

Integrated Environmental Assessment and Social Assessment  
(EA/SA)  
Of the GEF Project entitled  
*Reversal of Land and Water Degradation Trends in the Lake  
Chad Basin*



Lake Chad Basin Commission  
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## Executive Summary

The problems of land and water degradation in the Lake Chad Basin are now widely recognised. The Lake Chad Basin Commission (LCBC) has approached the Global Environment Facility for support in confronting these problems. The resulting project is entitled, *“Reversal of Land and Water Degradation Trends in the Lake Chad Basin”*. UNDP and the World Bank, have both assisted in developing the project. Key elements of the project include completion of a Transboundary Diagnostic Analysis (TDA), preparation of a Strategic Action Programme (SAP) and execution of six pilot projects in the five LCBC countries. It is expected that a full-scale implementation of the SAP will be undertaken through a subsequent phase of the project.

This report presents the conclusions of the Environmental and Social Assessment carried out on behalf of the World Bank, as part of the preparatory work in developing the main project and the supporting pilot project proposals. The World Bank contracted three independent consultants to work alongside staff members from the LCBC in carrying out this assessment. The fieldwork was undertaken in October 2001.

The objectives of the Environmental Assessment and Social Assessment (EA/SA) can be summarised as follows:

- Identify, qualify, and to the extent possible, quantify the likely negative and positive environmental and social impacts of the project as presently designed;
- Propose mitigating measures to be implemented to avoid negative impacts;
- Ensure that the project is in compliance with the World Bank’s Safeguard Policies and Quality At Entry requirements;
- To enhance the quality and sustainability of the project.

The evaluation focused on the six proposed pilot projects, as these are the project components that were expected to have direct positive and/or negative environmental and social impacts. The six pilots are referred to in this report as the Waza-Logone Floodplains (northern Cameroon), the Komadougou-Yobe Integrated Wetlands (the KYB pilot) (northern Nigeria), the Transboundary Desertification Control (Niger and Chad), the Lake Chad Shorelines pilot (Cameroon, Chad, Niger and Nigeria), the Lake Fitri pilot (Chad) and Upper Chari Basin Transboundary Project (Central African Republic and Chad).

The work of the team in the field was constrained to an exceptional degree by evolving security considerations during the mission. Ultimately, the team was able to visit four of the six proposed pilots.

Field visits were combined with interviews with key informants and local stakeholders. Following each field visit, the full team reviewed their individual analyses to reach a consensus on key findings. The team also contacted other experts within the four countries and internationally.

As required by OP 4.01, the Safeguard Policies were applied to all project activities, including those that would be co-financed by other donors. Safeguard Policies were also applied to numerous pilot activities that are to be “catalysed” or promoted by the pilot projects, but not funded by the projects.

All the pilot projects will involve negotiated changes to access to land and resources. This triggers OD 4.30 on Involuntary Resettlement (and the draft OP/BP 4.12 Involuntary Resettlement) even though physical resettlement will rarely, if ever, be required by the pilots. The guidelines are clear that there is a need to involve communities in the planning and implementation of interventions that result from these policies and in most cases this implies the need for a conflict resolution mechanism. OP 4.12 states “...*particular attention is paid to the needs of vulnerable groups ... especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples and ethnic minorities.*”.

Pilot specific impacts and proposed mitigating measures were analysed. Both the Waza Logone and the KYB pilots will seek to catalyse changes in the management of existing dams upstream from the wetlands targeted by these projects. OP 4.37 Safety of Dams requires that dam safety inspections will need to be conducted on the Maga Dam in northern Cameroon for the Waza Logone pilot and the Tiga and Challawa Gorge Dams in northern Nigeria for the KYB pilot.

The Team's preliminary analysis indicates that there may be serious safety problems with the 30 km long earth Maga Dam. "Piping" under the dam and the design of the emergency spillway are the principal concerns. Correcting these defects may be very expensive and would require funding from other donors.

Both the Waza Logone and the KYB pilots will make modifications to floodplain channels to seek to increase flooding of priority wetland areas. It is critical that floodplain residents and stakeholders are fully consulted and involved through a participatory process in the planning of these changes. IUCN has done an exemplary job of facilitating such a process before reopening floodplain channels on the Waza-Logone in 1994 and '97. Their methodologies should be used as a model for the new modifications.

The Desertification Pilot may have the most dramatic social, if not environmental, impacts of all the pilots because it will necessitate radical changes to natural resource access rights and changes to the way the range resources are used. Such changes are fraught with the potential for conflict and for inequities if not managed in a strongly participatory and sensitive manner. However, such radical changes are absolutely necessary – open access to resources in this fragile environment is a certain formula for continued degradation. Sand dune fixation as proposed would have minimal impact and no measures for sustainability are advanced. The Team proposes integrating sand dune fixation with range management with both activities dependent on management systems based on equitable control of resource access rights.

It was found that the Upper Chari Basin and the Lake Fitri pilots will not have any significant environmental or social impacts as presently designed. These projects will produce natural resource management plans as their principal outputs, but will not implement these plans.

Lake Chad Shorelines will develop and implement a few community-based natural resource management systems. However, the resources to be managed and the forms of management are not specified making it impossible to assess impacts.

The assessment team proposes that the Transboundary Diagnostic Analysis for this project should include the following key components:

- Identify and prioritise problems/issues relating to the degradation of land and water resources within the Basin, focusing on transboundary problems and issues;
- Identify and analyse root causes of land and water degradation;
- Inventory of successful approaches/projects/pilots/traditional management systems
- Distil lessons learned and identify enabling conditions for success in reversing natural resource degradation
- Define priorities and objectives for reversing natural resource degradation. This should include priorities by natural resource sector and by geographic region within the Basin.

The **Strategic Action Program** should emphasise:

- Co-management of international water resources of the Basin;
- Sustainable management of natural resources based on TDA priorities and objectives;
- Sustainable, productive agriculture in priority zones of the watersheds.
- All of the support measures needed (capacity building, policy reform, sustainable funding, etc.) to support the above.

The principle role of the pilot projects should be the development/testing/adoption of sustainable natural resource management systems on a small scale to identify those that are best suited for large scale application in the SAP. Proven and promising sustainable NRM systems will be critical to the SAP. But the present level of development natural resource management systems in the Lake Chad Basin is very low.

The revised World Bank disclosure policy for GEF projects states "*Make EA report self-standing (and)...Make disclosure a prerequisite for beginning of appraisal*". Appraisal has been scheduled for mid-January 2001. The Bank requirement for the disclosure of EA and SA reports could be accommodated

through a stakeholders' meeting to be organised by LCBC. This could be done in early January – or even in parallel with the appraisal mission.

The executing institutions for the pilots will play key roles in the refinement and application of the public participation plans. The lead institutions that will execute the Desertification pilot, Lake Chad Shorelines, Lake Fitri and Upper Chari Basin have not yet been identified. One of the key steps remaining in project development is their identification. The World Bank ASPEN unit expressed a desire to see organigrams of responsibility for each pilot project. Obviously, this will not be possible until the lead executing agency is identified for each pilot.

The World Bank Safeguard Policies that are triggered by the pilot projects are shown in the following table:

**World Bank Safeguard Policies Triggered by Pilot Project Interventions**

	Waza Logone	Komadougou-Yobe Basin	Desertification	Lake Chad Shoreline	Lake Fitri	Chari River Transboundary
4.01 Environmental Assessment	Applies to all pilot projects including co-financed components Requires public consultation and dissemination of conclusions					
4.04 Natural Habitats	Enhanced or no significant changes					
4.09 Pest Management	Not applicable, no significant agricultural interventions					
4.36 Forestry	Not applicable		Enhanced	Not applicable		
4.37 Safety of Dams	Proposals to increase releases from existing dams		Not applicable			
4.11 Cultural Property	Not applicable, will not destroy or limit access to cultural property					
4.20 Indigenous Peoples	The pilots are not expected to have specific impacts on ethnic minorities, but there may be impacts on other minority social groups not included in decision-making processes. Their rights and interests will have to be protected through the OPs 4.01 and 4.30					
4.30 Involuntary Resettlement (and OP/BP 4.12)	Although it appears no one will be displaced/resettled, all pilots involve negotiated changes to natural resource access rights/usufruct rights.					
7.50 International Waterways	Not applicable, no significant changes in water quality or discharge					
7.60 Disputed Areas	Not applicable to the pilot projects, although some islands in Lake Chad are currently disputed and under review at the Hague.					

# 1 Introduction

## 1.1 Context

Lake Chad is one of the larger lakes in Africa, but with a highly variable open water area it is ecologically closer to the flood zones of large tropical rivers than true lakes. Lake Chad is the second largest wetland in Africa. While the actual lake basin is around 25 million km<sup>2</sup>, much of the basin is arid or semi-arid with no runoff contributing to the lake. The effective basin area is around one million km<sup>2</sup>.

The shift in rainfall regimes in the southern Sahel since the late 1960s has resulted in generally lower rainfall with a corresponding reduction in the open water area of the lake. In parallel with the change in rainfall patterns, human populations continue to increase rapidly, putting additional pressure on natural resource systems. Throughout the basin there are now indications of unsustainable land use, with the key problems being overgrazing, arable production on fragile and increasingly infertile soils, uncontrolled cutting of trees for fuelwood or construction purposes, and little or no management of fisheries. The reduction in surface water sources in the Chad Basin has intensified groundwater abstraction for domestic and industrial supplies and there are already indications extraction rates may be exceeding recharge. Large irrigation schemes established in the 1970s and '80s in the four countries bordering the lake are now largely non-functional.

The problems of land and water degradation in the basin are now widely recognised and the Lake Chad Basin Commission (LCBC) has already identified a number of transboundary issues. The five member states have agreed on an initial Strategic Plan for the sustainable development of the Lake Chad basin.

Building on this, LCBC has approached the Global Environment Facility for support in confronting these problems. The resulting project is entitled, "*Reversal of Land and Water Degradation Trends in the Lake Chad Basin*". The two GEF implementing agencies, the UNDP and the World Bank, have both assisted in developing the project. Key elements of the project include completion of a Transboundary Diagnostic Analysis (TDA), preparation of a Strategic Action Programme (SAP) and execution of six pilot projects in the five LCBC countries. It is expected that a full-scale implementation of the SAP will be undertaken through a subsequent phase of the project.

This report presents the conclusions of the Environmental and Social Assessment carried out on behalf of the World Bank, as part of the preparatory work in developing the main project and the supporting pilot project proposals.

## 1.2 Terms of Reference for the Environmental and Social Assessment

World Bank internal procedures require that an Environmental Assessment be conducted for this project. The World Bank contracted three independent consultants to work alongside staff members from the LCBC in carrying out this assessment. The fieldwork was undertaken in October 2001.

The objectives of the Environmental Assessment and Social Assessment (EA/SA) can be summarised as follows:

- Identify, qualify, and to the extent possible, quantify the likely negative and positive environmental and social impacts of the project as presently designed;
- Propose mitigating measures to be implemented to avoid negative impacts;
- Ensure that the project is in compliance with the World Bank's Safeguard Policies and Quality At Entry requirements;
- To enhance the quality and sustainability of the project..

The evaluation focused on the six proposed pilot projects, as these were expected to include direct activities that would have positive and negative environmental and social benefits. The consultants were also required to develop a participatory monitoring and evaluation plan covering any significant environmental



or social impacts where these were not already included in monitoring proposals presented in the pilot project outlines

In addition, following the World Bank requirements on Public Consultations (in OP4.01 Environmental Assessment) in the EA/SA process, the consultants were required to develop a Public Consultation Strategy that would allow for information dissemination and public consultation before and during the project implementation phase. The consultants were also asked to assess the degree of participation of the key stakeholders in project preparation and make recommendations on the extent to which they will be involved in the implementation, monitoring and evaluation of the project activities.

Finally, the team was asked to review how the pilot project proposals could best fit into the overall structure of the project, feeding lessons learned into the development of the TDA and the SAP.

The Evaluation Team included:

- Roy Hagen – Team Leader, natural resources specialist
- Amadou Konare – social assessment adviser
- Nicholas Hodgson – environmental assessment adviser
- Johnson Oguntola – LCBC head of water resources
- Mey Mahamat- LCBC agropastoralist specialist

### 1.3 Methodology

The team met in N'Djamena at the beginning of October, coinciding with the LCBC Steering Committee Meeting. This allowed for preliminary discussions with senior project partners before leaving for the field. The team also benefited from the presence of Tracy Hart from the World bank and David La Roche of UNDP, the two key individuals from the two GEF implementing agencies who have been directly involved in putting the GEF project together. The team was provided with office facilities in N'Djamena by the World Bank and started by reviewing the project documents while travel arrangements were made.

The work of the team in the field was conditioned to an exceptional degree by evolving security considerations during the mission. A preliminary itinerary prepared prior to the Team's arrival was as follows: Lake Fitri, Bol, Diffa, Nguigmi, Nguru, Kano, Maroua and finally CAR. All sites were to be visited by overland travel from N'Djamena except for the CAR.

However, three major changes to the itinerary had to be made during the course of the mission based on the following factors:

- Major riots broke out in Kano, Nigeria during the Team's first field visit in northern Cameroon. As a result, the Team could neither get security clearance to either visit the Komodougou-Yobe pilot site downstream from Kano nor clearance to drive across north-eastern Nigeria to the pilot sites around Diffa and Nguigmi in south-eastern Niger.
- Most of Air Afrique's planes were seized by creditors after the mission began, making it impossible to fly from N'Djamena to Niamey without going through Europe. To reach the Diffa/Nguigmi sites, two of the team members flew to Niamey via Paris and were met by a LCBC team member and vehicle in Niamey from where they drove the length of the country to Diffa/Nguigmi. This itinerary was then reversed to return to N'Djamena
- The Bol area to the north of Lake Chad was excluded due to rebel activity in the area and military operations against them during the course of the Assessment mission.
- Security clearance could not be obtained to travel outside of Bangui to the project site. The visit to CAR was limited to a meeting with stakeholders held in Bangui.

The actual itinerary was as follows:

- Waza Logone – Maroua 7 to 9 October – whole team
- Lake Fitri – 16 to 18 October – whole team

- Desertification – Diffa, Nguigmi (via Niamey and Paris) 21 to 29 October – Roy Hagen, Nicholas Hodgson and Johnson Oguntola
- CAR – Bangui – 23 to 29 October – Amadou Konare and Mey Mahamat

The team adopted an approach where field visits were combined with interviews with key informants and local stakeholders. Following each field visit, the full team reviewed their individual analyses to reach a consensus on key findings. The team also contacted other experts within the four countries and internationally for additional information on flood plain fisheries management and dam safety.

The team prepared a preliminary draft before leaving N'Djamena and presented their conclusions at a meeting held in the LCBC meeting room on Friday 2 November, before leaving Chad on November 4.

A full draft was completed in English by November 14 and was submitted to LCBC and World Bank/ASPEN for review. Review comments were received by December 9 and the final report was prepared by early January 2002. The report will be translated by LCBC and the French version passed to Roy Hagen for a final check.

### 1.3.1 Key Issues

The approach taken by the team was based on recommendations in the World Bank *Environmental Assessment Sourcebook*, which (in digital form) includes the most recent versions of the World Bank Operational Policies as well as the updates. The team also based their comments on disclosure policy on the World Bank “*Disclosure Policy Revisions (August 2001)*” and the 2000draft *World Bank Policy On Information Disclosure*.

The umbrella policy is OP 4.01 Environmental Assessment. This document indicates the range of the study- *natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property); and transboundary and global environmental aspects*. This OP also indicates where the World Bank expects this policy to be applied; Footnote One is very clear “*This policy applies to all components of the project, regardless of the source of financing*”.

In at least two cases, Waza Logone and Komadougou Yobe, the pilot projects are expected to be cofinanced. Therefore, following World Bank guidelines, the team has reviewed all of the pilot project components, not just those expected to be financed by the World Bank.

The team was provided with both the full pilot project documents and the short project summaries for each pilot project. In some cases there were differences between the short and long versions, with a different emphasis placed on project components. Where this is the case, the team reviewed the document that provides the greatest detail, as this is the document on which the project will be eventually implemented. Also, the 1.5 to 2 page summaries generally do not provide enough detail to do an adequate assessment.

It is worth noting that the pilot projects also include *direct and indirect actions*. The project proposals for Waza Logone and Hadejia-Nguru use the words such as “*catalyse*” for actions that the project will promote rather than undertake themselves. This is effectively the same process as advocacy and as such may not be a direct action but can have a direct impact. The team has therefore included in the review both direct and indirect activities that can lead to significant environmental and social impacts.

### 1.3.2 Background Documents

The team was provided with the following background documents:

- The GEF Project Brief *Development and Implementation of a Strategic Action Program (SAP) For The Lake Chad Basin Ecosystem*; the Project Information Document (PID) and the Environmental and Social Data Sheet *Reversal of Land and Water Degradation Trends in the Lake Chad Basin Ecosystem*;
- The full proposal and the short summary, both entitled *Outline of a GEF. Pilot Project on the Rehabilitation and Integrated Management of the Hydrological and Ecological Resources of the Waza-Logone Floodplain*;

- The full proposal *Outline Definition of a GEF Pilot Project on Integrated Wetlands Management in the Komadougou-Yobe Basin Integrated Wetlands Management in the Komadougou-Yobe Basin and the short summary Integrated Management in the Komadougou-Yobe Basin*;
- The full proposal French version *Projet Pilote de Lutte Contre la Desertification dans la Bande Transfrontaliere Niger/Tchad Chad-Niger piloting adaptive strategies to mitigate land and water degradation on the northern margin of Lake Chad* and the short summary *Piloting adaptive strategies to mitigate land and water degradation on the northern margin of Lake Chad.*;
- The full proposal and the short summary *Lake Fitri Management Plan Definition*;
- The full proposal *Lake Chad Shores RAMSAR Designation Project Outline* and the short summary *Lake Chad Shoreline Management Plan*;
- The French version of *Gestion intégrée des zones humides transfrontalières du bassin du Chari avec la participation des populations locales* and the short summary *Land Use Impacts in the Head Waters of the Lake Chad Basin*
- Other key documents included *The Lake Chad Conventional Basin – A Diagnostic Study of Environmental Degradation, the Master Plan for the Development and Environmentally Sound Management of the Natural Resources of the Lake Chad Conventional Basin* and the *LCBC Strategic Action Plan*.

In addition the team referred to the GEF *Operational Strategy*, the GEF *Operational Programmes*, *Lessons Learned During the GEF Pilot Phase*, and the UNDP GEF *Information Kit on Monitoring and Evaluation*.

## 2 Description of the Proposed Project

This project review focuses on the activities of the pilot projects proposed for implementation within the framework the GEF (UNDP/World Bank) project “*Reversal of Land and Water Degradation Trends in the Lake Chad Basin<sup>1</sup>*”.

The project builds on existing on-going interventions in the basin and on previous development proposals. Previous activities are indicated by the following key reports:

*A Diagnostic Study of Environmental Degradation in the Lake Chad Conventional Basin*; formally adopted by LCBC Member States in 1989.

*The Master Plan*; ratified by the Heads of State at a meeting in Abuja in 1994

*The Strategic Action Plan for Sustainable Development of the Lake Chad Basin*; financed under GEF PDF B in 1995, this “indicative” plan defined a strategic approach to protect the shared resources of the Lake Chad basin.

The long-term objective of the proposed GEF project can be summarised as “...ensure that the integrity of the Lake Chad system is protected by integrated management of the basin’s resources”...<sup>2</sup>”.

The project has three immediate objectives. The first is capacity building among riparians and stakeholders. The second is to complete a transboundary diagnostic analysis (TDA). The third is to prepare a GEF

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<sup>1</sup> This title is the one used in the PID and ESDS forms. The title is not always consistent between documents and the GEF Project Brief refers to the project as “*Development and Implementation of a Strategic Action Programme for the Lake Chad Basin Ecosystem*”.

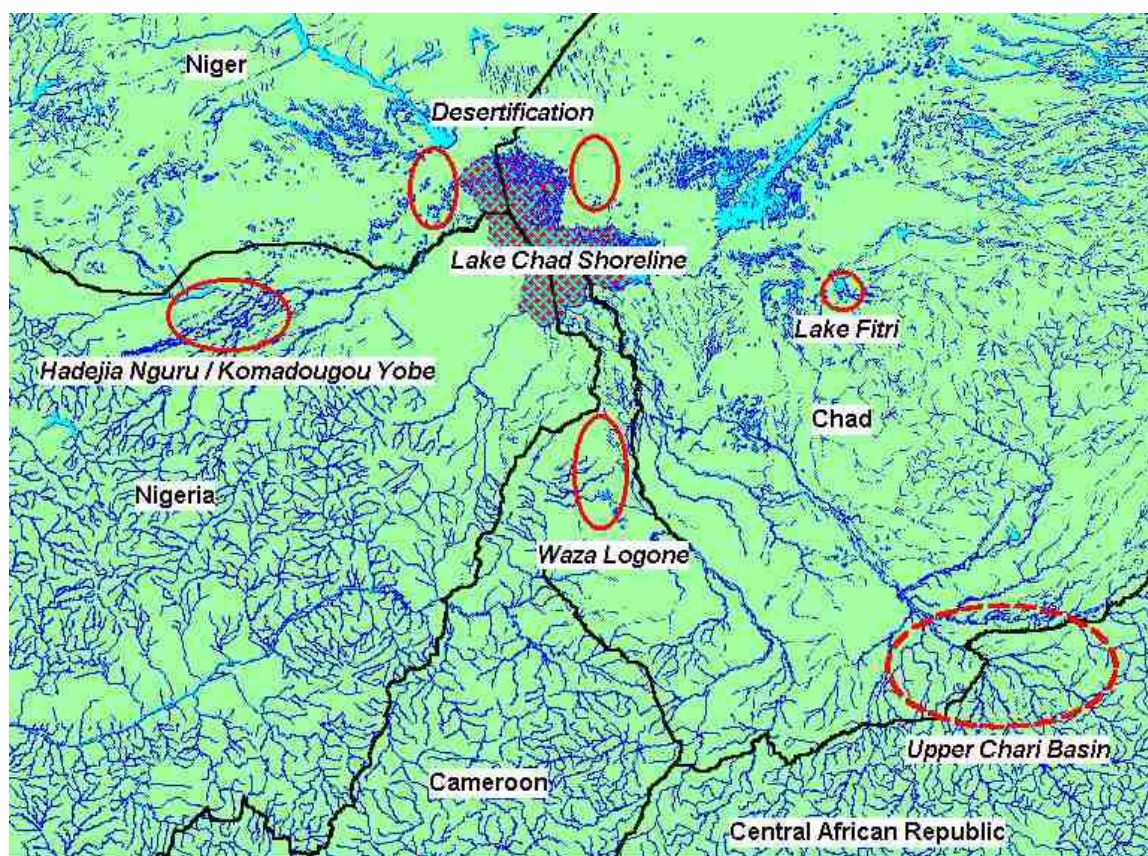
<sup>2</sup> The actual wording in the text incorporates mechanisms within the objective “to achieve global benefits through broad, basin wide participation in the development and implementation of measures that ensure that the integrity of the Lake Chad system is protected by integrated management of the basin’s resources”, or in the logframe as “Develop and implement measures that ensure Lake Chad achieves sustainability through concerted, integrated management of its linked land and water resources”.

strategic action programme (SAP) for long-term implementation of priority actions to address transboundary issues<sup>3</sup>.

The project has six principal outputs:

1. An established Program Co-ordination Unit (PCU) and nominated lead agencies in each country
2. Strengthened regional policy initiatives and institutional mechanisms to address transboundary issues
3. Fifteen completed community-endorsed plans for access to and the sustainable use of natural resources.
4. A completed TDA and (in itself a major output) established monitoring systems and models of the hydrological/ecological functions within the basin
5. Six Pilot Projects implemented – with feedback from implementation supporting the development of the TDA and the SAP
6. A Strategic Action Programme endorsed by LCBC and donor support mobilised for implementation

**Figure 1 Pilot Project Sites**



<sup>3</sup> The Convention on the Protection and Use of Transboundary Watercourses and International Lakes defines transboundary waters as "...any surface or ground waters which mark, cross or are located on boundaries between two or more States...". Transboundary impacts are "...any significant adverse effect on the environment resulting from a change in the conditions of transboundary waters caused by a human activity...include effects on human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factors; they also include effects on the cultural heritage or socio-economic conditions resulting from alterations to those factors".

The only direct actions that the project will take that will have significant environmental or social issues are in the six pilot projects.

The project start-up is expected for 2002 and to run for a period of four years. Total project cost is \$13.1 million of which the GEF input is almost \$10,000,000.

## 2.1 Rationale for GEF Project Support

The project comes under the GEF focal area International Waters Operational Programme (OP) 9 Integrated Land and Water Multiple Focal Area. This programme focuses on integrated approaches to the land and water resource management on an area-wide basis. Expected global benefits are the protection of international waters, conservation of the Lake Chad Basin ecosystems and conservation of biodiversity.

## 2.2 Monitoring and Evaluation

Both the main project and the pilot projects include monitoring/survey components.

The main project includes a significant commitment to carrying out hydrological studies and the further development of a hydrological model linking surface water and groundwater. The logframe describes the *Output 4: A Completed TDA and Synthetic Framework for Concerted Management of the Basin, as "Enhanced Scientific Knowledge of the Lake Chad Basin"*.

It is worth noting that the development of the TDA focuses on data and indicators, but is not clear what process of consultation will be used to achieve a regional consensus on threats and priorities, nor on the process of setting objectives or of identifying and selecting strategic options for achieving objectives. These are all key to the GEF approach to developing a TDA and SAP<sup>4</sup>.

In addition to the studies proposed under the umbrella project, there is a varying emphasis put on monitoring and the reasons for monitoring in the pilot projects.

There are three aspects to monitoring and evaluation in the pilot projects:

- Project Performance – to guide overall project management, evaluating whether or not projected or planned activities took place;
- Project Impacts – to evaluate social or environmental impacts that are the result of direct or indirect project actions; and
- Lessons Learned – to provide a wider evaluation of pilot project performance and impacts to feed in to the development of the SAP, indicating replicability to other parts of the basin.

Project performance monitoring is covered by standard World Bank, UNDP and GEF procedures and will be part of the normal tasks of pilot project management.

The direct and indirect pilot project impacts and any necessary monitoring requirements are discussed in the following sections on each pilot project. "Lessons learned" will take the impact evaluation and placing it in the broader environmental and social context of the basin, will allow future interventions to be developed for implementation under the next phase of the SAP.

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<sup>4</sup> GEF describes the process of developing a SAP as "strategic joint fact finding" as a means of arriving at a consensus on what actions are needed to address threats. In strategic joint fact finding, collaborating states establish technical teams that work to establish a common baseline of facts and analysis of the problem in the form of a transboundary diagnostic analysis (TDA), which is then used to set national priorities for actions to address threats to international waters in the form of a strategic action program (SAP).

However, it is clear that many of the monitoring and research studies proposed for the pilot projects are not necessary to evaluate either project performance or project impacts. It is also questionable whether the proposed studies are necessary to evaluate the project impacts with a view to developing better projects for implementation under the SAP.

There also appears to be considerable overlap in some of the proposed studies. The most obvious example is hydrological studies, which are included in the main project and to a significant extent in four of the six pilot projects.

**Table 1 Proposed Surveys and Monitoring Studies**

Project or Pilot Project	Broad Area of Proposed Study or Monitoring Programme		
	Hydrology	Socio-Economic	Natural Habitats
Development of SAP and TDA	Key Hydrological Measurements	Review of existing data and evaluation of gaps	
Waza Logone	Rainfall, Surface flow and floods, Groundwater  Topographic and Bathymetric Surveys	Socio-Economic Monitoring	Ecosystem Indicators, Biodiversity, Wildlife in Parks Fisheries, Pasture...
Komadougou-Yobe Basin	Hydrological Monitoring  Bathymetric Survey	Socio-Economic Monitoring	Biodiversity and Biological Resources Inventory  Eco-monitoring
Desertification	Groundwater Monitoring		Pasture Monitoring System
Lake Chad Shoreline		<i>Simple and appropriate monitoring schemes – according to RAMSAR Guidelines</i>	
Lake Fitri	Hydrological Surveys Batha River and Lake Floor	Pastoral Groups, Fisheries, Problem Analysis, Map Land Use	Bird Counts, Nesting Sites and Wildlife Resources
Chari River Transboundary	Hydrological Monitoring System		Baseline Land Use Data and Ecosystem Status

### 3 Relevant Safeguard Policies

The World Bank uses Environmental Assessment to evaluate the environmental and social risks and benefits associated with a bank-lending programme, which specifically include investment components of hybrid loans, GEF projects and GEF components of Bank Projects.

The World Bank policy OP 4.01 Environmental Assessment is the umbrella for the Bank's safeguard policies. The objective of the World Bank's Safeguard Policies is "...to ensure that Bank operations do not cause adverse impacts and that they do no harm".

Key considerations in the EA process include:

- Integration with social assessment;
- Evaluation of alternatives;
- Public participation and consultation; and

- Disclosure of information.

The safeguard policies can be roughly categorised into groups, relating to the Environment and Natural Habitats, Rural Development, Social Development, and International Law.

**Table 2 World Bank Safeguard Policies Triggered by Pilot Project Interventions**

	Waza Logone	Komadougou-Yobe Basin	Desertification	Lake Chad Shoreline	Lake Fitri	Chari River Transboundary
4.01 Environmental Assessment	Applies to all pilot projects including co-financed components Requires public consultation and dissemination of conclusions					
4.04 Natural Habitats	Enhanced or no significant changes					
4.09 Pest Management	Not applicable, no significant agricultural interventions					
4.36 Forestry	Not applicable		Enhanced	Not applicable		
4.37 Safety of Dams	Proposals to increase releases from existing dams		Not applicable			
4.11 Cultural Property	Not applicable, will not destroy or limit access to cultural property					
4.20 Indigenous Peoples	The pilots are not expected to have specific impacts on ethnic minorities, but there may be impacts on other minority social groups not included in decision-making processes. Their rights and interests will have to be protected through the OPs 4.01 and 4.30					
4.30 Involuntary Resettlement (and OP/BP 4.12)	Although it appears no one will be displaced/resettled, all pilots involve negotiated changes to natural resource access rights/usufruct rights.					
7.50 International Waterways	Not applicable, no significant changes in water quality or discharge					
7.60 Disputed Areas	Not applicable to the pilot projects, although some islands in Lake Chad are currently disputed and under review at the Hague.					

### 3.1 Environment

#### *OP 4.01 Environmental Assessment*

Ensures that appropriate levels of environmental and social assessment are carried out as part of project design. It also deals with the public consultation process, and ensures that the views project-affected groups and local NGOs are taken into account.

However, this does not guarantee that the views of minority groups or economically or socially disadvantaged groups are incorporated into proposals<sup>5</sup>. To some extent these issues are covered under OP 4.20 Indigenous People and OP 4.30 Involuntary Resettlement.

<sup>5</sup> "A review of Bank experience found that while an increasing number of EAs involved consultation with NGOs, consultation with local communities was more limited. Women and the poor were seldom reached..." Update Number 5 - Environmental Assessment Sourcebook - Public Involvement in Environmental Assessment: Requirements, Opportunities and Issues



Given the uncertainty of the potential direct and indirect impacts of the pilot projects, the Bank requested an EA on all project components.

It is worth noting that OP 4.01 applies to all components of a project with financing from the World Bank, including cofinanced components financed by the recipient or by other agencies<sup>6</sup>.

#### ***OP 4.04 Natural Habitats***

Supports the conservation of natural habitats and the maintenance of ecological functions. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats.

The objective of the project is to conserve and protect natural habitats. The only possible negative impacts would come through the introduction of potentially invasive species, with *Prosopis* sp. (Mesquite) suggested for dune stabilisation and possible fuelwood production for fish smoking. However the species has already been introduced and the proposals are to selectively manage the systems, which could then promote indigenous species. The impact must therefore be considered as neutral.

## **3.2 Rural Development**

#### ***OP 4.09 – Pest Management***

Promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides, and follows World Health Organisation's Recommended Classification of Pesticides by Hazard and Guidelines to Classification.

None of the pilot projects are dealing directly with major agricultural projects and therefore the use of pesticides or IPM. However, if the recommendations in the Komadougou-Yobe Basin Project are followed, there will be a limit to the further expansion of irrigated agriculture. Pest management is therefore either not relevant or neutral.

#### ***OP 4.36 – Forestry***

Aims to reduce deforestation and enhance the environmental and social contribution of forested areas, the Bank does not support commercial logging in primary tropical moist forest.

The project is only addressing forestry issues in the pilot project dealing with desertification. Here the proposed impacts will be positive, as the interventions include dune rehabilitation with local and exotic tree species, and the management of rangeland resources, which include woody vegetation.

#### ***OP 4.37 – Safety of Dams,***

In view of the major potential impacts of dam failure, the Bank is concerned with the safety of new dams and existing dams on which a Bank-financed project is directly dependent.

The project is proposing to "catalyse" increased wet season flood releases from Maga Dam above the Waza Logone Floodplain, and also from dams in the upstream part of the Komadougou-Yobe Basin. As these are significant changes to operating rules, the Bank will require a complete safety check of all dams affected by qualified dam engineers, unless it can be shown that suitable inspections have already been done. There are specific concerns, detailed in this report, with the structural integrity of Maga Dam.

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<sup>6</sup>. Footnote 1 of OP 4.01 "*Bank*" includes IDA; "*EA*" refers to the entire process set out in OP/BP 4.01; "*loans*" includes credits; "*borrower*" includes, for guarantee operations, a private or public project sponsor receiving from another financial institution a loan guaranteed by the Bank; and "*project*" covers all operations financed by Bank loans... This policy applies to all components of the project, regardless of the source of financing."



### 3.3 Social Development

#### **OP 4.11 – Management of Cultural Property**

The Bank avoids projects that will significantly damage non-replicable cultural property, and will assist only those projects that are sited or designed so as to prevent such damage.

None of the pilot projects will submerge or otherwise destroy any cultural sites, nor will there be restricted access for cultural purposes to land that might have cultural value.

#### **OD 4.20 – Indigenous Peoples**

Defined as *"...social groups with a social and cultural identity distinct from the dominant society that makes them vulnerable to being disadvantaged in the development process. For the purposes of this directive, "indigenous peoples" is the term that will be used to refer to these groups."*

Projects must avoid or mitigate potentially adverse effects on indigenous people whose social and economic status restricts their capacity to assert their interests and rights in land and other productive resources.

Effectively the World Bank requires the project to develop a programme for addressing the issues based on the informed participation of the indigenous people themselves. Any project that affects indigenous peoples is expected to include components or provisions that incorporate an "Indigenous Peoples Development Plan".

All the pilot projects are concerned directly or indirectly with managed access to natural resource systems, however as yet no access/management agreements have been defined with communities. For example, systems for controlling access rights to rangelands will need to be negotiated on the Desertification pilot, but the specific sites and the specific groups that will be involved have not yet been identified. While it is not clear that the projects will have impacts on "indigenous" groups, they are likely to have impacts on sections of the society, such as women's groups or female led households that are not normally included in the decision making processes. The pilot projects will need to ensure that the access/use rights of these "minority" groups are identified and provided for in any agreements.

#### **OD 4.30 – Involuntary Resettlement (and the draft OP/BP 4.12 Involuntary Resettlement)**

Ensures that the population displaced by a project receives benefits from it; it also covers those with usufruct or customary rights to the land or other resources taken for the project<sup>7</sup>. The OP is specifically inclusive, ensuring that all those affected both directly and indirectly by project developments are compensated as part of the project. Affected population, include those with income derived from informal sector and non-farm activities, and from common property resources. The absence of legal title does not limit rights to compensation.

The draft OP/BP 4.12 on Involuntary Resettlement will replace the original OD 4.30, but retains and clarifies the existing principles covering household resettlement and restricted access rights, specifically where the loss of access rights is linked to the management of protected areas.

The guidelines are clear that there is a need to involve communities in the planning and implementation of interventions that result from these policies and in most cases this implies the need for a conflict resolution mechanism. OP 4.12 states *"...particular attention is paid to the needs of vulnerable groups ... especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples and ethnic minorities."* None of the pilot projects are expected to involve significant population resettlement. However, as stated above, all the pilot projects are concerned directly or indirectly with managed access to natural resources, and hence negotiated changes to usufruct rights.

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<sup>7</sup> World Bank ESSD definition *"In some instances, people may lose the right to use resources without losing possession of them. Such involuntary loss of access to resources may also be considered involuntary resettlement."*

### 3.4 International Law

#### *OP 7.50 – Projects on International Waterways*

Covers any body of water that forms a boundary between, or flows through, two or more states and any tributary or other body of surface water that is a component of an international waterways. The guidelines apply to projects that will adversely change the quality or quantity of water flows, and requires that the issues involved are covered by an appropriate agreement between the riparian countries; or that the other riparians have given consent to the project.

The proposals to “catalyse” wet season floods from Maga Dam and the dams in the Komadougou-Yobe basin, if successful, will return river flow regimes to a more natural flow/flood cycle.

#### *OP 7.60 – Projects in Disputed Areas*

Relates to territorial disputes between different countries, a project can only be supported if the governments concerned agree that, pending the settlement of the dispute, the project proposed for country A should go forward without prejudice to the claims of country B.

The only disputed areas within the active basin, are islands in Lake Chad, and there are no pilot project interventions that will affect their use.

## 4 The Waza-Logone Floodplain

### 4.1 Baseline Information

#### 4.1.1 The Project Area

The full title of this proposed pilot project is “Pilot Project on the Rehabilitation and Integrated Management of the Hydrological and Ecological Resources of the Waza-Logone Floodplain (See Figure 2). The project area covers around 8000 km<sup>2</sup>, roughly half of which is the active part of the Waza Logone floodplain. The project area includes both the Waza National Park and the Kalamaloue National Park. Much of the Waza NP is not on the floodplain.

The floodplains are highly productive, providing breeding grounds for fish, dry season pastures that support cattle, and fertile land for arable crops and forestry products. Over 100,000 people directly earn all or part (or most) of their livelihoods from the resources of the floodplains.

The area inundated in any year depends on over-bank flow from the Logone River, flow from seasonal streams called “Mayos” flowing out of adjacent upland areas, direct rainfall onto the floodplain and water released from the Maga Dam (whose reservoir is itself fed by these same three sources of water).

The 30km earthen Maga dam was constructed on the upper part of the floodplain in 1979 to provide water for the SEMRY<sup>8</sup> irrigated rice scheme. At the same time, a dike was constructed along the edge of the Logone extending 20 km downstream from Maga Dam to prevent the irrigated rice fields from being flooded from over-bank flow from the Logone. The Maga Dam and associated dikes altered the natural flood patterns through trapping a number of seasonal streams in the upper part of the floodplain, and through the diversion of part of the flow of the Logone River. The Maga Dam and associated dikes significantly reduced the flooding of the Waza-Logone floodplain below the dam. In particular, it severely reduced flows in the Mayo Vrick below the dam.

An IUCN hydrodynamic study of the floodplain reviewed the impacts of the dam for three scenarios, good years, average years and drought years evaluated the impacts of this development<sup>9</sup>. The pre dam “average year” flooded area was estimated at around 3385 km<sup>2</sup>, and following dam construction around 2420 km<sup>2</sup>, a

<sup>8</sup> Société d’Expansion et de Modernisation de la Riziculture de Yagoua

<sup>9</sup> Etude du Modèle Hydrodynamique du Logone; Mott MacDonald/Projet Waza Logone 1999

decrease of around 30%. The impact of this change was predominantly in reductions in flood extent in the top end of the floodplain below the dam.

#### **4.1.2 The Waza Logone Project**

The social and environmental problems caused by the dam became apparent during the 1980s. These impacts were particularly significant as this coincided with the most severe drought event since meteorological records have been kept. The Waza Logone Project was established in 1988, with the support of IUCN. The Project objectives included promoting the integrated management of the natural resources of the floodplain, providing a sustainable livelihood for the local communities, maintaining biodiversity, and in particular to maintain the integrity of the Waza National Park.

In 1992, under Phase II, the project began a process of evaluating the system constraints and opportunities, collecting valuable data on socio-economics, hydrology and ecology, and initiating a process of stakeholder participation in the evaluation and planning of the management of the floodplain. This led to the idea of creating breaks in the dike that extends downstream from Maga Dam as a means of increasing flooding and partially restoring the ecology and livelihoods on the upper Waza-Logone floodplain. Project evaluation indicated the idea was sound.

Supported by strong requests from local communities and the local administration, in 1994 SEMRY allowed the project to open a section of dike that had blocked the flow from the Logone river to the Petit Gorema floodplain channel, and flood waters re-entered the system (Figure 2).

Phase III started in 1995, with funding from the Netherlands Government and WWF. The Project continued monitoring the effects of the 1994 release and continued the dialogue with affected communities and other stakeholders. In 1997, a second break in the dike was opened to allow waters to flow into the Areitékélé floodplain channel. The flow from here joins the original channel of the Mayo Vrick and with the additional flow from the Petit Gorema re-instated flooding to a major part of the floodplain west of the Logomatya channel. The total “average” flooded area has been increased by some 200 km<sup>2</sup> equivalent to 6% of the original floodplain. The impact is locally very significant as the flooding is focused on the area affecting the southern zone and the Waza National Park. The major achievements of the Waza Logone project are at two levels.

Regionally and internationally: the project has drawn attention to the social, economic and ecological benefits of maintaining or reintroducing floods in natural floodplains.

Within the floodplain: the “pilot” releases have been maintained and are effectively a permanent feature, re-establishing flooding to some 6% of the floodplain with localised significant benefits to communities in the south and other parts of the floodplain, and to the ecological integrity of Waza National Park.

#### **4.1.3 Waza Logone Phase IV**

GEF will provide part of the funding for the “Pilot Project on the Rehabilitation and Integrated Management of the Hydrological and Ecological Resources of the Waza-Logone Floodplain”. This is intended to be the “Exit Phase” of the Waza Logone Project (as specified in the original proposal for Dutch funding), with the focus of activities on handing over management responsibility of the ongoing programme to local institutions.

The Dutch Government has committed to providing roughly 80% of the total project costs, leaving a GEF commitment of US\$ 475,000 over a three-year period.

The majority of financing for project activities is not clearly differentiated between donors. The exception is direct field interventions related to the construction of dry season wildlife water supply ponds in the National Park and the opening up of a natural stream channel that connects two larger river channels within the floodplain.

The environmental and social assessment covers both the expected direct impacts of project activities and the impacts of project facilitated activities.

## 4.2 Activities with Significant Environmental and Social Impact

### 4.2.1 Project objectives

The project document presents a “Development Objective” that is stated as:

*The long-term enhancement and wise use of the Waza-Logone aquatic ecosystems, and a sustainable improvement of the quality of life of its inhabitants, as a means of establishing working methodologies for the integrated management of transboundary aquatic ecosystems.*

The immediate or specific objectives are:

- *To promote the integrated management and use of the water resources of the Chari-Logone Basin, including the regular allocation of water for the inundation of the Waza-Logone Floodplains.*
- *To promote the restoration, enhancement and sustainable use of the biological resources of the Waza-Logone Floodplains.*
- *To develop and implement an effective ecosystem, hydrology, and socio-economic monitoring and evaluation system.*

It should be noted that there is no proposal to convert any component of the wetlands to other use and therefore no change of use - rather a restoration of use to previous "more natural" systems in the lower floodplain, while protecting the existing investments in irrigation development immediately below the Maga Dam.

### 4.2.2 Activities with Significant Impacts

The Logical Framework Analysis provides a detailed breakdown objectives, outputs and activities. However, their wording is not always clear. Many of the outputs would be better described as either a long-term development objectives, as they are clearly not an output achievable during the project period. As an example, “Output 1.1 *An equitable and sustainable allocation and distribution of the sub-basin’s water resources*” is unlikely to be achieved during the project life.

A few of the activities listed are activities that will have environmental and/or social impacts and are activities that the project is committed to implementing. In addition, however, many of the project activities are part of a process of advocacy. A large part of the activities consist of “promoting” or “catalysing” other activities that would be executed and funded by others. In this case, the project activity is to catalyse something but not to do or to fund this themselves.

However there are key components of the objectives, outputs and activities that would have clear environmental and/or social impacts . These can be categorised as follows:

- Increased releases of water to the floodplain from Maga Dam;
- Rehabilitation/creation of a wildlife pond in Waza NP
- Cleaning/enlarging of a channel connecting two streams on the floodplain
- Developing and implementing natural resource management plans

## 4.3 Relevant Safeguard Policies

*OP 4.37 Safety of Dams is triggered by the proposed increase in release of waters from Maga Dam. . A dam safety inspection by an qualified expert is required under this OP. This requirement is independent of the Team’s preliminary analysis of safety concerns presented below.*

OP 7.50 Projects on International Waterways is triggered by this pilot because the pilot proposes to make changes to the hydrologic regime of the Logone River, which is recognised as an international waterway, forming the border between Chad and Cameroon .

## 4.4 Analysis of Significant Environmental and Social Impacts

### 4.4.1 Increased Releases from Maga Dam

#### 4.4.1.1 Description of proposed activity

The key phrase in the first objective is:

*“...the regular allocation of water for the inundation of the Waza-Logone Floodplains”*

This is primarily supported by the stated output:

*“A restoration of the flood pulse of the Waza-Logone Floodplains.”*

Which will result from the following activities:

- a) *Catalyse construction of additional openings and canals, and the installation of sluice gates.*
- b) *Catalyse regulated releases to the floodplains.*
- c) *Catalyse construction clearance canals.*
- d) *Catalyse releases from Maga Dam for additional floods for the Waza National Park.*
- e) *Catalyse the construction of canals to direct releases from the dam to the park.*

Items a), c) and e) would require funding that the project does not have. It is questionable that the project will be able to “catalyse” them. Activities b) and d) are essentially one and the same. Achieving them would be almost cost free. They would only require a change in the way that SEMRY manages the release of waters from Maga Dam.

**Photo 1 Maga Dam - Erosion and Sand Bag Protection on the Inside Dam Wall**



If structural and operational changes are made to manage increased releases, these would include channel protection to reduce present, and avert future, flood risks within the irrigation zone and specifically protect Maga town.

The emphasis is on restoring the natural ecological systems in the downstream zone, with the agreement of the local communities. It would not affect or restrict access rights to communities in the irrigation areas.

#### 4.4.1.2 Analysis of the feasibility of the proposed releases of water

The Maga Dam diverts water from the Logone River and traps a number of seasonal streams (Mayo Tsanaga, Mayo Boula and Mayo Vrick). The spillway of Maga Dam spills directly back into the Logone river. There are a number of problems with the design, operation and maintenance of the Maga dam and there are a number of studies that can be drawn on to review options. These include a report by DELFT which proposes an alternate spillway system.

The main structural and operational problems are listed below.

The design outlet capacity of the main sluice system, which is on the Mayo Vrick, is 50cumecs (cubic meters/sec)<sup>10</sup>. There are four additional sluices providing water to the rice scheme and these also pass through drainage canals into the Mayo Vrick. However, the actual release capacity from the reservoir is much less than design capacity. The main sluiceways can only safely release around 5 to 10cumecs without flooding Maga town or the irrigated perimeter. When the Team visited the sites, roughly 5 cumecs were being released, and this was close to the maximum possible. This is because the channel capacity of the Mayo Vrick is now very low. This is partly as a result of silting and may also be partly caused by vegetation growth during drought years. IUCN estimates that the bed of the Mayo Vrick would require major cleaning and enlargement over a distance of about 15 km before it could handle 50 cumecs. The cost of this might be in the millions of dollars and no donor has been identified.

The spillway is reported by SEMREY to periodically flow in the wrong direction, taking water from the flooding Logone into the reservoir.

The failure of the dam would threaten both the immediate downstream population centres of Maga and the other rice scheme settlements and the more distant floodplain populations.

#### 4.4.1.3 Analysis of the environmental and social impacts

Following the opening of the first channel in 1994, IUCN carried out a preliminary Environmental Impact Assessment of the first opening and of the proposed second channel opening, concluding that both were mostly beneficial. There seems to be a broad consensus that the environmental and socio-economic impacts of the re-inundation effected in 1994 and 1996 through the openings in the dikes that had been blocking the Logone River were very positive.

All or most of the dwellings on the floodplains are located on natural levees or other areas that are only slightly higher than the rest of the floodplain. Following the construction of Maga Dam in 1979, some people had built on lower areas that were no longer flooded. IUCN project staff reported that floodplain communities wished to have the channels reopened, even though it was expected that these dwellings would be flooded out. As expected, the reopening of the two channels in 1994 and 1997 led to the flooding, and subsequent abandonment, of some of these structures.

There has been no specific evaluation done by project proponents of the impacts of the proposed modifications to the design and operation of the existing Maga Dam. However the preliminary discussions have been based on modifications to the design and operation of the Maga dam, that would allow for the release of floods to the upper part of the Waza Logone floodplain while protecting the existing investments in the irrigation zone immediately below the Maga Dam.

If the proposed increased releases of water were effected, they would have major environmental and socio-economic impacts on the upper Waza-Logone floodplain, at least partially restoring the natural

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<sup>10</sup> Quoted as 100cumecs in some documents.

hydrological cycle and wetlands functions to the floodplains immediately below the irrigated zones. Environmental and socio-economic impacts would be largely positive.

On the negative side, there are probably some people who have built on lower sites that would be flooded once again by the proposed increased releases of water from the dam – in the same way that such people with the channel opening in 1994 and 1997. The appears that the number of people that would be affected has not been assessed.

#### 4.4.1.4 Preliminary analysis of the safety of Maga Dam

OP 4.37 on Dam Safety states that “...the Bank is concerned about the safety of new dams it finances and existing dams on which a Bank-financed project is directly dependent.” The pilot project’s proposed increases in releases of water from Maga Dam would clearly trigger this OP.

Items 7, 8 and 9 of the OP then go on to state that “The Bank requires that the borrower arrange for one or more independent dam specialists to (a) inspect and evaluate the safety status of the existing dam or DUC (dams under construction), its appurtenances, and its performance history; (b) review and evaluate the owner’s operation and maintenance procedures, and (c) provide a written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam or DUC to an acceptable standard of safety.

The Bank may accept previous assessments of dam safety or recommendations of improvements needed in the existing dam or DUC if (a) the dam or DUC is located in the same country as the subject project; (b) an effective dam safety program is already in operation there; and (c) full-level inspections and dam safety assessments of the existing dam or DUC have already been conducted and documented.

*Necessary additional dam safety measures or remedial work may be financed under the proposed project.”*

The Assessment Team did not include a dam safety specialist. The Team did find, however, indications that Maga Dam is a not a safe structure. Risk factors for the dam include:

- **Piping** Maga Dam is an earthen dam built on the Logone floodplain. There is seepage under most of the length of the dam. This seepage can, and periodically, does, develop into “piping” or active holes at the base of the dam that must be stopped immediately, day or night, to avoid catastrophic failure of the dam. Such near failures have occurred repeatedly in the past three years. They have occurred during the current rainy season.
- **The overflow spillway** of a dam must be able to release excess water from the reservoir to avoid failure of the dam. For Maga Dam, this would occur if the sluice gates became dysfunctional or if they had insufficient capacity to handle excess floodwaters (Opening the sluice gates to full capacity would cause severe flooding in Maga and the irrigated perimeter). The overflow spillway on the Maga dam appears to be very poorly designed and maintained. It is located on the east side of the reservoir upstream from Pouss (see Figure 1) on the edge of the Logone. When the Team visited the site on October 7, 2001, the water level of the reservoir was only about 20-30 cm higher than that of the Logone. The level of the Logone had already been falling since its peak this year. With only a small increase in the water level of the Logone, water would flow from the Logone over the spillway and into the reservoir – and there would be no way to stop it. The Mott Macdonald report states that this is a regular occurrence. Also, the entire area on the reservoir side of the spillway was choked with dense aquatic vegetation (probably rooted), further impairing the functioning of the spillway. Also, there were signs of recent repair work, crudely done, on the spillway. An exceptional flood on the Logone would result in huge amounts of water entering Maga reservoir, putting the dam at risk.
- **Inability to release floodwaters through sluice gates** The village of Maga is located immediately next to the Mayo Vrick and directly below the highest point of the dam. The ability to open sluice gates to their full capacity for release of floodwaters is critical to dam safety. However, one cannot use more than a small percentage of the design capacity of Maga Dam’s main sluice gates without flooding the town of Maga and the irrigated rice fields. Maga has grown from a small village to a population centre of thousands of people – the offices of SEMRY are located here.

- **Dam management/maintenance capacity** The dam is managed and maintained by the parastatal SEMRY. It frequently cannot cover its own operating costs. SEMRY's heavy equipment necessary for dam maintenance and for emergency repairs was said to be nearly all broken down at the time of the Team's visit. SEMRY frequently must rely on requests for special funding from the government and the government seeks emergency funding from donors.



**Photo 2 The Spillway at Maga Dam – with flow from the reservoir into the river at below full flood**

Failure of Maga Dam could be catastrophic for Maga town if the break occurred directly above the town. This could include significant loss of life. It would also cause variable levels of flooding in all the villages downstream on the Waza-Logone floodplain. Assessment of the severity of the impacts of dam failure on these villages more removed from the dam would require specialised expertise. The impacts of dam failure would probably be largely socio-economic. Environmental impacts would probably be temporary in nature and not of great significance to the ecology of the floodplain.

The threat to human life of dam failure would be largely conditioned by circumstances. A daytime break several kilometers from Maga would lead to a relatively gradual flooding of this population centre, probably allowing much of the population to be evacuated. A night time break immediately above Maga would be far more serious. Maga is located directly below one of the deepest portions of the reservoir.

Mid to long term impacts would depend on whether the dam was subsequently repaired. If it was not restored, all of those who presently depend on the irrigated agricultural scheme would have to find other livelihoods. Most of them would probably have to be relocated. The economic base for Maga town would be severely reduced. The continued existence of Maga would require the construction of protective dikes around the town. Access to Maga would be a problem, as much of the road into the town would be flooded.

#### ***OP 7.50 Projects on International Waterways***

The Logone River is recognised as an international waterway. Agreements exist on the maximum volume of water that can be taken from the river by either Cameroon or Chad. The design of the Maga reservoir and release structures takes account of these agreements.

The intake structure at the top end of the canal leading to the reservoir can be varied between 19 and 30 cumecs, in line with the international agreement. However, any modification of the spillway design may



affect the potential releases back into the Logone, and as a result may have implications on the capacity to abide by existing water extraction agreements.

One possible measure for increasing dam safety could be the construction of a new overflow spillway near the western end of the dam – as discussed in the Delft report. Waters from such a spillway would be released onto the floodplain, contributing to the project's objective. One would need to determine if this would be compatible with the existing agreements on water sharing.

#### **4.4.2 Rehabilitation/creation of a wildlife pond in Waza NP**

##### **4.4.2.1 Description of the proposed activity**

The focus of direct action under the second project objective is indicated in Output 2.1 “An operational drought management strategy for Waza and Kalamolue National Parks”. The proposed activities are not completely finalised, but at present it is planned that the key interventions will be the construction or rehabilitation of a wildlife pond in Waza National Park, and the enlargement of a natural channel to direct more water to an areas that would include the floodplain portion of Waza National Park. The first of these two activities is analysed here.

The Waza National Park has a range of both floodplain and upland, rainfed habitats. The upland zones are in the southern and western zones of the park. They are characterised by natural tree and shrub savannahs. These upland zones provide rainy season habitat and grazing for wildlife, but their use in the mid to late dry season is severely restricted by lack of water.

The national parks have already constructed a number of wildlife ponds, typically around 50 metres across and a couple of metres deep. They are filled from direct rainfall and run-off during the rainy season. However, some of these ponds do last for the whole dry season. When wildlife move out of the park to watering spots in the adjacent land used by farming communities, they are exposed to poaching and there have been conflicts with those who control access to these water points. The problem is particularly bad during drought years. Park management has had to resort to transporting water in bowers to refill ponds.

The present proposal is for the GEF to finance the construction or rehabilitation of one pond (out of a half dozen that are called for in the park management plan), to drill a borehole near the pond and to provide a pump so that the pond can be recharged during the dry season. The site for the pond has not been chosen, but it will be in the unflooded, upland tree savannah area of the park.

##### **4.4.2.2 Analysis of the environmental and social impacts**

**Environmental impacts** The principal environmental impacts of this activity would be on the wildlife and on the natural habitats in the Waza NP. (OP 4.04 Natural Habitats applies here.) It is worth noting that the upland areas where the pond would be rehabilitated/created is, in ecological terms, not the natural, dry season grazing zone for wildlife. Prior to the occupation of the areas peripheral to the park, most of the wildlife would have moved out of this area to the floodplain where they could rely on standing water in residual ponds in floodplain depressions or on stream bottoms.

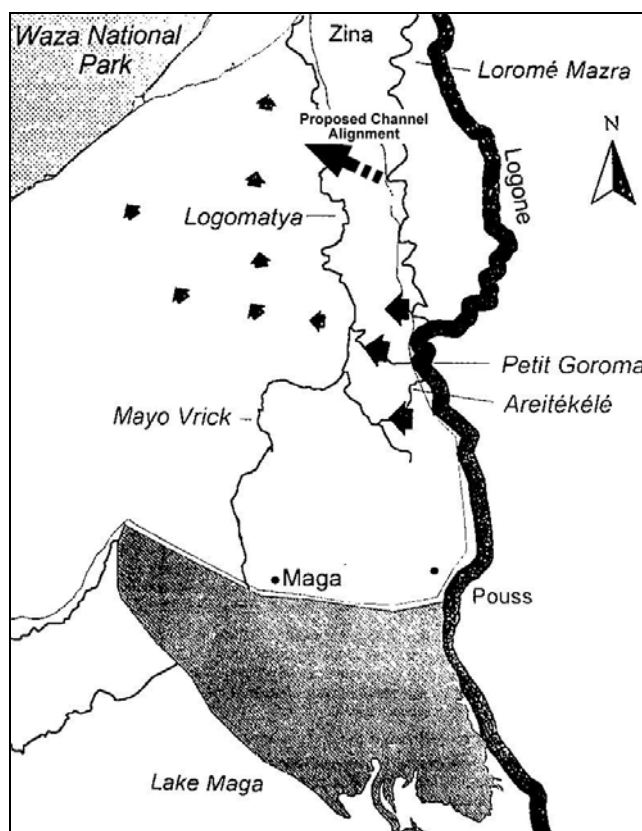
Under natural conditions, the wildlife were reliant on mobility, just as modern-day transhumant and nomadic herders rely on mobility to find pasture and waters for the herds. Unfortunately, the possibility for the wildlife of Waza NP to move freely in and out of the park is now greatly reduced – as it is increasingly for most protected areas in the world. Waza NP was just part of a much larger ecosystem that no longer exists. To maintain good populations of wildlife in the park, one must provide for the dry season water needs for the wildlife. This will necessitate some changes to the natural ecology of the park and its natural habitats.

Predicting and analysing the impacts of creating a new dry season wildlife pond is not a simple matter. When wildlife are concentrated around a few dry season water points, they can have market impacts on the habitats around the water points. The short-term environmental impact of the new pond in Waza NP will be to reduce grazing/browsing pressure around other existing water points and to increase localised grazing/browsing pressure around the new water point.

However, if the limiting factor on wildlife populations is the availability of dry season water, then increasing the availability of dry season water may lead to higher wildlife populations in the park. One could easily envisage a scenario whereby one increases the number of dry-season water ponds to the point where water is no longer the limiting factor – where the availability of browse and pasture becomes the limiting factor. Providing too many dry season water points could easily lead to overgrazing/overbrowsing and degradation of the natural habitats of the park. This is almost certainly not a significant risk for the single pond to be funded under this project.

The Assessment Team finds that the project is in line with the Bank OP 4.04, “...the conservation of natural habitats and the maintenance of ecological function.” However, it is clear that there will be some changes in vegetation structure around the water point. It is therefore recommended that the project maintain an area of upland forest with no water points, as an example of unmodified habitat.

**Social impacts** The provision of additional water within the park should reduce conflict between wildlife and communities at watering sites outside the park. There is no proposal to increase the extent or reduce present access rights to the protected areas, as a result OD 4.30 and the draft OP/BP 4.12 on Involuntary Resettlement are not triggered.



**Figure 2 Proposed Channel Construction**

#### **4.4.3 Cleaning/enlarging of a channel connecting two streams on the floodplain**

##### **4.4.3.1 Description of the proposed activity**

There are two main streams, the Logomatya and the Loromé Mazra, flowing through the floodplains east of Waza NP. They both flow parallel to the Logone river. They are key to feeding floodwaters onto the floodplains, including those in eastern Waza National Park – see Figure 1.

Prior to the construction of Maga Dam, the Mayo Vrick, the Petit Goroma and the Areitéké channels fed the Logomatya. All three of these were cut off by Maga dam and the dike along the Logone. The project has reopened floodwater flow into the Petit Goroma and the Areitéké channels in 1994 and '96 by creating openings in the dikes along the Logone. The Loromé Mazra, which was not affected by the construction of the dike, runs between the Logomatya and the Logone River. As floodwaters rise, water also flows through lesser channels and through overland flow across the entire floodplain between and amongst the Logone, the Loromé Mazra and the Logomatya. Direction of flow on any floodplain varies over time as relative inputs from different water sources vary.

The project proposes to open and enlarge an existing natural channel between the Loromé Mazra and the Logomatya to increase water from the former to the latter and to thereby increase overall flooding to the west including the floodplain portion of the Waza NP. The Assessment team travelled by boat down the Logomatya to the western end of this channel. The channel is only open for about 200m. Beyond that, it is choked with aquatic vegetation through which it is still possible to pass by poling through in a small dugout canoe. GEF funds would be used to clean and enlarge this channel over its full length of over 4 km.

#### 4.4.3.2 Analysis of the environmental and social impacts

##### *Environmental impacts*

It is not entirely clear that this will have the expected impacts or how large the impacts will be. Before the re-opening of the Petit Goroma and the Areitéké channels, the flow of water into the Logomatya should have been much less than it has been since they were reopened. The hydraulic head and hence flow of water from the Loromé Mazra to the Logomatya should have been significantly greater than it has been since the two channels feeding the Logomatya were reopened. However, all but the lower hundred meters or so of the existing channel is blocked with vegetation, indicating that there may not have been major flows through this channel even when other water inputs into the Logomatya were much reduced. It also indicates there may not be enough flow to prevent the channel from becoming blocked again in the future (from vegetation growth and/or sediments) after the channel is cleaned and enlarged.

It is also possible that the Petit Goroma and the Areitéké channels may be undergoing a “natural” process that increases their capacity to carry waters into the Logomatya in compensation for the greatly reduced flows from the Mayo Vrick that resulted from the construction of Maga Dam. To “fill the void” these two channels might be undergoing a phenomenon of increased speed of water flow, deepening and widening of their channels. On the Petit Goroma, a completely new side channel was cut off from this stream when it was first opened, a channel that remains open today. The fact that virtually all of the villages along the Logomatya are scarcely above water (perhaps 20 to 40 cm above the water level of the Logomatya) indicates that the Logomatya has already returned to a flow approaching the pre-Maga Dam levels. Indeed, houses constructed on lower sites that were not habitable prior to construction of Maga Dam are being abandoned because of flooding, while village sites that existed prior to Maga Dam still remain viable.

If the cleaning and enlarging of the channel does work as envisaged, there will be a number of impacts on the floodplain. The extra water flow will compensate for the decreased wet season flow in the Mayo Vrick, and the flooded area would be expected to increase in this part of the floodplain.

A number of families/communities who had moved into the lower parts of the floodplain, following decreased flooding can be expected to move back to their original settlement sites on higher ground within the floodplain.

##### **OP 4.01 Environmental Assessment - Public Consultation**

The project has held extensive discussions with local floodplain communities, as well as conducting more formal socio-economic surveys. It is clear that the benefits of restored/enhanced flooding are understood and welcomed by the communities. The agreement to the initial “pilot” releases was at the request of local communities and through the Governor and other representative bodies.

#### ***OP 4.04 Natural Habitats***

Again the project supports OP 4.04, through reinstating flooding to natural floodplain habitats. The benefits will extend into both the national park and the surrounding community resource areas.

#### ***OD 4.30 Involuntary Resettlement***

As a result of the increased releases to the Logomatya there has been a partial restoration of flooding to the floodplain. As a result of this, households that had moved following the construction of the Maga dam to areas nearer the river, have or are moving back to their original settlement areas on higher areas within the floodplain.

Before the releases were made, discussions were held with all affected communities and the settlement implications of re-flooding were made clear. All communities signed an agreement stating that they were aware of these implications and wanted to floods to be re-instated.

The project will use the same process of dialogue that has been endorsed by the communities, before any further modifications to the hydrology of the floodplain.

The project has in principle agreed to “co-management” of park resources. However, it is not clear what this means as at present there is no formal agreements for extractive use of park resources, although discussions have been held on the possibility of fishing in the park, under strict supervision/monitoring of park staff.

### **4.5 Proposed Environmental and Social Mitigation Measures**

#### **4.5.1 Increased water releases from Maga Dam**

Dropping the output and activities concerning increased releases of waters from Maga Dam might remove the trigger for OP 4.37. This would not, however, remove the risks

#### ***Project Options:***

##### ***Alternative 1: Drop the activities that trigger OP 4.37 Dam Safety***

Achieving significant increases in water releases is unfeasible without making very large investments for which no donor has been identified, (as discussed previously). The proposed “catalysed” intervention is therefore unlikely to be undertaken.

There was no cost associated with water increases, so there would be no change in the project budget.

Removing the activity removes the “trigger” for OP 4.37 and one could argue that the dam safety inspection would no longer be required. However, dropping the activity and dropping the dam safety inspection will not diminish the risks of dam failure. Our preliminary analysis indicates that the risks are very substantial.

Another section of OP 4.37 states, *Because there are serious consequences if a dam does not function properly or fails, the Bank is concerned about the safety of new dams it finances and existing dams on which a Bank-financed project is directly dependent.* Even if project activities do not depend on the safety of Maga dam, the security, the homes, and, to some extent, the livelihoods and of nearly all of the stakeholders of the Waza-Logone pilot depend on the safety of Maga Dam. The dozens of villages on the floodplain in the project area would probably all be flooded – the extent of flooding needs to be analysed. Widespread damage if not collapse, of homes, granaries and other buildings, might occur. It would be hard to say that this pilot project is not dependent on the safety of Maga Dam.

If Maga Dam fails during the life of the project, and if it becomes known that the World Bank was aware of the risk, the Bank could be exposed to criticisms and attacks in the regional and world media.

### ***Alternative 2: Conduct the Dam Safety Inspection and Find Funding for Corrective Measures***

This is the ideal solution, and would in large part eliminate the risks of catastrophic dam failure. If the repairs and modifications result in the ability to partially or fully restore the flood pulse on the Waza-Logone, then all the environmental and socio-economic benefits of the natural floodplain system would be enhanced.

**However**, the costs of repairing the dam to make it safe are almost certainly beyond the means of the project. Other donors would have to be found. If acceptable repairs to the dam cannot be made, then World Bank Safeguard policies would probably require that the Bank withdraw their funding from the Waza Logone pilot project.

### **Alternative 3: An Economics of Dam Safety Study**

If the dam safety inspection finds that the risk of dam failure is high – especially if there is risk of loss of life-- and if repair costs would be very high, it may be very difficult to obtain funding for the needed repairs. If this should prove to be the case, the Assessment Team suggests that it may be opportune to conduct a study on the economics of achieving dam safety. This study would be an analysis of both the costs and benefits of repairing and maintaining the dam versus the costs and benefits of decommissioning the dam.

Decommissioning of old, low-head hydroelectric dams has become fairly common in the US in recent years in situations where cost benefit analyses reveal that the costs of repairs and maintenance exceed the benefits of these dams.

It is not clear to the team that the dam and the irrigated perimeter is, or can be, an economically viable unit, even without considering the initial investment costs or the future expected repair costs needed to make it safe. SEMRY is frequently subsidised by the Government of the Cameroon or by donors. It is said that rice can presently be imported and delivered to consumers in Cameroon more cheaply than it can be produced at Maga.

This alternative would consist of amending the project to provide project funding for the following steps:

1. Conduct the dam safety inspections;
2. Estimate the costs of making the needed repairs (make use of any earlier studies that may have already been conducted, such as the study by Delft) and subsequent maintenance;
3. Using both standard and environmental accounting methods, conduct a cost benefit analysis of continuing to operate the dam for irrigated agriculture (If this has already been done, bring the study up-to-date) versus the costs of dismantling the dam (making a number of breaks in it to restore normal floodplain flooding) and providing equitable indemnity payments to those who presently benefit from it (resettlement, lump-sum payment or other). The economic and environmental benefits of fully restoring the natural floodplain regime should be included in the analysis.
4. Conduct a participatory synthesis of the above alternatives and develop the preferred alternative as part of the Strategic Action Programme.
5. Mobilise funding for the preferred alternative. One must recognize that dismantling the dam would also incur costs – including the costs of mitigation measures for those who have become economically dependent on Maga Dam.

### ***Costs of ensuring dam safety***

**Piping:** the preliminary analysis would indicate that there may be two principal elements of costs of eliminating risks of dam failure. Other than lack of routine maintenance, there seem to be two principal

safety risks to the dam – piping and overtopping of the dam because of failure of the spillway and/or sluice gates. The problem of piping may be potentially the most expensive to resolve. This would be true if piping is a problem over a significant portion of the 30 km length of the dam. Corrective measures must be made to render the affected areas of the dam impermeable. This is especially critical for that portion of the dam immediately above Maga town.

**Floodwater release:** the second problem is the apparent inability to release floodwaters to prevent the dam from being overtopped. As far as we know, the main sluice gates are functional. But they cannot be used to release more than small quantities of water because the Mayo Vrick is badly sedimented up. We were told that the Mayo Vrick would need to be dredged/enlarged over a long distance (roughly 20 to 30 km) and this would be very expensive.

The inability to use the main sluice gates might be an acceptable situation if the dam had a proper spillway. During the Assessment Team's briefing at LCBC, we learned that one possible solution to for the spillway problem that has been proposed in the past (the Delft report) would be to construct a new spillway near the western end of the dam (See Figure 2). This would certainly be an alternative that should be analysed. It would have the added benefit of restoring excess floodwaters on to exactly that portion of the floodplain that was the most negatively impacted by the construction of Maga Dam. Construction of a new spillway would probably require the construction of an earthen dike to prevent uncontrolled flooding of the irrigated rice fields.

If either Alternative 2 or 3 lead to measures to partially or fully restore the natural flood pulse on the Waza-Logone floodplain below the dam, it will be critical to undertake a fully participatory dialogue with all affected stakeholders. Particular attention will need to be given to any families/individuals who have moved onto lower portions of the floodplain that would be re-inundated under the new water management regime. IUCN appears to have done a commendable job in the past on facilitating such a dialogue. They should facilitate a similar participatory process as needed during the new project.

### ***Wildlife ponds***

The project should seek a commitment from the institution charged with the management of Waza NP, that some portion of the rainfed, upland tree savannah zone of the NP remain free of dry season water point development. This will guarantee that a portion of this natural habitat will remain in a more natural condition.

### ***Floodplain channel opening***

It is critical that floodplain residents on the Logomatya downstream from the channel to be opened between the Loromé Mazra and the Logomatya be fully consulted before the final decision is made to open this channel. They should be asked if they think the opening of the channel will have the desired effects. They should be asked if they think there is any risk that they would be flooded out as a result of the enlargement of this channel. They should be asked if they fully accept the risks of increased flooding of their villages.



**Photo 3 Existing Channel Outlet between the Loromé Mazra and the Logomatya**

The Waza-Logone Project did an excellent job of informing and getting written agreements of floodplain residents before making the two openings of the dikes in 1994 and 1997. The assessment team is confident that project staff have to capacity inform and seek approval from stakeholders that would be affected by the proposed channel cleaning.

#### **4.6 Proposed Monitoring and Evaluation Indicators**

Monitoring and Evaluation is seen as a key pilot project component and is a stated objective of the project – *“To develop and implement an effective ecosystem, hydrology, and socio-economic monitoring and evaluation system.”*.

The proposed monitoring component effectively serves two purposes, firstly ensuring that the project is effectively implemented and secondly to develop a better understanding of the interactions between the hydrological, biological and socio-economic systems in the floodplains.

It is worth noting that over sixty percent of the GEF funding is going to support hydrological surveys as part of the monitoring programme. The following aspects are included under the proposed monitoring programme:

- Rainfall, surface flow and floods and groundwater at strategic locations in the basin.
- Ecosystem conditions, biodiversity and biological resources in the parks and the floodplains.
- Socio-economic conditions in the floodplain and uptake of “wise use options”

The project document does not explain why these surveys are needed, i.e., how the results of the hydrological surveys, and monitoring of biodiversity will contribute to better management of the floodplains or reversal or natural resource degradation.

The project has been carrying out detailed monitoring studies in the floodplains for over ten years. The results of this research/monitoring exercise have demonstrated the considerable social and economic value of wetlands and have been used to guide local, national and regional policy development.

The systems they have established are now well tried and understood by local staff. This is particularly true of the socio-economic monitoring.

However, there are some doubts about the capacity of parks staff to effectively monitor biological parameters within the park, let alone in the surrounding flood plains. It is therefore recommended that alternative options are identified for this activity. Having said this, it is recommended that monitoring in the park specifically addresses ecological changes in both the areas adjacent to the new or rehabilitated water holes, and in the upland forest areas that are left without dry season water. This needs to be done to determine the ecological impact of the new water point that will be opened with GEF funds.

The project should provide regular reports on the process of resolving the issues of safety and water release from Maga dam.

#### **4.7 Participation of Key Stakeholders in Project Preparation**

The pilot project was developed out of previous project proposals and as part of this exercise included discussions with many of the key ministries and agencies that will be involved in project management.

At the national level discussions were held with the Ministry of Agriculture and the Ministry of Water and Fisheries in Yaounde and with the National GEF Focal Point, Yaounde. Discussions were also held with IUCN at Waza Logone and with IUCN, WWF and Birdlife International in Yaounde. Some staff members of LCBC were also included in the consultation process. Although it was not possible to hold discussions with any of the communities within the flood plain, the previous project held extensive consultations with flood plain communities on the restoration of flooding to the upper part of the floodplain, and obtained written consent for their actions from individual households.

SEMREY officials confirmed that the project has also held discussions with them on the issue of water releases from Maga Dam. However, no funds have been identified to modify structures to achieve this.

### **5 Komadougou-Yobe Integrated Wetlands Management**

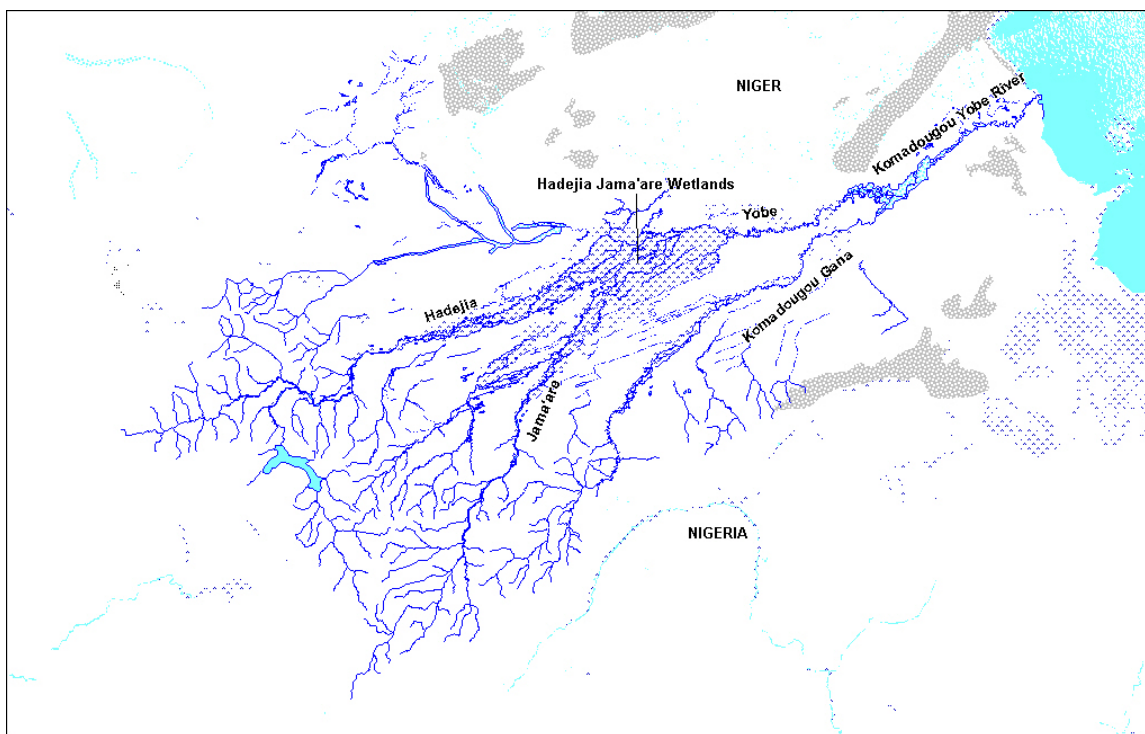
#### **5.1 Baseline Information**

This pilot project is effectively a continuation of the existing Hadejia-Nguru Wetlands Project, which has been working in the area since 1987. The full project document for this pilot has a budget that would rely primarily on cofinancing. Since the project mission the pilot project proposal logframe has been revised, as has the accompanying budget.

Due to the prevailing security situation in Nigeria at the time of the evaluation, the Environmental and Social Assessment team was unable to obtain security clearance to visit the project site, however discussions were held with project staff and LCBC staff in N'Djamena. This review has been updated to reflect the revised project document and background literature provided to the team after they had left the region.

It must be emphasised that according to OP 4.01 this EA/SA covers all components of the proposal, regardless of the financing source.





**Figure 3 Wetland Areas in the Komadougou Basin**

### 5.1.1 The Project Area

The Komadougou-Yobe River forms the international boundary between Niger and Nigeria for the last 150 km before flowing into Lake Chad. The Komadougou-Yobe basin covers an area of around 150,000 km<sup>2</sup>, and is the only perennial river system flowing in to the northern pool of lake Chad. Following the construction of a number of dams on the upper watershed, the total flow from the system is now typically less than 1% of the total annual surface and rainwater input to the lake.

The main flow into the Komadougou-Yobe river system is from the Hadejia and the Jama'are tributaries in the wetter upland areas of Kano, Jigawa and Bauchi States in Nigeria. These two rivers flow into an extensive floodplain, the Hadejia Jama'are wetlands, referred to in the project document as the Hadejia-Nguru Wetlands after the two main settlements in the area.

Although described as wetlands, much of the Hadejia-Nguru floodplain is dry for some or all of the year. It provides a wide range of resources including fertile agricultural soils, grazing, non-timber forest products, firewood and fisheries. In addition, the wetlands are a unique migratory habitat for many wildfowl and wader species from the Northern Hemisphere. A number of forest reserves are found on the floodplains.

However, the floodplain has come under increasing pressure from drought and upstream water developments. The maximum extent of flooding has declined from between 250,000 and 300,000 ha in 1960s and 1970s, to 70,000 to 100,000 ha more recently. There are also potential issues of water quality, with some signs of increasing salinity in the Hadejia River.

The key management body responsible for water related development is the Hadejia Jama'are River Basin Authority (HJRBA). The main long-term threat to the floodplain is water diversion through large-scale water projects on the Hadejia and Jama'are Rivers. The largest upstream irrigation scheme at present is the Kano River Irrigation Project, fed by the Tiga Dam completed in 1974. Water is also released from this dam to supply Kano City.

The second major irrigation scheme within the river basin, the Hadejia Valley Project is under construction. The HVP will be supplied by Challawa Gorge Dam on the Challawa River, upstream of Kano, which was finished in 1992. Challawa Gorge may also provide water for Kano City.

So far there has been little development on, the Jama'are River with only one small dam across one of its tributaries. However, plans for a major dam at Kafin Zaki have been in existence for many years to provide water for an irrigated area of around 84,000 ha. Work on Kafin Zaki Dam has been started and then stopped a number of times, most recently in 1994, and its future is at present unclear.

There are also major land use changes within the wetlands themselves. Small-scale irrigation has greatly increased largely through the use of small petrol-powered pumps and the ban on the importation of wheat in 1988. As the use of small pumps spread, conflicts emerged between farmers and pastoralists, and between small and large farmers for access to land.

The Hadejia-Nguru wetlands have been designated a RAMSAR site in recognition of the high biodiversity and ecological values.

### **5.1.2 The Previous Project Phase - Hadejia-Nguru Wetlands Conservation Project**

The the Integrated Wetlands Management in the Komadougou-Yobe Basin Pilot Project, is an extension of The Hadejia-Nguru Wetlands Conservation Project (HNWCP). The original project was established in 1987 by IUCN, working together with the Federal Government of Nigeria, the Nigeria Conservation Foundation and the Royal Society for the Protection of Birds.

The HNWCP project objectives were as follows:

- To explore appropriate use options for the water resources for the benefit of wildlife and human communities
- To monitor wildlife resources, especially migrant water birds
- To develop conservation education and public awareness programmes
- To assist State Wildlife Departments by training staff

The project has carried out research on land use, fisheries, grazing pressure, hydrology and bird habitats. The conclusions of the studies on floodplain environmental economics have made a major contribution to a wider understanding of the major importance of flood plain to local and national economies. The project has developed a management plan for the Dagona Waterfowl Sanctuary and trained game wardens on bird identification and provided support in developing links with communities. The project has supported environmental education programmes in local schools and villages.

### **5.1.3 Integrated Wetlands Management in the Komadougou-Yobe Basin**

The pilot project proposal builds on the work carried out under HNWCP to extend the lessons learned to the whole of the basin and more generally to water resources management throughout the Lake Chad Basin. However, the focus of activities remains the Hadejia-Nguru Wetlands.

The pilot project is expected to have three financing inputs: one set of activities funded specifically under the GEF; one set of complementary activities co-financed as part of the DFID funded "Jigawa Enhancement of Wetlands Livelihoods Project"; and a third component funded under the draft proposal for a GEF "Flyways" project. The final project proposal is still under revision, and the precise nature of the complementary components still needs clarification.

However, it should be noted that the DFID logframe does not have an identical emphasis to the components of the pilot project that are stated as being undertaken with DFID support.

The overall objective of the pilot project is stated as:

*The long-term sustainability and wise use of the wetlands of the Komadougou-Yobe Basin as a means of establishing working methodologies for the integrated management of trans-boundary aquatic ecosystems*

The project document includes the following three specific objectives:

- *To promote the sustainable management and use of the water resources of the KYB by relevant institutions and communities.*

- *To promote the sustainable management and use of the biological resources of the wetlands of the KYB by relevant institutions and communities.*
- *To develop and implement an effective ecosystem, hydrology, and socio-economic monitoring and evaluation system.*

It should also be noted that although the original budget of \$2.5 million has been reduced to around \$500,000 to reflect the GEF financing component, this revised funding is spread across the entire project, not focused on those components stated as being financed through the GEF.

## 5.2 Activities with Significant Environmental and Social Impact

The Logical Framework Analysis provides a breakdown of objectives, outputs and activities. Many of the outputs would better be described as long-term development objectives, as they are clearly not an output achievable during the project period. *As an example, "Output 1.3 Hydrological rhythm of the downstream component of the KYB restored"*.

The project has one significant activity that will have a direct impact:

- Clear blockages on floodplain channels to facilitate flows to downstream locations and floodplains.

To the extent that the hydrology of the floodplains has changed due to long term drought and to the construction of upstream dams, this activity will clearly not, in itself, restore the hydrological rhythm of the downstream floodplains. The other activities are all indirect, with the project "*Catalysing*" **other** agencies to take actions to restore a managed flooding cycle that will emulate the natural flooding cycle.

The following activities are related to either releasing increased flows during the rains from upstream dams, or reducing upstream water demand:

- Promote upgrading of existing water management plan for the basin, including catering for rainy season releases.
- Catalyse redesign of an efficient water intake structure for Kano City Water Supply.
- Catalyse replacement of gravity irrigation with drip and sprinkler irrigation in large irrigation schemes.

Within the wetlands areas, the project is proposing to reduce water consumption and develop systems of negotiated access to common property resources to reduce land/water resources in the wetlands:

- Promote residual moisture cultivation and the conjunctive use of surface and ground water in crop production.
- Promote communal ownership of fisheries.
- Promote review of land tenure law for equity.

The project also has specific conservation/protection objectives, linked to the second objective, "*Promote the sustainable use of the biological resources...*":

- Identify critical wetlands for conservation; assist in developing and implementing management plans for critical wetlands.
- Provide equipment to assist in the management of protected areas.
- Catalyse designation of additional RAMSAR Sites
- Assist to conserve both in situ and ex situ threatened cultivars.

## 5.3 Relevant Safeguard Policies

OD 4.30 and the draft OP/BP 4.12 Involuntary Resettlement are triggered by the proposals for changing the balance of community access to wetlands resources. This will be particularly the case if the project promotes "protected area" approaches for conserving biodiversity in wetlands. The implication is that there

may be a need for incorporating conflict resolution mechanisms. This is specifically an output of the parallel DFID project.

OP 4.37 Safety of Dams is triggered by the proposed increase in release of waters from the upstream dams. A dam safety inspection of Tiga Dam and Challawa Gorges Dam will need to be done, unless suitable inspection acceptable to the Bank have recently been done. OP 4.37 requires that dam safety inspection be done, even though the Team has no reason to suspect that there are any safety issues with these dams.

OP 7.50 Projects on International Waterways “...any river, canal, lake, or similar body of water that forms a boundary between, or any river or body of surface water that flows through, two or more states...”. The last 150 km of the river is the international boundary between Nigeria and Niger

## 5.4 Analysis of Significant Environmental and Social Impacts

### 5.4.1 Clear blockages on channels in the floodplains

The only direct project activity that will have an impact is clearing/constructing channels within the floodplain to try to direct water to key areas (Activity 1.3.1).

#### 5.4.1.1 Analysis of the feasibility of clearing channels

Since the construction of the upstream dams, and within a general pattern of declining rainfall, there has been a change in the extent and function of the floodplains. Sedimentation and blockage of wetland channels has resulted in changed floodplain discharge patterns, and a number of channels have been cleared to try to re-establish flood patterns.

Below the junction with the Burum Gana, the Hadejia River has become progressively choked with vegetation. In 1993 it was not possible to detect any flow within the channel. Local populations are increasingly influencing the distribution of flows on a local scale. They have cut a new channel for the Hadejia River, and on the Marma Channel are actively involved in removing vegetation and excavating irrigation ditches.

However, it is not clear how effective channel clearance is, as the benefits will tend to be short lived. Under natural conditions, channels are kept open by high flow rates. Artificially cleared channels are likely to need regular maintenance to keep them open<sup>11</sup>.

#### 5.4.1.2 Analysis of the environmental and social impacts

Opening channels will redirect water to different parts of the floodplain. The flow rate in the river downstream from the point where the canal is constructed or cleared will be deprived of flow, while the area to which the flood is directed, will receive increased flooding.

The objective is to direct water to “key” areas. However with a complex pattern of natural resource systems dependent on period and depth of flooding, the impact of this changed flow regime will be similarly complex. The level of induced flooding can favour open water systems, swamp or grassland, but always with a corresponding change in another zone with a reduced water supply.

The changes in the ecosystem function as a result of changed flooding patterns will have direct social impacts – indeed the definition of a “key” area is a social intervention, implying a decision to favour a certain group or groups of resource users.

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<sup>11</sup> Dr Julian Thomas of the Wetland Research Unit of the University College of London concludes in a research paper, referring to the opening of the channel above Hadejia town, “...the benefits obtained through the dredging of this channel appear to be short lived. Downstream of Hadejia town the discharge of the Hadejia River declines rapidly as adjacent fadamas are inundated.”

The physical impact may favour grassland production and through this, transhumant pastoralist groups, under certain conditions this may also favour fishing communities dependent on spawning/nursery areas in flooded grassland.

Key areas are likely to also include protected areas with high biodiversity interest.

In all cases there can be no generalisation on environmental or social impacts as these will be highly site specific. Without visiting the site and meeting with project staff and stakeholders, we cannot be more specific in our analysis. However the decision on “key” areas must be made through a full consultation process with all potentially affected communities.

#### ***OP 7.50 Projects on International Waterways***

In theory any actions within the floodplain have the potential to change flow in downstream systems. Interventions to locally increase flooding are likely to lead to reduced flow in the downstream, shared river system. However changes are unlikely to be significant

### **5.4.2 Promote increased flow from upstream systems**

The project proposal includes activities that it hopes will result indirectly in overall changes in the management of water in the basin.

#### **5.4.2.1 Description of the proposed activity**

The main objective is to get agreement from the operators of the upstream dams and barrages and the irrigation schemes to release additional water at key times during the wet season to recreate a more natural flooding cycle.

In addition the project is hoping to influence decisions on the future expansion of irrigation, limiting the areas to those already under the command of the dams and barrages This includes decisions on the future of the Kafin Zaki Dam and the irrigation of 84,000 ha along the Jama'are Valley. The project would hope to ensure that any future designs for Kafin Zaki Dam would incorporate outlet structures capable of releasing the artificial floods.

The project also hopes to reduce upstream water demand through promoting lower water use irrigation systems and through improved water supply systems for Kano.

#### **5.4.2.2 Analysis of the environmental and social impacts**

##### ***Dam safety***

The proposed changes to the management of the upstream dams triggers OP 4.37 on Safety of Dams.

As an initial step, the previous studies on the upstream dams will need to be reviewed by a qualified dam engineer, and on the basis of this a decision can be made on whether a more detailed dam safety inspection will need to be carried out on each of the dams whose management will be affected. As far as the team is aware, there is no reason to believe that there are problems with dam safety at any of these dams. The dams have been subject to recent major flood events without significant damage to the dam structures<sup>12</sup>. The releases are planned for the wet season, when the added discharges would reduce the risk of overtopping and upstream flooding.

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<sup>12</sup> The floods in August/September which left over 200 people dead and property worth millions destroyed in Kano and Jigawa States was caused by *"unprecedented excessive rainfall recorded in most parts of the country."* which resulted in *"... very high in flow of water into Tiga and Challawa Gorge Dams this year. The two dams started spilling one month earlier than the normal time they usually started spilling in the previous years."* Alhaji Shehu Abdulkadir, Managing Director Hadejia-Jama'are River Basin Development Authority, (HJRBD A)

### ***Upstream/downstream trade-offs***

The main environmental impacts of these promoted interventions would be increased flooding in the downstream wetlands. However these could not happen without upstream impacts.

Managed flood releases, with timing and volume linked to a basin wide monitoring system would allow for enhanced flood management, limiting flood release when there are major rains in the lower basin.

However, the proposal to limit further expansion of major irrigation schemes in the upper catchment does have social and economic implications. The valuations carried out so far clearly show the macro economic benefits of maintaining floodplain systems as opposed to the development of further irrigation, however there are then decisions implied in this as to who will benefit – upstream irrigation users or downstream floodplain users.

The promotion of more water-efficient irrigation systems does in itself have some environmental implications. If the use of less water results in less flushing of salts from the irrigated soils, then it is likely to increase the risk of salinization of soils in the irrigation schemes.

### **5.4.3 Promoting improved water management and common property access**

The second objective of the project is *“To promote the sustainable management and use of the biological resources of the wetlands of the KYB by relevant institutions and communities.”* This objective has two themes running through it: activities to promote community rights and community activities within the floodplain; and activities related to the management of protected areas.

The most recent documentation on the pilot project indicates that this second objective will effectively be incorporated into the complementary DFID funded “Jigawa Enhancement of Wetlands Livelihoods Project”. The institutional linkages between these two projects has not been clarified. However the DFID project focuses more specifically on negotiating access rights to common property resources, rather than the biodiversity conservation aspects.

#### **5.4.3.1 Description of the proposed activity**

The project recognises that there are some small-scale interventions that could reduce water demand within the floodplain. However these impacts are likely to be limited. The project is proposing to promote a process of dialogue relating to land tenure and access to common property resources in the floodplain. Specifically the project will *“Promote communal ownership of fisheries.”*, and *“Promote review of land tenure law for equity”*.

The DFID funded “Jigawa Enhancement of Wetlands Livelihoods Project” also deals with negotiated access rights common property resources. While based in Jigawa State, the project will apply equally to the whole of the wetlands.

The objectives of the DFID project are:

- *Assist stakeholders to debate, define and reach agreement on, access rights to common property resources and to make widely available the lessons learned both in the wetlands and nationally*
- *Help to inform government stakeholders on the livelihoods strategies and outcomes of the wetlands poor and enhance their capacity to develop policies and service delivery mechanisms which favour the poor*
- *Help to establish information collection and dissemination systems for livelihood and environmental factors important to the livelihood strategies of the wetlands poor; promote dissemination locally, nationally and regionally*
- *Assist wetlands customary and statutory stakeholders to debate and clarify institutional responsibilities and to generate widespread understanding of those responsibilities*
- *Identify effective mechanisms for managing conflicts in the wetlands and demonstrate the value of these mechanisms in selected areas; disseminate the lessons learned locally, regionally and nationally*

The project has been approved and is currently under tender. The project is recognised as being a “process project” and has a nine-month inception phase, which will be followed by a three to six year implementation phase. The project will become active in 2002.

*The present project proposal should be revised to clarify the institutional relationships between the two projects and modified to ensure that there is a clearly defined congruence in the objectives as stated in the DFID stand-alone project proposal and the objectives and activities assigned to the DFID project in the pilot project proposal.*

#### **Analysis of the environmental and social impacts**

The project hopes to “Promote residual moisture cultivation and the conjunctive use of surface and ground water in crop production.” This refers to flood recession farming and fadama irrigation, both existing floodplain activities. There are no significant negative environmental impacts expected as a result of this indirect action.

The main focus of interventions is through addressing social, cultural and institutional constraints to improved natural resources management. Land tenure and resource access rights are very sensitive issues. However, the project is looking for negotiated solutions and no negative social impacts are expected.

The project specifically intends to promote community ownership of fisheries. There is no mention of community management of fisheries. If traditional community management systems exist, and if they are viable sustainable systems, and if the establishment/reestablishment of community ownership results in a reinforcement or reestablishment of these traditional systems, then the environmental impacts should be very positive. The social impacts could be positive or negative, depending on the equitability of the traditional system. If there are no traditional fisheries management systems, then the establishment of community ownership of fisheries by itself might be positive or it might be negative – it will all depend on how they organise themselves and how they use these new rights.

### **5.4.4 Protected areas and conservation**

#### **5.4.4.1 Description of the proposed activity**

The project is going to identify critical conservation areas, and assist in developing management plans for these areas, one of which they expect to be designated as a RAMSAR site. The project will assist in in-situ and ex-situ conservation of threatened cultivars.

The implicit assumption is that these conservation areas will be effectively protected areas, and that the land use zones are defined on the basis of activities that are allowed that support the primary purpose of biodiversity conservation<sup>13</sup>.

The emphasis is on training staff from line institutions in “community liaising”, community based development and integrated resources management.

#### **5.4.4.2 Analysis of the environmental and social impacts**

The outcome of these facilitating activities will have positive environmental impacts through the conservation of “critical wetlands”. However, the development of land use zone plans with communities does imply restricting activities within those zones, and unless carefully managed this will result in increased pressure on floodplain resources away from these protected areas.

This therefore triggers OD 4.30 and draft OP/BP 4.12 Involuntary Resettlement through changed access to protected areas. As a result the project will need to establish a process of participatory project design and conflict resolution to further develop these proposals. This process is specifically included in the DFID proposal, although in the DFID case, not specifically to protected areas.

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<sup>13</sup> *Catalyse formulation and implementation of land use zonation plans for the wetlands; Propagate wise use options for wetlands biological resources*

The social interventions – stakeholder consultation, increasing awareness –link back to the proposals on land tenure and common property access rights. If the protection theme is matched by the access rights theme, then there should be no major social impacts.

## 5.5 Proposed Environmental and Social Mitigation Measures

### *Creation of protected areas*

The project proposal includes environmental and social mitigation measures as part of the project activities. Protection of critical wetlands through the creation of protected areas implies restricting access to and/or use of resources. This is matched by interventions to promote access rights, such as “*Promote communal ownership of fisheries*”. However, this will probably not be adequate by itself. In the process of creating protected area, one must identify all the stakeholders who have traditional tenure or use rights over the area. These need to be fully documented. Specific mitigating measures will need to be negotiated with all of these parties.

### *Redistribution of floodplain waters*

One must ensure that all stakeholders that will be affected either positively or negatively are identified and that they are fully involved in the planning for any actions that will redistribute waters on the floodplain. Approval should be obtained from those who will receive additional waters and from those who would receive less.

The project should attempt to assess the impact of redistribution of floodplain waters on downstream areas, especially the transborder areas with Niger. If significant changes would result, non-objection from the government of Niger should be sought before any measures are implemented.

### *Land tenure/access rights*

The project should coordinate their actions fully with the DFID-funded project to avoid duplication and to avoid conflicting messages/approaches.

### *Community ownership of fisheries*

The project should ensure that the establishment or reestablishment of community ownership of fisheries will be accompanied by the establishment or reestablishment of a fisheries management system that is based on the biology and ecology of the fisheries resource. If sound traditional systems exist, they should be re-established. If not, the project should assist the communities in developing sustainable fisheries management systems.

## 5.6 Proposed Monitoring and Evaluation Indicators

The project includes specific monitoring and research studies, most of which are a continuation or extended coverage of the existing programmes undertaken by the Hadejia-Nguru project.

The following components are included in the present project proposal:

- Baseline surveys of hydrology, ecology and socio-economy of the wetlands.
- Hydrological monitoring.
- Ecological monitoring.
- Socio-economic monitoring.
- Evaluation of all project activities.

More specifically the hydrology studies are expected to monitor river flow at key sites in the basin, monitor ground water levels and flood extent and monitor the quality of ground and surface water at strategic locations. The output will be a hydrological yearbook for the basin.



The project also proposes to carry out topographic surveys of river channels and of the exposed floors of the northern pool of Lake Chad. In addition the project proposes to carry out a reconnaissance bathymetric survey of the northern pool of Lake Chad.

The project proposes to carry out an inventory of the biodiversity and biological resources of key wetlands and develop systems to monitor ecosystem conditions.

The project expects to continue to undertake surveys of base line socio-economic conditions in and around key wetlands and to monitor changes in socio-economic conditions and the uptake of “wise uses options”.

The project intends to evaluate water resources development activities, uses, and demands throughout the basin and compare these with water availability. With this information the project expects to refine the Hadejia-Nguru Wetlands Conservation Project report “Water Management Plan Options” and extend it to the whole of the Komadougou-Yobe basin.

It is not clear how much of the proposed monitoring or research studies will actively support either the management of the proposed project interventions or the development of future project interventions.

It is therefore recommended that the project review the proposals, focusing socio-economic and ecological monitoring and hydrological and bathymetric studies on specific sites where project activities are expected to have impacts. This could then release more funds for project activities that would directly address issues of sustainable management of the wetlands that have been affected by upstream changes in water release and by climate change.

Specifically, the project should monitor the following:

- The extent to which physical measures to redistribute floodplain waters actually do redistribute the waters, and the areas affected
- The environmental and social impacts of these redistributions
- The environmental and social impacts of increased releases of water from upstream dams.
- The impacts of community ownership of fisheries on the fisheries resources and on the equitability of the distribution of costs and benefits of the new use/management systems that will be put in place.
- The socio-economic impacts of the creation of protected areas on those stakeholders whose tenure/access rights have been diminished.
- The environmental and social impacts of negotiated changes to land tenure and resource access rights.

## 5.7 Participation of Key Stakeholders in Project Preparation

HNWP has been operating in the area for over 14 years, and has carried out a number of stakeholder consultation exercises as part of the previous project activities. The preparation of the largely parallel DFID financed project, the Jigawa Enhancement of Wetlands Livelihoods Project, has also involved considerable stakeholder consultation.

The present project proposal includes indirect activities to ensure that the stakeholders are actively involved in directing project activities as they develop.

- *Facilitate the functioning of a stakeholder consultative forum.*
- *Catalyse the formulation of a regular consultation forum for authorities and communities.*

The Assessment Team was not able to visit the site and therefore not able to make its own assessment of stakeholder involvement in project preparation.

## 6 Niger/Chad Transboundary Desertification Control

### 6.1 Baseline Information

#### 6.1.1 The Project Area

The area to the north of Lake Chad (referred to in the Diagnostic Study as the Northern Diagnostic Basin) is the largest “drainage” area in the basin. However, there is virtually no surface flow from this area into the lake, and indeed what little drainage pattern there is, flows away from the lake.

Moving sands and recent “ergs” cover the majority of the area. Wind erosion is a normal phenomena throughout most of the area, and the change in rainfall patterns has moved the limits of wind erosion to the south. However, the problem of erosion is exacerbated by poor land use practices in the transition zones to the south. Overgrazing and cultivation on once stable dune structures has resulted in the loss of the vegetation that held the dunes in place. The changing rainfall patterns have also increased grazing pressure on the remaining rangeland, moving the pattern of transhumance southwards.

The project area is the extreme southern portion of the Northern Diagnostic Basin in the area with the highest rainfall and the most stable ground cover. The project is located in the districts of Diffa, Nguigmi, and Mainé-Soroa in Niger and Bol, Liwa, and Rig-Rig in Chad. Project interventions during this pilot will be restricted to a radius of 20 kilometres around these towns.

#### *Niger:*

The population of *Département* of Diffa, is estimated at 210,000. East of Diffa there is a major wet season grazing area, with seasonal ponds providing stock water. Although most of the entire area is ecologically best suited for livestock production, rainfed agriculture occurs through much of the area.

#### *Chad:*

The main population centres are Bol and Mao, with a population of around 30,000. The rest of the population are distributed in small villages around the wadis, or are nomadic/transhumant herders. In this region, where annual rainfall amounts to less than 300 mm, Lake Chad plays a key role in the economy. There are three separate hydro-ecological zones:

- The continental zone, inland from the Lake, the largely stable dunes of the Kanem erg, with some irrigated crops.
- The intermediate zone, along the Lake shoreline, many of the wadis are flooded by Lake Chad, either permanently or seasonally, and are used as polders for irrigation or for recession farming.
- The island zone of the Lake. The dominant economic activities here are livestock and fishing.

#### 6.1.2 Project Description

The present project concept has developed from an original proposal in the 1992 LCBC Master Plan. The project addresses concerns linked to the wider management of the Lake Chad basin, and to the Convention on Desertification. This pilot project will address land/resource degradation and desertification in the transboundary area to the north and east of Lake Chad in the two countries of Niger and Chad. The project proposes to work in the areas of sand dune fixation, range management, water point development and agricultural improvements on upland, rainfed sites (as opposed to the lake itself and its associated wetlands and shorelines).

and shorelines).



**Photo 4 Access to Water Points and Impacts of Grazing Pressure on Range Quality**

## **6.2 Activities with Significant Environmental and Social Impacts**

### **Project objectives**

There are major differences in the statement of objectives between the short summary and the full project document for this pilot. The specific objectives presented in the full document are the following (translated from French by the Team):

1. *Help local populations fight against the sanding-up of depressions, infrastructure and rangelands;*
2. *Improve the organisational capacities of villages in the project zone through the development of their local expertise in the struggle against sand deposition and in their expertise in managing natural resources;*

Output 2 would indicate that natural resource management is limited to range management.

3. *Improve and diversify their production systems.*

Output 3 indicates this will be done through local credit.

### **6.2.1 Activities with Significant Impacts**

The project lists a number of activities that should have direct and significant environmental and/or social impacts.

Three activities should have significant environmental and/or social impacts:

- Dune stabilisation – This will have both environmental and social impacts.
- Range management with associated water point development (three schemes) – Major environmental and social impacts.

Activities that are considered to have insignificant impacts are the following:

- Activities related to improvements in agriculture are not expected to have significant environment or social impacts because the scale of these activities is expected to be so small. The project proposes to develop water points for a range of crops. Crops mentioned are red pepper, cassava, wheat and the algae *Spiruline*. Impacts could be significant if the project were to introduce a new crop or new production technique that yielded such high financial returns that this would lead to greatly increased investments in areas cultivated or in ground water used. This is deemed unlikely. The one possible exception is Spiruline culture that has some potential for market development on a world scale. The project proposes to create artificial basins or ponds for Spiruline culture to be filled with ground water. If a major market for Spiruline were to develop, this could lead to significant environmental and social impacts, but the chances for this seem remote.
- The project also proposes to establish a credit scheme to fund minor local enterprises, which in turn could have direct local environmental and social impacts. The fund is expected to be used for the purchase of simple agricultural tools, drying equipment for algae, equipment for mining and treatment of natron, and for small businesses. The scale of these impacts, however, will probably be insignificant.

### 6.3 Relevant Safeguard Policies

The only safeguard policy that could potentially be triggered by this project is O.D. 4.2 on Indigenous Peoples or OD 4.30 or draft OP/BP 4.12 Involuntary Resettlement – range management would involve radical changes to access to range resources – this could potentially affect indigenous transhumant pastoral groups.

The project should be guided by the greater details given in OP/BP 4.12 on the need for participatory processes in drawing up the plans for managing access rights. This specifically includes the need to take account of the needs of vulnerable groups and especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples and ethnic minorities.

## 6.4 Environmental and Social Impacts

### 6.4.1 Dune Stabilisation

#### 6.4.1.1 Description of the proposed activity

The project proposes to select dunes that pose immediate threats to important infrastructure or valuable lands. The project document proposes a combination of physical and biological techniques for fixing or stabilising sand dunes. The physical techniques will require large amounts of plant materials to construct a checkerboard like pattern of fences or barriers across the dunes to be stabilised. These structures are intended to minimise sand movement long enough for biological controls to be put in place. The biological dune fixation measures proposed consist of the planting of perennial trees and shrubs. Nine species are proposed for planting on the dunes including two exotics species of *Prosopis*. No mention is made of what institutions, incentives or systems will be put in place for managing or protecting the dunes once they have been successfully stabilised. Dune stabilisation would have both environmental and social impacts.

#### 6.4.1.2 Analysis of the environmental and social impacts

The significance of the impacts of dune stabilisation will be a function of the approach used. If one only imitates the techniques already employed in the Diffa area, the areas treated will be very small, and the impacts will be relatively insignificant. If the approach would address fundamental causes that cause stable dunes to become live dunes, the impacts could be very significant. This would involve addressing land tenure and access rights. It would involve restrictions on the right to practice rainfed agriculture on fragile, high-risk sites. It would involve an end to open access grazing of livestock on live dunes and on sites at risk of becoming live.



**Photo 5 Seedling Planted for Dune Stabilisation at Nguigmi**

### ***Environmental impacts***

**Positive impacts** Dune activation might be considered the ultimate form of land degradation. The stabilisation of dunes that have become active because of unsustainable land use practices is, in a *de facto* sense, a clearly positive environmental benefit. Stabilised sand dunes will once again support vegetation that serves as primary producers that recycle nutrients and that may serve as wildlife habitat.

**Significance as a function of scale** The significance of this activity will depend totally on the approach and the techniques employed and the conditions of resource access and natural resource management systems that will be put in place. The project document only talks of stabilising dunes that are threatening infrastructure or lands of particular value. This is strictly a treatment of the symptoms of the unsustainable land use practices that lead to the dune activation in the first place. The prodoc says nothing about addressing root causes of dune activation. If the project does not address root causes, the areas that can be treated will remain very small and so will the environmental impacts.

**Risk that positive impacts will be temporary.** The project document says nothing about what will be done after the dunes are stabilised. It does not say how the stabilised dunes will be protected or managed over time, who will be responsible, what incentives will be put in place, what restriction on use and access will be developed and how recurrent costs will be covered. In the lack of such measures, one would expect that dunes may become active again. The risk would be especially high during the next severe drought. If this were to happen, not only would the positive environmental impacts be lost, but the psychological impact could very well discourage local populations from ever again trying to stabilise the dunes.

**Negative impacts** The mechanical fixation of dunes requires large volumes of suitable plant materials for the construction of “fencing” materials. The prodoc specifies that doum palm (*Hyphaena thebaica*) leaves



and burning bush (*Leptodinia pyrothechnica*) branches will be relied upon. Needless to say, the availability of such trees and shrubs in the vicinity of live dunes is usually severely limited – such resources are frequently themselves in need of protection or regeneration. Harvest of such materials may actually accelerate the degradation of the sites where they are harvested. There are no known management systems in place that would ensure their sustainable harvest.

**Risks posed by the use of invasive species** The project proposes to primarily use *Prosopis* spp. for biological fixation of dunes. *Prosopis* is the principal tree used for this purpose in Niger, and, almost certainly, the principal species used successfully for dune fixation all across the Sahel. It has been widely promoted by donor projects over the past 20 years for reforestation, fuelwood, agroforestry and dune fixation.

*Prosopis* can also be a highly invasive species. The Assessment Team has seen it behaving as a successful invader on sites in Niger, Chad and Cameroon. It can frequently invade highly degraded sites that have little or no vegetation at all – sometime sites with less than 300 mm of rainfall. In Sudan, it has invaded irrigated rice fields. In Niger, it has been highly invasive along stream banks in the Majia Valley. It has invaded parts of the shorelines of Lake Fitri forming dense stands. It is so widely established across the Sahel, that it would almost certainly be extremely difficult, if not impossible, to eradicate. Its seedpods are eaten by livestock that disseminate its seeds widely. It is undergoing rapid expansion of its range into new ecological niches across the Sahel. *Prosopis* will almost certainly become a prominent feature of many Sahelian landscapes and ecosystems in the future.

There are probably no habitats or ecosystems in the pilot project area that can be considered to be anything close to “natural”. However, native species of trees and shrubs are still dominant throughout most of the project area. *Prosopis* appears to be much more aggressive in regenerating on many sites than these native species – and will, to an unknown extent, replace, or reduce the importance of, these native species. Introducing *Prosopis* for dune fixation will certainly accelerate this process – but the process itself must be considered largely inevitable.

### ***Social Impacts***

The social impacts of dune fixation will be a function of what sort of management systems and/or restrictions are put into place. These are not specified in the project document, but they will be critical for the long-term success of this effort.

#### **Positive impacts:**

- The protection of high value infrastructure, fields and pastures from dunes and sand encroachment. This will have positive economic impacts and will increase food security.
- Sand dune fixation may restore some or all of the productivity of areas that had lost nearly all productive capacity. Stabilised dunes can potentially produce wood and secondary forests products, forage and browse for livestock (under controlled management systems), wildlife habitat and other goods and services. Such use, however, will need to be very carefully controlled and monitored – one must consider the restabilized dunes to be much more fragile than dunes that have never become active in recent decades. Harvesting wood products from species that sprout readily from the stump can probably be done sustainably with little risk – if done properly, it may actually improve canopy cover and diminish wind erosion. The development of sustainable grazing systems on stabilized dunes would be much more difficult and risky, but not necessarily impossible.
- The stabilisation of dunes can play a critical function of demonstrating that desertification can be reversed by local populations. The development of live dunes is perhaps the most dramatic example of desertification and degradation of natural resources. Successfully fixing a dune can go a long way to counter the fatalist notion sometimes encountered that desertification is “an act of god” that one is fated to accept. Successfully fixing a dune may help convince people that they can also reverse forest degradation, depletion of fish stocks, disappearance of wildlife, decrease in soil fertility, etc.

**Negative impacts:** If no long term management system is put in place, the positive environmental impacts will be lost and the positive social impacts along with them. If the stabilised dunes were to become active a second time, this could be highly demotivating to local populations.

## 6.4.2 Range Management and water point development

### 6.4.2.1 Description of the proposed activity

The Assessment Team strongly supports the proposed development of range management systems as one of the most critical activities needed to reverse the degradation of natural resources in the project area. However, the project document provides almost no information about how this will be done. It speaks of a strong involvement of transhumant pastoralists. It proposes to make use of traditional knowledge on the management of pastoral resources. It speaks of involving all stakeholders in the “assisted regeneration” of rangelands. Water points will be developed in association with the range management systems. The project also proposes to develop an information system to inform herders about the availability of pastures. However, none of this provides enough information to enable us to assess the impacts of this activity.

At this point we must make some basic assumptions about what the range management entails. Range management is one of the least developed technical disciplines in Africa. This is probably due in part to the fact that the two principal ex-colonial powers do not themselves have extensive pastures or rangelands – range management is relatively undeveloped in universities and technical services.

Range management is based on the basic biology of the preferred forage and browse species. Grazing must be controlled in such a way as to favour the reproduction and growth of these preferred species. There must be an empowered management body/structure that has control over access to the rangelands. It means that this management structure must be able to control the timing of range use by livestock. It may require control of livestock numbers. It means that herders moving through the area must abide by the rules for rangeland use that will be put in place by the management body to be developed – and that the management body will have the authority to apply these rules.

Similarly, we assume that water point development will be fully integrated with the range management system. The same management structure will control both water and range resources. The severe degradation that so routinely occurs around water points across the Sahel will be avoided by including the pasture areas close to the water points in the overall range management system.

In any case, open access grazing is totally incompatible with range management. Range management will require a radical change in the present access rights and use systems.

### 6.4.2.2 Analysis of the environmental and social impacts

#### *Environmental impacts*

**Positive impacts:** From the environmental perspective, range management can be expected to have several positive impacts:

- Increased soil cover and increased biomass production;
- Increased diversity of herbaceous and woody species. Overgrazing leads to the decrease and disappearance of preferred forage and browse species;
- Greatly decreased wind erosion.
- Decrease and/or reversal of dune activation. Range management on fragile sites that are susceptible to dune activation should prevent this from occurring in most cases. Range management should be a key element of sand dune stabilisation and of the sustainable use of areas that have been stabilised;
- Improved habitat for wildlife.

On heavier soils in other parts of the Lake Chad Basin, part of the rainfall received runs off into streams and part infiltrates where it contributes to plant growth and to ground water recharge. The coefficients of infiltration and of runoff are strongly influenced by the amount of vegetative cover. Cover is strongly influenced by range management. On such sites, range management would have significant environmental impacts on the hydrologic regime of streams draining the managed area. The LCBC should be aware that

range management can be a powerful tool on such sites for influencing ground water recharge and stream hydrology (Decrease in flood peaks, etc.).

**Negative impact on groundwater recharge:** On very sandy soils, all rainfall soaks into the ground, whether or not the site is degraded. This is the case in most (perhaps for all) of the pilot project area. Range management may have some negative impact on ground water recharge in the project area. This is because the increase in vegetation cover that will result from range management should lead to an increase in evapotranspiration. Increases in woody vegetation would have an especially strong impact. Deep-rooted evergreen species continue to transpire throughout the dry season. Increases in perennial grasses would also increase evapotranspiration. Although the impact of decreases in ground water recharge might be considered negative, they should also be considered natural. The present degraded condition of the rangelands is not natural.

### ***Social Impacts***

**Positive impacts** Range management would have a range of positive socio-economic impacts that would include:

- Restored productivity and quality of pasture for livestock;
- Increased production of secondary products from trees, shrubs, perennial grasses;
- Increased food security;
- Increased confidence of local people that they can positively influence their environment and their production systems. A successful range management pilot should serve to convince people that it is possible to reverse resource degradation. Some people in the project area don't believe that overgrazing is a problem. They believe, rather, that degradation of resources is a result of decreased rainfall –that whether it rains or not depends on the “will of God” and is beyond human control.

**Risks of negative impacts** that have been identified as potential impacts<sup>14</sup>:

- **Risk that transhumants may be “left out”** Because of their mobility, there is a risk that some indigenous transhumant herders may be underrepresented or unrepresented in the range management planning and implementation. Some transhumant herders are commonly not present in the project area during parts of the year. If project start-up occurs during a severe drought year, some transhumants who routinely use the project area during good rain years, may not even be present.
- **Risk of conflict generation** Range management necessitates radical changes to traditional methods of resource use. In particular, it necessitates an end to open access to range resources. Open access may be the most equitable of all resource use systems, but it also the most destructive. All herders will have to abide by the new rules that will be put into place. It is unrealistic to believe that all parties will be in full agreement. The risk of conflict is inherent in such a radical change in resource access rights. It is a necessary risk that one must seek to minimise.
- **Risk of to women/disadvantaged groups** Some livestock owned by sedentary villagers are allowed “free range” for all or part of the year. They are allowed to run free and are not accompanied by a herder. Range management will require that all animals must be herded. Although the total manpower needed for herding under a range management scheme may be reduced (because flocks may be groups together), the costs may be increased for those who previously invested little or nothing in this activity. The costs might be especially difficult for women or disadvantaged groups who may only have a very small number of animals and who traditionally let them run free unattended.

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<sup>14</sup> It must be emphasised that they won't necessarily occur. They are risks.



## 6.5 Proposed Environmental and Social Mitigation Measures

The project gives clear indications of possible approaches to rangeland management through the negotiation of access rights and responsibilities to specified communities. However, as yet no specific communities or areas have been identified. The project should take into account the guidelines on participatory planning and stakeholder involvement in drawing up these management plans. The need to include minority and disadvantaged groups is specified in the draft OP/BP Involuntary Resettlement.

### 6.5.1 Integration of Dune Fixation with Range and Forest Management

A number of negative impacts and risks can be avoided or mitigated by fully integrating the dune fixation component of this project with the range management component and by expanding both to include “forest” management. Uncontrolled open access grazing is one of the leading causes of dune activation. Once dunes become partially or fully active, even relatively low-intensity open access grazing effectively prevents grasses, shrubs and trees from re-establishing themselves and restabilizing the dune – even in good rainfall years.

Live dunes and severely degraded sites should be integrated in the area under range management. As part of the range management system developed, severely degraded areas should be closed to grazing and most extractive use activities (cutting of fuelwood and construction materials, thatch harvest, etc.) should be stopped until the sites recover. As they recover, more and more uses may be allowed as appropriate.

Such an approach is the only way to achieve positive environmental impacts on a significant scale. In the Diffa Department, there are hundreds of square kilometres of live sand dunes that have become unstable in the last 30 years. They cannot possibly be treated with the techniques proposed in the project document. It is only through putting an end to open access and the development of management systems that one can hope to restabilise these dunes under the climatic conditions that have prevailed since 1967.

If one can keep livestock off of the live dunes, then one can test other much more cost effective techniques of re-establishing vegetative cover to fix the dunes in place. A variety of direct seeding techniques could be used. The government of Mauritania has reported quite spectacular success in aerial seeding of four or five tree species on live dunes in areas with as little as 50 mm average annual rainfall – in areas where no livestock are present.

If species like *Prosopis* are used for dune stabilisation, they will very quickly develop into a resource that can be harvested for construction wood, fuelwood and other things of value under a simple management plan. *Prosopis* sprouts very readily from the stump and is easy to regenerate. Management systems can be developed for all of the tree and shrub resources within the range management area. There is now a wealth of forest management experience in Niger, Burkina Faso and other countries upon which to build. Adding a forest management component should be done to ensuring that this key component of the ecosystem is restored and used sustainably. Sustainable harvest of wood systems can generate revenues for the management structure and for the user groups that harvest products under the management plans to be developed.

### 6.5.2 User Fees to Ensure Sustainability

To sustain this pilot interventions beyond the end of the project, it is critical that the management structures to be developed generate adequate revenues to cover maintenance costs, capital replacement (pumps, boreholes) and other management costs. The project document makes no mention of this. The water points to be developed presents the clearest need for this. Boreholes will be put in and equipped with pumps. The pumps have operating and maintenance costs and must periodically be replaced.

Niger has a relevant policy to confront this need. The government there instituted a policy in 1992 that requires that a water point user association be created. The association must develop a system of generating revenues to cover such costs. Generally the water point management authority charges fees to those who use the water.

This principle should be expanded to the range resource. The range resource has value. Managing the resource involves costs. The management structure should charge users fees for the use of the resource. Fees can also be used as a management tool to limit the use of the resource as needed – to avoid.

### 6.5.3 Fully Exploiting Lessons Learned by Others

Failure of the range management effort could have a serious impact in discouraging LCBC partners to undertake future attempts to reverse the degradation of the rangeland resources. One should not underestimate the challenge of developing successful range management systems in the Sahel. Tens of millions of dollars were invested in the 60s, 70s and early 80s in failed range management efforts in the Sahel. Failure was so universal that most donors withdrew from the sector. Most of the early attempts involved western style fenced ranches – generally run by government agencies instead of by local herders. In retrospect, these early efforts appear rather naïve.

The best way to mitigate the risk of failure is to do the best possible job of building upon lessons learned by those few who continue to work in the range management sector. It appears that some of greatest successes in the field have come out of the Pilot Pastoral Project (PPP) sponsored by the World Bank. This consists of a network of field pilot efforts in about five Sahelian countries – including both Chad and Niger. These activities have been running for about 4-5 years.

The management system is based on the basic biology of the preferred forage species at each site. Management authority is in the hands of a management structure composed of the herders that use the resource. The management system involves the division of the area to be managed into a variable number of grazing parcels (the number is a function of the biology of the forage grasses). Only one parcel is open to grazing at a time. The rotation system allows preferred range grasses on each parcel to complete their full reproductive cycle producing mature seeds favouring the reproduction of these preferred species. The rotation is achieved without fencing – all animals are accompanied by herders that keep them in the parcel that is currently open for grazing.

The PPP has had very significant success in increased vegetative soil cover, increased forage production and improvement in species diversity. During a fairly severe drought at one of the sites in Niger about three years ago, the PPP site generated a good deal of interest because it was the only site in the whole area that had forage throughout the whole dry season.

The PPP is certainly one of the most promising approaches to study – there may be others. In analysing and adapting the best approaches, it is critical that herders from the pilot project areas be included amongst those who visit the pilot sites of these ongoing projects.

## 6.6 Proposed Monitoring and Evaluation Indicators

The project proposal indicates that it will implement a pasture monitoring and evaluation system for the whole of the project period. The system will be implemented with pastoralists and their representatives, to provide information on forage availability.

However, this is only one of the proposed project activities and if the integrated approach recommended in this report is adopted, then this should be reflected in an integrated monitoring system covering controlled access to rangeland, regeneration of vegetation on dunes, and access to boreholes.

As a starting point, the project will need to document the process of negotiating and formally handing over rangeland access rights and responsibilities to communities.

The key impact of the proposed interventions should be improved vegetation cover. The approach should be to evaluate change in soil cover by vegetation, forage production, species composition and abundance. The PPP has developed an effective monitoring system for these and other parameters – they should be consulted and the monitoring system developed should be compatible with the PPP if possible to facilitate comparison of impacts. Subjective evaluations by herders can be supported by simple transect surveys. The use of fixed point photography can contribute to a monitoring programme over a number of years.

The project is also proposing to construct boreholes to supplement existing water supplies. The water depth and quality in these should be monitored over the season, along with the animal numbers using each water source.

## 6.7 Participation of Key Stakeholders in Project Preparation

The Assessment Team visited Diffa and Nguigmi in Niger but was not able to visit sites in Chad. The Team was able to confirm that the consultant who developed the project document did travel to Diffa and did meet with government technical services in the zone. We weren't able to confirm that he met with rural user groups, but this is not surprising given that there is no contact list in the project document of those that he may have met with.

The key will be to ensure that all stakeholders are involved in the development of agreements on rangeland access in the implementation stage of the project, and in negotiations with government on formalising access rights.

## 7 The Lake Chad Shorelines

### 7.1 Baseline Information

#### *The Project Area*

The project area is defined as the shoreline of Lake Chad and the lake body itself. However, given the extremes in the fluctuation in the depth/extent of the lake (less than 3000 km<sup>2</sup> to over 25,000 km<sup>2</sup> over the past several decades), the actual project target area is unclear. As an example, the southern part of the lake is more like a delta than a conventional lake. The “northern pool” is more like a conventional, though shallow, lake, but it only fills from overflow from the southern pool. During all of the 80s and most of the 90s, this never happened and the northern pool remained dry. It has received waters again in some of the past few years. Overtime, land that has been dry for decades can become a shoreline, a wetland or open water.

The hydrology of the lake is quite unique and is not fully understood. 120 species of fish have been recorded in the lake. The importance of the lake and its wetlands for migratory birds makes it a site of global biodiversity importance

Cropping on the lake bed and recessionary agricultural have become much more important in the recent decades of decreased rainfall and lake levels. There are no traditional tenure systems for this and conflicts are common. Large numbers of livestock use the lake bed and the wetland margins in the dry seasons – conflicts are also common between herders and farmers.

#### *Project Description*

In July 2000, the Heads of State of the LCBC declared Lake Chad a “*Transboundary Ramsar site of International Importance*”<sup>15</sup>. However, as yet none of the countries have designated any specific sites around the lake.

*The project will seek to promote the sustainable use of the natural resources of Lake Chad and its shores by developing an overall agreement between the various owners, occupiers and interested parties through the Ramsar management planning process. Ramsar contracting parties are expected to formulate and implement their planning so as to promote the conservation of wetlands included in the (Ramsar) List, and as far as possible the wise use of wetlands in their territory.*

### 7.2 Activities with Significant Environmental and Social Impact

#### *Project Objectives*

The stated wider objective of the project is:

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<sup>15</sup> With the support of the Ramsar Bureau and the Living Waters Campaign of the World Wide Fund for Nature (WWF).

*To maintain biodiversity and achieve the long-term sustainable use of the natural resources of Lake Chad and its shores.*

One immediate objective is defined as:

*To sustainably manage the natural resources of the Lake Chad and its shores by providing support to the development and implementation of a management plan according to the guidelines developed by the RAMSAR convention.*

The project proposes to carry out the management planning exercise at two levels, producing:

- *A management plan and monitoring scheme for the Lake Chad and its shores produced according to RAMSAR guidelines;*
- *Natural Resources-use action plans and sectoral codes of conduct developed and implemented in 4 – 6 communities selected according to agreed criteria. (Clearly this will not suffice for the achievement of the immediate objective)*

Effectively the first component is part of the overall project development of the Strategic Action Programme, dealing at the macro level with regional/national lakeshore conservation priorities.

The National RAMSAR desk officer in each country will implement the local planning exercises through the national agencies in which they are based.

The second level is site specific, with the “*development and implementation of community-based natural resource-use action plans*”. The emphasis of this planning exercise is “*...voluntary agreements on sectoral codes of conduct ... in the sustainable conservation of the sites*”. The implication is that the local action plans will include the community acceptance of restricted access to certain resources or resource areas, but with additional or alternative benefits developed for the affected communities.

However, as yet no specific sites have been confirmed, although Nguigmi in Niger and Bol in Chad have been suggested.

### ***Activities with Significant Impacts***

The only direct action proposed by the project that could have environmental and social impacts is minor funding for unspecified interventions:

- Provide seed funding for highest priority initiatives identified in the community action plans, within limits of current project resources.

The “*development and implementation of community-based natural resource-use action plans*” will probably have both environmental and social impacts. However, the project design does not even specify what type of resources will be managed – fisheries or stands of cattails or lake bottom for recessionary agriculture or wetlands pasture resources or other.

## **7.3 Safeguard Policies**

The management plan and action plans will invariably have to address question of access rights to the lake, its wetlands and its shorelines. Attention will need to be paid to safeguard policies on 4.20 Indigenous Peoples and 4.30 and the draft OP/BP 4.12 Involuntary Resettlement as they relate to access rights to resources and usufruct rights.

This is particularly relevant as it can be expected that the proposals, based on RAMSAR guidelines will include protected area management, with restricted access rights negotiated with site specific communities.

Lake Chad is an international waterway, but OP 7.50 – Projects on International Waterways is not triggered as the project is not expected to adversely impact on the quantity or quality of water in the lake.

## 7.4 Environmental and Social Impacts

### *Environmental Impacts*

As presently designed (the prodoc does not even specify which resources will be managed, how or by whom), it is impossible to determine if the Shorelines pilot will result in any significant environmental impacts. At this point, no significant environmental impacts are expected from this project. Any negative trends in the degradation of the resource base of Lake Chad will be expected to continue.

### *Social Impacts*

This pilot project strongly emphasises a participatory planning approach to develop strategic and sustainable actions designed to reverse current resources degradation. This would yield significant benefits for the overall process of future projects design and implementation, as well as for the various stakeholder groups involved. If well designed these projects could foster ownership and accountability for project results on the part of the various stakeholder groups. They could also address social equity issues brought about by the proposed action plans and mitigate their adverse impacts on marginalized and vulnerable groups, including women, youth and elderly people. However, as in any planning process, there are potential risks that could affect project performance and sustainability. The project document does not make it clear who is to manage Lake Chad and its shorelines or what the roles of the different community and user group stakeholders will be in its management. There is a risk in engaging rural stakeholders over a period of years during which no concrete changes are brought about in their lives. As people are engaged, expectations are raised. The risk is that people will eventually become disillusioned and uncooperative if nothing concrete comes out of the process.

Given the lack of traditional tenure systems over the present shorelines, it is not clear how access rights and management authorities will be defined and developed. This will be a critical issue in project development, because all forms of natural resource management require the definition of resource access rights and the development of an empowered management structure or structures. Funding will need to be secured for the implementation of the management plans. However there is no guarantee that funding will be obtained.

## 7.5 Participation of Key Stakeholders in Project Preparation

The full project proposal presents a rather long list of people consulted Nigeria, Niger, Cameroon and Chad in developing the proposal. However, they are all institutional stakeholders – no community or user group representatives from the lake were included. Given that the actual project sites have not been defined, it would not be possible to hold discussions with those who would be directly involved in the natural resource use action plans. This aspect will need to be addressed as a high priority in developing these lake shore management proposals. The project should initially draw on the proposed mechanisms for participation and conflict resolution mechanisms in the DFID funded “Jigawa Enhancement of Wetlands Livelihoods Project”, and on the previous activities carried out on the Waza Logone and Hadejia Nguru projects. The lack of traditional land tenure/resource access rights and the mobility of the “shorelines” will make this pilot project especially challenging.

## 8 Lake Fitri

### 8.1 Baseline Information

#### *The Project Area*

Lake Fitri is located 300 km north-east of N’Djamena. Like Lake Chad, it has no outlet, and like Lake Chad, it is not salty. The project area is completely within Chad and has no direct transboundary component. The annual rainfall is around 3-400 mm and highly variable. The lake is fed by the Batha River that provides around 60% of the annual inflow, and by direct rainfall and local run-off. During periods of low rainfall the lake can dry up, this has happened most recently in 1991, and previously in 1985 and 1913.

Following a series of waterfowl counts in the mid-1980s, attention was drawn to the biodiversity value of the lake. In 1987, the lake was declared a RAMSAR site. IUCN became involved in 1988 and assisted the Government of Chad in registering Lake Fitri as a “Biosphere Reserve” in 1990. The project document defines the project area as the Biosphere Reserve of Lake Fitri, which includes rainfed land around the lake giving a total area of 195,000 ha.

The key global conservation importance is the very high populations of seasonal migratory birds and afro-tropical waterfowl. The lake environment also supports the endangered Red-fronted gazelle (*Gazella rufifrons*) and there are reports of Roan (*Hippotragus equinus*) and Tiang (*Damaliscus lunatus*) antelopes, as well as Lion, in the wooded area south of the lake. This area also harbours a small elephant population.

There are two main groups that use the lake and the surrounding areas: sedentary Bilala farming communities and transhumant Arab pastoralists. The lake and surrounding areas fall under the traditional authority of the Sultan of Yao.

Access to resources was traditionally controlled by the Sultan of Yao, and there are some aspects of natural resources management that are still relatively tightly managed. The most obvious example is fisheries, with the use of nets banned, a closed season from September to November and permitted fishhook sizes regulated. Less satisfactorily, the traditional system of limiting access to the lake and shore grazing for transhumant pastoralists to a period late in the dry season, has broken down. The rainfall of the area is marginal for sustainable rainfed agriculture, but rainfed agriculture continues to expand and conflicts between sedentary agriculturalists and transhumant herders have multiplied.

The increase in the area of recessionary agriculture in the dry season has also resulted in more conflict between transhumant pastoralists and sedentary farmers. Recently, there have also been conflicts between groups of pastoralists over the control of wells – resulting in significant bloodshed.

Clearly there are already issues of access rights and conflicts between pastoralists and sedentary farmers and between different groups of pastoralists. The project proposes to develop management plans at various scales that will involve negotiation between different user groups, and advocacy to maintain the rights of minority groups.

## 8.2 Activities with Significant Environmental and Social Impact

### *Project Objectives*

The goal (global objective) of the pilot project is *“To manage sustainably the natural resources of the Lake Fitri area for the benefit of wildlife populations and rural communities.”*

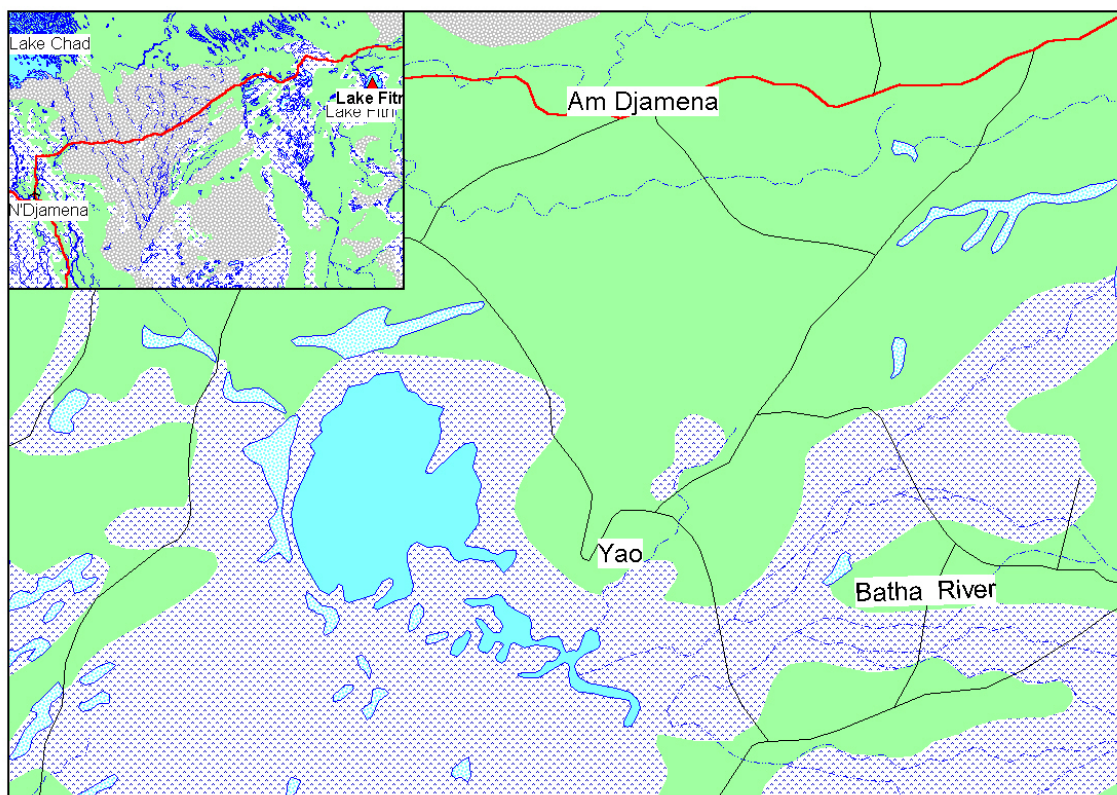
Over the three-year project period, the project objectives can be summarised as:

1. Achieving a general consensus on the future management of the Lake Fitri ecosystem, based on the interests of the local population groups and international conservation values;
2. Formulating a management plan, including identifying bottlenecks [It is not clear what this means] in the Lake Fitri catchment area that threaten the lake’s future water provision, and proposing strategies to deal with them<sup>16</sup>;
3. Demonstrating the “cross-pollination function” of conservation and development, in the context of a small water body in Sahelian Chad

The only safeguard policy that could potentially be triggered by this project is OD 4.30 or draft OP/BP 4.12 Involuntary Resettlement, given that there are already conflicts over access rights to lake shore and hinterland resources.

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<sup>16</sup> This would appear to extend the potential project interventions to the whole of the Lake’s watershed, most of which is outside the present project area. The meaning of bottlenecks in this context is not clear, but is understood to mean environmental and social issues that threaten the integrity of the lake system.



**Figure 4 Lake Fitri**

The project should be guided by the greater details given in OP/BP 4.12 on the need for participatory processes in drawing up the plans for managing access rights. This specifically refers to the need to take account of the needs of minority groups including women and children. This will clearly need to be extended if the project extends to the management of the larger catchment.

The project may also include the establishment of formal protected areas in and around the lake area, again this will raise issues of access rights, and hence negotiation with local communities.

#### ***Activities with Significant Impacts***

The focus of the project is compilation of existing studies, the holding of a “seminar”, the conduct of new studies, dialogue with stakeholders, the formulation of a management plan, approval of the plan, and the establishment of a management platform, although this is not clearly defined.. None of these would have any direct impacts.

The project has two minor unspecified activities that may have direct environmental and social impacts:

- Small-scale development activities, priority should be given to problems linked to ecological issues. These are likely to build on and link with activities promoted by the NGO SECADEV.
- Small-scale conservation inputs – as yet unidentified.

The “*small-scale development activities*” would be undertaken for the purpose of gaining the confidence of the local population groups. These would be identified through *village problem assessments* to be conducted after project start-up. The activities already conducted by the NGO SECADEV are cited as examples. These concern health, animal health and agriculture. By definition, such small-scale development activities would normally not have any significant environmental or social impacts.



A potential exception would involve the introduction of exotic species into the project area. The NGO SECADEV has already done this with the introduction of promotion of *Prosopis* (mesquite). *Prosopis* is frequently an invasive species that can sometimes have serious environmental and economic impacts. *Prosopis* seems to be at least mildly invasive in the Lake Fitri area. A dense stand of *Prosopis* is developing along the shoreline at Yao's little "port". However, this is only speculation. The introduction of exotic species that could potentially be invasive is not mentioned as a potential activity in the project document.

As presently designed, the Lake Fitri pilot is not expected to have any significant environmental or social impacts.



**Photo 6 Dense Stands of *Prosopis* Established on the Shore of Lake Fitri**

### **8.3 Environmental and Social Impacts**

#### ***Environmental Impacts***

No significant environmental impacts are expected from this project. Any negative trends in the degradation of the resource base of Lake Fitri will be expected to continue during the life of project.

#### ***Social Impacts***

This pilot project strongly emphasises a participatory planning approach to develop strategic and sustainable actions designed to reverse current resources degradation. This would yield significant benefits for the overall process of future projects design and implementation, as well as for the various stakeholder groups involved. If well designed these projects could foster ownership and accountability for project results on the part of the various stakeholder groups. They could also address social equity issues brought about by the proposed action plans and mitigate their adverse impacts on marginalized and vulnerable



groups, including women, youth and elderly people. However, as in any planning process, there are potential risks that could affect project performance and sustainability.

There is a risk, however, in engaging rural stakeholders over a period of years during which no concrete changes are brought about in their lives. As people are engaged, expectations are raised. The risk is that people will eventually become disillusioned and uncooperative if nothing concrete comes out of the process. The risk may be especially high at a site like Lake Fitri that has seen many exploratory missions visit Yao. A number of field studies have been funded and conducted, but no donor-funded project (other than very small-scale activities done through the NGO SECADEV) has ever been executed.

Funding will need to be secured for the implementation of these plans. However there is no guarantee that funding will be obtained.

## 8.4 Participation of Key Stakeholders in Project Preparation

None of the stakeholders in the Lake Fitri area that the team met showed any convincing evidence of having been consulted in the development of this project. At a meeting with the representatives of four “*groupements*” and the head of the federation of seven “*groupements*”, there was some discussion on a consultant who had been in the area in late 2000, but this person had not discussed natural resource management with them (fisheries, range, wildlife, forest or wetlands management).

The Sultan of Yao, the traditional head of the sedentary Bilala people living around Lake Fitri, is arguably the most important individual stakeholder in this project. It is doubtful whether any project for Lake Fitri could be executed without his approval. He had never heard of this project and said he had not met the consultant who prepared the project document (although the Sultan is listed on the top of the list of persons contacted in Yao). The Sultan showed the team bound copies of three IUCN reports from the late 1980s.

Significantly the Sultan of Yao stressed the issue of outside organisations coming to the lake, carrying out studies and preparing reports and disappearing, leaving the communities with raised hopes but then no actions.

The Sultan told the team that their principal concern in the area is the continued existence of the lake itself. This, of course, depends on the management of the lake’s watershed. It is not clear that the watershed will be included in the proposed project.

The project proposal suggests SECADEV as a potential partner. SECADEV is the only significant national NGO operating in the Lake Fitri area, and has a centre in Am’Djamena Bilala. The Assessment Team discussed the project the two SECADEV professional staff in Am’Djamena. However, they had both just been posted there and knew nothing about the project. They said they would definitely be interested in collaborating with the project. They would appear to be a good potential partner, but it is doubtful that they could take the lead in developing natural resource management systems for the lake and its surroundings.

## 9 Upper Chari Basin Transboundary Pilot

### 9.1 Baseline information

#### *The Project Area*

The boundary used for planning purposes by the Lake Chad Basin Commission, described as the “new conventional basin”, specifically includes the upstream components of the Chari-Logone and Komadougou-Yobe river systems. Lake Chad receives the majority of its water from the Chari River system and its tributaries, Bahr Aouk, Bamningui, Bangora, Gribizi and Ouham.

The Chari pilot project site is defined loosely as the entire upper catchment of the Chari River, lying within the Central African Republic and Chad.

### ***Project Description***

The project focus is on establishing the basic data sets and monitoring systems that it expects to need for developing projects and managing project interventions in the upstream catchment. The identified areas of study include climatic, hydrological and ecological characteristics of the basin and an inventory of the different resources use and management systems, including: land use, wild life, fisheries, and birds.

It is envisioned that the project will be co-managed by two co-ordinators – one in Chad and the other in CAR – each with their team of experts, researchers, as well as their resource people from civil society. These two committees are to be involved in both the planning and implementation of the project.

## **9.2 Activities with Significant Environmental and Social Impact**

The specific objectives of the project are:

- Establish a transboundary co-ordination structure for the management of the Chari basin;
- Put in place a relevant and up-to-date database for water and land resource use systems in the basin;
- Incorporate available information on trans-boundary hydro-systems for CAR and Chad in the database and Lake Chad Basin Commission (LCBC) decision making processes;
- Identify and inventory eroded ecosystems;
- Elaborate an Information Education and Communication (IEC) program for the management of the Chari Basin; and
- Identify income-generating activities.

### ***Activities with Significant Impacts***

The project logical framework has eleven activities, none of which have any direct environmental or social impacts.

## **9.3 Environmental and Social Impacts**

### ***Environmental Impacts***

No significant environmental impacts are expected from this project. Any negative trends in the degradation of the resource base of the Upper Chari will be expected to continue.

### ***Social Impacts***

This pilot project proposes a participatory planning approach to develop strategic and sustainable actions designed to reverse current resources degradation. This could yield significant benefits for the overall process of future projects design and implementation, as well as for the various stakeholder groups involved. If well designed these projects could foster ownership and accountability for project results on the part of the various stakeholder groups. They could also address social equity issues brought about by the proposed action plans and mitigate their adverse impacts on marginalised and vulnerable groups, including women, youth and elderly people. The project could use as a starting point, the guidelines on participatory process and conflict resolution mechanisms given in the relevant Operation Directives and Policies (OD 4.30 and the draft OP/BP 4.12 on Involuntary Resettlement).

There is a risk, however, in engaging rural stakeholders over a period of years during which no concrete changes are brought about in their lives and production systems. As people are engaged, expectations are raised. The risk is that people will eventually become disillusioned and uncooperative if nothing positive for them comes out of the process. Funding will need to be secured for the implementation of any plans that are developed. However there is no guarantee that funding will be obtained.

## 9.4 Participation of Key Stakeholders in Project Preparation

The CAR-Chad transborder pilot project appears to have been unilaterally developed by a national consultant in conjunction with the CAR “Direction de l’Environnement” (Directorate of Environment), the GEF focal point in the country.

Following discussions held with the CAR representative at the Steering Committee meeting at LCBC in October 2001 in N’Djamena, the Central Africans organised a meeting between Assessment Team members and stakeholders in Bangui. The majority of the stakeholders at the meeting were staff from the Ministry of Environment. There was also a representative of WWF and two political appointees from the proposed project area within CAR: the Mayor of Bossangoa, who deals mostly with administrative matters and a national congress (Assemblée Nationale) member, and a representative of N’Délé, a province covered by the project site. Local community and resource user representatives were not present at the meeting.

It appears that no other stakeholder groups, among bilateral organisations or civil society, were involved in project preparation. On several occasions participants claimed to have not seen the project document nor to have been contacted to provide any inputs in its preparation.

The proposal stresses the transboundary nature of the project. However, project preparation has only involved the Central African Republic. In the CAR, project preparation has involved very few people besides the director of environment, the director of regional programs and a consultant.

The Ministry of Environment referred to the project proposal as an “avant-projet” – a preliminary draft of a pre-project document.

## 10 Linking Pilot Projects to the SAP/TDA

### 10.1 The TDA and the SAP

Two of principal outputs of the full project are the TDA and the SAP. The GEF Operational Programs in the International Waters (IW) recommends that “transboundary concerns are defined by neighbouring countries in a transboundary diagnostic analysis”. Furthermore, one should “*formulate a Strategic Action Program (SAP) of actions each country needs to take to address the priority transboundary concerns... and to leverage non-GEF resources for implementing both baseline and additional actions*”.

The **Transboundary Diagnostic Analysis** for this project should include the following key components:

- Identify and prioritise problems/issues relating to the degradation of land and water resources within the Basin, focusing on transboundary problems and issues;
- Identify and analyse root causes of land and water degradation;
- Inventory of what works/what doesn’t work for reversing land and water degradation and for sustainably managing water resources, rangelands, forests, fisheries, wildlife and agricultural lands;
- Identify & analyse successful approaches/projects/pilots/traditional systems
  - Distil lessons learned and identify enabling conditions for success in reversing natural resource degradation
- Define priorities and objectives for reversing natural resource degradation. This should include priorities by natural resource sector and by geographic region within the Basin.

The **Strategic Action Program** should emphasise:

- Co-management of international water resources of the Basin;
- Sustainable management of natural resources based on TDA priorities and objectives;
- Sustainable, productive agriculture in priority zones of the watersheds.

- All of the support measures needed (capacity building, policy reform, sustainable funding, etc.) to support the above.

## 10.2 Role of the Pilots in Support of the SAP

The principle role of the pilot projects should be the development/testing/adoption of sustainable natural resource management systems on a small scale to identify those that are best suited for large scale application in the SAP. Proven and promising sustainable NRM systems will be critical to the SAP. But the present level of development natural resource management systems in the Lake Chad Basin is very low.

### *State of the Art in NRM*

There is very little management of natural resources in the Lake Chad Basin. The present natural resource use systems are characterised by de facto open access to resources i.e., no management at all. The following is a very preliminary analysis of the present “State of the Art” for sustainable NRM in the Basin:

- Range Management – The World Bank-has funded the Pilot Pastoral Project (PPP) for four to five years in both Chad & Niger. Early results of the community-based management approach are very promising, but no one has yet attempted to replicate and adapt these pilots to new sites.
- Natural forest management – Harvest of wood products from natural forests is regulated by national forestry services through permit systems. This should not to be confused with management systems that ensure adequate regeneration of the resource harvested. Natural forests subject to such permit systems are undergoing severe degradation all across Africa. The Team was unable to identify any pilot natural forest management initiatives in the Basin. Burkina and Niger (outside of the Basin) are leaders in natural dry forest management in Africa – both countries have developed very successful community-based management approaches. Burkina has over 550,000ha under management.
- Fisheries management – There are very promising/successful, but isolated, examples of good fisheries management to build upon. The traditional system controlled by the Sultan of Yao at Lac Fitri in Chad seems to be an exceptionally successful case. There is a very successful example of community-based river fisheries management involving three villages on the upper reaches of the Chari River in Chad (at Nyala or Nyalama??). There may be others.
- Wildlife management – We are unaware of any ongoing pilot initiatives. The UNDP/GEF Manda project in southern Chad proposes to include a community-based wildlife management component.
- Wetlands management (for extractive uses of wetland resources) – None identified
- Groundwater management – None identified
- Watershed management – None identified
- Multiple use NRM/integrated NRM/environmental management – None identified. Most successful or promising examples of natural resources management across Africa remain limited to a single sector. There have been relatively few attempts to integrate management of multiple resources on the same site – such as managing the forest, range and wildlife resources on the same piece of dryland forest.

Once again the above analysis of the “state-of-the-art” for the Basin is very preliminary. The TDA will have to perform a much more complete inventory. But the Team would be very surprised to learn that the level of development is substantially better than this preliminary analysis would indicate. The pilot projects should play a critical role in developing sustainable natural resource management systems that can effectively reverse the degradation of land and water resources in the Basin.

Appendix B presents some suggestions from the Assessment Team on how the Effectiveness of the Pilots might be improved.

## 11 Public Consultation Strategy Plan

The GEF, World Bank and UNDP all have public disclosure policies. The 1994 Instrument for a restructured GEF states “...*GEF-financed projects shall provide for full disclosure of all non-confidential information, and consultation with, and participation as appropriate of, major groups and local communities throughout the project cycle.*”

The policy for disclosure of information on the Bank’s GEF operations goes beyond this and provides for more open access to GEF project-related information. In August 2001, the World Bank Disclosure policies were revised. The revised policy for GEF projects states “*Make EA report self-standing (and)...Make disclosure a prerequisite for beginning of appraisal*”. In addition, during project preparation factual technical documents will “...*continue to be disclosed by the country director...*”. It is assumed that these same criteria will apply to projects developed as part of the SAP and to the SAP and TDA themselves.

### 11.1 Disclosure of the Environmental and Social Assessment

The newly revised guidance for disclosure of Environmental Assessments requires disclosure prior to project appraisal. Appraisal has been scheduled for mid-January 2001. The Assessment report will not be completed until the beginning of January. It will then be translated into French. The Bank requirement for the disclosure of EA and SA reports could be accommodated through a stakeholders’ meeting to be organised by LCBC. This could be done in early January – or even in parallel with the appraisal mission. It is recommended that LCBC invite key stakeholders from all pilot project sites to a meeting in N’Djamena which would be attended by LCBC and national counterpart staff.

The following list of pilot project stakeholder groups is indicative of the range that should be invited to the stakeholder meeting:

- Waza Logone – IUCN, SEMREY, National Parks and community leaders (lamido) from the flood plain communities;
- Komadougou-Yobe/Hadejia Nguru – IUCN, Hadejia Jama’are River basin Development Authority, National Conservation Foundation, DFID, community leaders;
- Desertification SODELAC, representatives from the Ministry of Environment, Livestock, Water and Agriculture in Diffa and Nguigmi, the President of the Pastoralists Association in Nguigmi, community leaders from Bol, Liwa and Rig-Rig;
- Lake Chad Shoreline Management Plan – RAMSAR, representatives of lake shore user groups,
- Lake Fitri – The Sultan of Yao, the Sous-Prefet of Ambassetna, RAMSAR, SECADEV, leaders of the local Union of *groupements* in Yao;
- Upper Chari Basin – WWF, Ministry of Environment, non-governmental and other village representatives from project sites.

Stakeholders should be provided with copies of the pilot project proposals and with the relevant sections of the EA report in French or English as appropriate

### 11.2 Public Consultation and Disclosure During Project Implementation

The pilot project documents emphasise stakeholder consultation processes, as part of project development and in monitoring project performance. Indeed the main project has as a clearly identified output “*Strengthened engagement of stakeholders*”, with the first activity “*Create and provide resources ...for the engagement of stakeholders and key user groups at all levels*”.

However the linkages between pilot stakeholder consultation and consultation within the main project is less clear, despite the fact that in many cases it is likely to be the same stakeholder groups involved. While promoting this strengthened engagement of stakeholders, the project proposals are less clear about the actual role that this “*engagement*” has in guiding project management or in what the outputs from the consultation process will be. Nor is it clear who will manage this consultation process.

### 11.2.1 Public Consultation and the Pilot Projects

The Assessment Team found that stakeholder participation in pilot project preparation had generally been insufficient at the level of user groups and community groups. It is very important that measures be taken to correct this situation and to substantively involve these stakeholders in project development.

Although the guidelines are different for different levels of project intervention, the World Bank policies recognise the benefits of the involvement of stakeholders at all stages of the project cycle. This includes both the planning stages, and, during implementation, the management and monitoring – and if necessary, modification – of project interventions.

The World Bank Participation Sourcebook focuses on the use of participatory planning approaches to address poverty reduction at the macro-level. The concepts at the macro-level overlap with those being developed to promote Community Driven Development that has so far been most successful at the micro level.

The pilot projects include planning and management activities, and in most cases have identified possible stakeholder communities or project sites for project interventions. The one main exception to this is the Lake Chad Shoreline Project, which has not yet identified the proposed project sites round the lake.

A review of project experience with stakeholder involvement has indicated the following key issues that will need to be addressed:

- Groups should demonstrate a need and have a common interest in the outcome of the project;
- There is clear understanding of the benefits and desired changes to be derived from the project;
- The groups (or communities) have the capacity, leadership, knowledge and skills needed to manage the tasks for implementing the project;
- Groups (or communities) are capable of making and enforcing their own rules and regulations; and
- An inclusive decision-making process exists from the project design phase and throughout the project life.

Many of the communities around the lake have their own clearly defined representative organisations that provide effective channels for communicating local preferences. Traditional leaders occupy pivotal positions for mobilising people and should be brought into the planning and management process, with due concern for ensuring genuine representation of the stakeholders. Other communities do not have representative structures or traditional leaders that can speak for them. No foolproof methods exist to guarantee full local-level participation.

Each pilot project will have to define its own community management structures depending on the communities involved and the resource base that they will manage.

### 11.2.2 Consultation in the Preparation of the TDA and the SAP

As previously indicated the GEF sees the development of the TDA and the SAP as essentially a process of consultation with stakeholders at all levels.

The GEF emphasises the need for country participation and country commitment to the preparation of the TDA and the SAP.

*"The centrepiece of the GEF strategy... is the concept of "strategic joint fact finding" as a means of arriving at a consensus on what actions are needed to address threats... collaborating states establish technical teams that work to establish a common baseline of facts and analysis of the problem in the form of a transboundary diagnostic analysis (TDA), which is then used to set (national) priorities for actions to address threats to international waters in the form of the SAP."*

The process involved will vary from region to region, largely in response to the capacity of existing national and regional institutions and the existence or otherwise of relevant treaties or conventions that can support the subsequent implementation of the SAP.

Building on the proposals that are in the document, it is recommended that the project support a national consultation process through the strengthened stakeholder steering committees and with representatives from these national stakeholder steering committees involved in regional level discussions.

As well as supervising the implementation of the pilot projects and the development of proposals for the community resources management interventions to be funded under the subsequent phase of the project, these groups could then be given a specific role in the development of the TDA and the SAP, feeding into the existing LCBC Basin Committee for Strategic Planning.

The management of these consultation processes will be a key task of the Project Co-ordination Unit.

A possible structure for public consultation process could involve the following components:

1. Creation of National Planning Teams with the following duties:
  - At the initiation of pilot project activities, managing a public workshop at the pilot project site to present and review the pilot project proposals
  - Supervising the implementation of pilot projects
  - Identifying key stakeholder groups at local and national levels, including the private sector, community based organisations and NGOs
  - Managing local and national workshops to develop three proposals in each country, for community based resource management projects to be funded in the next phase of the SAP<sup>17</sup>.
  - Managing national consultation workshops to develop national components of the TDA and the SAP and to clarify national perspectives on priority issues and opportunities
  - Preparing national reports as inputs to the regional consultation process.
2. Creation of a Regional Planning Team with representatives from the national planning teams, with the following duties:
  - Reviewing national information from the national planning processes, bringing together national perspectives on priority issues and development options within a regional transboundary framework
  - Preparing a regional Transboundary Diagnostic Analysis, which not only covers threats, but also identifies best practices and lessons learned from successful development interventions in the five countries and in other parts of the world.
  - Preparing a regional Strategic Action Programme which prioritises specific regional and national projects and identifies key agencies, communities and sites where development interventions should be focused.
  - Presenting the TDA and the SAP to the LCBC Basin Committee for Strategic Planning and to the Inter-ministerial Co-ordinating Committees for approval and subsequent endorsement.
  - Managing regional consultation workshops and donor conferences to review the TDA and the SAP and to gain donor commitment for future cofinancing.

The process of preparing the TDA and the SAP is recognised as being complex and will require a number of meetings at national and regional level, as well as the two proposed donor meetings to leverage support for future activities under the SAP.

The process of consultation will require facilitation by centrally recruited staff, to ensure that there is coherence in the approach adopted by the different countries.

It should be noted that there are significant cost implications to this public discussion process that are not covered in the present budget allocations.

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<sup>17</sup> Activity 3.3. in the main project document.

### **11.2.3. Identification of Lead Executing Institutions**

The executing institutions for the pilots will play key roles in the refinement and application of the public participation plans. The lead institutions that will execute the Desertification pilot, Lake Chad Shorelines, Lake Fitri and Upper Chari Basin have not yet been identified. One of the key steps remaining in project development is their identification. The World Bank ASPEN unit expressed a desire to see organigrams of responsibility for project execution. Obviously, this will not be possible until the lead executing agency is identified for each pilot.

## **11.3 Conflict Resolution and Management**

### **11.3.1 Need for a Framework for Conflict Resolution**

The need for greater public consultation among stakeholder communities in planning and implementing pilot projects has been discussed above.

However, there is an additional element to consultation that has not been emphasised: the role of consultation process in avoiding or resolving conflicts within and between communities, helping stakeholders with different interests explore and potentially find common interests. Part of the process of stakeholder consultation is establishing how conflicts will be resolved.

The underlying theme of the core project and the pilots is the need to reverse a pattern of land and water degradation. The causes of this degradation have been previously discussed, principally the decreases in the rainfall regime and unsustainable land and resource use systems. The effect of this is increased pressure on remaining resources and as a result increased potential for conflict over access to these resources.

These conflicts often arise because people have different uses for resources, such as forests, water, land or pastures. An example is the recurrent disputes between herders and farmers or between several groups of herders themselves in Lake Fitri watershed area. Disagreements also occur when the interests and needs of individuals or groups in a given social setting are incompatible, or when the priorities of some user groups are not considered in policies, programs and projects.

In situations where there are guidelines or legislation on improved management of resources, there may then be conflict between those who play by the rules and those who don't. In the Waza Logone zone, many of the present fishing practices are incompatible with conservation and sustainable use of resources. Many fishermen ignore any restrictions on mesh size or controlled seasons. Such conflicts of interest are a common feature of all societies, but the ways in which people respond to natural resource conflicts vary considerably. Most communities have to certain extent their own ways of dealing with conflicts, using the same basic procedures to address conflicts, including negotiation, mediation, arbitration and adjudication.

The Lake Chad basin is characterised by the coexistence of customary systems and national legal systems for accessing and managing natural resources and the conflicts that may emerge over their use and control.

Customary conflict management systems, with adjudication through traditional community leaders and elders, often encourage participation by members of the community and respect local values, customs and hierarchy. They also foster decision-making based on collaboration, with consensus emerging from wide-ranging discussions that could lead to local reconciliation. However, they seem to have been supplanted or eroded by administrative laws and regulations.

The advantages of legal structures for managing natural resource conflicts include the fact that they are officially established with defined procedures; result in decision that are legally binding; and involve judicial and technical specialists in decision-making. Conversely, they may not consider indigenous knowledge, local institutions and long-term community needs in decision making; may involve judicial and technical specialists who lack the expertise, skills and approach required for broad participatory natural resource management. In addition legal systems tend to use procedures that are generally adversarial and promote a winner-loser situation.



### **11.3.2 A Conflict Management Framework for the Pilot Projects**

Clearly conflict management structures need to be established at the implementation level. Each pilot project has a different set of stakeholders competing for different resources. However as many of the communities already have their own clearly defined local representative organisations that are and will continue to be involved in decisions on resources access, each pilot project will have to define its own conflict management structures.

This can be supported by the central project, and in particular through the proposed review of national environmental legislation, and where necessary through the identification of “neutral” facilitators to support local negotiations.

The pilot projects should work towards an integrated conflict management system, where local, customary and national legal management systems are complementary and mutually reinforcing. Such a framework should embody the following characteristics:

- Use stakeholder analysis to plan around the various situations as part of the conflict management and negotiation procedures – averting conflict as part of the planning process;
- Build capacity to address complex situations involving many stakeholders;
- Emphasise capacity building within communities so local constituents become better communicators, planners and managers of conflicts.
- Foster ownership in decision-making and implementation processes;
- Promote conflict management and resolution by building upon shared interests and finding points of agreement;

## Appendix A Contact List

Pilot Projects	Names	Titles	Institutions
Waza Logone	Oyo, Pierre	Directeur	CACID Waza Logone
	Kouokam, Roger	Chef DPP	CACID Waza Logone
	Pirot, Jean Yves	Coordinateur Programme Zones Humides/eau	IUCN
	Santen, José Van	Coordinateur Homologue CEDC	CML
	Madi, Ali	Coordinateur CEDC	CEDC Maroua
	Nono, Micheline T.	RAF CACID/Waza Logone	CACID Waza Logone
	Mohamadou, Oumarou	A.T. Ecologie Appliquée CACID Waza Logone	CACID Waza Logone
	Saleh, Adam	Conservateur du Parc National de Waza	Conservation
	Ngantou, Daniel	Directeur Regional IUCN BRAC	IUCN
	Peghouma, Ibrahim	Responsable Chargé de l'éco- développement	CACID Waza Logone
Lake Fitri	Kélélé, Mahamat Absakine	Sultan	Yao/Lake Fitri
	Ibrahim, Mahamat	President	Groupeement des Pêcheurs du Lac Fitri
	Ousmane, Abakar	President	Douhounou -- Groupeement des Agriculteurs de Yao
	Jerma, Mahamat	President	Marmiton -- Groupeement des Agriculteurs de Yao
	Abba, Al Hadj Hassane	President	Doumbourou -- Groupeement des agriculteurs de Yao
	Yirima, Al Hadj Hassane	President	Hijer
	Youssou, Mariam	Presidente	Siyé -- Groupeement des femmes
	Kaidela, Mariam	Sécrétaire	Siyé -- Groupeement des femmes

	Dogo, Haoua	Présidente	Logona -- Groupement des femmes
	Issa, Aiché	Sécrétaire	Logona -- Groupement des femmes
	Abba, Mariam	Trésorière	Logona -- Groupement des femmes
	Payouni, Ahmad	Responsable Unité Appui et Programmes	SECADEV-Direction
	Bertran, Hadji	Directeur Délégué	SECADEV--Ambassetna
	Beral, Bernard	Délégué adjoint	SECADEV--Ambassetna
Lakeshore / Desertification	Kala, Badoua	Chef Service	Environnement-Diffa, Niger
	Sani, Garba	Chargé du Génie Rural	Environnement-Diffa, Niger
	Kanta, Moussa	Directeur	CEG
	Ouma, Hamza	Chef Service	Plan
	Sani, Mamadou Gani	Chef Service	Elevage PI
	Chabane, Hassine Ben	Manager	Ramboll--Water & Sanitation Project
	Mai, Manga Maina Yacouba	Député National	PCD/E
	Louali, Maroussa Mahamane	Directeur Adjoint	Hydraulique--Diffa, Niger
Community Participation In The Integrated Management Of The Chari Basin	Djimet, Abdel-Karim	Adjoint au Maire	Mairie-Ndélé, RCA
	Mandaba, Jean Michel	Ministre Délégué	Ministère de l'Environnement
	Neby, Issa Michel	Député	Sous-préfecture Ndélé
	Karalema, Jean	Divisionnaire	Eaux et Forêts--Ndélé
	Nguette, Eugène	Maire 4ème Arrondissement	Arrondissement de Bossanguoua
	Doungoube, Gustave	Directeur Environnement & Point focal FEM	Direction de l'Environnement--RCA
	Azouyangui, Catherine	Directrice Environnement	Direction de l'Environnement--RCA
	Mbo, Basile	Chef de Division Forestière	Division forestière de Bossanguoua
	Yamindou, Jean	Coordinateur	World Wildlife Fund (WWF)
Lake Chad Basin Commission	Sani, Mohamed	Sécrétaire Exécutif	Commission du Bassin du Lac Tchad (CBLT)
	Gbafolo, Martin	Directeur Département des Ressources en Eau	CBLT

	Assane, Mahamane	Directeur de la Planification et du Suivi et Evaluation des Projets	CBLT
	Ahmed, Sadick	Hydrologue	CBLT
	Mey, Mahamat	Agropastoraliste	CBLT
	Oguntala, Johnson A.	Chef Unité ressources en Eau	CBLT
	Yonkeu, Emmanuel	Directeur Département Documentation	CBLT
	Boukari, Modi	Chef Service Financier	CBLT
	Tam, Lambert	Sécrétaire Exécutif Adjoint	CBLT
Other Key People Contacted	Gregor Hans Binkert	Country Manager	AFMTD -- World Bank
	François Rantrua	Senior Environmental & Information Specialist	AFTES -- World Bank
	Tracy Hart	Senior Economist, Water and Urban West & Central Africa- -	ATFU2 -- World Bank
	Robert Calderisi	Country Directeur	Chad/Cameroon/CAR/Equ. Guinea/Gabon
	Charles Donang Ningayo	Senior Operations Officer	AFMTD -- World Bank
	David Laroche	IW	UNDP
	Mrs. Laokole	Program Officer	UNDP--Chad

## Appendix B Improving the Effectiveness of Pilots

### Context

The TOR for the Environmental Assessment calls upon the Team to make recommendations as to how the pilot projects can better support other key elements of the full project:

*The environmental and social assessment is expected to rely on previous texts written on the greater Lake Chad conventional basin (such as the 'Diagnostic Study') as well as the GEF project documents so as to understand how the relative success or failure of these six pilot projects may buttress the Strategic Action Program (SAP) and Transboundary Diagnostic Analysis (TDA) exercises to be conducted in parallel during the course of implementation. The environmental and social assessment is asked to creating a framework for the feedback of information coming out of the pilot projects and the SAP/TDA exercises. This would give the project an idea of where the gaps in the regional environmental and social assessment may be sooner rather than later. These gaps can then be addressed through the use of the funds allocated within the project to additional technical studies during SAP implementation.*

The title of the full project is “Reversal of Land and Water Degradation Trends in the Lake Chad Basin”. The main environmental problem in the basin countries is the degradation of the natural resource base. This is caused by decades long decreases in the rainfall regime and by unsustainable land and resource use systems. The people of the Lake Chad Basin can't change the climate. They must either adapt their production systems to remain sustainable within the constraints of whatever climatic fluctuations come their way or their resource base that forms the basis of their economies will continue to degrade.

One of the key causes of land and water degradation is the extensification of non-sustainable rainfed agricultural systems that leaves soils eroded and depleted or that can only sustain crop production at very low levels of productivity. Another key cause of degradation are *de facto*, open access, natural resource use systems that prevail on the vast majority non-agricultural lands. Open access and sustainable management are incompatible – there is no possibility of natural resources management under conditions of open access to resources.

The main solutions to land and water degradation must be found in the development of flexible, sustainable natural resource use/management systems and of productive, sustainable agricultural systems. Opportunities for rapid progress in the development of sustainable natural resource systems are probably greater than that for the development of productive, sustainable rainfed agricultural systems.

*In situ* conservation of natural resources can be achieved through sustainable use systems or through protection. The creation of new protected areas would present a third option for reversing degradation and of land and water resources. This could be used for limited areas of exceptionally high conservation value. But protected areas cannot be a mainstream solution for reversing trends in land and water degradation in the basin as a whole, because the livelihood of the vast majority of rural populations is dependent on the use of their natural resources.

### Suggestions for Improving Effectiveness of Pilots

In Chapter X of the EA/SA, the Assessment Team proposed that the principle role of pilots project should be the development/testing/adoption of sustainable natural resource management systems on a small scale to identify those that are best suited for large scale application in the SAP. The Team also argued that the present level of development natural resource management systems in the Lake Chad Basin is very low.

If the full project does not contribute substantially to the further development of NRM systems, then the needed systems will probably not be available as needed for developing and implementing the SAP. The Assessment Team sought to identify ways to improve the effectiveness of the pilots for NRM system development.

**Modify pilots to include NRM development** At present three of the pilots do not include any natural resource management activities – they only focus on the development of natural resource management plans. Prior to project appraisal (now scheduled for January 2002) one could seek to modify the pilots to include small-scale testing/development of key natural resource management systems. Given the geographical dispersal of the pilots across different agro-ecological zones, one should be able to cover a good range of key NRM systems that are needed in the Basin. To achieve this would require some shuffling of pilot activities and budget items. We have shown in Table 1 in Chapter 2 some of the areas where such savings/shifts might be achieved.

**Build upon best practices for NRM** The project brief includes language about sharing experiences and lessons learned with other GEF IW projects and other GEF projects in the Basin. The Assessment Team strongly recommends that the search for best practices and lessons learned be expanded to all actors – GEF certainly has no monopoly on success stories. Success stories in NRM are few and far between. It is critical that successes be sought out and analysed wherever they occur – whether they are modern, donor-funded pilots or traditional systems like that at Lake Fitri. The pilots should seek to adapt and build upon the best practices that are identified – not simply replicate what others have done.

**Involve resource user in design/monitoring/evaluation** Reversing natural resource degradation necessitates changes to the way that rural resource users use or abuse their natural resources. It is critical that farmer, herders, woodcutters, fishermen, etc. be involved front and centre in selecting, developing, testing, monitoring and evaluating the natural resource management systems on the pilots. This will involve arranging study tours for these stakeholders representatives to visit best practices identified elsewhere and/or bringing resource users and technicians from success stories to work with the stakeholders on the pilots. Sustainable NRM systems will only be adopted if it is in the best interests of the local resource users.

**Develop monitoring systems to extract lessons learned** If one accepts that a key role for the pilots is to test and improve upon natural resource management systems, then the monitoring and evaluation systems should be conceived in part to monitor the success or failure of what is being tested. M&E systems need to involve monitoring and evaluation by both project technicians and by the local stakeholders.

## Preliminary Lessons Learned

The Team wishes to suggest a number of emerging “lessons learned” from across Africa. We suggest that they should be treated as working hypotheses for consideration in refining and implementing the pilots.

- **Management by government agencies has largely failed** Upon independence, most African governments assumed ownership of natural resource. The experience with government control and “management” of natural resources has been a largely negative one. Laws, regulations, permits systems and enforcement have not added up to sustainable management of natural resources.
- **Major success stories are in CBNRM** Most of the most successful and promising examples of natural resources management across Africa are found in community-based natural resource management approaches. There have been two large-scale programs that have developed. This has involved community-based dry forest management in Sahel (especially Burkina and Niger) and community-based wildlife management in southern Africa (especially Namibia, Botswana and Zimbabwe).
- **Key elements of successful CBNRM** are generally the following:
  - A legally constituted, representative community management structure is created;
  - A contractual transfer of management rights if effected from government to this management structure;
  - The contract requires that the community ensure the regeneration of resources exploited. Most contracts require the development and formal approval of natural resource management plans
  - NRM is developed as a money making, economic activity. Revenues generated for:
    - Community members/resource users

- Community as a whole
- Management costs
- Capacity development of community structures is critical to success.

## Example of Pilot Project Specific Suggestions

### Lake Fitri

Two natural resource management opportunities were identified that could be developed at the Lake Fitri pilot.

**Natural Forest Management** The Sultan of Yao expressed great concern about the overacting of “forest” resources in the Lake Fitri area. He reported that it is legally sanctioned by forestry agents issuing harvest permits for harvest for urban fuelwood supplies. The Sultan told the Team that fuelwood and other wood products are becoming increasingly scarce for the villages around the lake. Smoke fish demands a higher market price than dried fish, but wood for smoking is increasingly hard to come by.

An invasive species of *Prosopis*, introduced by SECADEV, has formed pure stands along the shore of Lake Fitri. The Team was unable to determine the areal extent of these stands, but they are almost certainly increasing in size. It would be quite simple to develop a simple management plan for sustainably harvesting *Prosopis* – *Prosopis* resprouts readily from the stump when cut and is easy to regenerate from seed. The management system for *Prosopis* could also be expanded to include natural stands/species also.

The Team explained the concept of management to the women’s *groupement* in Yao, and asked if they would be interested in harvesting/managing the *Prosopis* stand as a money-making activity. They could sell wood to fishermen and to villagers. They indicated they would be quite interested in this. (Many of the natural forest management community groups in Burkina Faso are comprised primarily of women).

**Wildlife Management** The area south of Lake Fitri is reported to still have populations of large wildlife – even including a small herd of elephants. Lake Fitri may be one of the few sites amongst the pilots that still has potential for wildlife management. A community-based approach, building on work in southern Africa or Burkina Faso, developing safari hunting as the main revenue earner, might have good potential here. This approach is based on the idea that communities will protect wildlife population if they realise substantial economic benefits from the wildlife.

Developing wildlife management at Lake Fitri might require a higher level of resources and expertise than may be available without securing cofinancing

**Fisheries Management** Lake Fitri already has a basically sound fisheries management system under the control of the Sultan of Yao. If a tropical fisheries expert was able to identify/propose improvements to their system, it should be relatively easy to test/implement them through the existing management structure. There is also probably opportunity to assist fishing groups to improve their processing and marketing of their product.

**Range Management** There is a relatively high level of conflict between transhumant herders and sedentary farmers. One should probably adopt a go-slow approach and not attempt to introduce range management during the first phase of the project.