

# Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika

## Strategic Action Plan

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Tanzania

Conclusions of the National Consultation Process  
For the Regional Strategic Action Plan

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29 October 1998

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## Summary

Tanzania has now completed the two major stages of the national consultation process contributing to the development of the Lake Tanganyika Strategic Action Plan (SAP).

The process has involved two five day workshops attended by some sixty participants, and has been supported by a major effort in preparing background materials analysing the resource base, management problems affecting the resource base and policy, legislation and regulations that guide management.

This document provides an overview of the conclusions that have come out of the national consultation process. The next stage will be for the team of Tanzanian delegates to present their conclusions to a regional Transboundary Diagnostic Analysis workshop (TDA), scheduled for November 1998<sup>1</sup>. The team will be expected to give an overview of the most critical conclusions and to justify the reasons for setting priorities from the Tanzanian view of the main biodiversity problems of the lake.

The first part of this report gives a general background to the process of developing the SAP, as set by the Project Steering Committee in January 1998. The report then reviews the objectives of the national consultation process, provides some details on the scope of the discussions, and on the range of individuals and institutions involved in the consultation.

The report provides details of the methodology used in developing the Analytical Problem Matrix - the agreed format that will be used in the four countries and subsequently in the TDA to present their conclusions. This is followed by a discussion of the logic behind the prioritisation of specific problems and hence a prioritisation of the proposed actions to address specific problems that are threatening the biodiversity of the lake.

The following table shows the first three priorities given to addressing specific problems in each general action area, contributing to counteracting one of the major threats to biodiversity. These and lower priorities problems are discussed in the text. Proposed actions are given in Annex 3 Analytical Problem Matrix.

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| <b>Reduce Impact of Fishing</b> | <b>Control Pollution</b>                  | <b>Control Sedimentation</b>                 |
|---------------------------------|---|--|
| 1. Use of beach seines          | 1. Oil spillage from Kigoma power station | 1. Clearing land for farming on steep slopes |

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<sup>1</sup> An agenda for the Transboundary Diagnostic Analysis workshop has not yet been prepared, but delegates should be prepared to make a presentation that should not exceed 20 minutes, and then be prepared for open discussion.

- |   |   |   |
|---|---|---|
| 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 |
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# 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, the National Coordinator (Vice Presidents Office) called a special National Working Group Planning Meeting, which was held in Dar es Salaam on 26 and 27 May 1998. 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  
(Completed October 1998)

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

Regional Transboundary Diagnostic Analysis<sup>2</sup>  
(Proposed November 1998)

Regional Draft Strategic Action Plan  
(Proposed January 1999)

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<sup>2</sup> 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 and National Environmental Priorities and Strategies Review**

The objectives of the two workshops can be summarised as a national preparatory exercise in advance of the regional process of developing a Regional Strategic Action Plan. This is to ensure that Tanzania's concerns are fully understood and that her interests can be adequately presented by the national team delegated to participate in the regional consultation of preparing a Transboundary Diagnostic Analysis and Strategic Action Plan.

The specific objectives of the workshops are as follows:

1. 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.
2. 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.
3. 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.

*As a preparatory exercise in advance of the Regional Transboundary Diagnostic Analysis, so that Zambia's interests, having been fully understood, can be adequately represented in the SAP.*

The first workshop was held between July 28 and 31, and the second between October 12 and 16 1998.

### **2.1 Participation in the Consultation Process**

The need for wider consultation was accepted at the first National Working Group Planning Meeting, when a list of potential interested institutions and individuals were identified as possible contributors to the national consultation process.

Both workshops were held in Dar es Salaam, however, over one third of the local national participants were from the lake area. Annex 1 lists the participants and the institutions represented.

Over 60 individuals representing more than 30 organisations were involved in the consultation process, including national and international NGOs, government agencies and parastatals, local councils, academic and research institutions, the church and the private sector.

## **2.2 Background Materials**

In order to ensure that all participants had a 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, background papers<sup>3</sup>: were prepared in advance of the workshops.

As a starting point, authors could draw on the baseline reviews prepared for the Inception Workshop in September 1996. In addition authors reviewed critical policy and legislation, with respect to the specific problems and proposed actions that were identified.

The following topics were covered by background papers at the first meeting:

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

The second meeting were provided with background information covering Legislation and Regulation::

National Environment Policy, Land Policy, Fisheries Policy, Forest Policy, Mineral Policy, Wildlife Policy, Agriculture and Livestock Policy, Water Policy, Energy Policy, Industry Policy. Transport Policy, National Environmental Action Plan, Fisheries Regulations, Marine Parks and Reserves Act, Mining Act, Wildlife Conservation Act, National Parks Act, Water Utilisation Act, Forests Ordinance, Local Government Laws,

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<sup>3</sup> The papers have been compiled and are available as a separate report

### 3 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 workshops adopted a formal analytical matrix analysis that would be duplicated in all four countries, and subsequently in the regional TDA.

The complete matrix is given in Annex 3.

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**

#### Level 1

The first matrix presents the main threats which are still effectively those identified during the inception workshop, and built into the project design; the *Main Threats to Biodiversity* are Unsustainable Fisheries; Increasing Pollution; 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**

| <b>Main Threat to Biodiversity</b> | <b>Transboundary Implications</b> | <b>Main Institutional Problems</b>                            | <b>General Action Areas</b> |
|------------------------------------|-----------------------------------|---|-----------------------------|
| Unsustainable Fisheries            | Global Loss of Biodiversity       | Lack of Resources<br>Poor Enforcement of Existing Regulations | A) Reduce Impact of Fishing |
| Increasing Pollution               | Loss of Shared Fisheries Resource | Outdated Legislation  | B) Control Pollution        |
| Excessive Sedimentation            | Decline in Water Quality          | Lack of Information<br>Inadequate Institutional Coordination  | C) Control Sedimentation    |

**Level 2**

At the second level, *Stakeholders* includes all parties that will need to be involved in resolving management issues addressing each *Specific Problem* identified within each General Action Areas. *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. “Negotiate Boundaries of Additional Protected Areas” must be preceded by “Identify New Key Sites / Potential Protected Areas”).

*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.

**3.1 From Major Threats to Management Actions**

The basic approach is 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 a sequence of related Proposed Actions can be formulated 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 Problem”: Discharge of untreated domestic sewage from Kigoma Town

This can be addressed through the following sequence of Proposed Actions including a) Review existing town development plans b) Incorporate proposals for sewage, waste water and water supply and c) Propose developments & promote awareness to counteract existing situation of open drains etc.

All actions would be led by the Ministry of Lands Department of Human Settlement, which is represented at the district level, with staff stationed in Kigoma Town. The department has both the human and material resources to carry out all proposed actions and could start the process “Now”.

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.

### **3.2 Review and Enforcement of Policy, Legislation and Regulations - as a Management Action**

The management of Tanzania’s natural resources are guided by a whole series of policies, acts and regulations. The most obvious ones relevant to the management of the lake and catchment include the Fisheries Regulations and the Forestry Ordinance.

In a similar manner the social and economic development of the country is also directed by policies and these economic policies may themselves have major impacts on the management of the natural environment.

However, given that national Policies, Acts and Regulations are designed to be generally applicable to the wider management of Tanzania’s resources, 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 requirements.

In addition, many of the existing policies are under review. There is therefore a degree of uncertainty as to how the incoming policy revisions may effect the future management of the lake and catchment.

As a result of the review, it is clear that there are three levels of proposed action that relate to the existing policies, legislation and regulations:

**Review national regulations** - where there is uncertainty as to the relevance to the local situation, or where they are in the process of change;

**Establish local regulations** - where a bye-law can provide explicit local environmental management guidance;

**Enforce local regulations** – often constrained by lack of human and/or material resources.

### **3.3 Institutional Capacity to Undertake Proposed Actions**

Although the matrix does not generally include specific requirements for capacity building, these requirements are implied in the structure of the matrix.

Clearly where a key agency has indicated that it lacks human or material resources to carry out a proposed action, this indicates a need for capacity building - and a “No” will appear in the final two columns of the matrix.

Lack of human resources includes lack of personnel and/or lack of training to be able to carry out the proposed activity. Lack of material resources includes both lack of physical equipment, ranging from laboratories to vehicles, to lack of funds to cover subsistence or other field expenses.

Clearly where a “No” exists, the implementation of the action will require additional institutional capacity building, either through reallocation of Tanzania’s own resources among the agencies, or through external donor support.

***However, even where a “Yes” is indicated in the Human Resources column and a “Yes” in the Material Resources column, this does not mean that the key agency has the capacity to undertake the action “Now”, unless this action is made a priority and resources are diverted from other activities carried out by that agency.***

As a result if the rate of progress that can be achieved using only existing resources is considered unsatisfactory, then despite a “Yes” in the two resources columns, there is still a case for capacity building.

It is worth noting that out of the 128 proposed actions, Tanzanian institutions felt that they had the resources to complete exactly 50%, if priority was given to an individual action or sequence of actions.

In general, the only real constraints expressed were lack of material resources – only four actions were felt to be constrained by lack of, or inadequately trained human resources.

## 4 Prioritisation

From the above discussion, it is clear that there is a need to set priorities in addressing the proposed actions, and that these priorities need to be directed to solving immediate specific problems, and hence addressing the major threats to biodiversity<sup>4</sup>.

The immediate focus of the national consultation was to identify the priority in which Tanzania would like to address specific problems within each action area, whether or not resources were available for all the proposed actions needed to address the problem.

### 4.1 Priorities, Uncertainties, Now and Potential Problems

The approach taken to review the specific problems within each general action area and then to determine whether the problem was already a major threat and therefore required action “Now”, or alternatively a “Potential” problem.

*“Now”* problems, are specific problems that are known to be a threat or extremely likely to be a threat now (or in the immediate future)

*“Potential”* problems, are specific problems that occur now, but where there is uncertainty as to whether their impact is significant to biodiversity, or a future problem that may occur as a result of further developments in the catchment.

Although there may be uncertainties in both “Now” problems and “Potential” problems, requiring actions such as an assessment of the scale, trends and impacts, the “Now” case may already be followed by a sequence of proposed actions to address the problem.

In general where a problem is classified as a “Potential” problem, the proposed actions will stop at the assessment of the scale and impact and trends, leaving the proposal of management actions to a future iteration of the process of defining management interventions<sup>5</sup>.

### 4.2 The Prioritisation of Specific Problems

The following discussions give a brief introduction to the reasons for the priority placed on addressing each specific problem.

These priorities may change as a result of further information becoming available on the impacts of the problems on the biodiversity of the lake.

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<sup>4</sup> The logic used in this approach focuses on threats that can be addressed by local and regional management interventions; hence threats from global warming or from natural catastrophes such as volcanic disturbances are not addressed.

<sup>5</sup> Although the rationale of limiting proposed actions to assessment where there is uncertainty of the significance of the problem is clear, the participants in the consultation process did not always feel bound by this criteria and there are anomalies within the matrix.

The Analytical Problem Matrix is therefore not organised according to priority, but remains in the original order in which the problems were discussed. The priority of each problem is indicated in the heading on each page.

#### **4.2.1 Reduce Impact of Fishing**

##### **Priority 1 Use of Beach Seines**

Known to have a major and indiscriminate impact on biodiversity, and in particular on the spawning and nursery areas of many species, including many of the pelagic species. Occurring throughout the Tanzanian coastal strip, and also understood to be a problem in the other riparian states. The practice is already banned, which has caused resentment among fishermen and illegal use continues. Needs acceptable methods of phasing out the use of this gear and introducing acceptable fishing practices. (*“Now” Problem*)

##### **Priority 2 Inadequate Protection of Seasonal Spawning/Nursery grounds**

Neglected area owing to previous emphasis on offshore fisheries. Seen as very important vis a vis protection of biodiversity which is concentrated inshore. Focusing on spawning and nursery sites, spawning sites and biodiversity hotspots.. (*“Now” Problem*)

##### **Priority 3 Use of Inappropriate Gill Nets**

Currently very small mesh sizes common causing indiscriminate capture of numerous juveniles of many species. Need to negotiate a phased approach to larger mesh sizes and means of phasing out unsuitable gear. (*“Now” Problem*)

##### **Priority 4 Uncontrolled Extraction of Ornamental Fish**

Although little is known of the scale or impact of the problem, the fundamental nature of the business is based on targeting rare and potentially endangered species. The highly localised habitats of many of the cichlids make them particularly vulnerable. (*“Now” Problem*)

##### **Priority 5 Illegal fishing and export of fish by foreign nationals**

Applies to most types of fishing but from point of view of biodiversity conservation most destructive is probably that of removal of ornamental fish. Results in inability to monitor and manage fisheries effectively and is believed to have led to commercial overfishing in some areas (*“Now” Problem*)

##### **Low Priority Interventions**

The following specific problems were given a low priority:

Piracy forcing fishing into inshore areas - Clearly a real concern to local fisherman but scale of problem and impact on biodiversity not known. (*“Now” Problem*)

Increasing market for small fish for poultry feed - Previous trash fish now has market; pressure to fish with small meshed nets. (*“Now” Problem*)

Introduction of Exotic Fish through Fish Farming - Not currently a problem but not clear how current regulations cover Tanzanian species not endemic in the lake catchment. (*“Potential” Problem*)

No quota on fishing licences - seen as a potential threat as human populations increase and number of boats increases. Need for action before fleet reduction measures required. (*“Potential” Problem*)

#### **4.2.2 Control Pollution**

##### **Priority 1 Oil spillage from Kigoma power station**

An obvious and long standing threat to biodiversity and public health, hence concern among variety of institutions. Amenable to immediate remedial action with modest resources (*“Now” problem*)

##### **Priority 2 Discharge of untreated sewage from Kigoma town**

Immediate and growing threat. The town is discharging large quantities of raw sewage and general waste into the lake and is a continual and major source of pollution. Interventions will both reduce stress on the lake environment, and would be a major health intervention, providing a win-win situation and engaging political support that could benefit other biodiversity interventions. (*“Now” Problem*)

##### **Priority 3 Discharge of untreated sewage from lake shore institutions**

Direct effect on lake environment, amenable to control with all necessary regulations in place, Could provide good example to others. (*“Now” Problem*)

##### **Priority 4 Leachate from inappropriately sited solid waste dumps**

Waste dumps are seen as “heavy metal generators” serious and ever increasing threat to lake environment and public health. Identification of appropriate alternative sites a priority. (*“Now” Problem*)

##### **Priority 5 Heavy use of agrochemicals in flood plain horticulture**

Run off direct into the lake, little local knowledge of dangers, safer alternatives available. (*“Now” problem*)

##### **Low Priority Interventions**

Oil spillage from the docks - Not currently a major threat but one that could be fairly easily tackled. Some threat of large scale spill. (*“Now” problem*)

Oil barges flushing into lake - Known to occur but scale of problem unknown, difficult to monitor. (*“Now” problem*)

Discharge of toxic substances from mine workings - Main concern is mercury used in gold mining. Little mining occurs in catchment currently but plans in pipeline. (*“Potential” problem*)

Use of agrochemicals in catchment (especially on tobacco, coffee and cotton). - A possibly more serious threat in the future if site specific packages for sensitive areas not developed. (*“Now” problem*).

Major marine accident - oil spill. - Seen as a *“Now” problem* because main concern is prevention rather than cure as boat traffic increases. National contingency plans being developed.

Risks from unspecified hazardous cargo - The majority of goods move up and down the coast in small vessels, and there is little or no control over the type of cargoes or how they are packaged and transported. However, the scale of the problem has to be ascertained as has the threat to biodiversity.. (*“Potential” Problem*)

Dumping waste from boats - Of particular concern in the bay and harbour area, where the concentration of boats results in serious localised pollution. It is worth noting that international regulations on disposal of waste would constrain the practice, however current design of boats operating on the lake relies on open disposal. (*“Now” Problem*)

Oil spills from small boats - Many small boats transport fuel and owing to rudimentary methods much spillage occurs. Actual scale of threat not known, but remedial action could be relatively straightforward (*“Now” Problem*).

#### **4.2.3 Control Sedimentation**

##### **Priority 1 Clearing land for farming on steep slopes along the shore**

Seen as a direct threat to areas of high diversity (rocky areas close below steep slopes) such areas not accustomed to high sediment input. Linked to serious loss of soil fertility and thus cross sectoral concern. (*“Now” problem*)

##### **Priority 2 Stream Bank Cultivation**

An immediate source of sediments to the lake system through bank destabilisation, while decreasing bank vegetation trapping efficiency and allowing greater sediment transport from the hinterland. The problem is increasing with land pressure, exacerbated by recent drought years. (*“Now” Problem*)

##### **Priority 3 Inappropriate farming practices cultivating down slope**

Very widespread activity throughout inner catchment area. Appropriate alternatives and training programmes in water and soil conservation readily available. (*“Now” Problem*)

#### **Priority 4 Encroachment into gazetted forest reserves**

Important “protection” zones that once lost cannot be recovered. Under increasing threat in spite of existing regulation. Raising political awareness seen as crucial action. (*“Now” Problem*)

#### **Priority 5 Poor siting/management of refugee camps**

A perennial problem in NW Tanzania, original temporary camps now “permanent” poor environmental management has led to much deforestation. Urgent need for rehabilitation and re-location of sites as likely to be several years before root causes resolved. (*“Now” problem*)

#### **Low Priority Interventions**

Increasing flue cured tobacco cultivation causing deforestation - Long term trends and impact not clear but government has clear policy with stated measures to mitigate, seems to be a question of implementation of the policy. (*“Now” Problem*).

Smallholder mining practices - Perceived as a potential future threat need for investigation into current practices and trends (*“Potential” Problem*).

Potential impact of large mines - plans for large mines in the catchment are in the pipe line and need to be monitored. (*“Potential” Problem*).

Uncontrolled expansion of farming into non-gazetted forest areas - results in deforestation of sensitive zones. Zoning and control required before increasing population pressure results in extreme damage. (*“Now” Problem*).

Uncontrolled bush fires - perceived as a problem in certain critical areas but precise impact on run-off not clear (*“Potential” Problem*).

Unsustainable farming practices leading to shifting agriculture - includes most common forms of agriculture, based on traditional practices sustainable at low population densities, becomes unsustainable if fallow periods decrease beyond a certain point. The effect is to increase erosion and hence sedimentation, however the impact on increased sediment load and hence biodiversity, will depend on the distance to and transport by major streams. (*“Now” Problem*)

Increasing movement of agropastoralists into flood plain area - most noticeable in Malagarasi wetland area, exacerbated during periods of drought. Protection of this wetland highlighted as separate specific problem. (*“Now” problem*)

Impact of rural fuelwood extraction - Ever increasing demand for fuelwood and charcoal seen as important cause of deforestation. Need to evaluate scale and impact. (*“Potential” problem*)

Degradation of Malagarasi wetland - Wetland seen as important sink for sediments and pollutants which would otherwise run into the lake. In addition important focus of biodiversity in its own right. Urgent need to identify rate and causes of degradation and introduce protective measures, (*“Now” problem*).

## 5 Further Development of the Strategy

The purpose of the national consultation process has been as an input to the Regional Strategic Action Plan.

The next stage of the process will be to take the results of the Zambian consultation to the regional Transboundary Diagnostic Analysis workshop, to be held in Lusaka in November.

The Tanzanian delegates will be expected to provide an overview of the conclusions of the national consultation process and to ensure that Tanzania's concerns are adequately represented in the regional consultation process.

Following this the Tanzanian delegates will be responsible for participating in drawing up a draft Strategic Action Plan, that will define both regional priorities and hence indirectly national priorities for Zambia within this regional framework.

There will therefore have to be a national process agreed within the SAP which will allow for the review of the Tanzanian analysis and for further prioritisation within this regional framework.

Although these aspects were discussed during the national consultation process, the further development of these concepts, with proposals for institutional capacity building within the framework of the regional Strategic Action Plan must follow the overall prioritisation that will be defined by the regional meetings

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

***Within the regional framework of the Strategic Action Plan:***

***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 subsequent 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?...***

### ***The Strategic Action Plan***

***“The SAP should establish clear priorities that are endorsed at the highest levels of government and widely disseminated. Priority transboundary concerns should be identified, as well as sectoral interventions (policy changes, program development, regulatory reform, capacity-building investments, and so on) needed to resolve the transboundary problems as well as regional and national institutional mechanisms for implementing elements of the SAP. a balanced program of preventive and remedial actions, support both investment and capacity-building, and identify key activities in the following areas:***

- ***Priority preventive and remedial actions***
- ***Cross-cutting issues and linkages to other focal areas***
- ***Institutional strengthening and capacity-building needs***
- ***Stakeholder involvement and public awareness activities***
- ***Program monitoring and evaluation***
- ***Institutional mechanisms for implementation.”***

(Operational Strategy of the GEF; GEF 1996)

**Annex 1**  
**Participants involved in the National Consultation**  
**Workshops**

## Participants involved in the National Consultation Workshops

| Individual   | Organisation                                   | Based in:                                |
|--|--|--|
| Mrs. V. Macha  | Attorney General Chamber                       | Dar es Salaam                            |
| Ms S Capper  | AWF  | Arusha                                   |
| Mr A Lugome  | CARITAS Tanzania                               | Dar es Salaam                            |
| Bishop Dr G Mpango   | Diocese of Western Tanganyika                  | Kasulu                                   |
| Mr. M. M. Shirima<br>Mr. G. Makinda  | District Council                               | Kigoma<br>Nkasi                          |
| Mr. C. Swai<br>Mr. R Yonazi<br>Mr. S. Kisinto<br>Mr. S. Nkondokaya<br>Mrs. E. Makwaia<br>Ms. A . Madete<br>Mr Kayega | Division of Environment                        | Dar es Salaam                            |
| Mr. W. V. Haule<br>Mrs. V. Lyimo<br>Ms. B. N. Marwa<br>Mrs J Uronu   | Fisheries Division                             | Dar es Salaam<br><br>Kigoma              |
| Mr F Mukome  | Forestry Division                              | Dar es Salaam                            |
| Dr. Lukonge  | JET  | Dar es Salaam                            |
| Dr. Andrew Menz<br>Dr. F. M. Chale<br>Mr. JP Ledant<br>Mr. N. Hodgson  | LTBP   | Dar es Salaam<br>Kigoma<br>Belgium<br>UK |
| Mr. J. Dukuduku  | Maji-Ubungo                                    | Dar es Salaam                            |
| Mr C Rumisha   | Marine parks and Reserves Unit                 | Dar es Salaam                            |
| Mr D Mhalu<br>Mr m Ndimbo  | Ministry of Agriculture                        | Kigoma<br>Dar es Salaam                  |
| Sgt. T. Mwaijande  | Ministry of Communication and Transport        | Dar es Salaam                            |
| Mr. JB Tindyembwa<br>Mr M S Gilbert<br>Mr L Rwebembera   | Ministry of Energy and Minerals                | Dar es Salaam                            |
| Mrs I Aboud  | Ministry of Justice and Constitutional Affairs | Dar es Salaam                            |
| Mr. Kihurnwa   | Ministry of Lands and Human Settlements        | Dar es Salaam                            |
| Mr J Dukuduku  | Ministry of Water                              | Dar es Salaam                            |

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|   |                               |   |
|---|-------------------------------|---|
| Mr C Kangero<br>Mr G Makinda  | Natural Resources             | Kigoma<br>Rukwa                                       |
| Mr. P. Chisara<br>Mr. W. N. Sarunday<br>Mr L Nzali<br>Mr F Stolla   | NEMC                          | Dar es<br>Salaam                                      |
| Mrs. C. Makundi<br>Mr. S. Mayeye<br>Mr. AJ Mkama<br>Mr. J. Shilungushela                                  | NLUPC                         | Dar es<br>Salaam                                      |
| Mr. Kirit Vaitha  | Ornamental Fish Trade         | Kigoma  |
| Mr. T. Killenga<br>Mrs. A. E. Mayawalla   | Planning Commission           | Dar es<br>Salaam                                      |
| Mr. Z. Kittina  | PMO                           | Dar es<br>Salaam                                      |
| Dr. Mohamed Bahari<br>Mr. H.N. Kachechele   | Regional Office               | Rukwa<br>Kigoma                                       |
| Mr. D. B. R.<br>Chitamwebwa   | TAFIRI                        | Kigoma  |
| Mr. E. Lenganasa<br>Mr. M. T. Looboki<br>Mr. H. M. Mohamed<br>Mr. M Mbijima<br>Mr H Mollel<br>Mr W Daniel | TANAPA                        | Arusha<br><br>Dar es<br>Salaam<br>Gombe<br><br>Mahale |
| Mr Z Mshanga  | TANESCO                       | Kigoma  |
| Mrs h Mremi   | Tanzania Railways Corporation | Dar es<br>Salaam                                      |
| Mr.G. Strunden  | The Jane Goodall Institute    | Kigoma  |
| Dr. C.Mung'ong'o<br>Dr. H. Nkotagu<br>Prof Misana   | University of Dar es Salaam   | Dar es<br>Salaam                                      |
| Mr p Nnyiti   | WCST                          | Dar es<br>Salaam                                      |

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## **Annex 2**

### **Proposed National Team for the TDA and Draft Strategic Action Plan Consultation**

The following table indicates the identified individuals, their institutions and alternates who would be able to support the regional process. The remaining representatives have yet to be identified.

| <b>Name</b>  | <b>Institution</b>                                     | <b>Alternate</b> | <b>Institution</b> |
|--------------|--|------------------|--------------------|
| E K Mugurusi | Vice Presidents<br>Office – Director of<br>Environment |                  |                    |
| R P Yonazi   | National<br>Coordinator VPO                            |                  |                    |
| F M Nkatagu  | University of DSM                                      |                  |                    |



## Level 1

| Main Threat to Biodiversity  | Transboundary Implications   | Main Institutional Problems  | General Action Areas   |
|--|--|--|--|
| Unsustainable Fisheries<br>Increasing Pollution<br>Excessive Sedimentation | Global Loss of Biodiversity<br>Loss of Shared Fisheries Resource<br>Decline in Water Quality | Lack of Resources<br>Poor enforcement of existing Regulations<br>Outdated legislation<br>Lack of information<br>Inadequate institutional co-ordination | A)Reduce Impact of Fishing<br>B)Control Pollution<br>C)Control Sedimentation |

## Level 2

## A) Reduce Impact of Fishing Priority 3 (T) Now

| Specific Problem                             | Stakeholders  | Uncertainties | Proposed Actions   |
|--|---|---------------|--|
| 1) Use of Inappropriate Gill Nets Mesh Sizes | Fisheries;<br>Communities;<br>Equipment<br>Manufactures;<br>Suppliers; Bureau of<br>Standards; TAFIRI |               | 1.1) Negotiate<br>minimum acceptable<br>net size and means of<br>replacing / phasing<br>out unsuitable gear<br><br>1.2) Enforce<br>regulations |

## Level 2

## A) Reduce Impact of Fishing Priority 2 (T) Now

| Specific Problem   | Stakeholders   | Uncertainties   | Proposed Actions  |
|--|--|---|---|
| 2) Lack of Protection of Seasonal Spawning / Nursery Grounds | Fisheries;<br>Communities; Local Authorities; TAFIRI | Where and when to close.<br><br>Appropriateness of existing legislation | 2.1) Identify sensitive sites / seasons<br><br>2.2) Review existing legislation<br><br>2.3) Negotiate limiting access with fishermen<br><br>2.4) Incorporate closed seasons in existing regulations<br><br>2.5) Enforce local regulations |

## Level 2

## A) Reduce Impact of Fishing Priority 1 (T) Now

| Specific Problem               | Stakeholders  | Uncertainties | Proposed Actions  |
|--------------------------------|---|---------------|---|
| 3) Continued Use of Seine Nets | Fisheries;<br>Communities; Local Authorities; TAFIRI, net manufacturers |               | 3.1) Negotiate means of replacing / phasing out beach seine fishing<br><br>3.2) Implement phasing out programme<br><br>3.3) Enforce regulations |

## Level 2

## A) Reduce Impact of Fishing (T) Now

| Specific Problem                             | Stakeholders   | Uncertainties | Proposed Actions   |
|--|--|---------------|--|
| 4) Piracy forcing fishing into inshore areas | Fisheries;<br>Communities; Local /<br>Regional Authorities;<br>Foreign Governments;<br>Foreign Affairs; Home<br>Affairs; Police; Navy;<br>Army |               | 4.1) Assess scale of threat<br><br>4.2) Regional consultation<br><br>4.3) Improve patrol capacity<br><br>4.4) Promote HF radio use |

## Level 2

## A) Reduce Impact of Fishing Priority 5 (T) Now

| Specific Problem   | Stakeholders   | Uncertainties    | Proposed Actions  |
|--|--|------------------|---|
| 5) Illegal fishing (& export of fish) by foreign nationals | Fisheries;<br>Communities; Local /<br>Regional Authorities;<br>Foreign Governments;<br>Foreign Affairs; Home<br>Affairs; | Scale of problem | 5.1) Assess scale of threat<br><br>5.2) Agree with local stakeholders on practical and permanent solutions<br><br>5.3) Negotiate visible international boat registration system<br><br>5.4) Improve fisheries patrol capacity |

## Level 2

## A) Reduce Impact of Fishing Now

| Specific Problem                                     | Stakeholders   | Uncertainties | Proposed Actions  |
|--|--|---------------|---|
| 6) Increasing market for small fish for poultry feed | Fisheries;<br>Communities; Traders;<br>Poultry farmers |               | <p>6.1) Market survey of sources, transportation and end users</p> <p>6.2) Review alternative supply sources</p> <p>6.3) Review export regulations</p> <p>6.4) Promote, appropriate, fish farming as an alternative</p> |

## Level 2

## A) Reduce Impact of Fishing (T) Pot

| Specific Problem                           | Stakeholders  | Uncertainties | Proposed Actions   |
|--|---|---------------|--|
| 7) Farming Exotic Species in the catchment | Missions and other NGOs; Fisheries; Communities; Private Traders/Producers; Local Authorities; TAFIRI |               | <p>7.1) Check and review regulations as they apply to catchment species</p> <p>7.2) Establish local regulations for catchment;</p> <p>7.3) Promote awareness of risk and alternatives among stakeholders</p> <p>7.4) Enforce local regulations</p> |

## Level 2

## A) Reduce Impact of Fishing Priority 4 (T) Now

| Specific Problem   | Stakeholders  | Uncertainties      | Proposed Actions  |
|--|---|--------------------|---|
| 8) Unlicensed and poor control of licensed extraction of ornamental fish | Licensed Traders; Fisheries; TAFIRI; Foreign Affairs; Home Affairs; Customs | Endangered species | <p>8.1) Identify threatened species</p> <p>8.2) Regional agreement on exportable species by country of origin</p> <p>8.3) Monitor numbers and species exported</p> <p>8.4) Raise senior level awareness of problems</p> <p>8.5) Review possibility of species quotas</p> <p>8.6) Review number of licensees</p> |

## Level 2

## A) Reduce Impact of Fishing (T) Pot

| Specific Problem                              | Stakeholders   | Uncertainties                            | Proposed Actions  |
|---|--|--|---|
| 9) Lack of quota on granting fishing licences | Fisheries;<br>Communities; Local Authorities; TAFIRI | Optimal number<br>Impact on biodiversity | 9.1) Review LTR conclusions<br>9.2) Assess relevance to fish biodiversity issues<br>9.3) Assess trend in expansion of licensing<br>9.4) Review licensing procedures |

## Level 2

## B) Control Pollution (T) Now

| 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 | <p>1.1) Identify specific causes of leaks and spillage</p> <p>1.2) Check and review regulations and recommended procedures</p> <p>1.3) Review reasons for non-enforcement of regulations</p> <p>1.4) Implement remedial actions</p> |

## Level 2

## B) Control Pollution(T) Now

| Specific Problem                   | Stakeholders  | Uncertainties                | Proposed Actions  |
|------------------------------------|---|------------------------------|---|
| 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 | <p>2.1) Assess number of barge loads</p> <p>2.2) Identify flushing practices / sites</p> <p>2.3) Assess impact of current and projected levels</p> <p>2.4) Review applicability of national regulations for Lake Tanganyika</p> <p>2.5) Develop appropriate procedures for waste disposal</p> |

## Level 2

## B) Control Pollution Priority 1 Now

| Specific Problem  | Stakeholders  | Uncertainties | Proposed Actions   |
|---|---|---------------|--|
| 3) Kigoma TANESCO Power Station - pollution from oil storage, handling and contamination from operation | TANESCO; Local Council; Min of Water; Min of Energy; NEMC |               | <p>3.1) Identify appropriate management practices and structures</p> <p>3.2) Identify immediate remedial measures</p> <p>3.3) Review government plans for rehabilitation, including funding</p> <p>3.4) Identify &amp; implement appropriate long term solutions</p> |

## Level 2

## B) Control Pollution Priority 3 Now

| Specific Problem  | Stakeholders   | Uncertainties | Proposed Actions   |
|---|--|---------------|--|
| 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 |               | <p>4.1) Check and review regulations;</p> <p>4.2) Identify reasons for non-compliance</p> <p>4.3) Promote Senior level awareness</p> <p>4.4) Identify and propose practical treatment works and disposal sites</p> <p>4.5) Implement proposals</p> |

## Level 2

## B) Control Pollution Priority 2 Now

| Specific Problem   | Stakeholders   | Uncertainties | Proposed Actions  |
|--|--|---------------|---|
| 5) Discharge of untreated domestic sewage from Kigoma Town | Local Council; Regional Authority; Min of Water; Min of Health; Min of Lands |               | 5.1) Review existing town development plans<br><br>5.2) Incorporate proposals for sewage, waste water and water supply;<br><br>5.3) Propose developments & promote awareness to counteract existing situation of open drains etc. |

## Level 2

## B) Control Pollution Priority 4 Now

| Specific Problem   | Stakeholders  | Uncertainties | Proposed Actions   |
|--|---|---------------|--|
| 6) Leachate from inappropriately sited solid waste dumps | Local Council; Regional Authority; Min of Water; Min of Health; Min of Lands; Communities |               | 6.1) Identify appropriate sites;<br>6.2) Review present collection and disposal procedures<br>6.3) Check existing and introduce appropriate local regulations;<br>6.4) Develop appropriate sites |

## Level 2

## B) Control Pollution(T) Pot

| Specific Problem                                    | Stakeholders   | Uncertainties    | Proposed Actions  |
|---|--|------------------|---|
| 7) Discharge of toxic substances from mine workings | “Smallholder miners”;<br>Min of Energy and Mines; Min of Water; Regional / Local Authorities; NLUPC; NEMC; Min of Health | Scale of problem | 7.1) Quantify scale and processes used different mining areas<br><br>7.2) Review availability and knowledge of appropriate technology<br><br>7.3) Promote awareness of appropriate technology |

## Level 2

## B) Control Pollution Priority 5 (T) Now

| Specific Problem  | Stakeholders  | Uncertainties | Proposed Actions   |
|---|---|---------------|--|
| 8) Heavy use of agrochemicals in flood plain horticulture | Smallholders; Min of Agriculture; Min of Water; NLUPC; Local Authorities; Home Affairs; Min of Health |               | 8.1) Promote safe alternatives<br>8.2) Enforce ban on illegal trade and use of banned pesticides |

## Level 2

## B) Control Pollution(T) Now

| Specific Problem  | Stakeholders  | Uncertainties   | Proposed Actions   |
|---|---|-----------------|--|
| 9) Use of agrochemicals in the catchment (tobacco, coffee, cotton...) | Smallholders; Min of Agriculture; Min of Water; Marketing Boards; Private Companies | Scale and scope | 9.1) Develop site specific packages for sensitive areas<br>9.2) Promote site specific packages |

Level 2

B) Control Pollution (T) Now

| Specific Problem                      | Stakeholders  | Uncertainties | Proposed Actions                                      |
|---------------------------------------|---|---------------|---|
| 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 | 10.1) Risk analysis<br>10.2) Develop contingency plan |

## Level 2

## B) Control Pollution(T) P

| Specific Problem                                     | Stakeholders  | Uncertainties                     | Proposed Actions  |
|--|---|-----------------------------------|---|
| 11) Risks from unspecified hazardous cargo movements | Ship Owners / Barge Operators; Small Boat Owners Traders; Regional /Local Authorities; Shipping Department; NEMC; Min of Transport; Min of Water; TRC; Customs; | Scale of movement, types of cargo | 11.1) Assessment movements and handling procedures of hazardous cargoes<br><br>11.2) Review guidelines for small and large transporters |

## Level 2

## B) Control Pollution(T) Now

| Specific Problem             | Stakeholders   | Uncertainties | Proposed Actions   |
|------------------------------|--|---------------|--|
| 12) Dumping waste from boats | Ship Owners / Operators; Local Authorities; Shipping Department; Min of Water; NEMC; TRC | Scale         | 12.1) Identify present practices and scale of problem<br>12.2) Check and review present and proposed amendments to local and international regulations |

## Level 2

## B) Control Pollution Now

| Specific Problem                           | Stakeholders  | Uncertainties | Proposed Actions   |
|--|---|---------------|--|
| 13) Oil spills from small boats from boats | Small boat owners,<br>Regional Authorities;<br>Shipping Department;<br>Min of Transport; Min<br>of Water; NEMC;<br>Insurance Companies;<br>TAFIRI | Scale         | 13.1) Identify scale and importance<br><br>13.2) Identify and introduce appropriate handling |

## Level 2

## C) Control Sedimentation Now

| Specific Problem   | Stakeholders   | Uncertainties | Proposed Actions  |
|--|--|---------------|---|
| 1) Increasing flue cured tobacco cultivation causing deforestation | Min of Agriculture;<br>Private Sector;<br>Communities; Tobacco Council; Min of Water;<br>Min of Lands; Forestry Department, tobacco farmers, DWT |               | <p>1.1) Review legislation to support current policy</p> <p>1.2) Review long-term viability and impact of industry</p> <p>1.3) Investigate sustainable systems</p> <p>1.4) Promote awareness of deforestation issues and alternative curing techniques</p> <p>1.5) Establish woodlots</p> |

## Level 2

## C) Control Sedimentation Priority 1 Now

| Specific Problem   | Stakeholders   | Uncertainties | Proposed Actions   |
|--|--|---------------|--|
| 2) Clearing land for farming on steep slopes along the shore | Min of Agriculture;<br>Communities; NLUPC;<br>Local Authorities;<br>JGI/TACARE |               | <p>2.1) Raise awareness of critical issues</p> <p>2.2) Promote soil conservation measures</p> <p>2.3) Check/review local bye-laws</p> <p>2.4) Identify with communities sensitive areas, demarcate hazardous areas</p> <p>2.5) Assist villages in preparing land use plans</p> |

## Level 2

## C) Control Sedimentation Priority 3 Now

| Specific Problem   | Stakeholders  | Uncertainties | Proposed Actions   |
|--|---|---------------|--|
| 3) Inappropriate farming practices; cultivating down slope | Min of Agriculture; Communities; NLUPC; Local Authorities; JGI/TACARE |               | <p>3.1) Identify critical farmed zones</p> <p>3.2) Raise awareness of issues</p> <p>3.3) Promotion and training in soil &amp; water conservation measures</p> <p>3.4) Assist villages in preparing land use plans</p> <p>3.5) Promotion and training in appropriate farming practices.</p> |

## Level 2

## C) Control Sedimentation Pot

| Specific Problem                                       | Stakeholders   | Uncertainties           | Proposed Actions                                       |
|--|--|-------------------------|--|
| 4) "Smallholder" mining practices - cumulative impacts | "Smallholder" mining Communities; Regional Miners Association; NEMC; NLUPC; Local Authorities; FEMATA; Min of Water; Min of energy and mineral | Scale, sites, practices | 4.1) Review existing practices and projected expansion |

## Level 2

## C) Control Sedimentation Pot

| Specific Problem                   | Stakeholders  | Uncertainties | Proposed Actions   |
|------------------------------------|---|---------------|--|
| 5) Potential impact of large mines | Private Companies;<br>Local / Regional Authorities;<br>Communities; NEMC;<br>Min of Energy and Minerals; Tanzania Chamber of Mines;<br>Minister Responsible for Environment |               | 5.1) Identify critical sites and sensitive areas<br><br>5.2) Prepare a catchment zoning giving highly sensitive, medium sensitive areas<br><br>5.3) Review planning licensing procedures<br><br>5.4) Incorporate contingency disaster planning |

## Level 2

## C) Control Sedimentation Priority 5 (T) Now

| Specific Problem                             | Stakeholders   | Uncertainties | Proposed Actions  |
|--|--|---------------|---|
| 6) Poor siting / management of refugee camps | Local / Regional Authorities;<br>Communities; Forestry Department; UNHCR; Home Affairs; Min of Lands; NGOs, NEMC |               | 6.1) Review EIAs and rehabilitation proposals<br><br>6.2) Monitor rehabilitation works<br><br>6.3) Review existing sites and identify new potential sites to minimise future impacts of refugee movements<br><br>6.4) Review UNHCR camp management procedures |

## Level 2

## C) Control Sedimentation Now

| Specific Problem  | Stakeholders  | Uncertainties | Proposed Actions  |
|---|---|---------------|---|
| 7) Uncontrolled expansion of farming into non-gazetted forest areas | Local / Regional Authorities;<br>Communities; Forestry Department; Min of Agriculture; Min of Water; JGI/TACARE; NLUPC; |               | 7.1) Identify threatened / sensitive zones<br>7.2) Negotiate with communities to gazette sensitive areas<br>7.3) Enforce bye-laws<br>7.4) Promote sustainable farming systems |

## Level 2

## C) Control Sedimentation Priority 4 Now

| Specific Problem                              | Stakeholders  | Uncertainties | Proposed Actions  |
|---|---|---------------|---|
| 8) Encroachment into gazetted forest reserves | Local / Regional Authorities;<br>Communities; Forestry Department; NLUPC;<br>Min of Lands: TACARE |               | 8.1) Identify critical encroachment and critical threatened zones<br><br>8.2) Create political awareness of problems<br><br>8.3) Negotiate means of resettlement from sensitive areas<br><br>8.4) Promote community forest management and access rights |

## Level 2

## C) Control Sedimentation Pot

| Specific Problem           | Stakeholders  | Uncertainties | Proposed Actions   |
|----------------------------|---|---------------|--|
| 9) Uncontrolled bush fires | Local / Regional Authorities;<br>Communities; Forestry Department; Min of Agriculture; Wildlife Department; NGOs; Community Development |               | 9.1) Identify critical fire zones<br>9.2) Review existing regulations and bye-laws<br>9.3) Raise awareness focused on communities in critical zones<br>9.4) Enforce bye-laws |

## Level 2

## C) Control Sedimentation Now

| Specific Problem  | Stakeholders   | Uncertainties | Proposed Actions   |
|---|--|---------------|--|
| 10) Unsustainable farming practices leading to shifting agriculture | Local / Regional Authorities;<br>Communities; Min of Agriculture; DWT, CARITAS |               | 10.1) Identify sensitive zones within existing farmed areas<br><br>10.2) Focus Agricultural extension and NGOs on critical areas<br><br>10.3) Promote sustainable farming practices (agropastoralist systems, conservation farming...) |

## Level 2

## C) Control Sedimentation Now

| Specific Problem  | Stakeholders  | Uncertainties | Proposed Actions  |
|---|---|---------------|---|
| 11) Increasing movement of agropastoralists into floodplain areas | Local / Regional Authorities;<br>Communities; Min of Agriculture; Min of Lands; NLUPC;<br>Livestock Traders; Min of Water, Min of Natural Resources;<br>Community Development |               | 11.1) Review existing and proposed legislation to protect wetlands<br>11.2) Identify sensitive / critical areas<br>11.3) Evaluate carrying capacity<br>11.4) Negotiate acceptable stock access to sensitive areas |

## Level 2

## C) Control Sedimentation Pot

| Specific Problem                        | Stakeholders   | Uncertainties   | Proposed Actions  |
|---|--|---|---|
| 12) Impact of rural fuelwood extraction | Local / Regional Authorities;<br>Communities; Min of Energy and Minerals;<br>JGI/TACARE; Forestry Department | Impact on overall groundcover and hence sedimentation | 12.1) Evaluate impact of rural fuelwood extraction practices on sediment load<br><br>12.2) Review existing policy and legislation |

## Level 2

## C) Control Sedimentation Priority 2 Now

| Specific Problem            | Stakeholders   | Uncertainties | Proposed Actions   |
|-----------------------------|--|---------------|--|
| 13) Stream bank cultivation | Min of Agriculture; Communities; Min of Water; Min of Lands; Forestry Department, C.E.R. |               | 13.1) Review stream bank cultivation regulations.<br>13.2) Investigate reasons and recommend solutions<br>13.3) Amend and/or enforce regulations |

## Level 2

## C) Control Sedimentation (T) Now

| Specific Problem  | Stakeholders  | Uncertainties                             | Proposed Actions   |
|---|---|---|--|
| 14) Degradation of Malagarasi wetland as sink for Sediments and Pollutants. | Min of Agriculture; Communities; Min of Water; NLUPC; C.E.R.; Regional authorities, local authorities, Natural Resources, | Rates and principal causes of degradation | 14.1) Identify rate and causes of degradation<br>14.2) Identify remedial actions |

## 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       |

## Level 3

## A) Reduce Impact of Fishing - Lack of Protection of Seasonal Spawning / Nursery Grounds

| Proposed Actions  | Timing | Key Agency      | Human | Material |
|---|--------|-----------------|-------|----------|
| 2.1) Identify sensitive sites / seasons                 | Now    | TAFIRI          | Yes   | Yes      |
| 2.2) Review legislation                                 | 2.1    | Fisheries       | Yes   | Yes      |
| 2.3) Negotiate limiting access with fishermen           | 2.2    | Local Authority | Yes   | No       |
| 2.4) Incorporate closed seasons in existing regulations | 2.3    | Fisheries       | Yes   | Yes      |
| 2.5) Enforce local regulations                          | 2.4    | Local Authority | Yes   | No       |

## Level 3

## A) Reduce Impact of Fishing - Continued Use of Seine Nets

| Proposed Actions  | Timing | Key Agency           | Human | Material |
|---|--------|----------------------|-------|----------|
| 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       |

## Level 3

## A) Reduce Impact of Fishing - Piracy forcing fishing into inshore areas

| Proposed Actions             | Timing   | Key Agency                 | Human | Material |
|------------------------------|----------|----------------------------|-------|----------|
| 4.1) Assess scale of threat  | Now      | Fisheries                  | Yes   | Yes      |
| 4.2) Regional consultation   | On Going | Foreign Affairs            | Yes   | Yes      |
| 4.3) Improve patrol capacity | Now      | Police                     | Yes   | No       |
| 4.4) Promote HF radio use    | Now      | Marine Authority<br>Kigoma | Yes   | Yes      |

## Level 3

## A) Reduce Impact of Fishing - Illegal fishing by foreign nationals

| Proposed Actions  | Timing  | Key Agency           | Human | Material |
|---|---------|----------------------|-------|----------|
| 5.1) Assess scale of threat   | Ongoing | Fisheries            | Yes   | Yes      |
| 5.2) Agree with local stakeholders on practical and permanent solutions | 5.1     | Local Authority      | Yes   | Yes      |
| 5.3) Negotiate visible international boat registration system           | Now     | Foreign Affairs      | Yes   | Yes      |
| 5.4) Improve fisheries patrol capacity                                  | Now     | Fisheries Department | Yes   | No       |

## Level 3

## A) Reduce Impact of Fishing - Increasing market for small fish for poultry feed

| Proposed Actions  | Timing | Key Agency           | Human | Material |
|---|--------|----------------------|-------|----------|
| 6.1) Market survey of sources, transportation and end users | Now    | TAFIRI               | Yes   | No       |
| 6.2) Review alternative supply sources                      | 6.1    | TAFIRI               | Yes   | No       |
| 6.3) Review export regulations                              | 6.2    | Fisheries Department | Yes   | Yes      |
| 6.4) Promote appropriate fish farming as an alternative     | 6.2    | Fisheries Department | Yes   | No       |

## Level 3

## A) Reduce Impact of Fishing - Farming Exotic Species in the catchment

| Proposed Actions   | Timing | Key Agency           | Human | Material |
|--|--------|----------------------|-------|----------|
| 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 identification) | 7.3    | Local Authority      | No    | No       |

## Level 3

## A) Reduce Impact of Fishing - Unlicensed / poor control of licensed extraction of ornamental fish

| Proposed Actions   | Timing | Key Agency                   | Human | Material |
|--|--------|------------------------------|-------|----------|
| 8.1) Identify threatend species                                    | Now    | TAFIRI                       | No    | No       |
| 8.2) Regional agreement on exportable species by country of origin | Now    | Fisheries Department         | Yes   | Yes      |
| 8.3) Monitor numbers and species exported                          | Now    | Fisheries Department/Customs | Yes   | Yes      |
| 8.4) Raise senior level awareness of problem                       | Now    | Fisheries Department         | Yes   | No       |
| 8.5) Review possibility of species quotas                          | Now    | TAFIRI                       | Yes   | Yes      |
| 8.6) Review number of licensees                                    | Now    | Fisheries Department         | Yes   | Yes      |
| 8.7) Examine possibility of CITES inclusion                        | 8.1    | Fisheries                    | Yes   | Yes      |

## Level 3

## A) Reduce Impact of Fishing - Lack of quota on granting fishing licences

| Proposed Actions                                  | Timing | Key Agency           | Human | Material |
|---|--------|----------------------|-------|----------|
| 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    | Min of Water | Yes   | No       |
| 1.2) Check and review regulations and recommended procedures | Now    | Min of Water | Yes   | Yes      |
| 1.3) Review reasons for non-enforcement of regulations       | 1.2    | Min of Wate  | Yes   | Yes      |
| 1.4) Implement remedial actions                              | 1.3    | Min ofWater  | Yes   | No       |

## Level 3

## B) Control Pollution - Flushing oil barges in the lake

| Proposed Actions  | Timing | Key Agency | Human | Material |
|---|--------|------------|-------|----------|
| 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       |

## Level 3

## B) Control Pollution - Kigoma TANESCO Power Station - pollution from oil storage, handling and contamination from operation

| Proposed Actions   | Timing | Key Agency  | Human | Material |
|--|--------|-------------|-------|----------|
| 3.1) Identify appropriate management practices and structures                | Now    | Energy dept | Yes   | No       |
| 3.2) Identify immediate remedial measures                                    | Now    | Energy dept | Yes   | No       |
| 3.3) Review government plans for rehabilitation, including funding proposals | Now    | Energy dept | Yes   | Yes      |
| 3.4) Identify & implement appropriate long term solutions                    | 3.3    | Energy dept | Yes   | No       |

## Level 3

## B) Control Pollution - Discharge of untreated waste from institutions (Police, Prisons, Railway Station, Docks)

| Proposed Actions   | Timing   | Key Agency        | Human | Material |
|--|----------|-------------------|-------|----------|
| 4.1) Check and review regulations;                                     | On Going | Min of Water      | Yes   | Yes      |
| 4.2) Identify reasons for non-compliance                               | Now      | UWS&S dept        | Yes   | Yes      |
| 4.3) Promote Senior level awareness                                    | 4.2      | Local authorities | Yes   | No       |
| 4.4) Identify and propose practical treatment works and disposal sites | 4.3      | Min of Water      | Yes   | No       |
| 4.5) Implement proposals   | 4.4      | Min of Water      | Yes   | No       |

## Level 3

## B) Control Pollution - Discharge of untreated domestic sewage from Kigoma Town

| Proposed Actions   | Timing | Key Agency                              | Human | Material |
|--|--------|---|-------|----------|
| 5.1) Review existing town development plans  | Now    | Min of Lands<br>(Human settlement dept) | Yes   | Yes      |
| 5.2) Incorporate proposals for sewage, waste water and water supply;                               | 5.1    | Min of Lands                            | Yes   | Yes      |
| 5.3) Propose developments & promote awareness to counteract existing situation of open drains etc. | 5.2    | Min of Lands                            | Yes   | Yes      |

## Level 3

## B) Control Pollution - Leachate from inappropriately sited solid waste dumps

| Proposed Actions   | Timing  | Key Agency   | Human | Material |
|--|---------|--------------|-------|----------|
| 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       |

## Level 3

## B) Control Pollution - Discharge of toxic substances from mine workings

| Proposed Actions   | Timing | Key Agency          | Human | Material |
|--|--------|---------------------|-------|----------|
| 7.1) Quantify scale and processes used in different mining areas | Now    | Energy and Minerals | 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       |

## Level 3

## B) Control Pollution - Heavy use of agrochemicals in flood plain horticulture

| Proposed Actions   | Timing | Key Agency         | Human | Material |
|--|--------|--------------------|-------|----------|
| 8.1) Promote safe alternatives                                 | Now    | Min of Agriculture | Yes   | Yes      |
| 8.2) Enforce ban on illegal trade and use of banned pesticides | Now    | Min of Agriculture | Yes   | Yes      |

## Level 3

## B) Control Pollution - Use of agrochemicals in the catchment (tobacco, coffee, cotton...)

| Proposed Actions  | Timing  | Key Agency         | Human | Material |
|---|---------|--------------------|-------|----------|
| 9.1) Develop site specific packages for sensitive areas | Ongoing | Min of Agriculture | Yes   | Yes      |
| 9.2) Promote site specific packages                     | 9.1     | Min of Agriculture | Yes   | Yes      |

Level 3

B) Control Pollution - Major marine accident - oil spill

| Proposed Actions                | Timing  | Key Agency | Human | Material |
|---------------------------------|---------|------------|-------|----------|
| 10.1) Risk analysis             | Now     | NEMC       | Yes   | No       |
| 10.2) Develop contingency plans | Ongoing | NEMC       | Yes   | Yes      |

## Level 3

## B) Control Pollution - Risks from unspecified hazardous cargo movements

| Proposed Actions  | Timing | Key Agency | Human | Material |
|---|--------|------------|-------|----------|
| 11.1) Assessment movements and handling procedures of hazardous cargoes | Now    | Shipping   | Yes   | No       |
| 11.2) Review guidelines for small and large transporters                | 11.1   | Shipping   | Yes   | No       |

## Level 3

## B) Control Pollution - Dumping waste from boats

| Proposed Actions  | Timing | Key Agency | Human | Material |
|---|--------|------------|-------|----------|
| 12.1) Identify present practices and scale of problem   | Now    | NEMC       | Yes   | Yes      |
| 12.2) Check and review present and proposed amendments to local and international regulations | 12.1   | NEMC       | Yes   | Yes      |

## Level 3

## B) Control Pollution - Oil spills from small boats

| Proposed Actions                                  | Timing | Key Agency | Human | Material |
|---|--------|------------|-------|----------|
| 13.1) Identify scale and importance               | Now    | NEMC       | Yes   | No       |
| 13.2) Identify and introduce appropriate handling | 13.1   | NEMC       | Yes   | No       |

## C) Control Sedimentation - Increasing flue cured tobacco cultivation causing deforestation

| Proposed Actions                                      | Timing   | Key Agency         | Human | Material |
|---|----------|--------------------|-------|----------|
| 1.1) Review legislation to support current policy     | Now      | Min of Ag          | Yes   | Yes      |
| 1.2) Review longterm viability and impact of industry | Now      | Min of Agriculture | Yes   | No       |
| 1.3) Investigate sustainable systems                  | On Going | Min of Agriculture | Yes   | No       |
| 1.4) Promote awareness of deforestation issues        | Now      | Forestry           | Yes   | Yes      |
| 1.5) Review stream bank cultivation regulations       | Now      | Min of Agriculture | Yes   | Yes      |
| 1.6) Establish woodlots                               | Ongoing  | Forestry           | Yes   | Yes      |

## Level 3

## C) Control Sedimentation - Clearing land for farming on steep slopes along the shore

| Proposed Actions  | Timing | Key Agency         | Human | Material |
|---|--------|--------------------|-------|----------|
| 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       |

## Level 3

## C) Control Sedimentation - Inappropriate farming practices; cultivating down slope

| Proposed Actions  | Timing   | Key Agency         | Human | Material |
|---|----------|--------------------|-------|----------|
| 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) Promotion and training in soil & water conservation measures | On Going | Min of Agriculture | Yes   | Yes      |
| 3.4) Assist villages in preparing land use plans                  | 3.1      | NLUPC              | Yes   | No       |
| 3.5) Promotion and training in appropriate farming practices      | Ongoing  | Min of Agriculture | Yes   | Yes      |

Level 3

C) Control Sedimentation - “Smallholder” mining practices - cumulative impacts

| Proposed Actions                                       | Timing | Key Agency   | Human | Material |
|--|--------|--------------|-------|----------|
| 4.1) Review existing practices and projected expansion | Now    | Min of Water | Yes   | No       |

## Level 3

## C) Control Sedimentation - Potential impact of large mines

| Proposed Actions  | Timing | Key Agency          | Human | Material |
|---|--------|---------------------|-------|----------|
| 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      |

## Level 3

## C) Control Sedimentation - Poor siting / management of refugee camps

| Proposed Actions  | Timing   | Key Agency | Human | Material |
|---|----------|------------|-------|----------|
| 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  | Now      | NEMC       | Yes   | Yes      |

## Level 3

## C) Control Sedimentation - Uncontrolled expansion of farming into non-gazetted forest areas

| Proposed Actions   | Timing  | Key Agency         | Human | Material |
|--|---------|--------------------|-------|----------|
| 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                   | Ongoing | Min of Agriculture | Yes   | Yes      |

## Level 3

## C) Control Sedimentation - Encroachment into gazetted forest reserves

| Proposed Actions  | Timing | Key Agency          | Human | Material |
|---|--------|---------------------|-------|----------|
| 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 areas         | 8.1    | Local Authority     | Yes   | No       |
| 8.4) Promote community forest management and access rights        | 8.3    | Forestry Department | Yes   | No       |

## Level 3

## C) Control Sedimentation - Uncontrolled bush fires

| Proposed Actions  | Timing | Key Agency      | Human | Material |
|---|--------|-----------------|-------|----------|
| 9.1) Identify critical fire zones                             | Now    | Forestry        | 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       |

## Level 3

## C) Control Sedimentation - Unsustainable farming practices leading to shifting agriculture

| Proposed Actions   | Timing | Key Agency         | Human | Material |
|--|--------|--------------------|-------|----------|
| 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       |

## Level 3

## C) Control Sedimentation - Increasing movement of agropastoralists into floodplain areas

| Proposed Actions   | Timing   | Key Agency         | Human | Material |
|--|----------|--------------------|-------|----------|
| 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       |

## Level 3

## C) Control Sedimentation - Impact of rural fuelwood extraction

| Proposed Actions  | Timing   | Key Agency                       | Human | Material |
|---|----------|----------------------------------|-------|----------|
| 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      |

## Level 3

## C) Control Sedimentation - Stream Bank Cultivation

| Proposed Actions                                  | Timing | Key Agency    | Human | Material |
|---|--------|---------------|-------|----------|
| 13.1) Review stream bank cultivation regulations. | Now    | Min of Agric. | Yes   | Yes      |
| 13.2) Investigate reasons and recommend solutions | Now    | C.E.R         | Yes   | Yes      |
| 13.3) Amend and enforce regulations               | 13.2   | Min of Agric  | Yes   | No       |

C) Control Sedimentation - Degradation of Malagarasi wetland as sink for Sediments and Pollutants.

| Proposed Actions                              | Timing | Key Agency   | Human | Material |
|---|--------|--------------|-------|----------|
| 14.1) Identify rate and causes of degradation | Now    | Min of Agric | Yes   | No       |
| 14.2) Identify remedial actions               | 14.1   | Min of Agric | Yes   | No       |