

Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika

Strategic Action Plan

Tanzania

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

4 August, 1998

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Summary

This report is intended to be used as a briefing document for all participants at the second Tanzanian workshop contributing to the development of the Lake Tanganyika Strategic Action Plan.

The first workshop, The National Sectoral Problem Review was held in Dar es Salaam during the last week in July, with participants from the lake shore districts and from other local organisations, NGOs and the private sector, and from national centres in Dar es Salaam.

The output of the first workshop is an Analytical Problem Matrix, which proposes a series of actions to counteract specific problems related to the general action areas of reducing the impact of fishing, and controlling pollution and sedimentation. The matrix identifies key agencies and notes the availability of human and material resources. The matrix is attached as an Annex.

The second workshop, the National Environmental Strategies and Priorities Review, will take place during the week of 21 - 25 September 1998. These national meetings will be followed by Regional Meetings of the Lake Tanganyika Biodiversity Project TAC and Steering Committee, who will be responsible for developing the Strategic Action Plan.

The second workshop has two objectives: to review relevant national policies, legislation and regulations and to see how they can support the proposed actions identified during the first workshop, and to prioritise those actions within the framework of national policies and strategies for environmental conservation and development.

The final part of this report provides instructions to the authors who are expected to prepare background materials for the second workshop. The authors are required to review specific policies, acts and regulations within the context of the proposed actions identified in the analytical matrix prepared during the first workshop. It is likely that there will be occasions where the revision of regulations may themselves become a proposed priority action.

1. Background - The Strategic Action Plan

The “Lake Tanganyika Biodiversity Project” - LTBP - is jointly owned by the four countries surrounding the Lake, Zambia, DR Congo, Burundi and Tanzania.

The full title of the project is “Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika”. This emphasis is reflected in the project document, which has as the first immediate objective “...*establish a regional long-term management plan for pollution control, conservation and maintenance of biodiversity in Lake Tanganyika.*”.

Since the project document was prepared, the planning ideas incorporated in this immediate objective have been encapsulated in the concept of a Strategic Action Plan - SAP. Fundamental to this is the recognition that management plans have to be revised in response to changing circumstances, there can be no final plan. The SAP therefore establishes an agreed planning and management process, and prioritises initial interventions based on present knowledge.

1.1 Proposed Development of the SAP

Following the decision of the Steering Committee in January 1998 to proceed with the formulation of a regional Strategic Action Plan, a special National Working Group Planning Meeting was convened in Dar es Salaam, (26/27 May).

The meeting fixed dates for the Tanzanian workshops, agreed on the scope of the discussions and proposed an expansion of the consultation process to include wider representation from the communities, from local government, from the private sector and from national and international organisations..

Tanzanian National Working Group Planning Meeting
(Completed May 1998)

Tanzanian National Sectoral Problem Review
(Completed July 1998)

Tanzanian National Environmental Priorities and Strategies Review
(September 1998)

Regional Technical Advisory Committee Planning Meeting for the SAP
(Proposed August 1998)

Regional Transboundary Diagnostic Analysis¹
(Proposed October 1998)

Regional Draft Strategic Action Plan
(Proposed January 1999)

¹ The Project uses GEF terminology: a Transboundary Diagnostic Analysis, is a regional prioritisation focused on the management of threats to shared - i.e. *Transboundary* - resources.

Signed Strategic Action Plan
(Scheduled by the Steering Committee March 1999)

2. National Sectoral Problem Review

The objectives of the first workshop, were broadly defined in advance of the workshop, and then refined during the workshop. They can be summarised as follows:

- To define the main biodiversity problems of the lake, identifying the sectoral causes of those problems in the management of the lake and catchment, and to review the management actions that Tanzania can take to resolve those problems.
- As a preparatory exercise in advance of the Regional Transboundary Diagnostic Analysis, so that Tanzania's interests, having been fully understood, can be adequately represented in the SAP.

The workshop was held at the Kilimanjaro Hotel in Dar es Salaam from July 28 - 31 1998. The National Coordinator, Mr R P Yonazi, chaired the workshop.

The process of leading the Tanzanian team through the development of the SAP was led by Nicholas Hodgson, with Jean-Paul Ledant as an observer in his role of facilitator for the francophone countries. Andy Menz (Project Coordinator) also attended many of the sessions, and introduced the overall project objectives and goals.

2.1 Background Materials

In order to ensure that all participants had some level of common understanding of the value of the lake biodiversity and fisheries resources and of the problems facing the management of the lake resources and the surrounding catchment areas, the preparatory meeting identified a number of specific topics on which background papers would be prepared in advance of the meeting.

As a starting point, authors could draw on the baseline reviews prepared for the Inception Workshop in September 1996. The papers provided an overview of the present situation, expanding on actual management problems rather than updating research conclusions.

The following topics were covered by background papers²:

Lake and Shore Biodiversity Resources; Fishing; Sediment; Pollution;
Protected Area Management; and Catchment Land Use.

Following introductory proceedings, including an overview of the project and the Strategic Action Plan process, the authors presented their papers, with each one followed by a brief period for discussion.

² The papers will be compiled by the National Coordinators Office and made available as a separate stand alone document.

2.2 Analytical Problem Matrix

As a key stage in the SAP process, it is clear that the methods used to assess and present information from the perspective of the four participating countries will have to be similar.

In effect, the Transboundary Diagnostic Analysis brings together the four National Sectoral Problem Reviews; there must therefore be consistency in the approach adopted by the four countries, and subsequently used in the TDA.

The workshop accepted the proposal to adopt a formal analytical matrix analysis that would be duplicated in all four countries, and subsequently in the regional TDA. The meeting followed the matrix developed at the preceding workshop in Tanzania which includes an indication of the availability of human and material resources of the lead organisation who would undertake each proposed action.

The complete matrix is given in Annex 2.

The matrix has three levels of analysis:

Level 1: Main Threat to Biodiversity; Transboundary Implications; Main Institutional Problems; General Action Areas.

Level 2 For Each Action Area: Specific Problems; Stakeholders; Uncertainties; Proposed Actions;

Level 3 Proposed Action: Timing; Key Agency; Availability of Human / Material Resources

Although clearly open to improvement in terms of both content and structure, the final matrix structure did allow for the development of a set of proposed actions to counteract specific problems raised in the background papers and by the participants at the workshop.

Level 1

The first matrix presents the main threats which were also those identified during the inception workshop, and are built into the project design; the *Main Threats to Biodiversity* are Unsustainable Fisheries; Increasing Pollution; and Excessive Sedimentation. No additional threats were identified by the workshop participants, that could not be related to one of these three aspects.

The *Transboundary Implications* highlights the rationale for a regional programme, addressing global biodiversity and international waters issues.

The *General Action Areas* address the identified problems and provide a focus for linked programmes.

However, the *Main Institutional Problems* are identified during the detailed appraisal of the specific problems and proposed actions addressed in levels two and three. The institutional problems relate to common themes such as inadequate institutional capacity or inappropriate legislation for local conditions.

Table 1 Analytical Problem Matrix Level 1

Main Threat to Biodiversity	Transboundary Implications	Main Institutional Problems	General Action Areas
Unsustainable Fisheries	Global Loss of Biodiversity	Lack of Material Resources	A) Reduce Impact of Fishing
Increasing Pollution	Loss of Shared Fisheries Resource	Poor Enforcement of Existing Regulations	B) Control Pollution
Excessive Sedimentation	Decline in Water Quality	Lack of Locally Specific Regulations	C) Control Sedimentation

Level 2

At the second level, *Specific Problem* are identified within each General Action Areas. The *Stakeholders* include all parties that will need to be involved in resolving management issues addressing each Specific Problem. *Uncertainties* highlights those areas where further information is required to improve management. On the basis of the Uncertainties column, a set of *Proposed Actions* which address a Specific Problem, can include proposals for further research and/or monitoring activities.

Level 3

At the third level, for each Proposed Action, the column *Timing* indicates whether an activity is “On going”, whether it could start “Now” - assuming resources were made available, or whether a Proposed Action has to be preceded by another Proposed Action (e.g. “Identify sensitive sites / seasons” must be completed before “Negotiate limiting access with fishermen”, which also precedes “Incorporate closed seasons in existing regulations”).

Key Agency indicates the agency that would lead a particular Proposed Action; it will always be one of the Stakeholders from level 2. Finally the *Availability of Human / Material Resources* is an indication of whether the Key Agency could tackle the Proposed Activity with existing human and/or material resources. However this does not mean that these resources are already being directed to the action, merely that, given a priority by the agency, they could be made available now.

2.3 Conclusions of the National Sectoral Problem Review

The complete Analytical Problem Matrix is given in Annex 2. Level 1, the National/Transboundary overview is given below. It is worth noting that the Transboundary Implications extend into International Waters concerns as well as Global Biodiversity.

The matrix can only really be completed once policy regulations and legislation have been reviewed with respect to their capacity to support specific Proposed Actions. If

the policy, legislation or regulation does not adequately support a Proposed Action, then a revision of that regulation itself may be required as a Proposed Action.

2.3.1 From Major Threats to Management Actions

The basic approach taken by the workshop was that at Level 2, the General Action Area is addressed through a number of Specific Problems, each one of which is a component of the Main Threats to Biodiversity. Subsequently the workshop proposed a sequence of related Proposed Actions addressing each Specific Problem.

In this way what appears to be an excessively ambitious and daunting objective such as Control of Pollution, can be broken into a series of manageable tasks, many of which can be done with available resources.

As an example, the general action area “Control of Pollution” includes the Specific “Discharge of untreated domestic sewage from Kigoma Town”. This can be addressed through a series of Proposed Actions starting with “Review existing town development plans”, which deal with the future expansion of the town; “Incorporate proposals for sewage, waste water and water supply;” into the future development plans, and finally to “Propose developments to counteract existing situation of open drains”.

All activities could be undertaken by local government staff from the Ministry of Lands and Settlement, who have the specific mandate for supervising urban development, and could be carried out with the existing resources available to them in Kigoma Town.

As in the case given above, the exercise has shown that it is possible for many of the actions needed to counteract the threats to the biodiversity resources of the lake to be initiated by local institutions using available resources.

However given the overall low level of resources available to most institutions, not all actions can be undertaken at once; hence the need to prioritise interventions, undertaking only as many as the available resources permit in any year.

If this rate of progress is unacceptable then the key agencies will have to look for additional support from the government and from donor agencies.

2.3.2 Capacity to Undertake Proposed Actions

The workshop came up with over 100 proposed actions reasonable equally spread across the three general action areas.

However, it was significant to note that there were both more proposed and on-going activities relating to sediment control than to other general action areas. This reflects both the historic concerns of the Tanzanian government for rural focused development and the current donor agreements for support to the agricultural sector.

It is worth noting that 50% of the proposed actions were considered to be possible with the resources available to the key agencies. However where there were

constraints, these all related to lack of material resources, and generally to the implementation of programmes rather than the formulation or negotiation of programmes.

The conclusion is that responsible institutions have adequate manpower with adequate training to carry out the proposed actions, but are constrained by lack of equipment, particularly transport and a lack of operating funds. This seems to be particularly critical at the local level where many of the actions are expected to be led and financed through the decentralised local authority system.

	Reduce Impact of Fishing	Control Pollution	Control Sediment
Key Agencies	Fisheries (Local Authorities, TAFIRI)	Shipping; Town Council; Water, Agriculture; Energy / Minerals; Lands / Settlement...	Forestry (Field Services, Water Affairs, ECZ, Local Government)
On-Going	Discussions initiated by Foreign Affairs with DR Congo on piracy	Water reviewing sewage discharge regulations and institutional responsibilities	~4, mainly concerned with soil conservation, funded under other donor programmes
Adequate Resources, but not Undertaken	~17, indicating the need for Fisheries to prioritise interventions	~ 17, large number of actors but capacity largely limited to review and evaluation,	~ 21, farming and conservation proposals reflecting historic rural focus of attention.
Need Additional Resources	Similar for all action areas: Problems relate to material resources (operating costs, transport; additional consultancies, field expenses etc.) Human resources seen as adequate in both numbers of staff and levels of training for the jobs they are required to perform.		

Clearly the results of the first workshop lead directly into the second workshop, where the first task is to review the National Priorities and Strategies (Policies, Acts and Regulations) to see how these support the proposed actions. In some cases the review and/or revision of regulations is already a proposed action in itself. The matrix may then be revised and further proposed actions may relating to institutional development and policy and legislation may be included.

The second task of the workshop is to then prioritise the proposed actions, to focus available resources to a sequence of priority actions and to direct additional resources to support priority actions where resources are limiting.

3. National Environmental Priorities and Strategies Review

Based on the outcome of the first workshop, the objectives of the second workshop can be stated as:

- To define the potential and limitations of existing institutional mechanisms to counteract national priority threats and support priority actions to counteract them, with existing regulations and legislation, and existing environmental and sectoral policies.
- To agree on the priority of the proposed actions and to determine a sequence of proposed actions that can be undertaken by the responsible institutions in Tanzania.

On the basis of the prioritisation, Tanzania will be in a position to propose a strategic programme based on the use of available resources to undertake a sequence of proposed actions. In parallel, the programme will direct additional (donor) resources to management interventions that can not at present be undertaken due to human or material resource constraints, or if supported could be undertaken in a more timely fashion.

The two workshops together are a preparatory exercise undertaken in advance of the Regional Strategic Action Plan, so that Tanzania's institutional capacity to support the programme and requirements for support can be incorporated into the SAP.

3.1 Workshop Attendance

The National Working Group preparatory meeting held in Dar es Salaam in May identified a range of individuals and organisations that they felt should be incorporated into the consultation and planning process. The idea was that the majority would be present throughout the internal consultation process, to ensure continuity.

Invitations should be sent to those individuals present at the first meeting and hence expected at the second meeting, with a formal reminder sent to them and through their organisation at the beginning of September.

3.2 Proposed Workshop Agenda

Effectively the workshop has two tasks. The first is to incorporate an analysis of institutional constraints in the analytical matrix. This will include an assessment of where institutional tools, such as policy, legislation and regulation will need to be reviewed with respect to particular local requirements.

The second task is to prioritise the proposed actions. This will take account of both the support and constraints to proposed actions that result from problems with implementing existing policies, legislation and regulations, and how these proposed actions fit within the overall national priorities relating environment and development set out in government policies.

Review of Policies, Acts and Regulations

The workshop will be presented with a series of background papers which will review the relevance of national Policies, Acts and Regulations, designed to be generally applicable to the wider management of Tanzania's resources, to specific proposed actions dealing with local situations with unique local problems or environments.

Further reviews, revisions or the creation of local by-laws may then be included in the analytical matrix, and themselves become the subject of the next stage, the prioritisation of proposed actions.

Prioritisation of Proposed Actions

The purpose of the Strategic Action Plan, and the national inputs to the SAP, is to provide a prioritised framework for action.

The concept can be best presented by posing the following questions:

Using only existing resources, what would be the first action that Tanzania would carry out to protect the biodiversity value of the lake?

And then what would the second action be?...

However, one of the recognised functions of the SAP is to "leverage" additional funding for actions supporting the biodiversity conventions and the management of international waters.

It is expected that in general funding will go to national agencies, implementing national programmes, within and supporting the regional framework of the SAP.

In recognition of this the prioritisation exercise should also pose the following questions:

If a donor agency offers Tanzania additional funding and resources to carry out just one action to protect the biodiversity value of the lake, what would it be?

And then what would the second action be?...

By posing these questions, it can be seen that the prioritisation is of management interventions, which may not be the same as the prioritisation of threats.

The priority of the management intervention is a combination of the scale of the threat and the ability to counteract that threat. If there is no management intervention that can counteract the threat, then it is clearly not a priority for action.

3.3 Proposed Timetable

The following proposed timetable is based on the assumption that the workshop will be based in Dar es Salaam, and held over the five day period from September 21 to 25 1998.

Day 1

1. Registration
2. Chairperson Introductory Remarks
3. Introduction to the Project
4. Introduction to the Strategic Action Plan
5. Conclusions of the first workshop – National Sectoral Problems Review
6. Presentation of background papers

Day 2

7. Continuation of presentation of background papers
8. Identification of main policy, legislation and regulation issues.
9. Incorporation of policy, legislation and regulation into proposed actions of the analytical matrix
10. Identification of Time Frame, Key Actors, and Availability of Resources

Day 3

11. Review main institutional problems
12. Finalise analytical matrix
13. Review key agencies responsibilities for proposed actions
14. Propose priorities for each key agency, within each general action area.

Day 4

15. Continue assessment of priorities for key agencies
16. Finalise priorities by agency and by general action area

Day 5

17. Propose overall priority for activities that can be undertaken with available resources
18. Propose overall priority for activities that need additional resources and donor support
19. Identify additional key issues to be brought to the attention of the regional tac at the subsequent Regional Meetings of the TBDA and Draft SAP.

4. Preparation of Background Materials - Notes for Authors

As with the first national workshop, in order that the participants can be brought to a basic common level of understanding, there are a number of background papers that will need to be prepared to be presented at the second workshop.

The participants at the first workshop indicated which areas of policy would need review. However, given the time constraints no individual authors were identified.

The National Coordination office, with the support of the National Working Group will have to allocate tasks to specific individuals within government departments, the universities or private institutions.

4.1 Policies, Acts and Regulations

In general National Policies, Acts and Regulations are designed to be applicable to the wider management requirements of Tanzania's resources, however, there will be local situations with unique local problems or environments where existing government policy and legislation may provide inadequate support, or even be contradictory to local requirements³.

4.2 The Review of Policies, Acts and Regulations - Relevance to Proposed Actions

Authors must therefore review the relevance of these documents within the context of the particular Policy, Act or Regulation supporting a specific "Proposed Action" or set of actions within the matrix.

Clearly there will be many instances where these national regulations are entirely appropriate and strong enough to support one of the required actions, however equally clearly there will be cases where regulations are inappropriate for the specific requirements of protecting the biodiversity of the lake. In addition there may be cases where policies are contradictory.

Authors should therefore note how specific clauses in these national documents are relevant to a proposed action, either supporting the action strongly, relatively ineffective, or actually contradicting a proposed action.

Authors should also seek to identify contradictory policies or regulations between sectors.

Authors should also keep in mind that a regulation may seem to provide adequate control, but if unenforceable under present circumstances is not an appropriate regulation, and may need to be reviewed or supported by alternative regulations.

³ The Fisheries Regulations give closed areas and seasons for fishing for specific named sites, however no mention is made of Lake Tanganyika.

4.3 A Hypothetical Example

The following example may help authors in their review of the relevance and appropriateness of existing national policies, acts and regulations. The example is based on a specific concern raised at the National Problem Workshop, and on hypothetical contradictions in policies.

1. Main Threat to Biodiversity in Lake Tanganyika	Increasing Pollution
2. General Action Area	Control of Pollution
3. Specific Problem	Use of agrochemicals in the catchment (tobacco, coffee, cotton...)
4. Proposed Actions	a) Develop site specific packages for sensitive areas b) Promote site specific packages
5. Relevant Policy Documents	Agricultural Policy National Environmental Action Plan
6. Agricultural Policy	<i>Is likely to include the goal of increased productivity through the use "improved farming technology", that require high levels of fertiliser and pesticide inputs.</i>
7. National Environmental Action Plan	<i>Might include a policy statement proposing restrictions on the use of agrochemicals, or indeed farming in sensitive wetland areas or other parts of the catchment.</i> <i>This Environmental Policy could therefore support the proposed actions of drawing up local guidelines restricting the use of agrochemicals, but be contradictory to the broader policy guidelines in the Agricultural Policy.</i>

4.4 Authors, Timing and Preliminary Meetings

The date of the National Environmental Priorities and Strategies Review is 21 September 1998. All background materials should be prepared at least 2 weeks in advance to allow for duplication.

Policy, Act, Regulation or Convention

National Environmental Action Plan

Natural Resources Acts

Forestry

Wildlife

National Parks

Tourism

Energy

Water

Utilisation

Pollution

Agricultural Policy

Land Policy

National Environmental Policy

National Environmental Management Act

Shipping, Marine Act

Public Health Act

Local Government Act

Town and Country Planning Ordinates

Mining

Customs and Excise

CITES Convention

Ramsar Convention

Background reports should be divided into sections dealing with each policy or regulation separately, but with an additional overview of the linkages or contradictions of sectoral policies, acts and regulations.

Annex 1
Participants and Invitees to the National Sectoral Problem
Review Workshop

LIST OF PARTICIPANTS FOR THE WORKSHOP HELD AT THE KILIMANJARO HOTEL, 28TH - 31ST JULY 1998.

NAME	POSITION	ORGANIZATION	POST BOX	TELEPHONE/ FAX	EMAIL
Mr. JB Tindyembwa	Geologist	Min. of Energy and Minerals	3060		Madini@twiga.com
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Mr. G. Makinda	DED- Nkasi	Rukwa Region	2-DED Namanyesre/ Nkasi	6- Nkasi	
Mr. E. Lenganasa	Senior Warden i/c Tarangire National Park- TANAPA	TANAPA-Arusha	3134	057 3471	
Dr. Lukonge	Secretary General - TAFI	JET- Tanzania	9151	867417/ 46146	
Mr. Kirit Vaitha	Director-Aqua Products Limited	Kigoma	34, Kigoma	2408/2324	Aqua@cats-net.com
Mr. H. M. Mohamed	Senior Park Warden	TANAPA	1374		
Mr. M. M. Shirima	District Executive Director	Kigoma District Council	332, Kigoma	2262 (Office) 2552(House)	
Mr. H.N. Kachechele	Ag. Regional Administrative Secretary	Office of the Regional Commissioner	125, Kigoma	0695 2330/2330	
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Mr. N. Hodgson	Planning Adviser-NRI	NRI-UK	Central Avenue, Kent ME4 4TB, Chatham, Maritime	44 1634 883912/883959	Nicholas.hodgson@nri.org
Dr. Andrew Menz	Project Coordinator	Lake Tanganyika Biodiversity Project	P. O. Box 5956, Dar Es Salaam, Tanzania	255 51 118201/118202	Error! Bookmark not defined. ltbp.v@twiga.com.

The following were invited but were unable to attend:

NAME	POSITION	ORGANISATION	REGION	OTHERS
Saidi Mbwana		Lake Victoria Management Programme	Dar	
Mr. Mukhandi		Ministry of Water	Dar	
Prof. R. Mwalyosi	Senior Lecturer	IRA-UDSM	Dar	
Mr. R. Muyungi		Division of Environment	Dar	
Mr. H. Dumea	Head	Land-use Planning Unit, Ministry of Agriculture and Coop.	Dar	
Mr. O. M. S. Bendera	Growth Strategies Division	Planning Commission	Dar	
Mr. Dattomax Sellanyika	Warden	Gombe National Park	Kigoma	
Bishop G. Mpango	Western Diocese		Rukwa	
Ms. Alicia Magabe	Legal Adviser	NEMC	Dar	

Annex 2
Analytical Problem Matrix

Level 1

Main Threat to Biodiversity	Transboundary Implications	Main Institutional Problems	General Action Areas
Unsustainable Fisheries Increasing Pollution Excessive Sedimentation	Global Loss of Biodiversity Loss of Shared Fisheries Resource Decline in Water Quality	Lack of Resources Poor Enforcement of Existing Regulations Lack of Locally Specific Regulations	A) Reduce Impact of Fishing B) Control Pollution C) Control Sedimentation

Level 2

A) Reduce Impact of Fishing Specific Problem

Specific Problem	Stakeholders	Uncertainties	Proposed Actions
1) Use of Inappropriate Gill Nets Mesh Sizes	Fisheries; Communities; Equipment Manufactures; Suppliers; Bureau of Standards; TAFIRI		1.1) Negotiate minimum acceptable net size and means of replacing / phasing out unsuitable gear 1.2) Enforce regulations
2) Lack of Protection of Seasonal Spawning / Nursery Grounds	Fisheries; Communities; Local Authorities; TAFIRI	Where and when to close	2.3) Identify sensitive sites / seasons 2.4) Negotiate limiting access with fishermen 2.5) Incorporate closed seasons in existing regulations 2.6) Enforce local regulations
3) Continued Use of Seine Nets	Fisheries; Communities; Local Authorities; TAFIRI		3.7) Negotiate means of replacing / phasing out beach seine fishing 3.8) Implement phasing out programme 3.9) Enforce regulations
4) Piracy forcing fishing into inshore areas	Fisheries; Communities; Local / Regional Authorities; Foreign Governments; Foreign Affairs; Home Affairs; Police; Navy; Army		4.10) Regional consultation 4.11) Improve patrol capacity 4.12) Promote HF radio use
5) Illegal fishing by foreign nationals	Fisheries; Communities; Local / Regional Authorities; Foreign Governments; Foreign Affairs; Home Affairs;		5.13) Agree with local stakeholders on practical and permanent solutions 5.14) Negotiate visible international boat registration system 5.15) Improve fisheries patrol capacity
6) Increasing market for small fish for poultry feed	Fisheries; Communities; Traders		6.16) Market survey of sources, transportation and end users 6.17) Review alternative supply sources

			6.18) Review export regulations 6.19) Promote fish farming as an alternative
7) Farming Exotic Species in the catchment	Missions and other NGOs; Fisheries; Communities; Private Traders/Producers; Local Authorities; TAFIRI		7.20) Check and review regulations as they apply to catchment species 7.21) Establish local regulations for catchment; 7.22) Promote awareness of risk and alternatives among stakeholders 7.23) Enforce local regulations
8) Unlicensed and poor control of licensed extraction of ornamental fish	Licensed Traders; Fisheries; TAFIRI; Foreign Affairs; Home Affairs; Customs		8.24) International agreement on exportable species by country of origin 8.25) Monitor numbers and species exported 8.26) Raise senior level awareness of problems 8.27) Review possibility of species quotas 8.28) Review number of licensees
9) Lack of quota on granting fishing licences	Fisheries; Communities; Local Authorities; TAFIRI	Optimal number	9.29) Review LTR conclusions 9.30) Assess relevance to fish biodiversity issues 9.31) Assess trend in expansion of licensing 9.32) Review licensing

Level 2**B) Control Pollution
Specific Problem**

Specific Problem	Stakeholders	Uncertainties	Proposed Actions
1) Oil Spillage from the docks	TRC; Ship Owners / Operators; Local Council; Oil Companies; Shipping Department; NEMC; Min of Transport	No information on specific handling problems	1.1) Identify specific causes of leaks and spillages 1.2) Check and review regulations and recommended procedures 1.3) Review reasons for non-enforcement of regulations
2) Flushing oil barges in the lake	Ship Owners / Barge Operators; Local Authorities; Shipping Department; NEMC; Min of Transport; TAFIRI	Scale of problem and impacts	2.4) Assess number of barge loads 2.5) Identify flushing practices / sites 2.6) Assess impact of current and projected levels 2.7) Review applicability of national regulations for Lake Tanganyika 2.8) Develop appropriate procedures for waste disposal
3) Kigoma TANESCO Power Station - pollution from oil storage, handling and contamination from operation	TANESCO; Local Council; Min of Water; Min of Energy; NEMC		3.9) Identify appropriate management practices and structures 3.10) Review government plans for rehabilitation, including funding proposals
4) Discharge of untreated waste from institutions (Police, Prisons, Railway Station, Docks)	Police; Prisons; TRC; Local Council; Min of Water; Min of Health; Min of Transport; Regional Authorities		4.11) Check and review regulations; 4.12) Promote Senior level awareness 4.13) Identify and propose practical treatment works and disposal sites
5) Discharge of untreated domestic sewage from Kigoma Town	Local Council; Regional Authority; Min of Water; Min of Health; Min of Lands		5.14) Review existing town development plans 5.15) Incorporate proposals for sewage, waste water and water

			supply; 5.16) Propose developments to counteract existing situation of open drains etc.
6) Leachate from inappropriately sited solid waste dumps	Local Council; Regional Authority; Min of Water; Min of Health; Min of Lands; Communities		6.17) Identify appropriate sites; 6.18) Review present collection and disposal procedures 6.19) Check existing and introduce appropriate local regulations; 6.20) Develop appropriate sites
7) Discharge of toxic substances from mine workings	“Smallholder miners”; Min of Energy and Mines; Min of Water; Regional / Local Authorities; NLUPC; NEMC	Scale of problem	7.21) Quantify scale and processes used different mining areas 7.22) Review availability and knowledge of appropriate technology 7.23) Promote awareness of appropriate technology
8) Heavy use of agrochemicals in flood plain horticulture	Smallholders; Min of Agriculture; Min of Water; NLUPC; Local Authorities; Home Affairs		8.24) Promote safe alternatives 8.25) Enforce ban on illegal trade in banned pesticides
9) Use of agrochemicals in the catchment (tobacco, coffee, cotton...)	Smallholders; Min of Agriculture; Min of Water; Marketing Boards; Private Companies		9.26) Develop site specific packages for sensitive areas 9.27) Promote site specific packages
10) Major marine accident - oil spill	Ship Owners / Barge Operators; Regional Authorities; Shipping Department; NEMC; Min of Transport; Min of Water; NEMC; Insurance Companies; TAFIRI	Level of Risk	10.28) Risk analysis 10.29) Develop contingency plan
11) Risks from major / minor unspecified hazardous cargo movements	Ship Owners / Barge Operators; Small Boat Owners; Traders; Regional /Local Authorities; Shipping Department; NEMC; Min of Transport; Min of Water; NEMC; TRC; Customs;	Scale of movement	11.30) Assessment movements and handling procedures of hazardous cargoes 11.31) Review guidelines for small and large transporters
12) Dumping waste from boats	Ship Owners / Operators; Local	Scale	12.32) Identify present practices

Authorities; Shipping Department;
Min of Water; NEMC; TRC

and scale of problem
12.33) Check and review present
and proposed amendments to
local and international
regulations

Level 2**C) Control Sedimentation**

Specific Problem	Stakeholders	Uncertainties	Proposed Actions
1) Increasing tobacco cultivation - stream bank cultivation and deforestation	Min of Agriculture; Private Sector; Communities; Tobacco Council; Min of Water; Min of Lands; Forestry Departmentf		1.1) Review longterm viability and impact of industry 1.2) Investigate sustainable systems 1.3) Promote awareness of deforestation issues 1.4) Review stream bank cultivation regulations
2) Clearing land for farming on steep slopes along the shore	Min of Agriculture; Communities; NLUPC; Local Authorities; JGI/TACARE		2.5) Raise awareness of critical issues 2.6) Promote soil conservation measures 2.7) Check/review local bye-laws 2.8) Identify with communities sensitive areas, demarcate hazardous areas 2.9) Assist villages in preparing land use plans
3) Inappropriate farming practices; cultivating down slope	Min of Agriculture; Communities; NLUPC; Local Authorities; JGI/TACARE		3.10) Identify critical farmed zones 3.11) Raise awareness of issues 3.12) Promote soil conservation measures 3.13) Assist villages in preparing land use plans
4) “Smallholder” mining practices - cumulative impacts	“Smallholder” mining Communities; Regional Miners Association; NEMC; NLUPC; Local Authorities; FEMATA; Min of Water;	Scale, sites, practices	4.14) Review existing situation and projected expansion 4.15) Review availability of appropriate technology 4.16) Identify critical sensitive sites 4.17) Check and review existing and proposed legislation

5) Potential impact of large mines	Private Companies; Local / Regional Authorities; Communities; NEMC; Min of Energy and Minerals; Tanzania Chamber of Mines; Minister Responsible for Environment	<p>5.18) Identify critical sites and sensitive areas</p> <p>5.19) Prepare a catchment zoning giving highly sensitive, medium sensitive areas</p> <p>5.20) Review planning licensing procedures</p> <p>5.21) Incorporate contingency disaster planning</p>
6) Poor siting / management of refugee camps	Local / Regional Authorities; Communities; Forestry Department; UNHCR; Home Affairs; Min of Lands; NGOs	<p>6.22) Review EIAs and rehabilitation proposals</p> <p>6.23) Monitor rehabilitation works</p> <p>6.24) Review existing sites and identify new potential sites to minimise future impacts of refugee movements</p> <p>6.25) Review UNHCR camp management procedures</p>
7) Uncontrolled expansion of farming into non-gazetted forest areas	Local / Regional Authorities; Communities; Forestry Department; Min of Agriculture; Min of Water; JGI/TACARE; NLUPC;	<p>7.26) Identify threatened / sensitive zones</p> <p>7.27) Negotiate with communities to gazette sensitive areas</p> <p>7.28) Enforce bye-laws</p> <p>7.29) Promote sustainable farming systems</p>
8) Encroachment into gazetted forest reserves	Local / Regional Authorities; Communities; Forestry Department; NLUPC; Min of Lands	<p>8.30) Identify critical encroachment and critical threatened zones</p> <p>8.31) Create political awareness of problems</p> <p>8.32) Negotiate means of resettlement from sensitive areas</p> <p>8.33) Promote community forest management and access rights</p>

9) Uncontrolled bush fires	Local / Regional Authorities; Communities; Forestry Department; Min of Agriculture; Wildlife Department; NGOs; Community Development		9.34) Identify critical fire zones 9.35) Review existing regulations and bye-laws 9.36) Raise awareness focused on communities in critical zones 9.37) Enforce bye-laws
10) Unsustainable farming practices leading to shifting agriculture	Local / Regional Authorities; Communities; Min of Agriculture; NGOs;		10.38) Identify sensitive zones within existing farmed areas 10.39) Focus Agricultural extension and NGOs on critical areas 10.40) Promote sustainable farming practices (agropastoralist systems, conservation farming...)
11) Increasing movement of agropastoralists into floodplain areas	Local / Regional Authorities; Communities; Min of Agriculture; Min of Lands; NLUPC; Livestock Traders; Min of Water, Min of Natural Resources; Community Development		111.41) Review existing aand proposed legislation to protect wetlands 111.42) Identify sensitive / critical areas 111.43) Evaluate carrying capacity 111.44) Negotiate acceptable stock access to sensitive areas
12) Impact of rural fuelwood extraction	Local / Regional Authorities; Communities; Min of Energy and Minerals; JGI/TACARE; Forestry Department	Impact on overall groundcover and hence sedimentation	12.45) Evaluate impact of rural fuelwood extraction practices on sediment load 12.46) Review existing policy and legislation

Level 3

A) Reduce Impact of Fishing - Use of Inappropriate Gill Nets Mesh Sizes

Proposed Actions	Timing	Key Agency	Human	Material
1.1) Negotiate minimum acceptable net size and means of replacing / phasing out unsuitable gear	Now	Fisheries	Yes	No
1.2) Enforce regulations	1.1	Fisheries	Yes	No
A) Reduce Impact of Fishing - Lack of Protection of Seasonal Spawning / Nursery Grounds				
2.1) Identify sensitive sites / seasons	Now	TAFIRI	Yes	Yes
2.2) Negotiate limiting access with fishermen	2.1	Local Authority	Yes	No
2.3) Incorporate closed seasons in existing regulations	2.2	Fisheries	Yes	Yes
2.4) Enforce local regulations	2.3	Local Authority	Yes	No
A) Reduce Impact of Fishing - Continued Use of Seine Nets				
3.1) Negotiate means of replacing / phasing out beach seine fishing	Now	Fisheries Department	Yes	No
3.2) Implement phasing out programme	3.1	Fisheries Department	Yes	No
3.3) Enforce regulations	3.2	Fisheries Department	Yes	No
A) Reduce Impact of Fishing - Piracy forcing fishing into inshore areas				
4.1) Regional consultation	On Going	Foreign Affairs	Yes	Yes
4.2) Improve patrol capacity	Now	Police	Yes	No
4.3) Promote HF radio use	Now	Marine Authority Kigoma	Yes	Yes
A) Reduce Impact of Fishing - Illegal fishing by foreign nationals				
5.1) Agree with local stakeholders on practical and permanent solutions	Now	Local Authority	Yes	Yes
5.2) Negotiate visible international boat registration system	Now	Foreign Affairs	Yes	Yes
5.3) Improve fisheries patrol capacity	Now	Fisheries Department	Yes	No
A) Reduce Impact of Fishing - Increasing market for small fish for poultry feed				
6.1) Market survey of sources,	Now	TAFIRI	Yes	No

transportation and end users	6.1	TAFIRI	Yes	No
6.2) Review alternative supply sources	6.2	Fisheries Department	Yes	Yes
6.3) Review export regulations	6.2	Fisheries Department	Yes	No
6.4) Promote fish farming as an alternative				
A) Reduce Impact of Fishing - Farming Exotic Species in the catchment				
7.1) Check and review regulations as they apply to catchment species	Now	Fisheries Department	Yes	Yes
7.2) Establish local regulations for catchment;	7.1	Fisheries Department	Yes	Yes
7.3) Promote awareness of risk and alternatives among stakeholders	7.2	Fisheries Department	Yes	No
7.4) Enforce local regulations (need training in species recognition)	7.3	Local Authority	No	No
A) Reduce Impact of Fishing - Unlicensed / poor control of licensed extraction of ornamental fish				
8.1) International agreement on exportable species by country of origin	Now	Fisheries Department	Yes	Yes
8.2) Monitor numbers and species exported	Now	Fisheries Department/Customs	Yes	Yes
8.3) Raise senior level awareness of problems	Now	Fisheries Department	Yes	No
8.4) Review possibility of species quotas	Now	TAFIRI	Yes	Yes
8.5) Review number of licensees	Now	Fisheries Department	Yes	Yes
A) Reduce Impact of Fishing - Lack of quota on granting fishing licences				
9.1) Review LTR conclusions	Now	TAFIRI	Yes	Yes
9.2) Assess relevance to fish biodiversity issues	9.1	TAFIRI	Yes	Yes
9.3) Assess trend in expansion of licensing	Now	Fisheries Department	Yes	Yes
9.4) Review licensing procedures	Now	Fisheries Department	Yes	Yes

Level 3

B) Control Pollution - Oil Spillage from the docks

Proposed Actions	Timing	Key Agency	Human	Material
1.1) Identify specific causes of leaks and spillages	Now	Shipping	Yes	No
1.2) Check and review regulations and recommended procedures	Now	Shipping	Yes	Yes
1.3) Review reasons for non-enforcement of regulations	1.2	Shipping	Yes	Yes
B) Control Pollution - Flushing oil barges in the lake				
2.1) Assess number of barge loads	Now	Shipping	Yes	No
2.2) Identify flushing practices / sites	2.1	Shipping	Yes	Yes
2.3) Assess impact of current and projected levels	2.2	TAFIRI	Yes	Yes
2.4) Review applicability of national regulations for Lake Tanganyika	Now	Shipping	Yes	Yes
2.5) Develop appropriate procedures for waste disposal	2.4	Shipping	Yes	No
B) Control Pollution - Kigoma TANESCO Power Station - pollution from oil storage, handling and contamination from operation				
3.1) Identify appropriate management practices and structures	Now	Energy and Minerals	Yes	No
3.2) Review government plans for rehabilitation, including funding proposals	Now	Energy and Minerals	Yes	Yes
B) Control Pollution - Discharge of untreated waste from institutions (Police, Prisons, Railway Station, Docks)				
4.1) Check and review regulations;	On Going	Min of Water	Yes	Yes
4.2) Promote Senior level awareness	4.1	Min of Water	Yes	No
4.3) Identify and propose practical treatment works and disposal sites	4.2	Min of Water	Yes	No
B) Control Pollution - Discharge of untreated domestic sewage from Kigoma Town				
5.1) Review existing town	Now	Min of Lands	Yes	Yes

development plans				
5.2) Incorporate proposals for sewage, waste water and water supply;	5.1	Min of Lands	Yes	Yes
5.3) Propose developments to counteract existing situation of open drains etc.	5.2	Min of Lands	Yes	Yes
B) Control Pollution - Leachate from inappropriately sited solid waste dumps				
6.1) Identify appropriate sites;	Now	Town Council	Yes	Yes
6.2) Review present collection and disposal procedures	Now	Town Council	Yes	Yes
6.3) Check existing and introduce appropriate local regulations;	6.1/6.2	Town Council	Yes	Yes
6.4) Develop appropriate sites	6.3	Town Council	Yes	No
B) Control Pollution - Discharge of toxic substances from mine workings				
7.1) Quantify scale and processes used different mining areas	Now	NEMC	Yes	No
7.2) Review availability and knowledge of appropriate technology	Now	Energy and Minerals	Yes	Yes
7.3) Promote awareness of appropriate technology	7.2	Energy and Minerals	Yes	No
B) Control Pollution - Heavy use of agrochemicals in flood plain horticulture				
8.1) Promote safe alternatives	Now	Min of Agriculture	Yes	No
8.2) Enforce ban on illegal trade in banned pesticides	Now	Min of Agriculture	Yes	Yes
B) Control Pollution - Use of agrochemicals in the catchment (tobacco, coffee, cotton...)				
9.1) Develop site specific packages for sensitive areas	Now	Min of Agriculture	Yes	No
9.2) Promote site specific packages	9.1	Min of Agriculture	Yes	Yes
B) Control Pollution - Major marine accident - oil spill				
10.1) Risk analysis	Now	NEMC	Yes	No
10.2) Develop contingency plan	10.1	NEMC	Yes	Yes
B) Control Pollution - Risks from major / minor unspecified hazardous cargo movements				
11.1) Assessment movements and handling procedures of	Now	Shipping	Yes	No

hazardous cargoes				
11.2) Review guidelines for small and large transporters	11.1	Shipping	Yes	No
B) Control Pollution - Dumping waste from boats				
12.1) Identify present practices and scale of problem	Now	Min of Water	Yes	Yes
12.2) Check and review present and proposed amendments to local and international regulations	12.1	Min of Water	Yes	Yes

Level 3

C) Control Sedimentation - Increasing tobacco cultivation - stream bank cultivation and deforestation

Proposed Actions	Timing	Key Agency	Human	Material
1.1) Review longterm viability and impact of industry	Now	Min of Agriculture	Yes	No
1.2) Investigate sustainable systems	On Going	Min of Agriculture	Yes	No
1.3) Promote awareness of deforestation issues	Now	Forestry	Yes	Yes
1.4) Review stream bank cultivation regulations	Now	Min of Agriculture	Yes	Yes
C) Control Sedimentation - Clearing land for farming on steep slopes along the shore				
2.1) Raise awareness of critical issues	Now	Min of Agriculture	Yes	No
2.2) Promote soil conservation measures	Now	Min of Agriculture	Yes	No
2.3) Check/review local bye-laws	Now	Local Authority	Yes	Yes
2.4) Identify with communities sensitive areas, demarcate hazardous areas	Now	NLUPC	Yes	No
2.5) Assist villages in preparing land use plans	2.4	NLUPC	Yes	No
C) Control Sedimentation - Inappropriate farming practices; cultivating down slope				
3.1) Identify critical farmed zones	Now	Min of Lands	Yes	No
3.2) Raise awareness of issues	3.1	Local Authority	Yes	No
3.3) Promote soil conservation measures	On Going	Min of Agriculture	Yes	Yes
3.4) Assist villages in preparing land use plans	3.1	NLUPC	Yes	No
C) Control Sedimentation - "Smallholder" mining practices - cumulative impacts				
4.1) Review existing situation and projected expansion	Now	Min of Water	Yes	No
4.2) Review availability of appropriate technology	Now	Energy and Minerals	Yes	Yes
4.3) Identify critical sensitive sites	4.1	NLUPC	Yes	No
4.4) Check and review existing	Now	Energy and Minerals	Yes	Yes

and proposed legislation				
C) Control Sedimentation - Potential impact of large mines				
5.1) Identify critical sites and sensitive areas	Now	NLUPC	Yes	No
5.2) Prepare a catchment zoning giving highly sensitive, medium sensitive areas	5.1	NLUPC	Yes	No
5.3) Review planning licensing procedures	Now	Energy and Minerals	Yes	Yes
5.4) Incorporate contingency disaster planning	5.3	PMO	Yes	Yes
C) Control Sedimentation - Poor siting / management of refugee camps				
6.1) Review EIAs and rehabilitation proposals	On Going	NEMC	Yes	Yes
6.2) Monitor rehabilitation works	On Going	PMO	Yes	Yes
6.3) Review existing sites and identify new potential sites to minimise future impacts of refugee movements	Now	NEMC	Yes	Yes
6.4) Review UNHCR camp management procedures				
C) Control Sedimentation - Uncontrolled expansion of farming into non-gazetted forest areas				
7.1) Identify threatened / sensitive zones	Now	Local Authority	Yes	No
7.2) Negotiate with communities to gazette sensitive areas	7.1	Local Authority	Yes	No
7.3) Enforce bye-laws	7.2	Local Authority	Yes	No
7.4) Promote sustainable farming systems	7.1	Min of Agriculture	Yes	Yes
C) Control Sedimentation - Encroachment into gazetted forest reserves				
8.1) Identify critical encroachment and critical threatened zones	Now	Forestry Department	Yes	No
8.2) Create political awareness of problems	Now	Local Government	Yes	Yes
8.3) Negotiate means of resettlement from sensitive	8.1	Local Authority	Yes	No

areas	8.3	Forestry Department	Yes	No
8.4) Promote community forest management and access rights				
C) Control Sedimentation - Uncontrolled bush fires				
9.1) Identify critical fire zones	Now	Local Authority	Yes	Yes
9.2) Review existing regulations and bye-laws	Now	Local Authority	Yes	Yes
9.3) Raise awareness focused on communities in critical zones	9.1	Local Authority	Yes	No
9.4) Enforce bye-laws	9.3	Local Authority	Yes	No
C) Control Sedimentation - Unsustainable farming practices leading to shifting agriculture				
10.1) Identify sensitive zones within existing farmed areas	Now	NLUPC	Yes	No
10.2) Focus Agricultural extension and NGOs on critical areas	10.1	Local Authority	Yes	Yes
10.3) Promote sustainable farming practices (agropastoralist systems, conservation farming...)	10.2	Min of Agriculture	Yes	No
C) Control Sedimentation - Increasing movement of agropastoralists into floodplain areas				
11.1) Review existing and proposed legislation to protect wetlands	On Going	NEMC	Yes	Yes
11.2) Identify sensitive / critical areas	Now	NLUPC	Yes	No
11.3) Evaluate carrying capacity	11.2	Min of Agriculture	Yes	No
11.4) Negotiate acceptable stock access to sensitive areas	11.3	Local Authority	Yes	No
C) Control Sedimentation - Impact of rural fuelwood extraction				
12.1) Evaluate impact of rural fuelwood extraction practices on sediment load	Now	Institute of Resource Assessment	Yes	No
12.2) Review existing policy and legislation	On Going	Forestry Department	Yes	Yes