BWEBWA, Chercheur, C.R.H. – Uvira

M. Muke Syaïra MUKIRANIA, Chercheur, C.R.H. – Uvira

M. Risasi D MUZUMANI, Chercheur, C.R.H. – Uvira

2.1.3.3 Regional Dive Team:

Tanzania	Robert	MWAKAFUMBE	TAFIRI	BSAC-sport
	Fadhili	KIMAMBO	TANAPA – Gombe	BSAC-sport
Zambia	Rueben	SHAPOLA	DoF	BSAC-sport
	Charles	LUKWESA	DoF	BSAC-sport
	Maybin	MWENDA	DoF	BSAC-sport
Congo	Constantin	AMUNDALA	CRH - Uvira	BSAC-sport
	Patrick	BUDA	CRH - Uvira	BSAC-sport
	Donatien	MUZUMANI	CRH - Uvira	BSAC-sport
	Alexis	BASONGA	CRH - Uvira	BSAC-sport
Burundi	Albéric	RUGIRABIRORI	technicien au Département de Biologie à l'Université du Burundi	BSAC-sport
	Bernard	SINUNUOKA	technicien au Département des Eaux et Forêts Ministère de l'Agriculture chargé de ma maintenance du matériel de plongée	BSAC-sport
	Libére	NDAYISENGA	Chef Parc de la Rusizi	BSAC-sport
	Félix	Nicayenzi	LTBP	BSAC-sport

2.1.3.4 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

2.1.3.5 BIOSS Consultants

Dr Gashagaza (National University of Rwanda)

Dr Lu de Vos (National Museums of Kenya)

Dr Koen Martens (Royal Belgium Institute of Natural Sciences)

Dr Kelly West (SLO, LTBP)

2.1.3.6 Special Advisors

Dr Rosemary Lowe-McConnell (Independent)

Dr George Coulter (Independent)

2.1.4 Main Outputs and Achievements

- Technical workshop held for Francophone BIOSS teams

- Recruitment process for regional facilitator complete, successful candidate has been cleared by UNOPS and we await regional confirmation of his appointment.
- Plans for information management significantly advanced both for field teams and the link with the project GIS
- Proposals for activities complementary to BIOSS and the SAP submitted to the project for financial consideration
- Burundian team continuing with field programme and reporting regularly.

2.1.5 Main Objectives for the Next Quarter

- PCU to gain regional approval for selected candidate for regional facilitator post.
- Regional facilitator in post
- Facilitator to discuss BIOSS work plan with each of the field teams and assess current status.
- Receive decision from LTBP on proposal for additional funding for various activities.
- Second round of dive training initiated (trainers identified, additional equipment sorted) and plans for regional team to survey Mahele and Nsumubu advanced
- Draft standing orders document (i.e. specification of field procedures) completed and sent to various contributors for comment.
- Further plans for complementary projects arising from consultant's BTOR's: identify suitable regional counterparts, develop terms of reference and contracts.

2.2 Progress Report: June - August 1998 for Fishing Practices Special Study

2.2.1 Overall Summary of Progress

The Tanzanian team continue with their regular sampling and several of the team revisited Rukwa with the SESS team. The exchange of communication between London and Kigoma continues to work very well. The team report regularly on their work plans and when a piece of work is completed they send short technical reports. This arrangement works very well in lieu of a permanent regional facilitator based on the lake. It is anticipated that the Tanzanian team will be a significant source of information regarding work programmes and overlap with SESS for the newly appointed facilitator. Similarly, the team will benefit from regular contact with the facilitator who will provide a regional perspective and draw in the BIOSS work programme.

Mrs Marwa, the FPSS co-ordinator, presented a paper at the Tanzanian National Sectoral Problem Review meeting held as part of the SAP process. The paper was clearly written, providing background on the team's current state of knowledge of fishing practices. It included their management recommendations to reduce the impact of three key gears (lift nets, gill nets and beach seines) on biodiversity in the Lake.

FPSS work in Zambia is not following an LTBP work programme, we have no information exchange between Mpulungu and London regarding activities progress. This is very unfortunate as MRAG understands, from a variety of sources, that significant changes have taken place in the artisanal fishery over the last 6 months. These changes were stimulated by visits from SESS and EE consultants, and individuals who were involved in earlier FPSS activities participated. The lack of formal connection between Zambia and the FPSS is of great concern and will be a priority for the regional facilitator once in post.

Applications for the regional facilitator for FPSS have been assessed. The selected candidate is currently going through the project clearance procedure: to date UNOPS approval has been given and regional approval is being sought through the PCU. A priority task of the regional facilitator will be to assess Francophone teams and develop work programmes. Given recent political events in DR Congo, work will begin with Burundian teams in the hope that the programme can be extended as soon as it is safe for the project to work Congo.

We congratulate Mrs Marwa on her success in gaining a place at Dar Es Salaam university (BSc) and wish her well, we are grateful for her offer to maintain her link with FPSS in holidays and while in Dar. Mrs Marwa has done an outstanding job as FPSS facilitator and her leaving is a serious blow to the field programme, both in

Tanzania and potentially in the region as her experience would have been a bonus to other teams as they developed expertise within FPSS.

2.2.2 Chronology of Activities

June-Aug: Tanzanian FPSS team report regularly to London on planned activities. Communication exchange functioning very well, facilitated by James Bahati who efficiently maintains the Kigoma office. Regular sampling of Ujiji and Katonga continues.

June/July: Applications for FPSS regional co-ordinator assessed and discussed. MRAG discussed applications closely with PCU and colleagues from other SS's and other parts of the project. A short list was drawn up and the top three candidates were interviewed (Panel: Dr Ian Payne, Ms V Cowan and Dr West).

June: Tanzanian FPSS team conducted sampling visits to Luiche delta, Malagarasi. Analysis and report writing follow each field trip.

July: Tanzanian FPSS team re-visited Rukwa in a joint SESS/FPSS field trip.

July: Mrs Marwa attended the National working group meeting convened as part of the Strategic Action Plan process. Paper entitled: Fishing Practices and Gears was presented.

August: Request for details of the exact locations of field work sent to Tanzanian team. This is one result of joint meetings between MRAG and NRI (GIS component) on information management for the SS's and linking the data to the project GIS being developed. (refer to BIOS progress report for this quarter regarding links between the field programmes and TANGIS)

August; Tanzanian FPSS submitted report on beach seine fishery which used to operate out of Gombe national park: recent legislative changes have banned the gear in Tanzania. Report on Rukwa expedition also submitted.

August: CV of selected candidate for regional facilitator post submitted to UNOPS for clearance; process successful.

August Mrs B Marwa informed FPSS that she had been accepted for a BSc at Dar Es Salaam University (funded by Tanzanian government)

2.2.3 Staffing Schedule

2.2.3.1 Regional team

Tanzanian Team

Mrs Beatrice Marwa, Co-ordinator (DoF)
Mr Omari Kashushu (TAFIRI, Kigoma)
Mr Hamza Maboche (Community Development)

Zambian Team

Mr Joseph Chimanga (DoF, Mpulungu)
Mr Whiteford Chumba (DoF, Mpulungu)
Mr Charles Lukwesa (DoF, Mpulungu)
Mr Isaac Zulu (DoF, Mpulungu)

2.2.3.2 International team

Dr Ian Payne, MRAG Ltd, FPSS Director
Dr E Allison, MRAG Ltd, FPSS consultant
Dr P Petit, MRAG Ltd, FPSS consultant
Ms Vicki Cowan, MRAG Ltd, FPSS Management
Dr Rosemary Lowe-McConnell Specialist advisor
Dr George Coulter Specialist advisor

2.2.4 Main Outputs and Achievements

- Recruitment process for regional facilitator complete, successful candidate has been cleared by UNOPS and we await regional confirmation of his appointment.
- FPSS team in Tanzania improve skills in technical reporting, largely through the guidance of Mrs Marwa.

2.2.5 Main Objectives for the Next Quarter

- FPSS regional facilitator in post.
- assessment of FPSS's current status and development of work plan for next year completed by FPSS regional facilitator.
- Replacement for Mrs Marwa found to maintain momentum of field programme in Tanzania.

2.3 Progress Report: June - August 1998 for Legal and Institutional Component

2.3.1 Summary of Progress

The main progress this quarter has been in rationalising the work plan recommended at the legal workshop in February against the original terms of reference and the budget. The objectives outlined in the original project document for this component are as follows:-

1. Existing laws for the protection of the lake environment and other existing laws and regulations which impact the lake in the four countries will be reviewed.
2. Shortcomings in the implementation and enforcement of existing legislation will be identified
3. A comparative analysis for discussion between the four countries with the view of defining compatible legislation and means to harmonise realistic legislation will be prepared
4. A basic framework of lake environment legislation for consideration by the four countries will be recommended.

At this stage in the project, the completion of the legal and institutional baseline review meets objectives 1. and 2.

The requirements for objective 3 are met through both the legal and institutional baseline review and the discussion paper presented at the legal and institutional workshop in February 1998. The paper was entitled: **LEGAL AND INSTITUTIONAL ARRANGEMENTS FOR THE MANAGEMENT OF LAKE AND RIVER BASINS: ISSUES TO BE COVERED IN AN AGREEMENT AND POSSIBLE APPROACHES.**

At this stage, Objective 4 remains outstanding. This will be met by the production of a draft treaty for the consideration of each riparian country. A draft document will be produced within the current budget allocation. The legal consultants will complete this document, both French and English versions, and circulate it to the region by the end of 1998. The draft will include a commentary detailing the precedents etc. and the reasons why specific words and formats have been used. The consultants will work closely with the legal translators to ensure the French draft reflects the tone and meaning of the English draft.

The work programme recommended by the February workshop, with its series of consultation workshops, offers the project an opportunity to substantially improve the end product of this component. However, as noted this falls outside the current budget allocation. A proposal outlining the financial implications of this for the project has been submitted to the consortium for consideration.

2.3.2 Chronology of Activities

June: Legal consultants confirm to MRAG that the draft international agreement will be prepared, translated and ready for circulation in the region by the end of 1998.

July: MRAG letter to National co-ordinators, which was drafted in May (NB was marked as distributed in last quarterly report) was withheld pending confirmation of future work plan. The work plan recommended at the legal and institutional workshop (Lusaka February 1998) included activities beyond the original terms of reference for this component. The budgetary implications of these activities are currently under consideration.

2.3.3 Current Staffing Schedule

2.3.3.1 Regional Lawyers and Policy makers

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

Burundi M. Jean Bechmans Manirakiza (NC) M. Benoit Bihamiriza Ir. Roger Kanyaru 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-Mangani 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

2.3.3.2 International

Dr Ian Payne, MRAG Ltd, Component Director Mr Cormac Cullinan, MRAG Ltd (Legal Specialist, Anglophone) Mr Stephen Hodgson, MRAG Ltd (Legal Specialist, Francophone) Ms Caroline Blatch (Legal Specialist, Francophone) Ms Vicki Cowan, Component Manager
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2.3.4 Main Outputs and Achievements

- Rationalisation of recommended work plan against budget and original ToR. Confirmation that original ToR for the legal and institutional component can be met within existing allocation. Estimate of additional funding required if

recommended work programme with extensive facilitated regional consultation is to be implemented.

2.3.5 Main Objectives Next Quarter

- Legal consultants finalise English version of draft agreement and translation to French underway.
- Receive decision from LTBP on proposal for additional funding for consultation workshops.
- Communicate decision to regional counterparts and make appropriate plans for whichever work programme will be funded.
- Adjust agreement between MRAG and legal consultants in light of decision.

2.4 Progress Report: June - August 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:

- 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.
- 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.

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.

11 June: Msaky (TPDC) to University Arizona and began pollen analysis of sediment cores.

16-26 June: Wooster's visit to Tanzania

19 June: Nzeyimana completed his period of training at VUB and returned to Burundi.

3 July: Patterson and Irvine (Trinity College, Dublin) met with Henry Sichingabula of University of Zambia at NRI whilst he was in UK to attend a conference.

14 July: interviews at NRI for Seds study facilitator.

4 August: O'Reilly departed Tanzania.

10 August: further interviews at NRI for Seds study facilitator.

5-28 August: Field visit of Duck and Wewetzer of the University of Dundee.

24 August: Nkotagu to Kigoma for field visit.

24 August: Msaky arrived at Duke University, Zoology Dept. to begin period with Prof. Dan Livingstone on pollen identification.

27 August: A long process of selecting a regional facilitator resulted in a nominee (Olivier Drieu) being forwarded to UNOPS for clearance. At the time of writing it is not certain whether approval will be granted. Assuming this is forthcoming it is hoped that Drieu will commence his contract in September 1998 and travel to the region in October.

31 August: laboratory equipment arrived in Burundi to permit the work of Nzeyimana to commence.

2.4.3 Staffing Schedule

A summary of all of the staff involved in the Sediments Special study was given in the previous quarterly report. Apart from the selection of a regional facilitator (see above) there have been no major changes in staffing on this special study

2.4.4 Main Outputs and Achievements

Hudson Nkotagu of University of Dar es Salaam completed a quarterly report on his work on the rivers of Gombe region covering the period May to July 1998.

University of Arizona (Cohen) produced a quarterly report for the period April - June 1998 (2nd quarterly report) for the work analysing the lake cores. Mrs Msaky of the Tanzanian Petroleum Corp. is doing the pollen analysis for this work and as produced her first three monthly summary reports during the period for June, July and August 1998.

Sichingabula continued his work monitoring Zambia rivers and the project received his review report in early June - a milestone report for this work.

Phase 1 report was received from IGEBU and DGGM, Burundi at the end of July 1998. English and French versions are available. This completes Phase 1 of the work proposed for river monitoring in Burundi and makes proposals for Phase 2.

Kings College London produced their first quarterly report of progress of the modelling of erosion in the Lake Tanganyika catchment using remote sensing. This included the back-to-office report of Wooster's visit to Tanzania carried out from 16-26 June 1998. BTOR and first quarterly report submitted

Catherine O'Reilly of the University of Arizona returned from the region on August 4 1998 at the end of her contract with the Project. She presented the results of her findings at the International Limnological Society on 13 August. She has produced a brief summary report of her findings in anticipation of the longer technical report.

Duck and Wewetzer of the University of Dundee completed a field visit to Zambia which took place from 5-28 August 1998. Back-to-office report expected early in the next quarter with a fuller technical report to follow.

The questionnaire aiming to establish protocols for reporting and data deposition for all active participants in the special study was not completed during this quarter and this is now a target for the next quarter - this was delayed in order to establish protocols for data archiving with the GIS/database component of the project.

2.4.5 Main Objectives for the next quarter (September 1998 - November 1998)

Maintain the data flow and reporting schedule from operational monitoring programmes - see previous quarterly report for summary of field teams and their objectives.

- The study facilitator will be appointed by the end of September 1998 and will begin field operation in October after a short period at NRI with the project co-ordinator
- G. Patterson will attend the Technical Advisory Committee meeting in Arusha 11-15 October 1998.
- GP will follow the TAC meeting by visiting various institutions that are operational within the SEDSS this will be an opportunity to introduce the field facilitator to the staff of these institutions
- 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.

2.5 Progress Report: June - August 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'*.

This document draws on regular reports produced by Dr Francis Chale in Kigoma and Miss Nicola Wiltshire in Kigoma and Mpulungu as well as my own observations. The period included the first half of June spent by Dr Bailey-Watts in Mpulungu - following his visits to the other three project centres (i.e. Bujumbura, Uvira and Kigoma). We have established what are likely to be the few final additional limnological monitoring sites in the Mpulungu and Nsumbu areas: these bring the total coverage to 7 sites at and around Mpulungu and 6 stations at and around Nsumbu. Lawrence Makassa has produced a very useful map identifying these stations. The sampling effort in these two areas compares favourably with the 10 sites encompassing the Kigoma area and Gombe. Each of the three areas thus includes situations ranging from what can be perceived as remote and unimpacted, as well as heavily polluted.

Much of the physical and chemical sampling is now 'routine', and very good progress has been made with phytoplankton species diversity assessments in both Tanzania and Zambia - with the Francophone countries also embarking on these studies. A first scientific paper to be produced by the Project was presented in August at the 27th Congress of the International Association of Limnology (SIL) in Dublin⁶. In addition, Dr. Bailey-Watts gave a brief address to a working group - including Drs Rosemary Lowe-McConnell and George Coulter - to the SIL African Great Lakes Group Web Site Project.

We have, however, encountered problems (especially in Zambia, but albeit to a lesser extent Tanzania too), with a number of nutrient and pigment determinations; these stem largely from erratic power supply and inadequate spectrophotometers - on top of difficulties to be expected bearing in mind the very low concentrations of solutes and particulates in the generally dilute waters in these areas. As a result, Alex Kirika is - at the time of writing - in Mpulungu, with an IFE spectrophotometer; early reports suggest that this move is proving very successful.

As a result of these developments, the correspondence between chemical and algal results obtained by the IFE and Kigoma laboratories is very encouraging. This is due in large part to Dr Chale's direction of chemical analytical work, and Miss Wiltshire's training of the nationals in microscopy. In this connection Dr Chale and the Kigoma team are to be congratulated in facilitating a programme of nitrate analyses. Samples have been collected for this over many months, but only recently have we obtained the glassware and Cd columns to do the work. Another new initiative concerns epilithic algae - this being viewed as important in reflecting (in-shore) water quality status. To

⁶ PHYTOPLANKTON SIZE AND SPECIES DIVERSITY IN TWO VERY CONTRASTING WATERS: LAKE TANGANYIKA AND LOCH LEVEN. Bwathondi, G.¹, Kadula, E.¹, Kaweme, K.², Lukwesa, C.², Makassa, L.², Muhoza, S.¹, Wakafumbe, R.¹, Zulu, I.², Kirika, A.³, Wiltshire, N. J.³ and Bailey-Watts, A. E.³ Lake Tanganyika Biodiversity Project, P.O. Box 90, Kigoma, Tanzania, ² LTBP, P.O. Box 55, Mpulungu, Zambia and ³ Institute of Freshwater Ecology, Edinburgh Laboratory, Penicuik, EH26 0QB, Scotland.

this end Miss Wiltshire and the trainees have deployed artificial substitutes in a range of impacted, e.g. Kigoma Port, and unimpacted areas such as remote Nsumbu.

As indicated above, the algal results obtained by the Mpulungu and IFE stations are very similar, but problems over the chemical work persist.

A second FBA Zeiss microscope has been lent to the Project - for Mukungilwa Kamalebo based in Uvira.

The 4-person team in Bujumbura (see below) has started to sample the lake and some of the inflows in and near Bujumbura. - above and below point-source outfalls of pollutants including brewery waste and a sewage effluent treatment plant. The programme needs to be considerably expanded however, before it ranks with the coverages outlined above for Kigoma and Mpulungu. As a consequence of hostilities in the Congo, we are unsure as to the state and whereabouts of the equipment (including the microscope mentioned above) delivered recently to Uvira.

The intended analysis, interpretation and reporting on the physical, chemical and biological results to June 1988 has not transpired, although good progress has been made with regard to the algal work based at Gombe, Kigoma, Nsumbu and Mpulungu and chemical analysis at Kigoma (see below).

Drs Foxall, Chale and Bailey-Watts have given thought to the assessment of pesticides, heavy metals and hydrocarbons in lake water and biota. A suggestion involving a workshop and intensive analysis of samples at the Tanzania Pesticide Research Institute (Arusha) is under consideration.

No loadings of pollutants to the lake have yet been obtained, but sampling at selected river mouths near Kigoma, Mpulungu and Bujumbura has begun.

The visit to Mpulungu was remarkable in coinciding with wind-induced upwelling events resulting in a marked bloom of the cyanobacterium *Anabaena flos-aquae* fa *aptekariana* - extending from Mpulungu to at least as far as Nsumbu.

Ever-improving communications (telephone, facsimile and E-mail) is facilitating more and more frequent contact between UK and the region. It is heartening too, that the likes of Dr Chale, Mr Hakizamana, Mr Makassa and Mr Wilondja have used these facilities. However, I would like to see more of these exchanges - and more evidence of personnel from different regions getting together in this way. For example, the persons involved in phytoplankton should meet whenever possible.

2.5.2 Brief chronology of activities and visits

Dr Chale returned from Dar es Salaam and Arusha at the **beginning of June** with a replacement spectrophotometer and new apparatus for nitrate analysis. Dr Bailey-Watts was in Mpulungu **3-17 June**, following his visit to Kigoma ending **3 June**. Miss Wiltshire also visited Mpulungu at this time as part of her on-going duties at both stations. The visits concentrated on the on-going of training Mpulungu staff assigned to the PSS in the following activities/duties: field sampling, environmental recording, sample preservation, laboratory chemical and algal analysis, data logging (EXCEL) and graphing (SIGMA PLOT). Largely in response to the trainees themselves, much more attention than hitherto was also given to data interpretation. Dr Bailey-Watts and Miss Wiltshire thus stressed the value of firstly, plotting results and commenting on the nature of the plots and the values obtained for various chemical and biological determinands. Secondly, we discussed the possible causal relationships between the

determinands. Dr Bailey-Watts also completed a document on algal analysis including text on the basic algal ecology and limnology.

On **5 June** in Mpulungu Dr Bailey-Watts and Miss Wiltshire spent some 90 minutes with consultants Monique Trudel and Rachel Roland as part of a regional Training Needs Assessment; the consultants were very impressed with the 'on-the-job' training approach adopted by the PSS.

Dr Bailey-Watts visited NRI Chatham on **1 July** to meet the TNA consultants again and deal with LTBP budgetary matters and the situation regarding regional facilitator posts. He also visited John Rogers on NRI on **6 July** specifically to discuss the 'case' for additional funds for the PSS; Dr Bailey-Watts submitted a document on this to Mr Rogers on **15 July**.

Miss Wiltshire updated the work plans for Messrs Longinus and Muhoza in Kigoma on **15 July** in accordance with the requirement for assessing the population densities of phytoplankton (i.e. in addition to species diversity) and benthic algal studies.

On **20 July** Dr Chale produced a comprehensive listing of the PSS field and laboratory activities and schedules - including attention to heavy metals and pesticides. Dr Foxall has also provided a detailed document on sampling protocols for these materials and has progressed considerably some ideas on how to tackle the assessment of hydrocarbons.

Mr Kirika left Scotland for Mpulungu on **20 August** primarily to deal with persistent and potentially very serious chemical analytical problems experienced at the Mpulungu station.

2.5.3 Current staffing schedule

The present staff complement is as follows:

In Burundi: Messrs Hakizimana (PSS Co-ordinator in Burundi) and Wilondja Kamalebo, and Ms Consolata Musanisoni; a contract for Mrs Aline Irimbere (INECN) is also about to be signed.

In Congo: Dr Tshibangu (PSS Co-ordinator in Congo); contracts for Mukungilwa Kamalebo and two other persons are about to be assigned.

In Tanzania: Dr Chale (PSS Co-ordinator in Tanzania) and Ms Lyoba, D (50) and Ms Salome; Messrs Lyoba, Mfilinge, Muhoza (90), Tegulilwa, Kadula (80), Wakafumbe (75) - in addition to Miss Nicola Wiltshire (PSS Trainer in limnological aspects in Tanzania and Zambia) and Drs Bailey-Watts and Foxall, and Mr Kirika.

In Zambia: in Mpulungu: Messrs Makassa and Zulu; and Chimanga, Chombe, Kaweme, Lukwesa, Mwape, Syapila (50%). 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): Christopher Kashinga are involved as support for the PSS.

2.5.4 Main objectives for next quarter

1. To arrange visits of 3-4 month's duration to IFE/UEA laboratories for 2 persons (1 chemist, 1 algologist/biologist) from each main LTBP centre (Bujumbura, Kigoma, Mpulungu and Uvira. Especially bearing in mind the problems experienced even with such persons as Dr Chale and Miss Wiltshire permanently on hand, it is vital that selected staff from each region have a period in UK. Without such training visits we cannot see the work being sustained.

2. To attract funding (*ca* £1500) for literature that is much-needed by the trainees. There are currently virtually no books or papers of direct relevance to the limnological work of the PSS programme.

3. To replace in one form or another (ex-patriate or national) Miss Nicola Wiltshire who is leaving the Project at the end of this reporting period i.e. 31 August 1998 - a vital requirement. Miss Wiltshire would admit to some shortcomings, but her presence overall has been vital.

4. To accelerate and expand all aspects of the work in the Francophone countries in particular, but also Tanzania and Zambia with regard to heavy metals, pesticides and hydrocarbons.

2.6 Progress report: June - August 1998 for Socio-economics and Environmental Education components

[Held over until next quarter]

2.7 Progress Report: June - August 1998 for GIS and database management.

2.7.1 Overall Summary of Progress

Progress during the period December 1997 - May 1998 has focused on debugging the simple GIS and testing with a variety of datasets. Some meetings have been held with Special Studies Groups to identify data sources, and the metadatabase has been expanded to store metadata about non-centrally held datasets (web sites, maps held by ministries, conference reports etc). A classification scheme has been devised for each dataset catalogued in the metadatabase:

- LEVEL 1 - paper data not held by TANGIS
- LEVEL 2 - digital records not held by TANGIS
- LEVEL 3 - paper records held at a central database (i.e. with TANGIS)
- LEVEL 4 - digital records held by NRI and integrated with TANGIS.

NRI have searched for new datasets requested by the special studies.

- From King's College, we have received a new DEM and simple land cover map of the catchment area at 1:1M scale.
- NRI have made two datasets relating to refugee camps. One contains refugee camp locations with data about numbers at particular times and agencies working there. The second is more general information based around districts (for Burundi only at present).
- 1:1M rivers data set has been improved: the main rivers have been named, as have all the rivers entering the lake.
- 1:1 M settlement dataset has been improved, with names given to all settlement around the lake.
- 1:1M District boundaries have been located for all countries; to which we can join many other data. District level population for Burundi and provincial level population statistics for the other countries have already been catalogued.
- After a suggestion from MRAG, we have created a map of the lake divided into several study regions. We are awaiting comment on this as a useful division of the lake for research and management purposes.

More suggestions for useful datasets should be made. Also, many of these datasets are not static; if anyone has up to date information regarding refugee status or population, NRI would be pleased to hear about it.

NRI have started to liaise with Special Studies Groups and have received some data. The Biodiversity Group have given us their Literature database which can allow users to map source locations. The Sediments study have sent raw core sample data from studies around the lake. These have been entered as comma separated files and can be viewed in TANGIS.

Special studies - TANGIS is building up a list of locations of special studies. TANGIS allows presentation views to be created within the GIS which can demonstrate the data collected for each special study. Currently, special views exist for the core sample data. Other suggestions for what should be in the GIS should be sent to Anne Jackson at NRI.

Provision in TANGIS has been made for each special study interface to have modelling capabilities. A menu has been created in each interface called TOOLS, to which

specialist programmes can be added. Suggestions for this could be pollution modelling, erosion modelling, distance calculations, buffer zones, extended queries.

A concern we are highlighting with TANGIS regards the acceptance of datasets of different map projections. At present, two co-ordinate systems are in use, latitude/longitude (decimal degree based) and UTM projection (metre based). Both have merits, but unfortunately data from different projections cannot be shown in the same map in TANGIS. Feedback on people's preference for projection is requested: do you want standardisation to one projection (and if so which), do we hold two copies of all datasets in each projection (NRI can cope with the conversion, but this is an unsustainable procedure once TANGIS is installed in the region)? Alternatively, we continue gathering data in the projections they arrive in, and some data may not be compatible with other data. Feedback to NRI on people's views will be sought in the next quarter.

2.7.2 Chronology of Activities

June - Discussion with Graeme Patterson for Sediments Special Study.

July - Visit to MRAG to discuss compatibility of databases and demonstration of TANGIS.

July - Purchase of A3 printer for map outputs.

July - Enhancement of district, river and settlement datasets.

August - Purchase of Magneto-optical (MO) drive to allow transfer of data from Kigoma receiving station to TANGIS.

August - Creation of refugee camp dataset.

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 expanded to cope with non-digital and non-centrally held datasets.
2. Special Studies database started; demonstration views within GIS to show off Special study data.
3. Special Study Groups begun to liaise with GIS group for datasets.
4. Enhancement of "framework" datasets, to which other data can be joined.

2.7.5 Main Objectives for the next quarter (September 1998 - November 1998)

1. Work with LTBP team to identify bilingual GIS/RS training requirements, including how they can be integrated into overall project training plan.
2. Interviews to be held with Socio-economic and Pollution 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.
3. Watershed datasets to be created.
4. Short Data Catalogue published and updated bi-monthly, distributed to collaborators.
5. Web site design assistance including short and long data catalogues, GIS news of new datasets, contact points and guidelines for preparing GIS compatible datasets.

6. Assistance with erosion modelling study around Gombe National Park
7. Translation of TANGIS metadatabase interface into French.
8. Continuing expansion of datasets, particularly useful data from Special Studies groups. Focus on land use sets, social and economic statistics and bathymetric data.

2.8 APPENDICES

APPENDIX 1

Conclusions of the National Sectoral Problem Review - Guidelines for the National Environmental Strategies and Priorities Review (Zambia)

APPENDIX 2

Conclusions of the National Sectoral Problem Review - Guidelines for the National Environmental Strategies and Priorities Review (Tanzania)

APPENDIX 3

Conclusions from the National Working Group's planning meeting (Burundi)

APPENDIX 4

Conclusions from the National Working Group's planning meeting (DR Congo)