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Progress Report No 11

September - November 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 Etats 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**

Enquiries about this publication, or requests for copies should be addressed to:

Project Field Co-ordinator
Lake Tanganyika Biodiversity Project
PO Box 5956 Dar es Salaam, Tanzania

UK Co-ordinator, LTBP
Natural Resources Institute
Central Avenue, Chatham, Kent, ME4 4TB, UK

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

Progress Report No. 11

September – November 1998

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1. Project Co-ordination Unit

1.1 Project Co-ordinator and Scientific Liaison Officer

1.1.1 General Summary

This quarter was highlighted by three important events: the arrival of three of the four facilitators in the field, the visit of a two man mission to undertake a mid-term evaluation (MTE) of the project and the first Transboundary Diagnostic Analysis (TDA) of the threats to the lake. In other areas the project had, in general, a very active quarter with a number of notable advances in the special studies particularly with regard to the development of work programmes in the Francophone region. Lamentably, as reported in the last quarterly report, the good progress made in the Democratic Republic of Congo (DRC) since early 1998 was abruptly curtailed in August owing to renewed fighting in the eastern region of the country. However, towards the end of this quarter the border between Burundi and DRC has reopened and security conditions have improved somewhat to the point where project activities, including the renovation of CRH are once again in progress.

The three newly appointed facilitators (Dr Richard Paley, Biodiversity, Dr John Adam Dorr, Fishing Practices and Dr Olivier Drieu, Sedimentation arrived in post in early October. The Scientific Liaison Officer hosted the facilitators for a six-week orientation tour of the LTBP Stations in Zambia, Tanzania and Burundi. During this time the facilitators became acquainted with our national affiliates working on the special studies. They reviewed the special studies progress, became familiar with project logistical and administrative considerations, and the unique local conditions at each station. Current security conditions did not permit a visit to DRC, however, a team of our Congolese colleagues were able to cross the border and meet with the facilitators in Burundi. The SLO has written a Back to Office report on this mission, available from the project website.

Dr. Gerard Cougny and Mr. Niels Ipsen, recruited by UNOPS to conduct a mid-term evaluation of LTBP, visited the capitals and the LTBP riparian stations in, Burundi, Tanzania and Zambia between November 1-28. During their tour, the MTE team met with the LTBP National Co-ordinators, members of the National Working Groups, national special studies teams, Special Study Co-ordinators and facilitators, Strategic Action Plan (SAP) facilitators, and the PCU. They also attended as observers the TDA in Lusaka. They were unable to visit Kinshasa or Uvira.

At a final round up meeting with the PC in Dar es Salaam, the consultants expressed their appreciation to all those who had contributed to the organisation of their logistically complex trip around the lake region. They were particularly impressed with the largely successful efforts that were made for them to meet the majority of people and organisations affiliated with the project.

Progress with the SAP has developed apace and we are particularly pleased to be able to report that in spite of the problems in DRC it was possible to hold an intensive workshop in Arusha, Tanzania for delegates from Kinshasa and eastern DRC. The intensive workshop carried out a detailed national analysis of threats and mitigation actions concerning the lake and its resources thus bringing DRC in line with the other three countries in terms of development of the SAP. The first Regional Transboundary Diagnostic Analysis was completed at the workshop held in Lusaka on 23-26 November 1998.

The meeting brought together five environmental professionals from each of the four riparian countries, including the National Co-ordinators, to review the national

consultation exercises that had already been carried out in each country and to develop a regional perspective that will guide the future development of the SAP.

The workshop was assisted by additional support from several special study co-ordinators, project scientific liaison officer, project co-ordinator, representatives of special studies research programmes, and two facilitators with experience of the Strategic Planning Process. The workshop was a success and extremely beneficial to the development of the SAP. A brief report of the workshop has been circulated and more details are given in section 2. Strategic Action Plan (SAP) below.

Minor renovations and refurbishment were completed at Bujumbura Station; the SLO and the administrative assistant were finally settled in proper offices, with office space for, the facilitators, visiting researchers, communal laboratory space, and a communal computer room/library/meeting room.

A new administrative assistant, Mr. Clement Mwelwa, was recruited for Mpulungu Station to replace Martin Pearce who retired in July. Mr. Bahati James, the administrative assistant for Kigoma Station, and the SLO travelled to Mpulungu to welcome Mr. Mwelwa and train him in project policies and procedures. At the Dar es Salaam Office, Mr Ritesh Bhandari, was appointed as the assistant to the project co-ordinator to replace Ms Victoria Chale who left to take up a position in a commercial enterprise. The Technical Officer, Mr Jerod Clabaugh has finished his one-year contract with the project. The LTBP website will be a lasting reminder of Mr Clabaugh's excellent work with the project. He will continue to work with LTBP on a short-term consulting basis as and when required.

Mr. Pierre-Claver Nzimpora translated more than 600 pages of project documents during his first quarter of service, including all the SAP final reports, several SAP briefing documents and several technical reports. The volume of work and the fact that Mr Nzimpora is a full time employee of the project in the Bujumbura office results in a considerable financial saving to the project compared to having the work done by independent translators as piecework.

The security situation in Eastern Congo remains tense. Our Congolese affiliates are able to carry out some limited activities near to their centre but even these are sometimes cancelled due to deteriorating security conditions. Fortunately, they are often able to cross through to the Burundi border to brief us, however, as UNDP discourages traffic in the other direction, the PCU and Special Studies leaders and facilitators have not been able to visit Uvira Station since July. Nevertheless recent indications suggest that a visit may be possible shortly.

The Project Co-ordinator visited UK 3-8 October, to attend a consortium management meeting and discuss project progress with the NRI management.

Last but by no means least the LTBP's Intranet website is now on-line at **Error! Bookmark not defined.** and all who can connect to the internet are encouraged to do so and send comments and suggestions to the Technical Officer in Bujumbura. For those who do not have ready access to the Internet, CD-ROM production of the website has begun and will be distributed soon.

1.2 Technical Officer

IT Equipment: HF radio communications equipment for all four riparian stations has cleared customs and is awaiting installation. Work continued on licensing of VHF radios for use by the Bujumbura Station. A Sun Ultra 5 UNIX workstation computer was purchased and installed for purposes of hosting the LTBP Intranet website.

Boats: Three 22-foot fibreglass boats and engines are still awaiting delivery to the riparian stations

Newsletter/Website: The second issue of *Lakeside*, LTBP's newsletter, is in the final stages of production. LTBP's Intranet website is now on-line at <http://www.ltbp.org>. CD-ROM production of the website has begun.

Training: The TO lectured for one week on "World Wide Web site design in the context of development projects and the GEF framework" during 26-30 October at IW:Learn's annual "Training, Brainstorming, and Internet Workshop". The workshop was held at Royal Holloway University of London and 15 students from 8 GEF projects participated in the seven-week event. For more information, please see the Back to Office Report, available on the website.

Duty Travel: The TO spent 14 days in the United Kingdom.

The TO has finished his one year contract with the project. The TO will continue to work with LTBP on a short-term consulting basis.

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 a regional counterpart who will be in charge of continuing the development of the newsletter & Intranet;
4. Continued development and maintenance of LTBP's Intranet website;
5. Issue No. 2 of *Lakeside*, LTBP's newsletter, to be published and disseminated.

2. Strategic Action Plan (SAP)

The development of the SAP has continued to meet the agreed schedule set by the Steering Committee in January 1998.

However, following the TDA Workshop held in Lusaka in November, the Technical Advisory Committee (TAC), SAP Planning Team are recommending a changed schedule to allow for the incorporation of the legal consultants draft Convention for the Lake, now due in March 1999.

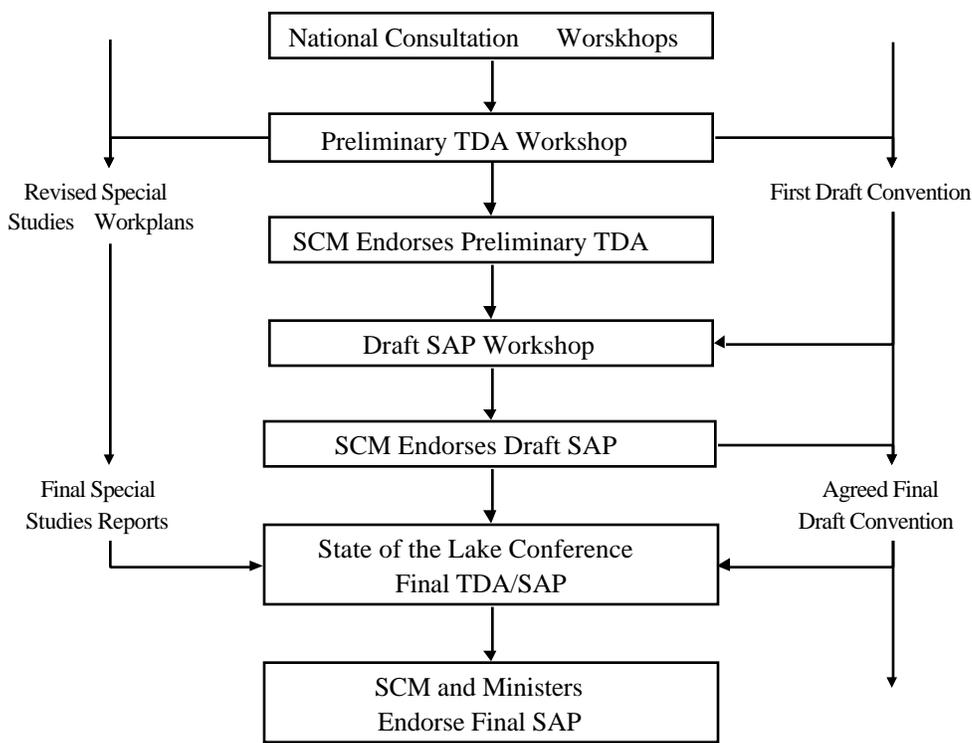
In addition, in order to bring in the final results of the special studies, it is now proposed that the analysis be extended through one further iteration. The study conclusions are expected in November 1999.

In summary, the Preliminary TDA will be presented to the National Co-ordinators for internal consultation in January 1999. The TDA will then be presented at the next scheduled Steering Committee Meeting for their endorsement.

The conclusions of the TDA, combined with the principles incorporated in the Convention, will then be developed into a draft SAP by the TAC SAP Planning Team at a workshop that has been provisionally proposed for June 1999.

The final project TDA and SAP will be prepared at a workshop linked to the proposed State of the Lake Conference provisionally scheduled for March 2000.

Figure 1 Seven Steps in the Development of the SAP



2.1.1 Workshop Progress

All National Workshops have been completed. However, the two DRC workshops were held back to back over a two-week period in Arusha. As a result the consultation

could not be as general as would have happened if it had been held in DR Congo, and limited to the National Working Group.

The first stage of the regional development of the SAP has been completed, with the preparation of the Preliminary TDA report. The next TAC SAP Planning Team workshop is now provisionally scheduled for June 1999.

Table 1 Workshop Progress

| | B | D | T | Z | R |
|--|-----|-----|-----|-----|-----|
| | u | R | a | a | e |
| | r | | n | m | g |
| | u | C | z | b | i |
| | n | o | a | i | o |
| | d | n | 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 | Yes | Yes | |
| National Environmental Priorities and Strategies Review | Yes | Yes | Yes | Yes | |
| Regional TAC SAP Planning Meeting | | | | | Yes |
| Preliminary Transboundary Diagnostic Analysis | | | | | Yes |
| Preparation of the Draft SAP | | | | | |
| Preparation of the final project TDA and SAP | | | | | |

2.1.1.1 *Zambia*

All National Workshops were completed during the previous quarter, June to August 1998¹; the results are presented in the report, “Conclusions of the National Consultation Process for the Regional Strategic Action Plan”.

2.1.1.2 *Burundi*

In Burundi the structure of the workshops were modified to reflect the development of the TDA concepts that had come out of the workshops held in the Anglophone countries. The major conceptual change was the specific linking of the national problem analysis to the regional TDA using the same terminology.

The first workshop was held in Bujumbura from 7-11 September 1998. The workshop developed the matrix and established priorities as part of the process of problem identification. This was then followed by the identification of stakeholders and details of actions related to priority problems.

The second workshop was held from 2-6 November 1998. It built on the previous workshop conclusions, and went on to identify issues of special transboundary interest, to be presented at the regional TDA meeting²

The workshop raised the concern that for the complete protection of the lake, Rwanda would need to be incorporated in the future management programme for the catchment.

¹ The final national workshop was held between 31 August and 3 September 1998.

² The following papers were presented at the workshops: Biodiversity and Lake Tanganyika; Catchment (land use, erosion); Human settlements, towns and industries; Fishing; Public works, mines and quarries; Problems specific to Rusizi plain; Institutions, legislation, education; Socio-economic inputs of the lake; NEPSR workshop (November); Lake transport (remainder of TDA); Water pollution (remainder of TDA); Laws on hydraulic public domain and waste disposal; National water master plan; Draft law on fisheries; National population policy; Urban development policy; Environmental co-ordination.

The conclusions have been presented in the report, “ Conclusions de la consultation nationale préalable à l’ADT: Analyse Diagnostique Nationale, Examen des Politiques et Stratégies Nationales pour l’Environnement”.

Jean Paul Ledant facilitated the meetings, with the assistance of Kelly West.

2.1.1.3 DR Congo – Potential Delays

As a result of continuing internal problems in DRC, the two national workshops were held back to back in Arusha from 19-29 October. The workshop was attended by six representatives from the lake and seven from Kinshasa.

As with Burundi the analysis was linked closely to the regional TDA requirements for the prioritised matrix. In practice, given that the two workshops were run back to back, there was little differentiation in the process of developing the national matrix of problems and priorities.

Again the consultation process was supported by the presentation of background papers³. The workshop went on to characterise problems with significant transboundary implications, and identified the main countries concerned.

The results of the national review process are presented in the report: Conclusions de la consultation nationale préalable à l’ADT : Analyse Diagnostique Nationale - Examen des Politiques et Stratégies Nationales

Jean Paul Ledant facilitated the workshop.

2.1.1.4 Tanzania

Following the conclusions of the first workshop, further background materials were prepared and the second workshop was subsequently held in Dar es Salaam from October 12-16 1998.

Jean Paul Ledant and Dr Menz facilitated the meeting.

The output of the second workshop was the completion of a prioritised matrix of problems and actions. The following table lists the top three priority problems in the areas of fishing, pollution and sediment control.

| Reduce Impact of Fishing | Control Pollution | Control Sedimentation |
|---|---|---|
| 1. Use of beach seines | 1. Oil spillage from Kigoma power station | 1. Clearing land for farming on steep slopes |
| 2. Inadequate protection of seasonal spawning / nursery grounds | 2. Discharge of untreated sewage from Kigoma town | 2. Stream bank cultivation |
| 3. Use of inappropriate gill nets | 3. Discharge of untreated sewage from lake shore institutions | 3. Inappropriate farming practices cultivating down slope |

The results of the national workshops are presented in the report, “Tanzania: Conclusions of the National Consultation Process for the Regional Strategic Action Plan”. By the end of the consultation process, over 60 individuals had participated, representing over 30 organisations including, national and international NGOs,

³ Lake Biodiversity; Pollution; Problems in the Ruzizi plain; Erosion and Sediment; Fisheries; Protected Areas; Demography; Socio-economic Aspects; Legislation and Institutions; Environmental Education.

government agencies and parastatals, local councils, academic and research institutions, the church and the private sector.

NB: In previous progress reports from SAP workshops have been appended to progress reports in addition to separate distribution. However, owing to the length of the reports from the remaining workshops they have not been appended to this report.

2.1.2 The Regional TAC SAP Preliminary TDA Workshop

The first full regional workshop in the development of the SAP was held in Lusaka from 23-26 November 1998. The meeting used the simultaneous translation facilities at the Mulungushi conference centre.

The meeting was opened by the Deputy Principal Secretary from the Ministry of Environment Mrs M.U. N. Nkhowa and Chaired by Zambia. The meeting brought together five environmental professionals from each of the four riparian countries, including the National Co-ordinators, to review the national consultation exercises that had already been carried out and to develop a regional perspective that will guide the future development of the SAP. The meeting was also supported by the leaders of the special studies for sediment, fisheries and biodiversity, and was facilitated by Nick Hodgson and Jean Paul Ledant with the assistance of Dr West and Dr Menz.

The project mid-term evaluation team who were in Lusaka on the last leg of their tour of the region, attended some of the workshop sessions as observers.

The objective of the meeting was to develop a Preliminary Transboundary Diagnostic Analysis, including the preparation of a prioritised matrix of Problems and Actions, based on the current knowledge and accumulated experience of the management of the lake and catchment resources.

The conclusions of the meeting are presented in the document, "Lake Tanganyika: The Preliminary Transboundary Diagnostic Analysis" which is being distributed to the National Co-ordinators for comment and any additional internal national consideration that they feel necessary. This document will then be presented to the Steering Committee for their endorsement.

The meeting went on to recommend a number of changes to the timetable of the development of the SAP to respond to concerns over the incorporation of the concepts that are being developed in the Convention, and to include the final results of the special studies. The implications for the project timetable have been summarised above.

The next formal meeting for the regional TAC SAP Planning Team is provisionally set for June, at which time the meeting will develop a Draft SAP based on a framework that will be prepared before the meeting.

2.1.3 Goals for the Next Quarter

The Preliminary TDA report will be passed to the National Co-ordinators for internal consultation. The National Co-ordinators and the National Working Groups will decide the mechanism for national consultation.

It is recommended that the document be discussed as part of the normal NWG meetings and if required then presented to the National Steering Committees.

Discussions are being held as to the best way to present and distribute the background papers that had been presented at the National workshops. It is expected that documents will be presented in their original language.

No further developments are expected during the next quarter, the next major workshop will be to develop the draft SAP provisionally set for June 1999

3. Reports of Special Study groups

3.1 Progress Report: September - November 1998 for "Biodiversity" Special Study and "Conservation Activities"

3.1.1 Overall Summary of Progress

This quarter has seen considerable progress in the work carried out by the Burundian and Zambian teams. In Burundi efforts have been concentrated on the survey of "Bujumbura Rural". A 40km stretch of shoreline from the southern outskirts of Bujumbura south to Magara was mapped using manta board. Two survey sites have been selected in this area, one of which – Makombe - has the highest levels of fish diversity yet encountered by the BIOSS team in Burundi. Habitat profiles and multiple fish and mollusc censuses have been conducted. Furthermore, the team have discovered a bed of mollusc shells, 6 km long, on a gently sloping shelf just north of Gitaza. Having established the dimensions of the shell bed they are now conducting censuses of the fish populations there. During December the team will concentrate on mapping the remainder of the Burundian shore, as a prerequisite for identifying potential sites for long term monitoring. In addition, the studies of terrestrial flora and fauna of Rusizi NP by INECN staff has been completed. This information will be combined with aquatic data already collected by the BIOSS team in a joint report which is currently being drafted.

In Zambia the BIOSS team has provisionally selected 6 sites for long-term monitoring. These locations have been chosen in close consultation with the pollution and sedimentation special studies and joint sampling is being undertaken on a quarterly basis. They include both impacted and pristine sites and represent a variety of substrates. Efforts are now being directed towards completing the broad scale habitat mapping of the entire Zambian shore in order to facilitate the final selection of monitoring sites.

During August activities in Congo were brought to a stand still by the outbreak of civil strife. Since then the situation has stabilised to a degree and the team now has greater freedom to operate. The team has recently been allowed to dive at a number of sites up to 20 km south of Uvira, which may prove to be suitable for long term monitoring. However, the situation in Congo remains uncertain at best.

Progress in Tanzania has been hampered by the difficulty in recruiting and maintaining a team of qualified personnel. To that end the BIOSS facilitator has approached a number of the key institutions in Kigoma to try and identify suitable candidates for dive training, so that the team can be reconstituted and participate fully in BIOSS activities.

The drafted version of the BLOSS Standing Orders document was circulated to contributors and the BLOSS facilitator discussed it with the BLOSS dive team and other interested parties in the region. Comments are starting to filter back to MRAG.

Dr Eddie Allison represented BLOSS at the Transboundary Diagnostic Analysis meeting held as part of the process to develop a Strategic Action Plan. Representation of the special studies at this SAP meeting was particularly important to initiate links between the two interdependent components of the project.

Looking forward to the next quarter; it is important that the skills of BLOSS team members are confirmed and enhanced. This should be possible using the expertise already accumulated within the teams. This applies particularly to the field of taxonomic identification where further training is required in order to achieve a uniform high standard across the board. In addition, it is hoped to run a second diving course to provide Tanzania with a fully functioning BLOSS team as well as to strengthen the other national dive teams and increase their sustainability for the future. These activities will provide a sound basis from which to complete the surveys of protected areas abutting the lake and continue the process of selecting long-term monitoring sites.

3.1.2 Chronology of Activities

September: BLOSS work in Congo is remains stalled by the deteriorating security situation.

September: Briefing of FPSS facilitator (Mr Paley) in London (Dr Payne, Vicki Cowan) and Norwich (Dr Allison), review of BLOSS documents and overview of project, particularly overlap with FPSS and SAP

September: Burundian team begins habitat mapping and censusing of fish and molluscs in area between Bujumbura and Magara.

October: Zambian team carries out the first surveys for this quarter of joint monitoring sites with the pollution and sedimentation special studies.

October: BLOSS Facilitator arrives in region and begins introductory tour of lakeside field stations with other facilitators (FPSS and SEDSS) and SLO. Tour concluded in mid November

October: first draft of the BLOSS standing orders document, providing guidance for field procedures is circulated to contributors and key LTBP staff for comment. Note the document is not to be released in the field until revisions have been made.

November: Meetings with Warden in Charge Gombe NP and the Director of TAFIRI, Kigoma, to identify suitable Tanzanian candidates for dive training.

November: Distribution of draft protocols to BIOSS teams for review, discussion and field testing. Comments and recommendations will be forwarded to MRAG.

November: Congolese team commences diving at selected sites outside Uvira, some as far as 20 km south of the town.

November: Dr Eddie Allison attends the TDA meeting in Lusaka as the BIOSS representative. A brief overlap with the mid term evaluation mission allowed Dr Allison to clarify some questions the team had about BIOSS

Sept-Nov: Zambian team completes joint survey programme for this quarter.

3.1.3 Staffing Schedule

3.1.3.1 *Burundi*

Dr NTAKIMAZI, Burundian Co-ordinator

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

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

3.1.3.2 *DR Congo*

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

3.1.3.3 *Regional Dive Team:*

| | | | | | |
|----------|------------|-----------|---------|-------------|------------|
| Tanzania | Robert | MWAKAFU | TAFIRI | – Kigoma | BSAC-sport |
| | | MBE | | | |
| | Fadhili | KIMAMBO | TANAPA | – Gombe | BSAC-sport |
| Zambia | Rueben | SHAPOLA | DoF | – Mpulungu | BSAC-sport |
| | Charles | LUKWESA | DoF | – Mpulungu | BSAC-sport |
| | Maybin | MWENDA | DoF | – Mpulungu | 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 | Félix | NICAYENZI | LTBP | – Bujambura | BSAC-sport |
| | Bernard | SINUNUOKA | DEPP | – Bujambura | BSAC-sport |
| | Libére | NDAYISENG | IECN | – Bujambura | BSAC-sport |
| | | A | | | |
| | Albéric | RUGIRABIR | Univ Bu | – Bujambura | BSAC-sport |
| | | ORI | | | |

3.1.3.4 *International*

Dr Ian Payne, MRAG Ltd, BIOSS Director

Dr Eddie Allison, MRAG Ltd, BIOSS Co-ordinator

Vicki Cowan, MRAG Ltd, BIOSS Management

Richard Paley MRAG Ltd, BIOSS Facilitator

John Pearce, Simon Holden, MRAG Ltd, BIOSS IT specialists

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)

3.1.4 Main Outputs and Achievements

- Arrival of BIOSS facilitator in region and completion of initial tour of field stations.
- Reports on current status of each field station submitted by facilitator to BIOSS Co-ordinator.
- Draft standing orders reviewed and field tested by regional dive team.
- Continued survey of potential longterm monitoring sites by Burundian and Zambian teams.
- Limited resumption of field programme by Congolese team following slight improvement in security situation.

3.1.5 Main Objectives for the Next Quarter

- Finalisation of BIOSS work plan for 1999.
- Completion of second round of dive training.
- Enhancement of taxonomic identification skills, through in-house training within regional team.
- Distribution of finalised standing orders document.
- Introduction of the survey database into the region for management of information by BIOSS teams.
- Completion of manta survey of Burundian lakeshore and continuation of survey of Zambian shore.
- Commencement of survey of Mahale National Park by regional dive team.

3.1.6 BIOSS Facilitator : Summary of Activities

3-6 October. Arrival and introduction to LTBP office Dar es Salaam; including meeting with Tanzanian National Coordinator, Mr Yonazi.

8 October–11 November. Initial visit to project field stations in riparian countries. Meetings with LTBP staff across all special studies, detailed discussions with BIOSS teams and review of SS resources and equipment. Unable to visit Uvira, but did meet with Congolese team in Bujumbura. Reports on current status of BIOSS in each station sent to BIOSS Co-ordinator in UK.

12-17 November. Visit of Mid-term Evaluation Team to Kigoma. In conjunction with LTBP Admin Assistant, Kigoma, co-ordinated programme of meetings with local government and project personnel.

18-25 November. Miscellaneous activities Kigoma Station. Including inventory of newly arrived project equipment and meeting with Warden in Charge, Gombe NP and the Park Ecologist for Gombe and Mahale NPs.

27 November – 4 December. Follow up visit to Mpulungu station to confirm short-term work programme and discuss Standing Instructions for Field Sampling with BIOSS team and test techniques in the field.

3.2 Progress Report: September - November 1998 for Fishing Practices Special Study

3.2.1 Overall Summary of Progress

The main progress in this quarter has been the reformulation of the workplan in light of the FPSS facilitator's extensive lakeside consultation and his attendance at the regional Transboundary Diagnostic Analysis (TDA) meeting. The stated aim of FPSS has always been to support the development of the Strategic Action Plan (SAP), and MRAG has been particularly concerned to develop links between the SAP process and both BIOSS and FPSS. Progress in this quarter, is therefore particularly significant, as it has allowed the appropriate reorientation of the FPSS work plan in light of regional priorities as expressed at the TDA.

The facilitator has prepared a detailed situation report and has drafted a work programme for the remaining period of the study. These documents are currently under review by MRAG and the PCU.

Unfortunately, the achievements of this quarter are affected by the news that Dr Dorr will leave the project due to another employment opportunity. This is a great loss to FPSS and LTBP. MRAG will replace Dr Dorr as soon as possible to maximise overlap in the field and so ensure a smooth hand-over of facilitator responsibilities.

3.2.2 Chronology of Activities

September: Briefing of FPSS facilitator (Dr Dorr) in London, review of FPSS documents and overview of project, particularly overlap with BIOSS and SAP

October: FPSS Facilitator arrives in region and begins introductory tour of lakeside field stations with other facilitators (BIOSS and SEDSS) and SLO. Tour concluded in mid November

November: FPSS Facilitator attends regional Transboundary Diagnostic Analysis meeting in Lusaka as the FPSS representative at this SAP meeting

November: FPSS Facilitator submits situation report and draft work plan to MRAG for comment

November: FPSS Facilitator informs MRAG that he intends to leave the project, due to another employment opportunity. MRAG begins making arrangements to find a replacement and manage the transfer of responsibility.

3.2.3 Staffing Schedule

3.2.3.1 *Regional team*

Tanzanian Team

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)

Mr Khalfan Kaweme (DoF, Mpulungu)

Burundian Team (proposed)

M. Antoine Kiyuku

- a representative from the Departement des Eaux, Peche et Pisciculture (DEPP)
- one other representative if the level-of-work justifies

Congolese Team (proposed)

M. Mulimbwa N'Sibula, Scientific Director, Centre for Hydrobiological Research

- a representative from the Secteur Peche du Service de l'Environnement (SPSE)

3.2.3.2 *International team*

Dr Ian Payne, MRAG Ltd, FPSS Director

Dr John Dorr, MRAG Ltd, FPSS Regional Facilitator

Ms Vicki Cowan, MRAG Ltd, FPSS Management

Dr E Allison, MRAG Ltd, FPSS consultant

Dr Rosemary Lowe-McConnell Specialist advisor

Dr George Coulter Specialist advisor

3.2.4 Main Outputs and Achievements

3-6 October. FPSS facilitator familiarised with LTBP office and staff in Dar es Salaam, including meeting with Tanzanian National Coordinator, Mr Yonazi.

7 October–13 November. Facilitator travel and visits to Mpulungu, Kigoma, and Bujumbura stations and completion of the following: meetings with the heads of all relevant institutions; discussions with FPSS staff at the first two locations; review of past and current work conducted by FPSS/Kigoma team; review of past and current Department of Fisheries programs at all three locations including sampling protocol, databases, reports, and field-sampling equipment; facilitator participation in BIOS survey and fish census work at Mpulungu and Burundi; follow-up FPSS work scheduled with all the station directors and FPSS teams at all three locations

16-20 November. Situation Report completed and distributed to field and home office ; extensive discussions held with LTR staff (G. Hanek, J.E. Reynolds) to develop the concept of co-operative field studies in anticipation of the finalisation of the LTR monitoring program by P. Mannini during early December ; FPSS work in Congo initiated through meetings with the Scientific Director of the Centre for Hydrobiological research and conceptualisation of a program to assess department of fishery work in the Uvira region (study to be conducted during 7-11 December).

23-30 November. Facilitator participation in the Transboundary Diagnostic Analysis conducted in Lusaka, Zambia during 23-26 November; link between SAP and FPSS studies outlined in draft attachment to the FPSS work plan; reformulation of the work plan initiated in light of tour and regional priorities expressed at TDA, and with from input gained during the 8 October-13 November reconnaissance of the field stations and FPSS work.

Major Outputs

- *Situation Report* on status of FPSS and related activities in all four countries
- Conceptual approach to the FPSS work plan drafted and reviewed by field and home offices
- Compilation of information on fishery statistical sampling programs and current data recording formats utilised by the departments of fisheries at Mpulungu, Kigoma, and Bujumbura (Uvira to be completed in December through activity referenced above)

3.2.5 Main Objectives for the Next Quarter

- Finalise work plan in December
- Implement FPSS work at all four field stations in January
- Establish co-operative field sampling programs with BIOS and LTR
- Organise and implement co-operative studies between FPSS and SESS
- Mobilise replacement for Dr Dorr
- Review and refine of work plan at end of quarter

3.3 Progress Report: September – November 1998 for Legal and Institutional Component

3.3.1 Summary of Progress

Progress in this quarter has been held back while the financial implications of the work programme, recommended at the regional workshop in February, have been addressed by the project. The final decisions have now been made and clearance given to hold the full set of consultation workshops. The consultant ToR is written and the drafting of the document will begin in the next quarter, with the deadline of March 1998 for the completion of the draft in both French and English.

3.3.2 Chronology of Activities

Sept-Nov : Extended discussions between MRAG and NRI regarding the proposals MRAG submitted in the last quarter. These proposals were essential as the recommended work plan, with its series of consultation workshops, effectively extended the original terms of reference and so had financial implications for the project.

3.3.3 Current Staffing Schedule

3.3.3.1 *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 |

3.3.3.2 *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 |
|---|

3.3.4 Main Outputs and Achievements

- decision on financing the recommended workplan made and full set of consultation workshops will now go ahead
- terms of reference for legal consultants to complete the requirements on this component written and under discussion

3.3.5 Main Objectives Next Quarter

- drafting of regional agreement begun, anticipated deadline for both language versions to be completed is March 1998.
- MRAG to send letter to National Co-ordinators and attendees at first regional workshop to update everyone on the remaining work programme and to seek dates for first round of consultation workshops.

3.4 Progress Report: September - November 1998 for Special Study on Sediment Discharge and Its Consequences

3.4.1 Overall Summary of Progress

This quarter saw the appointment of the special study facilitator, Olivier Drieu (OD). This report was jointly prepared by him and the special study co-ordinator, G. Patterson (GP).

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

1. 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
2. G. Patterson (GP) will attend the Transboundary Diagnostic Analysis (TDA) meeting in Arusha 11-15 October 1998.
3. GP will follow the TDA 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
4. 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.

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

3.4.2 Chronology of Activities

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

11-26 September - Dr Sichingabula travelled from Lusaka to Mpulungu. 5 new hydrometric stations were installed (Lufubu river, Luheche river, Izi river, Lunzua river, Kalambo village above Falls) with Water Affairs team from Kasama, 5 gauge readers were recruited locally and trained to record daily water levels at the stations (information in quarterly reports 4 and 5).

21 September 1998 - OD commenced work as regional facilitator of the Sedimentation Special study.

1-15 October - Dr Sichingabula's hydrometric stations inspection trip at/around Mpulungu, Zambia.

8 October - OD travelled from UK to Dar es Salaam, Tanzania

11 October - OD arrived in Mpulungu, Zambia.

11 Oct. - 13 November, - OD toured Mpulungu, Kigoma and Bujumbura lead by Dr Kelly West along with the other two regional facilitators J Dorr and R Paley

1 November - gauge reader recruited by the Project started her duties at Mpulungu Fisheries to record the Lake water level.

15-19 November 1998 - GP visited Burundi. Main activities to ensure field teams in Burundi and Congo are working towards their objectives within the special study.

23-26 November 1998 - GP attended the Transboundary Diagnostic Analysis meeting in Lusaka. This was a rescheduled meeting from that planned for Arusha in October 1998 (see objectives above). At time of writing a back-to-office report by GP is in preparation.

3.4.3 Staffing Schedule

A summary of all of the staff involved in the Sediments Special study was given in quarterly report number 10. There have been few changes since then. These are:

The regional facilitator, Olivier Drieu, (see above) commenced work during this quarter.

Bombi Kagogozo who previously worked for CRH, Democratic Republic of Congo, has now been nominated by the Director of CRH (Dr Nshombo) to continue as lead national of the Sedimentation Special Study. The project will commence discussion of terms of a contract with Mr Kagogozo who currently has no institutional affiliation.

3.4.4 Main Outputs and Achievements

Nkotagu of University of Dar es Salaam completed a quarterly report on his work on the rivers of Gombe region covering the period August to October 1998. He installed 2 automatic rain gauges and several plastic rain gauges in the catchments of the Gombe region. Mrs Mbwambo of the Tanzania Bureau of Standards is carrying out water analysis at TAFIRI, Kigoma and in Dar es Salaam.

University of Arizona (Cohen) produced a quarterly report for the period July to September 1998 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 three further monthly summary reports during the period for September October and November 1998.

Sichingabula continued his work monitoring Zambia rivers and the project received his two quarterly reports covering the period up till the end of November 1998 describing the construction and operation of the hydrometric stations in Zambia

Stage 2 of the work proposed by IGEBU and DGGM, Burundi commenced on 1 October 1998. GP completed details of the Phase 2 workplan which were passed to the PCU for production of a letter of agreement.

Kings College London produced the second quarterly report of progress of the modelling of erosion in the Lake Tanganyika catchment using remote sensing.

LARST reports (Kigoma) were produced for each of the three months of the quarter.

D R Congo: despite the severe security problems in Congo, the CRH of Uvira team have started some sampling work and archive data compilation. This work will be compiled by OD into a report including methods (with the help of R. Duck) and basic equipment requirements in order for Stage 2 of their proposed work to begin.

The questionnaire aiming to establish protocols for reporting and data deposition was again delayed in order to establish protocols for data archiving with the GIS/database component of the project.

3.4.5 Main Objectives for the next quarter

- Maintain the data flow and reporting schedule from operational monitoring programmes. If further information is required regarding personnel or institutions please refer to quarterly report number 10.
- The Sedimentation study workplan (GP) will be updated to reflect recent changes and comments from the UNDP mid-term review team.
- Irvine (University of Dublin) to travel to Mpulungu in early January 1999 to work with Department of Fisheries staff on impacts of sediments on biota.
- Brion and L. Goeyens (VUB) will travel to Burundi in early January 1999 to work with Dr E Nzeyimana at the Department of Chemistry, University of Burundi (OD to be present in Burundi during that time).
- OD will liaise with Dr J Dorr and R Paley and Dr K West to formulate a better collaboration between the Special Studies and plan for possible joint trips for all the sampling programs in the region.
- 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 (deferred from previous quarter).

3.5 Progress Report: September – November 1998 for Special Study on Pollution and its Effects on Biodiversity.

3.5.1 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 report summarises contributions from Dr Francis Chale in Kigoma, occasional communications from Mr Mwape and Mr Makassa in Mpulungu, and two major and *very welcome* reports and sets of data from Mr Gabriel Hakizimana (PSS Coordinator in) and his team (Mr Wilondja Kamalebo, Ms Consolata Musanisoni and Mrs Aline Irimbere) in Bujumbura. These outputs reflect the generally good progress made in the areas that the PSS Co-ordinator has stressed from the outset i.e. the provision of sound data on aspects of water quality; our findings and interpretations are likely to contribute to later debates on the choosing of areas worthy of 'reserve' status or the siting of water intake and effluent discharge pipes.

Dr Bailey-Watts and Mr Kirika have contributed ideas to Jerod Clabaugh (Technical Co-ordinator the LTBP) to feature in the Project's evolving Website. At a Steering Committee meeting in October, Dr Bailey-Watts outlined first, the PSS's considerable contribution to training in the region and the encouraging progress with all aspects of the Study's field and laboratory activities - now in evidence in Burundi and the New Democratic Republic of Congo as well as Tanzania and Zambia. However, he also expressed major concerns over the state of the PSS budget, the unlikelihood of attracting a regional 'facilitator' and replacement 'permanent presence' to fill the role vacated by Miss Wiltshire at the end of August.

We still hope to invite two persons (1 chemist, 1 algologist/biologist) from each country to the IFE/UEA laboratories for 2-3 months, but no further progress on this has been made. Equally, we still hope to attract funding for literature as reported previously.

Whilst perhaps not of major significance to many in the Project, I wish to highlight the crucial progress made by Mr Kirika during his visit to Mpulungu. This focuses on spectrophotometers vital to much of our analytical chemical work. He delivered and installed a 'CECIL' Instruments spectrophotometer of a superior specification to the one originally supplied (a 'JENWAY' 6300), which had been installed by himself and Ms Nicola Wiltshire in January 1998) when the laboratory was first 'commissioned'. (The 'JENWAY' had broken down - as had its counterpart in Kigoma - but luckily at the time, the PSS Group was able to borrow a spectrophotometer from the FAO Lake Tanganyika Project). The benefit of the new CECIL spectrophotometer is that it possesses a pour-in-pump-out auto-cell, which eliminates (i) the manual handling of the sample cuvette, and (ii) associated spillages and contamination of the optical surfaces of the cuvette. Mr Kirika also attended to a broken pH meter along with the motor and main circuit board of an electronic centrifuge, that had been inoperative since the laboratory was first set up in January 1998. Such faults are to be expected but they are especially worrisome bearing in mind that the likes of Nikki Wiltshire nor Martin Pearce are no longer there.

Plans for assessing the 'loadings' of materials in runoff (e.g. nutrients) have been progressed through a collaboration with Dr Henry Sichingabula (Sedimentation Consultant) and a team from the University of Zambia in Lusaka who have begun to install flow-gauging stations at river sites in the Mpulungu area. Similar studies are planned for the Bujumbura and Uvira areas where chemical sampling of feeder rivers is a major activity.

The need for further on-going, on-the-job' support and training in most of the laboratories is again highlighted, but in possible absence of future visits by the PSS Co-ordinator and his consultants, contact can only be maintained *via* e-mail, fax or telephone more than hitherto.

Drs Chale and Foxall have made good progress towards the identification of major sources of heavy metals, pesticides and hydrocarbons, and the preliminary analyses of these materials in content sediments and fish.

3.5.2 Brief chronology of activities and visits

Dr Chale has made a number of visits outwith those to the routinely sampled areas; these include Rukwa and Tabora regions of the catchment, and the Eastern and Southern Africa Minerals Development Centre (ESAMDC) in Dar es Salaam, the Tanzania Pesticide research Institute (TPRI) in Arusha. On **6 October**, TB-W attended a meeting of the Project Steering Group in Chatham. This reporting period includes the latter three-quarters of a crucial visit to Mpulungu by Mr Kirika **20 August to 18 September** (see above).

3.5.3 Current staffing schedule

The staff complement has changed little from that outlined in the previous report:

In Burundi: Mr Hakizimana, Mrs Aline Irimbere (INECN), Ms Consolata Musanisoni and Mr Wilondja Kamalebo.

In Congo: Dr Tshibangu (PSS Coordinator in Congo) and Mukungilwa Kamalebo; two other appointments are still to be made.

In Tanzania: Dr Chale (PSS Coordinator in Tanzania) and Ms Lyoba, D (50% of her time), Messrs Lyoba, Mfilinge, Muhoza (90%), Tegulilwa, Kadula (80%), Wakafumbe (75%).

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): Shadreck Nsongela (the PSS Coordinator in Zambia) is now the sole facilitator for the PSS.

3.5.4 Main objectives for next quarter

1. To progress plans for the visits of selected regional staff to UK as outlined above.
2. To supply literature to the regional laboratories.
3. To obtain a significant body of data on the situations regarding heavy metals, pesticides and hydrocarbons at selected sites and in selected materials in Lake Tanganyika.
4. To schedule the ideal total of 11 consultant visits to the region - mainly for continued 'on-the-job' training but also workshops on field sampling practices Analytical Quality Control (AQC), micro-algal population density and species diversity estimation AQC, and data analysis and interpretation.

3.6 Progress report: March – November 1998 for Socio-economics and Environmental Education components – Zambia and Tanzania.

The following summaries for Zambia and Tanzania have been prepared by Mr Shadreck Nsongela (EZC Zambia) and Mr Bart Tarimo (NEMC Tanzania) respectively.

3.6.1 Zambia

3.6.1.1 Overall summary of progress -

(1) Media Coverage of the Project. The project received a total of 11 captions in the media (radio, television and newspapers) publicising its existence and the various project activities being undertaken.

(2) Formation of Village Conservation Development Committees. A total of 10 officers from the Fisheries Department, Ministry of Community and Social Development, Ministry of Education, Local Authorities and the Department of National Parks and Wildlife Service set out on a tour of villages in the project area to facilitate the formation of Village Conservation Development Committees in line with the terms of reference agreed with the National EE Coordinator.

(3) Review of Village Conservation Development Committees (VCDC) and preparations for the formation of Stratum Conservation Development Committees (SCDC). The National Environmental Education Coordinator with the Assistance of staff from the Mpulungu office of the Fisheries Department undertook a lake-wide tour of villages. The tour was aimed at reviewing the performance of VCDC and to prepare for the formation of Stratum Conservation Development Committees (SCDC).

(4) Formation of Stratum Conservation Development Committees. Dr. Chipungu accompanied by staff from the Fisheries Department, Community Development and Social Welfare and the Local Authorities went on a lake-wide tour of villages to facilitate the formation of Stratum Conservation Development Committees.

(5) Training of Community Leaders. Officers from the Fisheries Department (Mr. Chipulu E. and Mr. Ngandu F) with the support of other staff from the Police Force, Local Authority, Community Development and Social Welfare organised two training sessions for Stratum Committee leaders. The training was aimed at improving the participants' leadership skills.

(6) Lake Tanganyika Fisheries Conservation Committee. Preparations are underway for the formation of the overall lake body - the Lake Tanganyika Fisheries Conservation and Development Committee with a number of consultative meetings having already taken place in the project area.

(7) Monitoring of VCDC and SCDC. Mr. Ngandu and Mr. Chipulu, officers from the Fisheries Department has continued to monitor the performance of VCDC and SCDC, rendering assistance to enable them operate more effectively

(8) Environmental Education and sensitisation Campaigns. VCDCs have spearheaded the conservation awareness campaign and are involved in enforcing conservation activities including control on use of small mesh size and fishing in sensitive areas.

3.6.1.2 *OUTPUTS*

- (1) Formation of 42 functional Village Conservation Development Committees
- (2) Formation of 5 functional Stratum Conservation Committees
- (3) A trained cadre of leaders for the proper functioning of Stratum Conservation Development Committees
- (4) Reduction in the use of inappropriate fishing gear by artisanal fishers

3.6.2 Tanzania

3.6.2.1 *Chronology of Activities.*

1 – 5 June 1998 Mr Tarimo (EE Coordinator for Tanzania) in collaboration with Kigoma Regional and District authorities organised World Environment Day (WED) activities in Kigoma. The whole process involved EE activities such as general cleanliness of the market places, speeches from Regional District authorities and National EE co-ordinators for the Projects retarding management of the lake , video show and exhibitions.

7th June . Rachel Roland and Monique Trudel Training consultants discussed with Mr Tarimo and Dr C Mung'ong'o (SE co-ordinator for Tanzania) on EE and SE components regarding capacity building and training needs.

8th – 24th July. Mung'ong'o and Tarimo conducted a special study of Institutional Appraisal in Sumbawanga region. The study covered three districts namely; Mpanda, Nkasi and Sumbawanga. The main objective was to identify NGOs, CBOs and Government institutions whose activities are closely related to environmental conservation. It is intended that some of these institutions will work hand in hand with the project during its implementation and subsequently.

27th –30 July Dr Mung'ong'o presented a paper to the Strategic Action Planning workshop held in Dar es Salaam.

1st August-30th Sept. Mr Tarimo attended and International Certificate Course in EE at Rhodes University in South Africa.

3.6.2.2 *Current staffing Schedule.*

| | |
|--------------------|---|
| Dr C.G. Mung'ong'o | Institute of Resource Assessment – UDSM. SE co-ordinator for the project. |
| Mr B.D. Tarimo | NEMC – EE co-ordinator for the project |
| Mrs B Marwa | Dept of Fisheries Kigoma. |
| Mr O Kashushu | TAFIRI Kigoma |
| Mr H Mabochi | Community Development, Kigoma. |

3.7 Progress Report: September - November 1998 for GIS and database management.

3.7.1 Overall Summary of Progress

Progress during the period September 1998 to November 1998 has focused on preparing the GIS/metadatabase package for installation in the region next year. This has involved the creation and testing of protocols for working with the metadatabase: i.e. accepting spatial data, inputting metadata and retrieving information as a service for all users. Over 200 datasets have now been catalogued into the system (half of these digital datasets), and progress has been made in making a dynamic link between the GIS and Web pages.

Further enhancement of so called “framework” datasets have been achieved. These are datasets, such as districts, onto which other non-spatially referenced data (e.g. population statistics) can be hung. An automatic mechanism to join these data to “framework” datasets has been created in TANGIS database.

The Metadatabase interface has been translated into French.

NRI have found ways of managing data from different projections within Arcview. We recommend that all map (vector) data should be sent to us in latitude/longitude format. Image and other raster data are still not able to be projected and may not be completely compatible with all other data, but must be in either UTM or geographic projection.

The short data catalogue is now available on the web site and dynamically links with a more detailed catalogue. Assistance with web page design has been given. This has included the preparation of draft pages to assist users with data formats and protocols, and pages which link users to useful external web sites containing pertinent GIS data for the region.

A short manual for users and metadatabase management is in preparation.

Training requirements have not yet been developed in full but will be a priority in the next six months.

A digital Arcview project has been created containing a gallery of posters that show some of the data collected for TANGIS.

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

A map of the study area, i.e. the catchment of Lake Tanganyika, has been made using a hydrological model from Arcview. This is at 1:1M scale and includes division of the catchment into a series of 5000 sub-catchments. These have been grouped into the sub-catchments for each river that flows into the lake.

The Digital Elevation Model provided by King's College allowed us to define the LTBP study area and create a 1km resolution slope map, aspect map, hillshading models, flow direction and flow accumulation models in UTM projection.

Index maps of country topographical map series have been identified and will be integrated into the metadatabase. Digital versions of these index maps have been created.

All paper topographical maps held by the project at NRI have been entered into the metadatabase.

3.7.2 Chronology of Activities

September - Creation of Bilingual metadatabase interface

October - Involvement in LTBP Management Meeting, NRI, 6/10/98

October - Design of GIS Web Pages

November - Creation of joining facility in TANGIS for non-spatially referenced datasets

November - Watersheds, flow accumulation, slope aspect and flow direction maps created

November - Preparation of TANGIS manual started.

3.7.3 Staffing Schedule

UK (NRI)

Dr Chris Sear, GIS supervisor

Alan Mills, Geographer; GIS developer

Anne Jackson, Data liaison officer

Valerie Obsomer, GIS technician

3.7.4 Main Outputs and Achievements

1. TANGIS metadatabase expanded to 200 dataset references.
2. Creation of watershed dataset, including main sub-catchments.
3. Mechanism for joining non-spatially referenced data to "framework" datasets.
4. Bilingual Metadatabase created.
5. Creation of GIS web pages.

3.7.5 Main Objectives for the next quarter (December 1998 - February 1999)

1. Training requirements will be assessed and training materials prepared for potential courses by mid 1999.
2. Investigation of dual level security for metadatabase - one level for users to interrogate metadatabase, another for data manager to maintain metadatabase.
3. Tools will be created to allow users to search metadatabase by location (by district, country, catchment and within a distance of a named settlement).
4. The manual and protocols will be completed and published.
5. Major searches for data will come to an end in February.
6. Investigation of other dissemination techniques - low cost/ freeware GIS systems (e.g. ArcExplorer). Integration of GIS into Web site will be taken further.