



GEF

**Mohamed T. El-Ashry**  
Chief Executive Officer  
and Chairman

## Global Environment Facility

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June 12, 2002

Dear Council Member,

UNDP, as the Implementing Agency for the project, ***Senegal: Integrated Ecosystem Management in Four Representative Landscapes of Senegal, Phase 1-3*** has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the *Council in May 2001* and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at [www.gefweb.org](http://www.gefweb.org). If you do not have access to the Web, you may request the local field office of the World Bank or UNDP to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

*for* Mohamed T. El-Ashry  
Chief Executive Officer  
and Chairman



United Nations Development Programme  
GLOBAL ENVIRONMENT FACILITY



30 May 2002

Dear Mr. El-Ashry,

**Subject: "Integrated Ecosystem Management in Four Representative Landscapes of Senegal"**  
**(SEN01G31)**

I am pleased to attach herewith the above mentioned project document. The brief was approved by the GEF Executive Council in May 2001. Also attached is our response to the comments raised by the GEF Secretariat and Council as well as the co-financing letters (Annex 18B) and the Agreement on Complementarity between UNDP-GEF and WB-GEF projects (Annex 19).. The latter constitute Annex 18B of the project document and are attached as a separate document.

As per paragraph 29 and 30 of the GEF Project Cycle, we are submitting this project document for circulation to the members of the GEF Executive Council and, subsequently, for your final endorsement.

Thank you in advance for expediting the review and approval of this project.

Yours sincerely,

  
Emma Torres  
Deputy Executive Coordinator

Mr. Mohammed El-Ashry  
Chief Executive Officer  
Global Environment Facility  
Room G6005  
1776 G Street  
Washington D.C. 20433

Cc: Ms. M. Niamir-Fuller, GEF Regional Coordinator  
Mr. M. Alers, GEF Regional Manager

**PROJECT DOCUMENT COVER NOTE**  
**Integrated Ecosystem Management in Four Representative Landscapes of Senegal**

**RESPONSE TO COUNCIL COMMENTS**

<b>Council comments</b>	<b>Response</b>	<b>Location in PRODOC where responses can be found</b>
<b>FRENCH COMMENTS:</b>		
<p>Ce projet prévoit de mettre en œuvre plusieurs dizaines d'activités, dans un très grand nombre de sites différents. L'expérience du développement rural au Sénégal permet d'avoir de sérieux doutes sur l'atteinte d'objectifs aussi dispersés. Il est donc fortement suggéré que le projet soit recentré sur des zones et des composantes plus réduites, avec évidemment un budget revu en conséquence</p>	<p>The choice of project sites was based on the concept of establishing demonstration sites in four representative ecosystems of Senegal. GEF financing will only cover a small number of villages and Community Nature Reserves (average 25 villages and 5 CNRs per site). Co-financing will replicate to a larger number in Phase 2 and 3.</p> <p>Furthermore, the project will phase its interventions on a yearly basis in the First Phase, on average covering a total of 20 villages and 4 CNRs per year.</p>	<p>Annex 17 Annex 7 Paragraph 59</p>
<p>Il paraît incohérent de dire qu'un projet GEF-BM va s'occuper de la gestion des zones côtières et marines du Sénégal en laissant une composante côtière et halieutique au présent projet (Parc du Siné Saloum).</p>	<p>The Government of Senegal has determined explicitly that the two projects are compatible and complementary. During a meeting convened by the Minister of Environment with the Resident Representatives of UNDP and World Bank on 12<sup>th</sup> April 2001, an agreement was reached on a separation of the geographical and thematic scopes of the two projects in the two sites of Saloum and Niaye in such a way that there is no expected duplication, nor confusion at the local level. This includes agreement reached on details such as protected areas, villages and territories. The letter confirming this agreement is attached in Annex 19.</p> <p>Furthermore, the project will work with IUCN in the Saloum area. IUCN is also expected to be the partner in the World Bank project, although this will be confirmed after the preparation of that project. In this way, IUCN will act as the coordinating body for the two spatially and thematically separated interventions.</p>	<p>Annex 19 Paragraph 59</p>
<p>Le crédit rural doit être laissé aux institutions spécialisées de crédit: cela ne relève pas d'un projet GEF</p>	<p>The micro-credit financing is indeed not to be carried out by GEF, but by co-financing (primarily UNDP and Govt); and this has been</p>	<p>Input Budget Paragraph 58 Paragraph 77</p>

	clarified in the revised document. Fonds de la Promotion de la Jeunesse expects to extend its ongoing and successful revolving fund programme to the project site. This will be planned in detail during the project implementation. The project sites are relatively remote areas of the country, and therefore do not immediately benefit from credit schemes. GEF increment will only finance technical assistance (studies, exchange of lessons learnt) and enabling environment (capacity building of communities) for existing specialized agencies to establish the micro-credit schemes in the project sites.	Paragraph 69
Il n'est pas fait référence à la décentralisation qui donne aux communes une autorité importante sur la gestion des ressources naturelles	Reference to the decentralization process in Senegal has been made in relation to its results, e.g. the New Forestry Code; creation of Community Natural Reserves. The revised document has been strengthened with explicit reference to Senegal's ground-breaking decentralization process.	Paragraph 28 Paragraph 30
Les objectifs chiffrés fixés pour la phase devront être atteints avant d'envisager la deuxième phase.	The project document includes explicit benchmarks that must be achieved before the funds for the second and third phases can be released. The logical framework's indicators are written in a phased approach.	Paragraph 60 Annex 6 Annex 3
<b>SWISS COMMENTS</b>		
The activity programs and pilot projects designed for the benefit of corridor communities are highly ambitious and complex. In this context it would be helpful to provide a more detailed account of how the proposed activities will generate sufficient sustainable income to the communities in order to alleviate the current pressures on land and resources and to alleviate poverty as the apparent principal root cause of land degradation.	An economic analysis of the project's expected impacts has been carried out after submission of the Brief. The results of this study have been incorporated into the revised document. For example, agroforestry activities are expected to increase crop production by 40 to 50% annually; livestock fattening can increase value by 100%; grazing fees are expected to be sufficient to cover costs of communities for natural resource management; and substantial incomes can be expected from leasing hunting rights in the CNRs. Finally, rents from eco-tourism, including the sharing of park entrance and other fees between PA and peripheral VTs, are expected to accrue to local communities, but this remains to be negotiated during the First Phase of the project.  But as these are only preliminary studies and estimates, the project will, during its implementation, conduct socio-economic feasibility analyses of all income generation	Annex 11 Paragraph 69

	activities prior to implementing them. This has been noted in the main text.	
Available baselines suggest that the majority of the PAs included in the project have low potential as tourist destination, especially in a highly competitive African market. Financial self-reliance is therefore highly doubtful for any of the selected PAs under the best of circumstances.	The economic study carried out a projection of expected financing of the two main PAs. The critical constraint is not so much that tourism potential is low, but that infrastructure is not well developed, and the entrance fees charged are too low. Experience from Private Reserves in Senegal shows that these fees can be increased once the biodiversity status and infrastructure are improved.	Paragraph 78 Annex 11
The planning matrix (result tree) therefore suggests <i>inter alia</i> that "buffer zones" have to be created, but without any indication of how this could be done.	Buffer zone concept has been incorporated into the project design in two ways: <ul style="list-style-type: none"> <li>a) The Community Nature Reserves (CNR)</li> <li>b) Improved land use management in Village Territories (VT)</li> </ul> This has been described in the main text, as well as in Annex on Technical Specifications, and Project Sites.	Paragraph 56 Annex 17 Annex 11
The planning matrix requests the elaboration of numerous management plans for sustainable land use models for selected corridor areas to be operational on completion of Phase 1. Furthermore, 19 management plans to be elaborated and/or upgraded for PAs by year 2. This appears to be impossible to achieve within the given time frames unless a large number of qualified planners are readily available which is very unlikely. Realistic rescheduling may therefore be required. Clarification is needed as to whether the required manpower can be delivered through the project.	The preparation of the project document has allowed this issue to be clarified. Each project site will have its own staffing, and will rely explicitly on the CERP, the Regional Planning Department and the Town and Country Planning Department. These national teams have proven expertise in the area of local grassroots development planning formulation. They have been involved in village land use planning actions of previous projects such as PREVINOBA and PROWALO. The project will therefore rely on teams formed through a combination of project staff and members of national structures, which will enhance project efficiency, resolve manpower issues, and ensure sustainability and replicability after project completion (with gradual phasing out of project staff starting in year 7).  In terms of scheduling, a realistic phasing has been adopted whereby the project will work in the first three-year phase with only 60 villages and 12 CNRs (in all 4 sites), or 5 villages and 1 CNRs in each site per year. The remainder (40 villages and 8 CNRs) will be involved in Phase 2. Thereafter, the government teams will continue to replicate to other villages and CNRs on government and other co-financing.	Annex 13 Annex 17

	These issues have been clarified in the Annexes on Implementation Arrangements and Project Sites.	
The log-frame matrix suggests alternative land use models and new technologies to be adopted by local people (i.e., introduction of fuel-efficient stoves, alternative energy supply, creation of woodlots etc.) without providing sufficient evidence whether the proposed interventions are socially and culturally acceptable to the local people.	There is good evidence for social and cultural acceptability for these technologies and models all over Senegal. The techniques and actions proposed within the project framework have been initiated by ongoing projects and described in the base line, notably in paragraphs 44-53 of the <i>Project Brief</i> . Annex 11 has been strengthened with additional information on this issue. Furthermore, as the project is based on a participatory planning and development model, it will only embark on new technologies and land use systems once these have been discussed and planned with local communities. This has been clarified in the Public Involvement Plan.	Annex 12 Annex 11
The planning matrix indicates that all PAs will be delimited and demarked by the interested parties at the completion of phase 2. It is very questionable that this can be achieved, especially in the light of existing boundary conflicts and land tenure issues and the current tensions between PA personnel and neighbouring communities that have to be resolved first.	Conflicts between PA agents and the populations are partly due to the absence of PA limit markings, even though the populations mutually admit that such limits can exist. In many cases, local communities report that, in the absence of visible markings, they unknowingly find themselves inside PAs while searching for forestry products. But PA agents believe this trespassing is done on purpose, which results in higher tensions. Therefore demarcation will greatly assist in reducing conflicts, but will not be sufficient. The project's activities in sensibilization, awareness raising and capacity building, and establishment of community eco-guards will also be essential.	Paragraph 26
The indicators provided in the planning matrix are generally too optimistic raising false expectations; they should be adjusted to reality	The figure of 100 CNRs and 425 villages indicated in the original <i>Project Brief</i> was based on an earlier option with a total financing of US\$ 57.7 million. This figure has been revised downward to 20 CNRs and 100 Villages. The revised document's logical framework has been corrected accordingly.	Annex 2 Annex 17
<b>GERMAN COMMENTS</b>		
The (much to extensive) proposal is well organized and mentions clearly the threats to bio-diversity on the national and global level. But the	Same as above	Annex 2 Annex 11 Annex 17 Annex 6

<p>measures to be undertaken are described in a more strategic than a concrete manner. Furthermore the implementation and the harmonising of the very large number of activities remain partly unclear. For such an ambitious project both in geographical spread as in goals to achieve this aspect should be more highlighted</p>		
<p>It would be helpful to get more information on <i>who</i> is going to implement <i>what</i> activities and <i>how</i>. A severe problem the project could face is to recruit sufficient appropriate training staff on the national level.</p>	<p>The development of the Project Document has allowed these issues to be discussed and a realistic operational framework has been developed. Detailed information on implementation frameworks and arrangements, staffing, terms of references, etc. have been provided in the Annex.</p> <p>The project's Activity 2.1.2 will train trainers, who will in turn expand and disseminate the extension of technologies, models, systems, etc.. The training will also cover exchange visits between villagers who will propagate, once back home, information and training as well as actions.</p>	<p>Annex 13</p>
<p>An issue of concern is that the mentioned co-financing by GTZ out of the project in Ferlo (PAPF) is not confirmed, nor had there been any negotiations on reprogramming the existing project in Ferlo. UNDP should contact the GTZ to resolve this issue</p>	<p>This issue has been resolved. In the course of Project Document preparation, the project sites have been clarified by the Government and Project Team. As a result, partnerships with the PAPF project (GTZ financing in the <i>Ferlo</i> region) have been left, in favor of the <i>Matam</i> Agricultural Development Project (PRODAM) financed by FIDA . Therefore, no co-financing is expected from GTZ.</p>	<p>Brief cover page Annex 18</p>

**UNITED NATIONS DEVELOPMENT PROGRAMME  
PROJECT DOCUMENT**

**PROJECT TITLE:** Integrated Ecosystem Management in Four Representative Landscapes of Senegal

**PROJECT NUMBER:** SEN/01/G31/A/1G/99

**COUNTRY(IES):** Senegal

**DURATION:** 3 years (phase 1)

**EST. STARTING DATE:** June 2002

**EST. END DATE:** May 2005

**ACC/UNDP SECTOR:** ENVIRONMENT  
POLICIES PLANNING  
AND LEGISLATION -  
ENVIRONMENT

<b>UNDP &amp; Cost-Sharing (Phase 1)</b>	
<b>UNDP GEF:</b>	<b>USD 4,000,000</b>
<b>Govt of Senegal:</b>	<b>USD 2,269,000</b>
<b>UNDP TRAC:</b>	<b>USD 1,650,000</b>
<b>Total:</b>	<b>USD 7,919,000</b>

**EXECUTING AGENCY:** Gov. of Senegal  
Ministry of Environment (ME) with the cooperation of DPN, DEFCCS, DCERP; and Ministry of Fisheries

**COOPERATING AGENCY:** UNOPS

**GOVERNMENT INPUTS:** in kind = USD 1,919,000  
In cash = USD 350,000

Summary: The project will promote community-based integrated ecosystem management (IEM) of globally significant biodiversity, sequestering of C and avoidance C emissions, and prevent degradation of 4 landscapes selected to represent the four major ecosystems in the country. The project will build on the baseline by testing and applying an ICD model at each site, promoting integrated eco-regional planning, and removing the legal, policy, and technical barriers to IEM. In the Village Territories, production systems will be intensified, land use will be rationalized and food and energy self-sufficiency will be promoted in order to enhance natural resource management and reduce pressure on protected areas. In the Community Nature Reserves, participatory, integrated, management plans for sustainable use and conflict resolution will be promoted in order to create buffer zones, and alternative techniques for income diversification through sustainable harvesting of biological resources will be demonstrated. In the Protected Areas, a co-management model will be tested for the first time in the Sahel including mechanisms for the equitable sharing of benefits accruing from conservation. Furthermore, the project will build institutional and technical capacities, will demonstrate innovative incentives for conservation, and will monitor impacts on biodiversity and carbon balances over the ten year period. The project will be phased. By the end of the second phase, replication of project results will be done by the populations themselves, as well as State services, ongoing projects and NGOs, in order to generate global benefits as well as sustainable socio-economic and environmental benefits at the national level well beyond project life.

<b><u>On behalf of :</u></b>	<b>Signature</b>	<b>Date</b>	<b>Name/Title</b>
Government of Senegal			
UNDP			
UNOPS			

## GLOBAL ENVIRONMENT FACILITY PROJECT BRIEF

### 1. Identifiers

<b>Project Number:</b>	<b>1148</b>
<b>Project Title:</b>	<b>Integrated Ecosystem Management in Four Representative Landscapes of Senegal</b>
<b>Duration:</b>	Ten years
<b>Implementing Agency:</b>	United Nations Development Programme (UNDP)
<b>Executing Agency:</b>	Ministry of Environment (ME) with the cooperation of DPN, DEFCCS, DCERP; and Ministry of Fisheries
<b>Requesting Country :</b>	Senegal
<b>Eligibility:</b>	Convention on Biological Diversity ratified in June 1994
<b>GEF Focal Area:</b>	Biodiversity and Climate Change, Crosscutting with Land Degradation
<b>GEF Operational Programme :</b>	OP12: Integrated Ecosystem Management

2. **Summary:** The project will promote community-based integrated ecosystem management (IEM) of globally significant biodiversity, sequestering of C and avoidance C emissions, and prevent degradation of 4 landscapes selected to represent the four major ecosystems in the country : (1) the Wildlife and Sylvo-pastoral Reserves in the Ferlo Steppe; (2) the Niokolo-Koba National Park and its associated Classified Forests in the South-East Sudanian-Guinean zone; (3) the Niayes coastal dunes and classified reserves along the northern sea front; and (4) the Saloum Delta National Park and associated classified forests and mangrove/marine systems in the south-eastern coastal area. The alternative GEF scenario will build on the baseline by testing and applying an ICD model at each site, promoting integrated eco-regional planning, and removing the legal, policy, and technical barriers to IEM. The landscapes consist of three inter-linked spatial units : PAs, newly established CNRs (Community Nature Reserves), and VTs (Village Territories). In the VTs, production systems will be intensified, land use will be rationalized and food and energy self-sufficiency will be promoted in order to enhance natural resource management and reduce pressure on protected areas. In the CNRs, participatory, integrated, management plans for sustainable use and conflict resolution will be promoted in order to create buffer zones, and alternative techniques for income diversification through sustainable harvesting of biological resources will be demonstrated. In the PAs, a co-management model will be tested for the first time in the Sahel including mechanisms for the equitable sharing of benefits accruing from conservation. Furthermore, the project will build institutional and technical capacities, will demonstrate innovative incentives for conservation, and will monitor impacts on biodiversity and carbon balances over the ten year period. The project will be phased. In the First Phase, it will remove barriers and create the enabling environment for IEM, ICD, CNRs, and Eco-regional Planning. In the Second Phase, it will test these models in representative sample sites and catalogue lessons learnt. In the Third Phase, replication of project results will be done by the populations themselves, as well as State services, ongoing projects and NGOs, in order to generate global benefits as well as sustainable socio-economic and environmental benefits at the national level well beyond project life.

### 3. Cost and Financing (Million US\$)

TYPE OF FINANCING	SOURCE	TOTAL*	PHASE 1	PHASE 2	PHASE 3
<b>GEF</b>					
Direct	GEF: PDF B	0.350			
	GEF : Project	9.720	4.000	4.320	1.400
	TOTAL GEF	10.070	4.000	4.320	1.400
<b>COFINANCING</b>					
Direct inkind	Govt Senegal	7.266	1.919	2.088	3.259
Direct inkind	PDF B	0.081			
Direct cash		1.050	0.350	0.350	0.350
	TOTAL Sen	8.397	2.269	2.438	3.609
Direct	UNDP: PDF B	0.051			
	UNDP : Project	3.243	1.650	1.251	0.342
	TOTAL UNDP	3.294	1.650	1.251	0.342
Re-programmed	JICA	3.298	0.900	1.600	0.798
	CIDA	0.700	0.700		
	UNCDF	3.500	2.000	1.500	
	Netherlands	3.000	1.934	1.066	
	EU	1.105	0.770	0.335	
	IFAD	4.000	3.000	1.000	
	SUBTOTAL	15.603	9.304	5.501	0.798
<b>TOTAL COFINANCING</b>		<b>27.294*</b>	<b>13.223</b>	<b>9.190</b>	<b>4.749</b>
<b>GRAND TOTAL PROJECT</b>		<b>37.364*</b>	<b>17.223</b>	<b>13.510</b>	<b>6.149</b>

\* total includes PDF B; but Phases 1,2 and 3 do not include PDF B.

### 4. Associated Financing (Million US\$)

Fonds pour le développement local (PNUD)	:	2.098
Partenariat pour combattre la pauvreté (BAD)	:	8.167
Promotion de l'intensification Agricole (AID)	:	7.100
Auto-gestion villageoise (FIDA)	:	10.960
Gestion traditionnelle de l'énergie (B.M/PNUD/MME)	:	10.145
Renforcement de la gestion des forages (FCD)	:	9.914
Soutien à la Pêche Artisanale (FED/AFD)	:	7.983
Lutte contre les feux de brousse (Gouvernement du Sénégal):		3.906

Programme Micro-financement FEM	:	2.500
Réhabilitation du PNNK FDS/FFEM)	:	0.606
<b>Total Associated Financing (Million US\$)</b>	:	<b>63.37</b>

5. **Endorsement of Operational Focal Point:** Name: Mme Fatimata Dia Touré, Directrice de L'Environnement et des Etablissements Classés-Ministère de l'Environnement; Date: Lettre d'approbation No.0492 du 27 juillet 2000.
6. **Contacts:** Maryam Niamir-Fuller: PNUD-FEM Coordonnateur Régional pour la Biodiversité et les Eaux Internationales: e-mail: <mailto:marayam.niamir-fuller@undp.org>

## LIST OF ACRONYMS AND ABBREVIATIONS

AFD	:	French Development Agency ( <i>Agence Française pour le Développement</i> )
AIEA	:	IAEA ( <i>Agence Internationale pour l'Energie Atomique</i> )
ATEF	:	Water and Forestry Technical Agent ( <i>Agent Technique des Eaux et Forêts</i> )
BOAD	:	West African Development Bank ( <i>Banque Ouest African pour le Développement</i> )
CBNRM	:	Community Based Natural Resource Management
CERP	:	Polyfunctional Rural Expansion Centre ( <i>Centre d'Expansion Rurale Polyvalent</i> )
CF	:	Classified Forest
CITES	:	Convention on International Trade in Endangered Species
CNR	:	Community Nature Reserve
CONSERE	:	Higher Council for Environment and Natural Resources ( <i>Conseil Supérieur de l'Environnement et des Ressources Naturelles</i> )
CSE	:	Ecological Monitoring Centre ( <i>Centre de Suivi Ecologique</i> )
CZM	:	Coastal Zone Management
DA	:	Directorate of Agriculture
DAT	:	Directorate of Land-Use Planning ( <i>Direction de l'Aménagement du Territoire</i> )
DEEC	:	Directorate of Environment and Classified Establishments ( <i>Direction de l'Environnement et des Etablissements Classés</i> )
DEFCCS	:	Directorate of Water, Forestry, Hunting and Soil Conservation ( <i>Direction des Eaux, Forêts, Chasses et de la Conservation des Sols</i> )
DIREL	:	Directorate of Livestock ( <i>Direction de l'Elevage</i> )
DP	:	Directorate of Planning
DPN	:	Directorate of National Parks ( <i>Direction des Parcs Nationaux</i> )
DPV	:	Directorate of Plant Protection ( <i>Direction de la Protection des Végétaux</i> )
ECN	:	Niayes Coastal Ecosystems ( <i>Ecosystèmes Côtiers des Niayes</i> )
FAO	:	Food and Agricultural Organization of the United Nations
FDS	:	Social Development Fund ( <i>Fonds de Développement Social</i> )
FED	:	European Development Fund ( <i>Fonds Européen de Développement</i> )
FFEM	:	French Fund for Global Environment ( <i>Fonds Français pour l'Environnement Mondial</i> )
FRG	:	Federal Republic of Germany
GEF	:	Global Environment Facility
GIE	:	Economic Interest Group ( <i>Groupement d'Intérêt Economique</i> )
GoS	:	Government of Senegal
ICD	:	Integrated Conservation and Development
IEF	:	Water and Forestry Engineer ( <i>Ingénieur des Eaux et Forêts</i> )
IEM	:	Integrated Ecosystem Management
IREF	:	Regional Inspectorate of Water and Forestry ( <i>Inspection Régionale des Eaux et Forêts</i> )
ISE	:	Environmental Sciences Institute ( <i>Institut des Sciences de l'Environnement</i> )
ITA	:	Agricultural Engineer ( <i>Ingénieur des Travaux Agricoles</i> )
ITE	:	Animal Science Engineer ( <i>Ingénieur des Travaux d'Elevage</i> )
ITEF	:	Water and Forestry Work Engineer ( <i>Ingénieur des Travaux des Eaux et Forêts</i> )
IUCN	:	International Union for Conservation of Nature
LC	:	Local Community
LMC	:	Local Management Committee
MA	:	Ministry of Agriculture
MAB	:	Man and Biosphere
MAT	:	Ministry of Land-Planning ( <i>Ministère de l'Aménagement du Territoire</i> )
ME	:	Ministry of Environment
MEF	:	Ministry of Economy and Finance
MI	:	Ministry of the Interior
NGO	:	Non-Governmental Organization
NP	:	National Park
NRM	:	Natural Resource Management
PA	:	Protected Area
PAGAP	:	PA Development and Management Plan ( <i>Plan d'Aménagement et de Gestion des AP</i> )
PAGERNA	:	NRM Self-Promotion Project ( <i>Projet d'Autopromotion en Gestion des Ressources Naturelles</i> )
PAGTV	:	Village Land Development and Management Plan ( <i>Plan d'Aménagement et de Gestion des TV</i> )
PAN/LCD	:	National Action Plan to Combat Desertification ( <i>Plan d'Action National pour la Lutte Contre la Désertification</i> )
PCU	:	Project Coordination Unit

PFIE	:	Environmental Training and Information Programme ( <i>Programme de Formation et d'Information Environnementale</i> )
PGCRN	:	Community-based Natural Resource Management Project ( <i>Projet de Gestion Communautaire des Ressources Naturelles</i> )
PNACB	:	National Action Plan for Biodiversity Conservation ( <i>Plan National d'Action pour la Conservation de la Biodiversité</i> )
PNAE	:	National Environmental Action Plan ( <i>Plan National d'Action pour l'Environnement</i> )
PNDS	:	Saloum Delta National Park ( <i>Parc National du Delta du Saloum</i> )
PNNK	:	Niokolo-Koba National Park ( <i>Parc National de Niokolo-Koba</i> )
PROGEDE	:	Participatory Management of Traditional and Alternative Energies Project ( <i>Projet de Gestion Participative des Energies traditionnelles et de Substitution</i> )
PSAOP	:	Agricultural Service and Private Organization Programme ( <i>Programme du Service Agricole et Organisation Privée</i> )
PTIP	:	Triennial Public Investment Programme ( <i>Programme Triennal d'Investissement Public</i> )
PU	:	Pastoral Unit
RC	:	Rural Community
RFA	:	Federal Republic of Germany
SFIECE	:	Environmental Awareness, Training, Information and Communication Programme ( <i>Sensibilisation, Formation, Information, Communication Environnementale</i> )
SNCB	:	National Strategy for Biodiversity Conservation ( <i>Stratégie Nationale pour la Conservation de la Biodiversité</i> )
SPR	:	Sylvo-Pastoral Reserve
UNDP	:	United Nations Development Programme
UNESCO	:	United Nations Education, Science and Culture Organisation
USAID	:	United States Agency for International Development
VG	:	Village Group
VT	:	Village Territories
WR	:	Wildlife Reserve

## PROJECT CONTEXT

### ***Environment Context and Global Significance***

1. Senegal is located at the crossroads of four major West African climatic zones – Saharan, Sahelian, Sudanian and Guinean. Senegalese ecosystems are characterized by their relative diversity and their multiple functions (environmental, economic, social and cultural). The country's ecosystems range from steppes, grassland and tree savanna in the North, to dry sub-guinean open forest formations in the East and South, and coastal and littoral ecosystems located along the entire length of the country's Atlantic coastline (500 km). Senegal's protected areas include 6 National Parks, 3 Wildlife Reserves, 8 Hunting Reserves, 20 Sylvo-pastoral Reserves, and 213 Classified Forests, all covering a total area of 11,934,663 ha (MEPN; 1993:35-39), or over 40% of the country's land area. Three of the protected areas are Biosphere Reserves; two are UNESCO World Heritage Sites, and four are Ramsar Wetland sites.
2. Senegal's carbon balance is in the negative. Total emissions of 9539.3 Gg of equivalent CO<sub>2</sub> are derived from energy consumption (41%), agriculture (31.3%), wastes (23.8%) and industry (3.9%). Senegal's forests are estimated to have a net sequestration capacity of 6001 Gg equivalent CO<sub>2</sub>, or 63% of emissions. However, this does not count the potential sequestration from estimated soil organic stock of around 1700 Gg (Batjes 1998).
3. Overall, ecosystem degradation is due to the impact of overgrazing, logging, erosion, bush fires and drought. Forest degradation in the country is estimated at 250,000 ha of tree savanna each year, i.e. 2% of the country's wood resources (Senegal Forest Action Plan, 1993). Rangeland degradation in the Ferlo has been estimated at 80,000 ha/year. Carbon emissions from forest degradation and rangeland fires is estimated to be about 19,286 Gg per year. Mangrove degradation is estimated at 10% a year, primarily from natural and anthropogenic causes. Natural pressures are due to changes in ocean currents caused by the disappearance of Sangomar Point between Toubacouta and Niodior. Anthropogenic pressures are linked to increased need for fuelwood and inappropriate techniques for oyster harvesting. Some 395,000 tons of fish (and over 300 marine species) are caught per year, 80% of which by traditional fishing. Of this tonnage, two species of sardinella alone represent more than 60% of the catch (DPM, 2000).
4. Annex 9A shows the major ecoregions of Senegal. The central zone as well as the Senegal River Valley are the most densely occupied and rate of land conversion to agriculture is high (Annex 9B). Of the remainder, biodiversity values still remain high in four major ecoregions : north and eastern pastoral, south and south-eastern savanna woodlands, Niaye complex of dunes and marshes, and southern mangroves. The project has identified four sites of high global significant most representative of these four main ecosystems (Annex 9C) - summarised below. Annex 7 provides detailed description of the flora and fauna of these ecosystems and lists the protected areas chosen to be part of the project.

### **Sylvo-Pastoral Ecosystems**

5. This ecosystem extends over a total of 5,816,900 ha in the north-eastern part of the country, i.e. 45% of the country's vegetation cover. It contains 9 protected areas (PAs) including Classified Forests (CFs), sylvo-pastoral reserves (SPRs) and wildlife reserves (WRs). The northern part of this ecosystem is grassland and shrub steppe (37%), largely dominated by Sahelian species, such as *Acacia tortilis* and *Balanites aegyptiaca*. The southern part is mainly wooded savanna (55%) of Sudano-Sahelian species such as *Pterocarpus lucens* and various Combretaceae. The transition consists of intermixing of Saharo-Sahelian shrubs (8%) such as *Guiera senegalensis*, *Combretum glutinosum*, *Grewia flavescens*, and *Anogeissus leiocarpus* (Bonfiglioli *et al*, 1988; Republic of Senegal, 1993:43).

6. Rainy season precipitation varies widely over time and space, producing a mosaic of pasture lands whose access and use by both domestic and wild animals are dependent upon the availability of water in depressions, ponds and permanent boreholes. A significant decrease in rainfall and irregular regime in the last three decades have resulted in the early drying of ponds, high mortality of certain plant species, and wind and water erosion. This phenomenon has been compounded by pressure from human activity, particularly around permanent water points. Eros Data Center reports that since 1982, there has been a general regression in the vegetation composition, decreasing soil cover, productivity, regeneration capacity and diversity of the vegetation community. In addition, desiccation induces transhumants to go further south, often reaching Niokolo-Koba Park in search of better conditions. However, such unplanned, and uncontrolled transhumance also disturbs the Park's ecosystems (see below).

7. Of the 31 rare plant species that are globally threatened and listed on the IUCN Red List for Senegal, there are three known endemic species in the Ferlo region : *Abutilon macropodum*, *Digitaria aristulata*, and *Nesaca dodecandra*. In addition, the status of *Justicia niokoloKobae*, *Digitaria aristulata*, *Dalbergia melanoxylon*, and *Pterocarpus lucens* remains critical. In spite of ecosystem degradation, several animal species are still observed in the Ferlo Fauna Reserves, including ostrich (the last remaining population in Senegal), Arabian bustard, Grimm's duiker, red-fronted gazelle, bushbuck, patas, porcupine and aardvark. The region provides wintering grounds for several migratory species, in particular raptors, such as the bustard, the land calao (*Bucorvus abyssinicus*), the bateleur eagle (*Terathopius ecaudatus*), and to a lesser extent, the white-tailed African kite, present only on a narrow strip through Sub-Saharan Africa (Ornis et al, 1998). The landscapes outside PAs still harbour significant biodiversity populations as well as biomass for carbon sequestration, mainly due to the dominance of mobile transhumance.

8. The eastern Ferlo's continuing capacity to facilitate migration of fauna to and from Niokolo-Koba National Park further south (aided by a corridor of contiguous classified forests), and as a wintering ground for palearctic migratory birds, add further to the sites's global significance and strategic importance for biodiversity conservation in Senegal, making this ecosystem an obvious choice for selection.

### Forest Ecosystems

9. The forest ecosystems in the south-east of the country consist mainly of dry, open forests of the sudanian type, with sub-guinean type forest further south, and interspersed dense gallery forest formations (Republic of Senegal, 1993:43). The transition zone to the Sylvo-pastoral zone consists of sahelo-sudanian wooded savanna. This ecosystem represents the most important ligneous cover in the country, both in terms of density and acreage. It contains diverse flora and fauna, including rare sudanian species such as the galago (*Galago senegalensis*). The vegetation cover is generally dominated by *Bombax costatum* (kapok tree), *Pterocarpus erinaceus*, *Daniellia oliveri* and *Sterculia setigera* and an underbrush with combretaceae and high perennial gramineae. This eastern forest zone includes a total of 6 PAs consisting of 4 Classified Forests, a National Park and a Wildlife Reserve. Gallery forests in the Niokolo-Koba system account for 78% of the gallery forests of Senegal, and harbour borassus and raphia palms as well as meadow swamps. Of the 31 plant species considered endemic to Senegal, 12 are present in this area, 8 of which are considered threatened by the NBSAP.

10. The area contains 80 mammal species, some 330 bird species, 36 reptilian species, 60 fish species, 2 amphibian species, numerous invertebrate species, and 1500 species of flora. Of these, 12 floral and 7 faunal species are endemic to Senegal, and 8 are listed on the IUCN Red List. Carnivores include the charismatic species such as the panther, lion and African wolf (*Lycaon pictus*). Also present in the area is the only viable population the sub-region of Derby eland (*Tragelaphus derbianus derbianus*) (approximately 100 to 120 individuals according to the latest survey). The Park is also the last refuge for the elephant (*Loxodonta africana*) in Senegal, and only approximately 150 chimpanzees (*Pan troglodytes*) inhabit the Park's gallery forests. The site also has strategic global importance since it

provides feed and shelter for migratory fauna during the dry season (Diop 2000:18). The landscapes outside PAs still harbour important biodiversity and carbon sinks because of the relatively low density of crop cultivation, when compared to the Peanut Basin and the Coastal areas.

### Niayes Coastal Ecosystem

11. The Niayes region is formed by the Atlantic fringe of the coast of Senegal from Dakar to Saint Louis. It stretches over nearly 180 km North to South, with a width between 30 to 35 km and is characterised by a succession of dunes and interdunal depressions frequently containing ponds which appear as the water table rises. It is distinguished from the rest of the country by a humid, sub-canarian maritime climate and strong, relatively constant marine trade winds. The dunes are sterile and active on the coast (white dunes), but stabilise gradually as one progresses towards the interior (red dunes) with the appearance of a very fragile vegetation cover. In the interdunal depressions, the soils are rich and suited for vegetable and fruit crops. The vegetation is sub-guinean in nature dominated by *Elaeagnus guineensis* in several tiers, but has been severely degraded due to human activities. This is compounded by droughts, which have caused a drop in the water table level, gradual salinization and an accelerated encroachment of active dunes.

12. Of the 31 plant species endemic to Senegal, 13 were found in the Niayes and 10 of them are threatened. The two species of the genus *Ceropegia* are also included in the 1996 CITES list. This zone has 9 PAs. The Gueumbeul Wildlife Reserve is globally significant as a wintering area for thousands of birds, mainly waders. The Langue de Barbarie National park is an important sanctuary for green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), and loggerhead turtles (*Caretta caretta*) and the common dolphin (*Delphinus delphis*). All these species are now on IUCN's Red List because of over-exploitation due to their culinary utility. Fish populations have generally decreased in the Niayes ponds and lakes. Some formerly abundant species, such as protopterus, have become very rare. Most of the forest species protected by the Forestry Code have practically disappeared from the Niayes region, hence the urgency to act for biodiversity conservation in this ecosystem, one of the rarest in the world.

### Saloum Domain

13. The Saloum ecosystem consists of three interdependent biophysical domains: (1) the continental domain consisting of guinean gallery and Sudanian wooded savanna, blending into the mangroves in the intertidal and coastal zone; (2) the insular domain with three major groups of islands (two of which are inhabited, containing some 25 villages); and (3) the marine domain, extending 10 km into the ocean. The Saloum estuary is a confluence of three rivers: the Saloum, the Diombos and the Bandiala interlinked by channels, each of which has its own chemical and biological characteristics. Recently, Sitatunga (*Tragelaphus speikei*), species have been noticed in the SDNP while this endemic species was already supposed to be completely extinct.

14. Three of the 31 endemic plants of Senegal are found in the forests of this Domain (*Lipocarpa prieuriana*, *Scleria chevalieri* and *Ficus dicranostul*). Fourteen tree species found in the area are rare and/or threatened (IUCN 1999) and are listed in the Forestry Code. Mangrove ecosystems extend over 80% of the surface area of the Saloum Delta National Park. The southern part of this mangrove is particularly well protected, and provides a rest and night shelter for numerous bird species, a refuge for several wild animals such as hyenas, and spawning and feeding grounds for fish. The islands' sand strings and terraces contain diverse flora with threatened species such as *Phoenix reclinata*, various Guinean species at the edge of their distribution areas, and important stands of rare species (*Lophira lanceolata*). According to Lykke (1996), the Fathala Classified Forest on the continental domain alone contains at least 400 plant species, including 160 ligneous species belonging to 39 families.

15. Manatees (*Trichechus senegalensis*), hump-backed dolphins (*Souza teuszii*), common dolphins (*Delphinus delphis*) and several species of marine turtles live in the marine section of the Park but are

highly threatened. In addition, 36 wild mammal species have been recorded in the Saloum Delta area, more particularly within the PNDS area. Among these species, the leopard (*Panthera pardus*) and the roan antelope (*Hippotragus equinus*) have recently disappeared. Among the crustaceans are some fifty species of lobsters, crayfish, slipper lobsters, shrimp, crabs and stomatopoda. Three fish species have disappeared or have become extremely rare: the tarpon (*Tarpon atlanticus*), the sawfish (*Pristis spp*), and the straw-fish (*Rhynchobatus lubberti*). In addition, *Lisa bandialensis*, carp (or yaakh) and groupers (*Epinephelus aenus*) or Thiof, are decreasing because they are highly sought after by Senegalese consumers. Furthermore, sharks, *Caranx hipos*, *Tilapia guineensis* and turtles are decreasing primarily due to disturbances in their nesting areas and over-exploitation. Sharks and rays, whose fins have a high commercial value, are subject to intense fishing pressures.

### **Socio-economic context and anthropogenic pressures**

16. Traditionally based on extensive agriculture, livestock farming, hunting and gathering, Senegal's present economy is dominated by the primary sector with increasing importance of services and low added value from the processing of crop, livestock and fish products. In each of the three major types of ecosystems, the socio-economic context is characterised by high consumption of biological resources in the production, processing, storage and marketing of goods. However, the nature of the production system varies in each of the ecosystems. Annex 8 provides detailed description of the socio-economic context, and describes the existing linkages between sustainable use and conservation.

17. The **Ferlo** is inhabited by several agro-pastoral ethnic groups (Wolof, Toucouleur, Sarakollé, Pheul). The first three are primarily sedentary, while the Pheul are primarily transhumant (Benoit 1988), but all practice both livestock and crop farming. Gathering of natural products, such as gum arabic from *Acacia senegal*, provides food, manufactured products and cash income. The dominant feature of traditional pastoralism is short or long distance mobility of animals, as a strategy for risk management (e.g. risks linked to climate, health, policy and conditions of natural resources).

18. Recently the character of agro-pastoralism has changed considerably in the Ferlo. First, the creation of boreholes in the 1980's has opened new pastureland, but has also resulted in an influx of transhumants from outside the system who are often unofficially sanctioned by local staff of Water and Forest Department. This is increasingly leading to overgrazing around the boreholes, and conflicts between traditional users and the newcomers. The fact that boreholes frequently break down adds to the pressure. Second, the high domestic demand for small ruminant meat has led to an increase in the number of extensive sheep and goat herds and an influx of Waalwaalbe families who specialize in small ruminant breeding. This has contributed to over-grazing, but also has increased the motivation of herders to kill predators such as jackals and hyenas who threaten small ruminants. But by far the greatest pressure comes from a third tendency, that of increasing settlement and influx of new farmers, resulting in excessive conversion of land to crops. This has not only resulted in degradation of lands marginal to cropping, but also reduction in pastureland, thus increasing pressure elsewhere. Although Rural Communities are legally empowered to regulate Village Territories and Sylvo-pastoral Reserves in terms of land use plus sustainable harvesting of resources, they are not able to enforce the law effectively nor to prevent chaotic settlement and cultivation from seeping into the Reserves.

19. Finally, the droughts have induced ever greater transhumance from Ferlo to the southern regions around Niokolo-Koba. The same pastoralists who are at home in the Ferlo, are now seen as outsiders by residents of Niokolo-Koba area. The frequency and destructiveness of bush fires has apparently not changed in recent years; however, it continues to be a major factor in determining both the health of the ecosystem, as well as its wood and forage supply. There is general agreement among local residents, Forestry Department, and scientists that fire must be managed more effectively.

20. The vast majority (91%) of the active population in the **Niokolo-Koba** zone is involved in agriculture, mostly at the subsistence levels, despite the low occupation rate of arable land in the region (3.9% only). Cereals (millet, maize, sorghum and rice) extend over 58% of the cultivated areas. Agricultural activities are marginally mechanized, rely on high labour input, and contribute to 40% of the GDP in the area. The greatest threat to biodiversity comes from ever expanding extensive crop cultivation. Livestock contribute to 30% of the GDP. Although livestock production is less extensive than in the Ferlo, it nevertheless has been increasingly pushed into or around protected areas because of expanding crop cultivation and settlement.

21. The second major threat to biodiversity comes from fuelwood harvesting. More than 55% of the country's domestic energy needs are met from wood and charcoal (UNDP, 1999:204), almost all of which is extracted and produced in the Niokolo-Koba zone. The extent of poaching the third major threat is much higher in this region, primarily due to hunting, but also to self-protection by farmers and herders. Furthermore, the relatively high cost of customary hunting permits encourages poaching. Poaching has been shown to be responsible for the disappearance of certain species such as the giraffe and the damalisk, and for the marked decrease in elephant and antelope populations. The lack of human and physical resources in the PAs management systems, the rigidity of the legal status of protected areas which does not allow benefit sharing, and the resultant low interest in conservation on the part of the population, all contribute to poaching. Hunting tourism has been introduced into the buffer zones of Niokolo-Koba National Park to generate revenue for park management. However, in some cases the concessions have not been well managed (hunting inside core areas and out-of-season hunting) to the extent that already there is some evidence that kill rates exceed sustainable limits. Until recently, the PNNK constituted a sanctuary, but the construction of a road several hundreds of kilometres in length cutting across the park poses grave threats for the fauna.

22. The **Niayes** is an important area for fruit and vegetable production (tomatoes, lettuce, onions, beets, cabbages, strawberries, and to a lesser extent rice), providing 2/3<sup>rd</sup> of Dakar's consumption and 89% of the national consumption. This production employs more than 75% of the local people. There is evidence that the fresh water table is decreasing due to overexploitation for irrigation for the gardens. The dunes are used for production of bovine and small ruminant in an extensive system, characterised by seasonal short scale mobility during the rainy season, when most of the land is flooded, and the dry season (lack of forage and to avoid conflicts with farmers). The white (active) dunes are increasingly being overgrazed. Colonial era afforestation (150 km of "filao" or *Casuarina equisetifolia*, along the Niaye coastline) is not spontaneously regenerating as the thickness of accumulated litter prevents spontaneous germination. Semi-industrial poultry farming is on the rise in the Niaye due to high demand from Dakar, but it is mainly owned by urban entrepreneurs who entrust the enterprise to rural relatives. Horticulture is at a rapid pace leading to habitat destruction in inter-dunal zones, plus pressure on expansion into the Ferlo.

23. Fisheries are increasingly under stress. Fish nets with very small mesh are used at sea, and have strong negative impacts on the aquatic fauna, particularly juveniles. Turtle nesting grounds on the coast, mainly in the central and northern Niayes, are severely disturbed. Despite an existing surveillance project (Project de Surveillance des Pêches), illegal boats continue to ply the coastal area, adding pressure on biodiversity and competing with local community fisheries. A few projects have worked on improving traditional fishing equipment, but their impact has not been felt yet on the fisheries resources. Local communities are keen to establish marine protected areas to allow reconstitution of stocks.

24. The production system in the **Saloum** site is based on four types of resources : fishing and trading of fish products, salt extraction, crop cultivation, and extensive livestock breeding. Fishing and gathering of molluscs, oysters and shells are done in the mangroves, mudflats and adjacent coastal waters. Local communities have reported a drop in fish production which they link to increased exploitation. Gathering and processing of crustaceans results in high demand for wood from mangroves. Decreasing income from

fisheries has pushed many men into salt extraction, which was formerly managed by women, but the impact on land use patterns is not clear.

25. Crop cultivation is practiced on the continental side by a different ethnic group than the coastal people. Major food crops are pearl millet, sorghum, rice and maize. Commercial crops include groundnuts, cotton, cashew nuts and, to a lesser extent, soy. During the dry season, valleys and low-lying areas are used for vegetable crops. Over-cultivation has led to fields coming adjacent to and even crossing over protected area boundaries, causing conflict between local communities and PA authorities. Livestock are also raised on the continental side. Because of the presence of tse tse flies, the livestock breed are generally trypanotolerant, although cross breeding is feared to be diluting this genetic resource. Livestock are raised relatively intensively in comparison to the other three ecosystems. Finally, despite the high tourism potential of the Saloum National Park, the tourism industry remains practically non-existent to this day, except for three private enterprises tapping only a minimal percentage of the ecotourism potential. In contrast, coastal tourism in neighbouring Gambia is very well developed.

26. In general across all ecosystems, the relationship between PA authorities and peripheral populations is very conflictual. One of the main sources of these conflicts is the absence of demarcated protected areas as well as lack of buffer zones. The fields cultivated by the population are adjacent or very near to the PAs, sometimes even seeping through the boundaries. As a result, predation on livestock and damage to crops from wildlife (hyenas, warthogs, monkeys and ground squirrels) pose problems, especially as forestry legislation does not explicitly provide for compensation for damages caused by wildlife. Local communities are prevented from accessing certain commodities that are rare in the village lands and abundant in the PAs (fuel wood, straw, medicinal plants, fruit). Conflicts between PA agents and the populations are partly due to the absence of PA limit markings, even though the populations mutually admit that such limits can exist. In many cases, local communities report that, in the absence of visible markings, they unknowingly find themselves inside PAs while searching for forestry products. But PA agents believe this trespassing is done on purpose, which results in higher tensions. Therefore demarcation will greatly assist in reducing conflicts, but will not be sufficient. The project's activities in sensibilization, awareness raising and capacity building will also be essential. Furthermore, the four ecosystems are united by their complementarity and spill over effects. Pressure from crop expansion in the Niaye, Saloum and Peanut Belt, into the Ferlo and Niokolo areas, is squeezing pastoralists in ever smaller rangelands. The lack of updated and detailed biological inventories and data hampers effective planning. The lack of participatory consultation between the various stakeholders and mechanisms to foster incentives for conservation and benefit sharing are at the root causes of these problems.

### ***Legal and Policy Context***

27. Senegal has signed and ratified all of the international environmental conventions (CBD, CCD, UNFCCC). The Ninth Orientation Plan for Economic and Social Development requested the formulation of the National Environmental Action Plan (PNAE) which has been accompanied by the establishment of the National Action Plan to Combat Desertification (PAN-LCD), and the National Biodiversity Conservation Strategy (SNCB). The latter was followed by the National Biodiversity Conservation Action Plan (PNACB) with UNDP-GEF support. These instruments define the following four strategic directions for biodiversity conservation in the country : (1) Biodiversity conservation in high BD density sites; (2) Integration of biodiversity conservation within sustainable development programmes and activities; (3) Equitable sharing of roles and responsibilities in biodiversity management and of benefits accruing therefrom; (4) Information and awareness-raising of all actors on the significance of biodiversity and the need for its conservation (MEPN, 1998:46). The present project addresses all of these issues.

28. The new Forestry Code of 1988 recognised for the first time the existence of community forests and private forests and confirmed both communal and private ownership of forest products (Republic of Senegal, 1998:9). The new Code is a direct result of the decentralization policies of the Government. In

addition, the government has instituted a tax on charcoal which is meant to help decrease excessive deforestation. However, such a tax as yet does not exist on wood.

29. The Hunting Code of 1986 prohibits the capturing, killing and selling of any parts of charismatic wildlife species. The Code is strictly enforced in PAs, markets, airports, railways, and ports. The Code is currently being amended in order to provide private and community incentives in control of poachers (e.g. community involvement in hunting leases and profit sharing). The Fisheries Code first developed in 1977, was revised recently in 1998, to encompass the definition of two types of fisheries : communal and industrial. In each of these types, the code establishes fish size capture, proscribes suitable equipment, and prohibits certain devastating techniques, such as dynamiting.

30. Land remains the property of the State but the State entrusts Local Communities (LCs) with the proper management of land. Senegal launched a decentralisation process in 1972 which led to a policy and law on the transfer of authority and responsibilities for stewardship to local communities in matters pertaining to Environment and Natural Resource Management (Republic of Senegal, 1997:89). This law allowed the creation of Rural Communities (RCs); and has also facilitated the project's intention to establish Community Nature Reserves. The RC is headed by an elected president with power to decide on land allocation and regulation within the boundaries of the RC. He is assisted by a Rural Council consisting of elected members from the villages in the RC. However, the does not specify precise criteria regarding land use regulation, and judgement remains subjective. For instance, although cultivation is considered a form of land development, thus allowing certain target groups to have access to land, livestock farming is not, thus effectively creating an "open access" regime on pasturelands. Furthermore, land allocated to an individual or group for agricultural use cannot be transferred, whether by sale or inheritance, and therefore cannot be used as collateral to obtain bank loans. This has a tendency to decrease incentives for investment in improvement of farmland. In addition to the management of natural resources, the RCs also have a budget funded by the rural tax and used by the Rural Council according to the priorities defined by the Council, covering mainly capital expenditures and social services. The public revenues from these rural taxes are managed centrally by Treasury, and allocated to the Provincial (Département) level for allocation to RCs.

31. Finally, lack of clarity of laws and regulations (including inconsistency with those in neighbouring countries adjacent to the selected sites such as Guinea and the Gambia) hinder conservation efforts.

### ***Institutional Context***

32. The Ministry of Environment (ME) is mandated to implement the national environmental policies under the authority of the Prime Minister and the President of the Republic. In addition, the ME is also in charge of environmental impact assessments and management of protected areas. In April 2000, the Government assigned two major priorities for this ministry : the sustainable management of Natural Renewable Resources and the conservation of biodiversity. The Ministry comprises the following departments: (1) Directorate of Water, Forestry, Hunting and Soil Conservation (DEFCCS); (2) Directorate of National Parks (DPN); and (3) Directorate of Environment and Classified Establishments (DEEC). The first two directorates have staff in each of the country's ten Regions. DEFCCS also has offices at the Provincial and District levels. The decentralised ME staff form a local team with their colleagues from the Ministry of Agriculture, Livestock and Fisheries, the Ministry of Planning, and Rural Counsellors, to serve as technical advisors to the RCs for integrated management of environment and development at the grassroots level. This team works in cooperation with NGOs and Village Associations (VAs) and constitutes what is called the Polyvalent Rural Expansion Centre (CERP). (See Organisational chart in Annex 13B). Although the structure exists for local level IEM, the capacity for inter-sectoral work requires strengthening.

33. At the national level, the ME is also supported by a multidisciplinary Higher Council for Environment and Natural Resources (CONSERE). The ME acts as the Secretariat of CONSERE whose members are representatives of agriculture, livestock, water, marine fisheries, tourism and decentralisation under the chairmanship of the representative of the Prime Minister's Office. CONSERE is mandated to ensure synergy and consistency between sectoral policies, actions and strategies.

34. The protected area system is based on a decreasing level of restrictions starting from strongest restrictions in national parks and Wildlife Reserves, to permitting some form of use rights and grazing in Classified Forests. Sylvo-pastoral Reserves allow permanent hydraulic installations and rangeland use, but do not allow durable dwellings. Local authorities mandated to manage the PA system are : Curators for national parks, Regional Inspectors of Water and Forestry and their Provincial staff and District Forestry Brigades for WR and CF, and Regional Livestock Inspectors for Sylvo-pastoral reserves. Although there is yet no specific law promoting co-management of protected areas, the government is keen to test viable approaches as a first step towards establishment of such laws.

35. The absorptive capacity of these institutions at the local, district and provincial levels is moderate, due to high levels of staff turnover, low salaries, and fair working conditions. The absorptive capacity of local communities, village councils and RC is also moderate, due to recent emphasis on decentralization, low experience with IEM, and continuing poverty levels. As a result, the project is designed to be implemented in three phases over 10 years, with considerable emphasis on capacity building and lifting institutional barriers upfront.

### ***Threats and Root Causes***

36. In summary, the problems facing long term IEM (through conservation of globally significant biodiversity, and carbon sequestration) in Senegal stem from four related issues : loss of endemic biodiversity, fragmentation of and increasing pressure on resources in the protected area system, land degradation in landscapes, and decrease in the ability of vegetation and other biological resources to spontaneously regenerate. The PDF B process conducted a major participatory planning exercise with representatives of sedentary farmers, transhumant pastoralists, fishermen, hunting lessees, hotel owners, women, vegetable-gardening groups, NGOs, agriculture, livestock and forestry extension services, National Parks and all baseline projects, as well as village leaders and rural advisors. This process identified seven priority threats to globally significant biodiversity in the four project sites. Some of these threats cut across all four project sites, and others are specific to certain sites. Some of these threats cut across all four project sites, and others are specific to certain sites. These are : land conversion, deforestation, poaching, overgrazing, and over-extraction of marine resources and non timber products, and uncontrolled fires. Annex 10 provides a problem and solution tree, as well as a summary matrix of threats, root causes and Alternative strategy.

### **Land Conversion**

37. The GoS has steadily been dismantling subsidies and price support to the traditional agricultural sector. For those farmers who had used the subsidies to adopt semi-intensive techniques and external inputs such as chemical fertilizers and pesticides. In the absence of large scale application of mitigating measures (e.g. alternative income generating activities; promotion of conservation farming; etc.) this has inadvertently resulted in a return to more extensive production requiring more cleared land. Compounding this trend has been population increase and drought. All of these factors are pushing farmers successively eastward and southward and often pushing against (and into) protected area boundaries. In the Ferlo, there is the added threat from settlement and cultivation around permanent water points. On the coast, this agricultural expansion contributes to dune instability in Niaye, and increased sedimentation and siltation in mangroves. Lack of environmentally sustainable and economically viable intensive production

technologies, and alternative income generating activities hampers any reversal of this trend. Furthermore, lack of clear procedural guidelines and participatory due process for land use planning and enforcement in RCs and Village Territories hampers effective control and regularization of expansion of farmland.

## Deforestation

38. Deforestation is continuing at a fast rate, both due to conversion of woodland into crops, and due to population increase and high urban demand for fuelwood. Furthermore, destructive practices (such as selective logging of only a few species, and uprooting of mangroves for oysters) results in deforestation targeted at globally significant species. This is compounded by over-browsing by livestock in the dry season. Deforestation in Senegal is estimated to release 19,244.5 Gg of  $\text{ECO}_2$  per year. As fuelwood resources outside of protected areas deteriorate, there is increasing pressure on resources inside. Lack of formalized co-management mechanisms for national parks and classified forests means that local communities continue to illegally log and harvest wood resources inside the protected areas, in effect approaching an open access situation due to the lack of protected area enforcement. Furthermore, the inconsistency in tax law (charcoal vs. wood) and lack of co-management legislation creates policy distortions and disincentives.

## Poaching

39. With crops and villages getting ever closer to protected area boundaries, damage from wildlife becomes more evident. A lack of buffering results in more frequent defensive poaching (particularly of predators, competitors such as monkeys, and dangerous invertebrates). Furthermore, hunting is rising in Senegal at a rate of more than 10% per year (see Annex 11). Opportunistic and illegal leasing of hunting rights by peripheral residents is fast becoming an attractive source of income. This is compounded by mismanagement of hunting concessions by the protected area staff. Illegal poaching is rampant because there is a lack of effective enforcement of regulations (staff, boundary markers, etc.). Local communities too do not have long term incentives to communally regulate poaching in the buffer zones.

## Overgrazing

40. Conversion of pastureland into crops is pushing pastoralists and their herds more and more into Reserves and even Parks. Even where grazing is allowed (e.g. Sylvo-pastoral Reserves), lack of effective communal structures and regulations for natural resource management (e.g. badly managed water resources), lead to overgrazing, conflicts between “resident” and non-resident transhumants, and conflicts between farmers and pastoralists. Very often to avoid conflicts, pastoralists move clandestinely into Parks, Wildlife and Forest Reserves. Most of the overgrazing in the Ferlo is centrifugal around 10 of the most used boreholes. Furthermore, there is a lack of readily available intensification techniques, particularly for small ruminants that are appropriate to the socio-economic and ecological situation. These factors are exacerbated by an attitude of mistrust between pastoralists and protected area managers.

## Over-extraction of marine resources

41. It is estimated that Senegal’s annual fish catch of 420,000 tons currently exceeds sustainable levels by around 25,000. Fishermen also report declining rates. In some cases, fishermen have turned to salt and fuelwood extraction as alternative income. Despite a national fisheries monitoring project, there is insufficient capacity to regulate large scale commercial fisheries. In addition, traditional fishing technology is inefficient, environmentally destructive, and affects reproduction. Harvesting of crustaceans is also done with environmentally damaging techniques. Furthermore, habitat conversion of mangroves

and littoral lakes has reduced nesting and spawning sites. The lack of effective enforcement of existing regulations on fisheries and increasing population growth in coastal areas are among the root causes.

### Over-exploitation of non-timber products

42. Sustainable harvesting in the traditional system is based on a very diverse range of products. The scale of harvesting is mostly limited to self-sufficiency in medicines, food, fiber, and oil, but some products are commercialized domestically (and in the case of gum arabic, internationally). These include the fruits of *Adansonia digitata*, *Ziziphus mauritiana*, and *Diospiros mespiliformis*. With decreasing economic returns from crop cultivation, there has been an increase in harvesting of these products in protected areas. Evidence suggests that the rate is strong enough to affect regeneration of the plants, as well as feed source of wild animals. Lack of incentives from co-management result in opportunistic action by local communities.

### Uncontrolled bush fires

43. Traditional techniques of using fire for clearing, pasture regeneration, honey harvesting, charcoal production, and the like, have been practiced for thousands of year, but they are not efficient and can run out of control. This is compounded by increasing human population and therefore higher incidence of such fires. In some cases, fires have also been deliberately set to drive away non-resident transhumants. There is evidence to show that uncontrolled fires can be damaging to the ecosystem. Fire in the savanna is estimated to emit 42 Gg of  $CO_2$  per year. Neither the customary system, nor the modern public system has the capacity to control fires on its own. But effective fire management cannot be implemented as long as there is lack of capacity in protected area systems, lack of effective and integrated natural resource management by the RC and VT, and lack of community collaboration in protected area management.

### **Baseline course of action**

44. The ongoing sustainable development efforts in the country are set within the umbrella of investments encouraged by the Triennial Public Investment Programme (PTIP), which focuses on five thematic areas : (1) Design and implementation of productive activities; (2) Strengthening of production support; (3) Enhancement of human resources; (4) Improvement of living conditions; and (5) Institutional strengthening. Added to these actions are those pertaining to the fight against poverty, a cross-cutting theme covering all activity sectors (MEFP, 1999 :5). A detailed description of the baseline situation is provided in Annexes 2 &5. The following is a brief analysis of the baseline.

45. Rural and Agricultural Development. Ongoing assistance to this sector is focusing on food security through promoting animal traction, locust control, rural organization, agricultural water management infrastructure, and better entrepreneurship. Ministry of Planning and the Rural Councils are engaged in a massive decentralization effort, during which RCs and VTs are mandated to conduct rural land use planning and classical regional planning and implementation. Several national and regional projects and programmes are currently underway, including the Matam Agricultural Development Project (IFAD), National Locust Control (Netherlands, IAEA), and Support to Farmer Entrepreneurship (CIDA). In addition a large WB assisted project is aimed at restructuring the Ministry of Agriculture and Livestock, reforming the National Fund for Agricultural Research, and providing technical assistance to farmer associations. Senegalese research institutions, such as ISRA, continue to experiment with appropriate agricultural technologies, however, their impact on rural production is low. Government agricultural extension agents continue to be deployed in the Districts, but need assistance to make the transition from a classical subsidized agricultural system, to the new self-reliant and environmentally sound production system.

46. Pastoral development. Ongoing assistance in this area is currently far less than what it used to be in the 1970's and 1980's. This previous work including ground-breaking projects in the development of pastoral associations and community based natural resource management. Lessons from these projects are now incorporated into ongoing work as well as the present proposal. Currently there are pastoral associations around each borehole in the Ferlo, who have the right to manage pasture and water including charging fees. Revenues are used for maintenance of the boreholes as well as provision of veterinary services and salt licks. However, these pastoral associations are still not legally recognized by the State. Furthermore, there is a disturbing trend towards increasing sedentarization, leading to greater land degradation in this fragile ecosystem. In terms of ongoing assistance, the Pastoral Self-Help project in the northern Ferlo (RFA/GTZ) is concentrating on building local capacity for marketing, and natural resource management. A major assistance is also being provided for rehabilitation and management of boreholes in the Ferlo (Belgium and AFD). Some assistance is also being provided by the GoS through the national rural production intensification programme for livestock intensification in the Niaye, Saloum and PNNK. However, none of the ongoing assistance is inter-sectoral, nor does it address biodiversity conservation issues, or incorporate larger landscape (eco-regional) planning issues.

47. Forestry sector. Baseline actions in this sector are focused on promoting natural resource management by RCs and villages, promotion of alternative energies, equipment for fighting bush fires, and rehabilitation of degraded lands, such as the Project for Community Based Natural Resource Management (USAID), Sustainable and participatory management of Traditional and Alternative Energies (WB/GEF), and Coastal Zone Reforestation (JICA). Furthermore, GEF small grant program and several national and international NGOs (among them research organizations) are active in ecosystems rehabilitation, in native species silviculture, fallow land management, fuelwood saving, food transformation and processing, population organization, training and extension services in the Country. In addition, there are some interesting initiatives for testing alternative technologies for bee keeping in the Niokolo-Koba area through a GoS programme since 1997. However, the baseline in the forestry sector has few links with biodiversity conservation in and around protected areas. Isolated attempts at reforestation in classified forests continue to use eucalyptus for fast growth.

48. Poverty alleviation and sustainable livelihoods. The baseline is very active in this sector. Most of the focus is on ensuring access to basic services and micro-credit, support to women and other vulnerable groups, and building small scale enterprises. These include the Local Development Funds Project (UNDP), the Project to fight poverty (AfDB), and the Village Self-Management and Development Project (IFAD).

49. Marine resources and fisheries. The baseline activities in this sector are centered mostly around private sector investment in fisheries. Some public sector assistance is available, particularly in improving the operation of the Saint Louis Fishing Complex (Japan), and Support to Artisanal Fisheries (AFD) in the southern coast of Senegal (Saloum Delta and Basse Casamance). A recently completed Japanese funded project in the Delta area (Missirah Center) was successful in promoting fish conservation techniques. But it failed to establish mechanisms to cover recurrent costs and much of the infrastructure and equipment have fallen into disrepair.

50. Environmental Education. The Ministry of Environment (through DEFCCS and DPN) holds yearly awareness campaigns to combat bush fires and promote reforestation around protected areas. In addition, the Environmental Training and Information Project conducts awareness raising campaigns in primary schools. These efforts are important in mainstreaming environmental concerns, but need to be integrated within a more holistic, multi-sectoral, IEM vision of conservation and sustainable use of land and resources at the community level.

51. Conservation. Ministry of Environment continues to cover recurrent costs of staff and infrastructure in all protected areas, but limited financial and technical capacity hamper its ability to look beyond PA boundaries. Out of 213 classified forests in the country, only half a dozen have a simple management plan. Most of the assistance to this sector has centred around infrastructure and capacity building of two major parks (PNNK and PNDS). In the former, good lessons have been learnt from a previous “Watershed Management Programme” in participatory approaches to co-management. In addition, ORSTOM provides assistance to DPN for periodic census of a limited set of species. Africa 2000 Network and SAPAD (an NGO) have had some success in the training of eco-guards/tourist guides (villagers recruited on a volunteer basis). The NGO WAAME, within GEF small grant program support has worked on regeneration of mangroves in the Saloum Delta. Mention must also be made of spontaneous initiatives by a number of Village Groups in the Niayes region to conserve certain species and restore forest cover by establishing Community Nature Reserves on the border of protected areas. The baseline situation has already advanced towards recognizing the need for linking conservation to sustainable development, but has a long way to go in terms of developing and testing viable models for IEM, and lifting technical, institutional and policy barriers for sustainability and replication.

52. Ecotourism. Baseline situation is very limited in this sector. There are two hotels each in PNNK and PNDS, and only a few camping facilities operated by the private sector adjacent to these parks. Community participation in providing services to tourists is very limited. Two Lakes in the Niaye region (Lake Rose and Tamna) attract quite a lot of day visitors, but there are no facilities for longer term stays. There is a need to lift barriers that would encourage the private tourism industry to increase its investment in Senegal. These barriers are related to protected area infrastructure, as well as capacity of local communities to provide services.

53. In summary, the baseline situation is such that pressure on biological and natural resources will continue to grow, while ongoing action will focus primarily on increasing living standards and devising short term solutions for natural resource problems. Concrete actions have been carried out with the participation of several development partners, NGOs, various economic associations (GIE) and Village Associations, as well as numerous youth and women groups. However, in most cases, these measures have failed to meet expectations. There has been a lack of sectoral integration, resulting in technological packages/systems that are non-replicable outside of laboratories or demo plots. There has been limited adoption by the population due to distortions in economic and policy incentives. And there has been limited involvement of the stakeholders in planning, monitoring and evaluation processes.

## **Project Rational and Objectives**

54. The **overall objective** of the GEF Alternative is to promote Integrated Ecosystem Management in four representative ecosystems of Senegal to generate both global benefits from enhanced biodiversity conservation and carbon sequestration, as well as national benefits from sustainable use and equitable sharing of benefits. The **GEF Alternative** will build on the baseline (described above) by consolidating lessons learnt and experiences from research and development organisations, into a 10 year phased program of activity that brings together GEF and other Assistance in a coherent package, in order to obtain both global and national benefits. The Alternative model will be tested in four representative landscapes in the country, and will be complemented with upstream activities in policy reform, capacity building and monitoring.

55. The model to be tested in this project has been developed during the PDF B process, based on a review of lessons learnt both nationally and internationally, and through consultation with local and national stakeholders. It is not a static model, but will be adapted to each site, and will be revised through an iterative process of adaptive management during the life of the project. The description below provides

the general outline of the model, but each site will have its own set of adapted activities. The expected outputs and indicators in Annex 3 reflect this adaptability.

56. Faced with increasing population pressure on biological and natural resources inside protected areas, and recognizing that pure conservation will no longer be effective in protecting Senegal's threatened biodiversity, nor in maintaining carbon sinks, the model adopted by the project will intertwine a series of co-managed conservation, community-based natural resource management, local land use planning and sustainable harvesting activities into an Integrated Conservation and Development (ICD) model based on IEM principles. In addition, the regional interlinkages between the four ecosystems will be taken into account by incremental eco-regional planning, where IEM and bio-regional issues are incorporated into regional planning, and provide the overall framework for ICD planning at the local and regional levels. IEM will be promoted through capacity building and enabling activities both at the national and regional levels (Regional Councils, etc.) as well as at the local level through the Polyvalent Extension Services (CERPs) which provide the structure for integrative work. Each of the project's four representative landscapes contains three different but integrated spatial units. These units and the activities that will be targeted selectively to them are :

- **Core zone of protected areas (PA):** The project will build on the baseline, by filling gaps related to equipment and infrastructure, as well as capacity building of PA staff in eco-regional planning, PA management, and participatory fire control. In addition, the project will build institutions and capacity for co-management with local communities. Finally, the protected area's capacity to generate revenue for covering recurrent costs will be strengthened. Enhanced protection is estimated to result in 5000 -6000 tonnes of carbon sequestered per hectare per year.
- **Community Nature Reserves (CNR) in buffer zones immediately around selected protected areas:** The project will encourage and build capacity for the establishment of community controlled Nature Reserves on the boundaries of selected protected areas of global significance following eco-regional principles. About 100 such CNRs were identified during the PDF B by local stakeholders. It will also develop and apply appropriate legislation and recognition of such Reserves as viable extensions of the protected area system. Communal management and control of the CNR, appropriate sustainable harvesting regimes for selected resources, community-based anti-poaching structures, links to Protected Area management, co-management of fire, opportunities for eco-tourism benefits, rehabilitation of degraded areas, and access to local credit and savings, are all issues requiring attention in the CNR. Buffer zones will enhance biodiversity protection in the Core zones. Rehabilitation and reforestation will result in an estimated 1400 tonnes of carbon sequestered per hectare per year.
- **Village Territories around these CNR and PAs:** The project will enhance baseline efforts in decentralization, by building capacity for CBNRM, conflict resolution, land use planning/enforcement, control of bush fires, and regulation of transhumance and pastoral resources at the Village Group level. Furthermore, the project will implement legal and regulatory amendments to the land tenure regime in support of this decentralization. In addition, it will demonstrate alternative technologies for low-external-input intensification of agriculture (crops and livestock), and meeting fuelwood demand, as well biodiversity-friendly alternative income generation activities (including processing and marketing). These activities will be supported by the establishment of local credit and savings schemes. At the regional level, integrated eco-regional planning will be promoted to rationalize land use and IEM. ICD and eco-regional planning will maximize the conservation effectiveness of PA's, and by creating economic prosperity, reducing the imperative of local communities to use PA

resources for survival strategies. Agricultural intensification is expected to reduce emissions of carbon from cropped land by at least 30%.

57. These field level activities will be complemented and supported by national and provincial level activities aimed at capacity building, monitoring, and inter-sectoral policy and legal reform for IEM. Senegal already has one of the most favorable policy environments for integrated ecosystem management, and therefore these policy changes are mostly in the nature of fine-tuning and operationalizing policies, rather than fundamental changes. It is felt that the combined and coordinated actions of several bilateral donors who have agreed to partner with the project, as well as the commitment of the GoS to the project, should help to affect these policy and legal changes in the First Phase, and if need be reinforced over the life of the project. Local level activities will be implemented through existing CERP and PA agents as well as NGOs. National level work will be coordinated through a project implementation unit housed in the Ministry of Environment.

58. The **GEF increment** will build upon the baseline and co-financing, to cover the additional costs related to achieving global benefits. Annex 18 provides the detailed description of coordination and co-financing arrangements for each site. In general, co-financing will cover the cost of sustainable development activities, remove barriers for credit schemes, promoting livelihood strategies, investments in production inputs, and replication of successful models. The GEF increment will cover the costs of developing, testing and demonstrating the integrated conservation/development (ICD) and eco-regional planning models in a few selected sites in each of the four landscapes. In some cases the GEF increment will provide innovative improvements to already existing technologies, and in other cases, it will test in Senegal techniques that have been developed elsewhere (See Annex 11). The GEF increment will also lift barriers to the sustainability and replicability of the ICD and eco-regional models, and appropriate harvesting techniques. These barriers are technical, economic, political and institutional in nature. The GEF increment will address these barriers at the local (e.g. appropriate technologies, institution building, economic incentives), provincial (e.g. capacity building), and national levels (e.g. inter-sectoral policy reform, legal clarification). A more detailed IC analysis is given in Annex 2.

59. **Project Sites.** The four representative landscapes represent a total of 5.7 million ha and include 4 National Parks, 4 Wildlife Reserves, 16 Classified Forests, 80 Sylvo-pastoral Reserves, and one Biosphere Reserve (Annex 7 and 17), with a total of 1014 villages adjacent to these protected areas (Annex 7). Although the initial landscape selection was based on biodiversity values, it was soon recognized that there can be substantial global benefits from carbon sequestration and integrated ecosystem management. The project has selected a sub-set of 19 protected areas (or 18% of the total) and their buffer zones to reflect this integrative nature of the project. In addition, a sample of 10% of the villages will be chosen to test all IEM models in Phases 1 and 2. Eco-regional planning (Annex 11) will be demonstrated in two linked landscapes : the Ferlo and Niokolo. Based on an agreement reached by the GoS for Niayes and Saloum landscapes (see below), this project will concentrate on terrestrial ecosystems/sites, while the sister GEF/WB project on Coastal Zone Management will focus on marine sites (see Annexe 17 for details and Annex 19 for Senegal's expressed needs for support from UNDP-GEF and from WB-GEF). Phase 3 will replicate successful results to a further 20% of villages and protected areas in all landscapes. Annex 7 provides a tentative list of villages based on initial rounds of consultation with local communities, government and donor partners and confirmed in January 2001. This list of 20 CNR and their corresponding 100 VTs for the 4 project selected sites are in Annex 17.

60. **Project Phasing.** The project will require consistent presence over a sufficient amount of time to ensure that results are sustained. Activities related to policy reform, participatory planning and development, capacity building, and ecological rehabilitation require investment in time in order to be effective. Therefore the project will be implemented over 10 years in three phases (detailed description and benchmarks in Annex 6). At the end of each phase, the achievement of benchmarks will be evaluated

and the proposal for the following phase will be developed. In the first phase (3 years), the project will establish the enabling environment for ICD and eco-regional planning at the national level (lift policy and legal barriers in the environment sector). It will also collect all necessary information (scientific, participatory visions, etc.), build political consensus in each landscape and sample site in the development of adapted ICD and eco-regional planning, build institutions and capacities at all levels, and initiate pilot activities not requiring prior removal of policy and legal barriers, such as micro-credit, sustainable harvesting regimes, some NRM, and fire control.

61. By the end of the first phase it is expected that the social and political groundwork will have been set to effectively implement the models in the selected sites in the second phase (4 years). Implementation will not only serve to test the model, but also allow demonstration to other areas. Policy reformulation and capacity building will continue as necessary. In this phase, emphasis will also be placed on developing appropriate economic incentives and credit schemes to ensure that recurrent costs of the activities are covered by non-project funding.

62. In the third phase (3 years), the project will conduct any remedial measures needed to refine the model in existing sites, and replicate actions to other protected areas and villages. All replication will be done through co-financing from government, local communities, NGOs, and other donors. As the third phase is one of disengagement, project activities will work towards refining mechanisms for economic sustainability and replicability of activities. Some GEF funding will also be made available for monitoring and evaluation, and any remaining barrier lifting work.

### ***Justification for GEF funding***

63. The project is eligible for GEF funding through the Operational Programme 12 (Integrated Ecosystem Management), because it addresses integrated threats and inter-sectoral concerns, by adopting an ecosystem approach, and because it is expected to provide benefits to two focal areas (biodiversity and climate change through carbon sequestration). In addition, the project adopts a long term phased approach to GEF funding, aiming at building capacity and sustainability in all actions, and supporting a change to more conducive policy and legislative environment. Furthermore, the project addresses the concerns of member states as well as the CBD COP for greater attention to the cross-cutting issue of land degradation, by focusing on mitigating the effects of over-cultivation, overgrazing, deforestation, and mangrove destruction. Project activities aimed at ecosystem rehabilitation, agricultural production intensification, and promoting sustainable harvesting regimes will have beneficial effects on controlling land degradation. The project also follows the guidance provided by the GEFSEC Action Plan on Land Degradation (1999) for lifting barriers at the policy and legislative level, and in emphasizing the leveraging of additional financing. Furthermore, the project will emphasize mainstreaming biodiversity and land degradation work into local and national concerns.

### ***Linkages to ongoing assistance***

64. The GoS and UNDP have established the 6<sup>th</sup> Country Cooperation Framework (CCF) which places environmental protection in a central position as a pillar supporting the two main thrusts of the fight against poverty, and good governance for sustainable human development. UNDP coordinated the formulation of the National Strategy and Action Plan, which led to the establishment of the priorities enshrined in this project. UNDP will continue its support to the project (in addition to having supported the PDF B phase) by focusing on strengthening stakeholders' capacities for sustainable development, improving access to local credit, and linking the project to other ongoing programmes to fight poverty in rural areas (e.g. AfDB programme).

65. The project has been closely designed to complement the interventions expected under the GEF/World Bank project (now under preparation) for coastal zone management. The present project's activities in the Saloum Delta and Niaye zones are restricted to a small number of demonstration sites on the terrestrial side, designed to test the ICD and eco-regional planning models (see Annex 11)<sup>1</sup>. It is expected that the project will provide lessons learnt that are cross-fertilized among the four representative ecosystems of Senegal, and can therefore add value to Coastal Zone Management. Modalities for cooperation and synergy between the two projects will be developed prior to CEO (annex 19) endorsement (in so far as possible given that the CZM project has not yet been designed).

66. Among other ongoing assistance that the project will coordinate closely with, one can mention the Community Based NRM project (USAID), which will serve to provide valuable lessons on developing the ICD model, and building synergies such as using similar networks and marketing channels. Another project which will be the subject of close coordination, is the Traditional Energy Management Project (WB/GEF) which aims to develop local level appropriate models for renewable energy conservation around Tambacounda area. Furthermore, several ongoing projects in the Ferlo, Coastal zone and Niokolo-Koba areas will work closely with the project, such as the Pastoral Self Promotion project (RFA/GTZ), two Projects on borehole management and maintenance (Belgium and AFD), Rehabilitation of PNNK (FDS/FFEM), AGIR(EU), Coastal zone reforestation (Japan) and Support to Artisanal fisheries (EDF/AFD). Annex 18 provides a description of modalities for cooperation with all of these projects. Further cooperative modalities will be fine-tuned during the feasibility study.

## Components and expected Outputs

67. The participatory planning process of the PDF B developed the logical framework of the project, including an indicative list of activities, verifiable indicators, means of verification, and assumptions, which is presented in Annex 3. The following is a brief description of the expected outputs and GEF increment for each component. Detailed technical specifications for all these outputs, based on lessons learnt, are provided in Annex 11.

### ***Component 1: Policy and legal framework adapted to participatory integrated ecosystem management (GEF: US\$98,000; co-financing : US\$65,000).***

68. The GEF Alternative provides that the legal status of protected areas will be amended in order to allow co-management and participation by local communities and the private sector in the management of and equitable sharing of benefits from national parks, classified forests, and wildlife reserves. Current development policies pertaining to agriculture, pastoralism, forestry and hunting will be reviewed in order to identify and remove obstacles and disincentives to individual and community initiatives for sustainable management of biological resources. This will include revision of land tenure laws pertaining to communal land to allow creation of Community Nature Reserves. In addition, the policy environment for eco-regional planning will be strengthened in relevant sectoral and planning ministries. Furthermore, the GEF Alternative will build capacity for compulsory environmental impact assessments of all future projects in the four project sites, in order to ensure harmonized conservation and development actions. The GEF increment will be additional to the efforts of other projects in influencing policy reform, and will focus on providing technical assistance, capacity building, and awareness raising on biodiversity conservation issues.

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<sup>1</sup> These sites were selected during a GoS planning meeting on 5 February 2001 and approved by the Minister of Environment As a result of this country driven guidance, the IEM project will focus on a sub-set of villages and sites on in-land dunes in Niayes, and in the PNDS the terrestrial section of the Park, and all villages on the periphery of these sites as in Annex VIIa and as stated in the Senegal letter of support needed from UNDP-GEF and from WB GEF in Annex VIIb).

**Component 2: Sustainable development and natural resource management in Village Territories (GEF : US\$920,000; Co-financing : US\$11,071,000)**

69. This component will initially focus on applying a multi-sectoral environmental awareness, training, information, communication and education programme at the four project sites, in order to establish the fundamental basis for change towards community based IEM. The component will then assist local communities in the development and implementation of management plans for the selected Village Territories, that are linked to the management plans in the CNR and PAs. The implementation will include demonstration of appropriate technologies (agricultural intensification, pastoral management, sustainable fisheries, forest and renewable energy management, fire control, land rehabilitation, soil and water conservation, etc.). It will also include institution and capacity building at VT and RC levels, for integrated eco-regional planning, land use planning, conflict resolution, and participatory and adaptive monitoring. Furthermore, activities will be designed to improve access of local communities and individuals to credit for sustainable use activities. These revolving funds will be managed by local communities and will be capitalized with membership fees, contribution from protected area revenues, and external co-financing and technical support from the Fonds de Promotion de la Jeunesse (Ministry of and UNDP. All alternative income generation activities will be promoted only after socio-economic analysis is done on their cost-effectiveness. The GEF increment will be additional on a substantial co-financing that focuses on sustainable development and poverty alleviation (donors, government and rural credit). The GEF increment will restrict itself to the biodiversity and inter-sectoral “added-value” primarily through technical assistance but also for investments in demonstration of appropriate technologies.

**Component 3: Conservation and sustainable management of Community Natural Reserves (GEF: US\$1,572,000; Co-financing : US\$5,315,000)**

70. This component will aim to establish a representative sample of Community Nature Reserves, the legal basis for which will have been developed in Component 1 and taking into account eco-regional principles. Local communities will donate parts of their village territories (100 such CNRs have already been identified) and the project will provide assistance and capacity building for developing and implementing management plans in these buffer zones. These plans will take into account the VT and PA plans in order to provide a spatial continuity and synergy in all actions. Land and vegetation rehabilitation, and ecologically sound pastoral production and eco-tourism techniques will be promoted. Sustainable harvesting regimes for wood, fruits, medicines, fish, fibers, and other natural products will be tested, demonstrated and implemented with the help of eco-guards. Local communities will be assisted in improved processing and marketing of these products as alternative income sources. Local micro-credit and savings scheme (component 2) will also be applied for these activities. An environmental awareness program will also target buffer zone issues, such as controlled management of and early warning system for bush fires, and adaptive monitoring. The GEF increment will finance the creation of these community reserves which are groundbreaking and innovative for West Africa and Senegal in particular. It will also cover the development and demonstration of sustainable harvesting regimes, capacity building of local communities in management and monitoring of CNRs, and testing ecosystem rehabilitation techniques. It is expected that revenues generated from sustainable use activities (and those in Component 4) will allow local communities to continue to monitor and regulate the CNRs after project completion.

**Component 4: Sustainable conservation and co-management of natural resources in protected areas (GEF: US\$6,760,000; Co-financing : US\$4,795,000)**

71. This component will develop and/or finalize management plans for selected protected areas, depending on the specific situation, as well as improve protected area infrastructure and human resources

through capacity building. It will also focus on reducing poaching, crop encroachment, overgrazing, uncontrolled fires, and deforestation in the protected areas through co-management systems and building incentives through benefit sharing with local communities. This will be coordinated with actions in components 2 and 3. Eco-guards recruited from the villages will be trained as tourism guides as well as biodiversity and fire monitors. Mechanisms to ensure that protected areas are able to cover recurrent costs will be developed and implemented, including greater decentralization of protected area budgets. The GEF increment will fill the gaps left by existing and planned assistance to the protected areas, as well as in promoting co-management models, and options and incentives for sustainability.

**Component 5: Participatory monitoring and evaluation of the ecosystem (GEF: US\$370,000; Co-financing : US\$165,000)**

72. This component is intended to provide the monitoring and evaluation “glue” to the project, that will allow it to apply an iterative and adaptive approach to project design and implementation. As a phased project, this component will be crucial in demonstrating achievement of results at each phase, and in refining and readjusting project actions in subsequent phases. Outputs will include a data bank on biodiversity dynamics and carbon sequestration (to be housed in an appropriate national institution) that integrates local knowledge and promotes participatory mechanisms for planning, development and adaptive monitoring. Results and lessons learnt will be continuously monitored and disseminated through national and international media, scientific journals and networks, community meetings, theatre troupes, etc.. The GEF increment will cover the cost of technical assistance and equipment for the data bank, capacity building for participatory M&E, and biodiversity “value-added” on diffusion and dissemination.

73. **Linkages between components:** The strategy of the project is to maintain synergistic linkages between the components, not only from a thematic perspective, but also in cross-fertilization among the four project sites. Thus the project will include periodic workshops, reviews and networking to ensure these linkages exist.

74. **End of project situation.** At the end of the 10<sup>th</sup> year, the GEF Alternative is expected to leave behind a situation where there is:

- ✓ Improvement of living conditions for local communities in the project site, equivalent to direct benefits for an estimate 50,000 people, and indirect benefits three times that amount
- ✓ Improved and self-sufficient management of protected areas (18% of the PAs in the project site, or about 3.68 million hectares)
- ✓ At least 100,000 hectares of newly established and sustainably managed Community Natural Reserves
- ✓ Effective capacity for IEM in CERP, VT, RC, and PA.
- ✓ Effective integrated eco-regional planning among RCs providing guidance to VT and PA plans.
- ✓ Effective models for co-management of protected areas, and mechanisms for sharing of benefits
- ✓ Effective appropriate technologies for agricultural intensification and sustainable harvesting
- ✓ Enhanced capacity for participatory monitoring and evaluation, conflict resolution and adaptive management among local stakeholders
- ✓ 50% reduction in uncontrolled fires in the four representative landscapes.
- ✓ Biodiversity status particularly of global significance is maintained or increased significantly.
- ✓ Senegal’s carbon balance improved by 10%.

## **Risks, Sustainability and Replicability**

75. The project's **assumptions and risks** are provided in the Logical Framework (Annex 3). In general the major risks are associated with instability and drought. Instability may be generated due to unforeseen political factors, either at the sub-regional, national or provincial levels, including spill over effects from the disturbances in Casamance, although the project sites are far from this area. The GoS has shown considerable stability particularly following the latest elections, and peace negotiations have resumed with the rebel movement. In addition, the government is keen to reform its legal and policy framework, and has renewed the push to greater decentralization and devolution of authority to the lowest feasible level. Droughts are known to affect this Sahelo-sudanian country regularly. Major droughts occur on average every 10 years, with minor ones every 3-4 years. The project's ten year phased approach is designed to smooth over these effects and increase its chances of success.

76. Various design elements have been incorporated to ensure sustainability of the project. The high commitment of the GoS to this project, as evinced by their substantial budgetary contribution, direct ownership of the PDF B process, and leadership in developing partnerships with Bilateral Donors for this project, is a major and necessary ingredient for ensuring sustainability in the long term. **Socio-economic sustainability** will be enhanced with the promotion of appropriate techniques to generate sustainable income and establish rules for sustainable NRM. The project will demonstrate appropriate mechanisms for consultation, cooperation and equitable sharing of the profits from conservation in CNRs and PAs. Participatory selection of village eco-guards, development of management plans, and design of conflict resolution mechanisms (based on both traditional and modern means) will help to ensure adherence to good management rules on the part of the residents and outsiders alike. Thus, illegal exploitation will be better controlled because local communities will have incentives to enforce the rules.

77. **Financial sustainability** will be ensured by the actors themselves, in particular by implementing activities capable of generating profit from sustainable use of renewable natural resources. A community-adapted credit system will extend loans at a 10% interest rate, with the money accruing from interest payments being used to cover recurrent costs and loaned to others through a revolving mechanism. The RC budgets, and donor matching grants will contribute to the capitalisation of these revolving funds, in addition to the contribution made by the individuals benefiting from the loans. The revolving funds will benefit from considerable experience in Senegal (and elsewhere) on the design of such funds. A second mechanism for financial sustainability built in by the project is that of grazing and watering fees. It is estimated that these will generate revenues up to US\$3,756,000 annually for the pastoral organisations in the Ferlo, which should be sufficient to assume all recurring costs of pastoral investments, while improving the living conditions and alleviating poverty. User fees will also be tested in the fisheries and agricultural sectors, so as to cover recurrent costs of operating, repairing and replacing equipment and other inputs through farmer or fishermen associations. Finally, one of the main assumptions of the project is that with the investments in protected areas and community level engagement in eco-tourism during the 10 years, receipts from gate fees will expand.

78. Based on the current statistics provided by the National Parks Department in terms of entrance fees and number of visits to Niokolo and PNDS parks, and assuming that project activities will improve the biodiversity status of PAs, the expected income from tourism revenues from these two main national parks over the next ten years can be expected to be \$2.7 million. In addition, GOS' annual contribution to the budget of these two PA, based on the statistics of the past two years, amounts to US\$ 1.2 million for the ten years' period. In total therefore, the two PAs alone are expected to have a revenue of US\$ 3.9 million during the life of the project. Both of these sources of revenue are expected to continue after project completion, thus ensuring financial sustainability of the project (Annex 11). Finally, the project will also improve mechanisms for self-reliance in protected area system, through more efficient budget allocations and management.

79. The project will not be creating new institutions, but will be working through existing ones. Therefore, **institutional sustainability** will be assured through capacity building of CERP agents, PA agents, and decentralized authorities in the RC and VG institutions. Recurrent costs will be assumed by the Government of Senegal, communities and the NGOs acting at grassroots level, which will ensure the continuation of the activities in the post-project phase, independently from the GEF.

80. The fundamental design of the project is based on testing and demonstrating models for **replication**, and preparing the enabling environment for such replication in Senegal. In addition, it is expected that the lessons learnt from this project will contribute in general to our understanding of ICD and IEM and community based conservation in Africa, as well as specifically to biodiversity conservation and carbon sequestration in similar situations in the Sahel.

## **Stakeholder participation and Implementation Arrangements**

81. **Stakeholders' participation** in the preparation and planning of this project was achieved during the PDF B through a series of workshops organized in 60 villages, directly involving some 2,000 people including crop farmers, sedentary and transhumant livestock farmers, hunters, forestry operators, tourist camp managers, village leaders, rural advisors, RC Presidents, sociologists, geographers, scientists, foresters, park and reserve managers, legal scholars, NGOs, and representatives of government entities and development partners (Annex 12). All of these actors and stakeholders approved the approach and endorsed the project, stressing its major innovation, i.e. the active role they were given at all identification and formulation stages, and the model of co-management. Actors including LCs, socio-professional organisations concerned with NRM, NGOs, various village associations, private individuals and GIEs will continue to participate in the implementation of this community project. They will be the primary actors responsible for applying the approaches and methods and carrying out the activities, and will assume responsibility for and acquire ownership of the project and its impacts to ensure the sustainability of the activities undertaken in the post-project phase.

82. The project will be **implemented** under the National Execution modality by the Ministry of Environment (ME) through assistance from UNDP, and under the financial supervision of the Ministry of Economy and Finance (MEF), which will open a bank account for the project and monitor expenses with UNDP. UNOPS will be requested to provide assistance as needed for international recruitment and procurement. MEF will be responsible for certifying expenses as authorised according to the established yearly work programme and cost estimate. The ME will be the project execution agency and will provide technical services through DPN and DEFCCS. The Project Coordination Unit and four Field Units will be supervised by the Project Steering Committee, and will seek advice from the Scientific and Technical Committee. The project will not create any new institutions, but rather will rely on permanent existing structures (both public and civic) so as to ensure institutional sustainability.

83. CONSERE will act as the project's Steering Committee, and will coordinate at the national level with other projects, including the WB/GEF projects on Renewable Energy, and Coastal Zone Management. CONSERE has already played a major role in ensuring coordination at the design stage of this and the CZM project. At the local level, the project will establish yearly coordination meetings with all Associated and Co-financing Projects. An external evaluation will be conducted towards the end of each phase to report on achievement of benchmarks and recommend revisions where necessary. A final evaluation will be conducted upon project completion according to UNDP and GEF procedures. Annex 13 provides more details on the implementation arrangements.

## Project Financing

84. The total cost of the GEF Alternative, including the baseline, is US\$ 269,251,000. Total cost of the project is US\$ 34,364,000 of which US\$ 27,294,000 is co-financing from several sources, including GoS, UNDP, EU, JICA, IFAD, CIDA, UNCDF, and Netherlands. The GEF incremental cost is \$10,070,000 including the PDF B. GoS co-financing is US \$ 8,397,000 of which US \$1.05 million is in cash (almost 13% of total government contribution). UNDP co-financing from TRAC resources is \$3.243 million for 2002 onwards. Given the participatory nature of the project, it is expected that local communities will also contribute in-kind resources (labour, minor equipment, land), but these have not been quantified.

### Project Output Budget (US \$ million)

Project Outputs	GEF	Direct Cofinance		Re-programmed Co-financing						TOTAL
		GoS	UNDP	Nether lands	JICA	UNCD F	CIDA	IFAD	EU	
1. A Policy and legal framework adapted to participatory IEM	0.706	0.183	0.030							0.919
2. Sustainable development systems and community based natural resource management in Village Territories	1.582	1.504	2.498	1.000		3.000	0.500	3.500	0.060	13.644
3. Conservation and sustainable management of Community Natural Reserves	1.932	3.440	0.553	0.500	3.298	0.500	0.200	0.500	0.030	10.953
4. Sustainable conservation and co-management of natural resources in Protected Areas	4.685	3.074	0.082	1.500					1.015	10.356
5. Participatory monitoring and evaluation of the ecosystems	0.815	0.115	0.080							1.010
<b>Total project outputs</b>	<b>9.720</b>	<b>8.316</b>	<b>3.243</b>	<b>3.000</b>	<b>3.298</b>	<b>3.500</b>	<b>0.700</b>	<b>4.000</b>	<b>1.105</b>	<b>36.882</b>
<b>PDF B</b>	<b>0.350</b>	<b>0.081</b>	<b>0.051</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.482</b>
<b>GRAND TOTAL</b>	<b>10.070</b>	<b>8.397</b>	<b>3.294</b>	<b>3.000</b>	<b>3.298</b>	<b>3.500</b>	<b>0.700</b>	<b>4.000</b>	<b>1.105</b>	<b>37.364</b>

85. The project will be implemented in three phases. Annex 6 provides a detailed but indicative description of the three phases and their expected outputs. It is expected that GEF and donor financing will gradually decrease by Phase 3, in order to ensure an orderly phase-out. Annex 13 describes the types of interventions expected from the major co-financiers of the project. The remainder of the co-financing (11% of the total project cost) will be confirmed during the feasibility study of the project.

## Monitoring, evaluation and dissemination

86. M & E will be conducted in several layers by the project. Monitoring of the biodiversity status and carbon sequestration (potential and actual) will be done formally (inventories, targeted research, surveys, etc.) through sub-contracts with competent organizations in Senegal, and through ongoing surveys by DPN, assisted by eco-guards and other local villagers. Monitoring of project results will be done through formal events (3 evaluations, one each at the end of a phase), as well as through participatory M&E techniques on a regular basis. Capacity of local communities and authorities will be enhanced to incorporate M&E techniques for adaptive management and enforcement. The PCU will submit quarterly technical and financial reports assessing the level of success in reaching the expected outputs, based on the indicators listed in the logical framework. It will indicate project potentialities, success and weak points, and recommend improvements as needed. The project's activities in awareness raising and dissemination of results are important tools for ensuring diffusion of lessons learnt within Senegal. Project staff and NGOs will be encouraged to disseminate information through existing networks and scientific journals. Supervision missions by UNDP-GEF, technical evaluations by STAP, and other formal evaluations by GEFSEC will be fielded on an as-needed basis in order to gather and disseminate lessons learnt. Annex 12b provides details of the M&E Plan.

## Legal context

This project document shall be the instrument envisaged in the Supplemental Provisions to the Project Document. The host-country implementing agency shall for the purpose of the Supplemental Provisions to the Project Document, refer to the Government co-operating agency described in the Supplemental Provisions.

All activities stipulated in the Project Document shall be implemented accordingly. However, should there be a need to make changes/modifications to any of the agreed activities, all signatories of the Project Document must concur, before such changes are made.

The following amendments may be made to the original Project Document, even if they are signed only by the UNDP Resident Representative, provided the latter assumes that all other signatories of the Project Document have no objections to the amendments:

- Revisions in, or additions to, any of the Annexes of the Project Document with the exception of the Standard Legal Text for non-SBAA countries which may not be altered and the agreement to which is a pre-condition for UNDP assistance.
- Revisions which do not result in a major changes in the project's immediate objectives or outputs, and which are attributable to a reordering of the activities or inputs in order to improve the realisation of the objectives or the outputs.
- Necessary yearly revisions which are made to reorganise the provision of already scheduled inputs, to reflect an increase in the cost of expert services or other services due to inflation.

The government executing agent designated on the cover page to this project document has been duly delegated by the government coordinating authority to carry out this project and accordingly will follow the NEX accounting, financial reporting and auditing procedures set forth in the following documents as may be amended by UNDP from time to time.

- The Accounting and financial reporting procedures set out in UNDP Programming Manual
- The UNDP Audit Requirements set out in the UNDP Programming Manual and, the UNDP Government Execution Manual (GEM).

The above documents are an integral part of this project document although incorporated herein only by reference. They have already been provided to the government and said Government executing agent.

Auditors to the project will be officially designated. Such auditors, and/or other officially appointed auditors shall undertake periodic management and financial audits of the project in accordance with UNDP auditing procedures for nationally executed projects, pursuant to the Government's overall national execution responsibilities under the Project Document and as set out in the documents listed above.

In addition, all accounts maintained by the government for UNDP resources may be audited by the UNDP internal Auditors and/or the United Nations Board of Auditors or by public accountants designated by the United Nations Board of Auditors.

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Annex 1. Letter of Endorsement of GEF Focal Point

République du Sénégal  
Ministère de l'Environnement  
Direction de l'Environnement  
et des Etablissements Classés

N° 00492 ENV/DEEC

Dakar, le 27 JUIL. 2000

## LE DIRECTEUR

A

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**Objet : Endossement du Projet de Conservation Communautaire  
de la Biodiversité des Aires Protégées au Sénégal**

**Réf : PDF B SEN99/G41/A/99**

**Monsieur le Président,**

J'ai l'honneur et le plaisir d'endosser et de vous transmettre, au nom du gouvernement du Sénégal, le document portant descriptif de projet « Projet Brief » du projet cité en objet et résultant du PDF B rappelé en référence et réalisé avec l'assistance du FEM et du PNUD. Ce descriptif de projet dont les actions sont inscrites parmi les priorités du gouvernement et parmi les opérations les plus urgentes du Ministère de l'Environnement porte sur quatre (4) sites couvrant plus de 5.7 Millions ha d'écosystèmes d'Aires Protégées dont certains de ces sites sont classés site du patrimoine mondial, zone de biosphère, et site Ramsar. Pour une utilisation durable de la biodiversité de ces vastes unités d'écosystèmes d'importance mondiale et servant d'habitat à de nombreuses espèces endémiques et à plusieurs espèces mondialement menacées, le projet implique dans sa démarche communautaire, les acteurs concernés des Terroirs Villageois adjacents aux sites retenus sur un total de 1 014 villages avec une population de plus de 425 000 habitants.

Entièrement conçu avec une participation active des villageois, des Collectivités Locales, de la société civile, de l'Etat, des ONGs et des partenaires au développement au Sénégal, le projet, pour une durée de Sept (7) ans, couvre un montant total de 56.790 M\$US dont un cofinancement de 31.296 M\$US comprenant une contribution du Sénégal de 9.475 M\$US et une contribution du FEM pour 25.494 M\$US au titre du financement des coûts additionnels pour permettre aux actions de base de générer des bénéfices environnementaux globaux de conservation communautaire durable de la biodiversité.

.../...

Par référence à l'adhésion et à l'importance des acteurs concernés de voir ce projet communautaire des Aires Protégées se traduire en actions concrètes et au vue des produits attendus de ce projet pour un développement harmonieux et pour une conservation durable de la biodiversité, je vous saurai gré Monsieur le Président, de toute l'attention, de la considération et de l'endossement que ce projet pourrait mériter de votre part, pour son inscription au programme d'actions du FEM, lors des délibérations de la réunion de son Conseil prévue en Octobre 2000.

Je vous en souhaite une très bonne réception et vous prie d'agréer, **Monsieur le Président**, l'assurance de ma considération distinguée.

cc : - Monsieur Rafael Asenjo  
Executive Coordinator,  
Global Environmental Facility, (GEF) UNDP  
New York, NY 10017 - USA

- Madame Maryam Niami-Fuller,  
Coordinatrice Régionale du Programme  
Biodiversité et Eaux Internationales  
GEF UNDP New York, NY 10017



## Annex 2: Incremental Cost Analysis

### Development Objective

*Economic Policy:* The Senegalese Government's (GoS), economic targets for 2001 include raising GDP to 6%, while keeping inflation below 3%, reducing their external current account deficit to 6% of GDP, maintaining a budget surplus of 2% or more, and sustainable improvement of social indicators. Public investment is being targeted at education, health and basic infrastructure while the GoS is liberalizing and promoting the private sector in other economic sectors.

*Agricultural Policy:* The Agricultural sector generates only 20% of the country's GDP, but employs over 60% of the workforce, particularly in rural poor. Policies have focused on improving access to credit and supporting producer organizations while removing subsidies, price support and more direct intervention in the sector.

*Environmental Policy:* the GoS has set aside 5.15 % of its land to total protection, and a further 35 % for multi-use including biodiversity conservation. In the second half of the last decade the GoS created the Higher Council for Environment and Natural Resources (CONSERE) to coordinate environmental policy between government Ministries. The Ministry of Environment is responsible for the management of National Parks and Classified Areas. However in recognizing the increasing strain on PA resources from local populations the GoS now wishes to make legal provisions for co-management of PAs in order to provide incentives for community involvement in biodiversity conservation and natural resource management.

### **GLOBAL ENVIRONMENT OBJECTIVE**

The four areas selected for project intervention contain the largest remaining pristine and contiguous mangrove in West Africa; a RAMSAR site of international importance for wintering migratory and palearctic birds; and two World Heritage sites. The sites are representative of Senegal's 4 main relatively untouched ecoregions, and contain endangered and charismatic species such as the elephant, Jaguar, and the African Wolf. These sites are under pressure from a number of principal threats, defined during PDF B preparations as: land conversion; deforestation; poaching; overgrazing; over-extraction of marine and non-timber resources; and bush fires. Over USD 269 million in baseline funding is being invested through projects, mainly in village lands to intensify natural resource management and to make approaches more sustainable. PA staff do not have sufficient capacity and resources to enforce PA legal provisions against illegal resource use. Recognizing this, the objective of the project is to promote integrated ecosystem management of globally significant biodiversity in and around Protected Areas through co-managed conservation, sustainable use and equitable redistribution of benefits from natural resources between local stakeholders, introduce eco-regional planning and buffer zone management principals in areas between PAs, and promote inter-sectoral integrated means to intensify crop production systems and enhance traditional pastoralism. Global benefits are expected to be generated from protection of globally significant biodiversity as well as increased carbon sequestration and enhancement of carbon sinks.

## ***BASELINE***

Those activities expected to occur during the life of the project are described below (Annex 5 provides a more detailed description of the baseline).

**Policy and legal framework : In the recent past, GoS has out into effect legislation concerning decentralization, EIAs, community based forestry, and environmental codes such as fisheries and hunting. Currently and in the near future, no activities are expected under the baseline that would have and impact on this output.**

Natural Resource Management: There are seven projects with a combined investment of around USD 40 million from UNDP, UNCDF, USAID, IFAD, GTZ, Germany, WB, BOAD, the GoS and local beneficiaries to help local stakeholders generate environmentally sustainable income opportunities on village lands. Interventions are focused at: assisting communities to organize themselves into advocacy, collective and other productive groups; assist private sector and collectives to develop investment plans, and assist Rural Councils to prepare area development and natural resource management plans; improve credit access to rural populations; and increase the profitability of local community economic activities.

Poverty Alleviation, Agricultural and Pastoral management: ten projects with combined investments of over USD 136 million, funded from IFAD, WB, BOAD, CFD, RFA, GTZ, AfDB, CIDA, IDA, the GoS and local beneficiaries, aim to combat poverty and improve the management of agriculture and pastoralism. Interventions focus on agricultural intensification; assisting agricultural start-ups; improve access to water; restructure the Ministry of Agriculture and improve the agricultural support services they provide to rural communities.

Forestry and fuel wood management: two projects with an investment of over USD 13 million, funded by Japan and Dutch aid, focus on sustainable forestry management and the sustainable management of traditional forms of energy.

Fisheries Management: two projects for over USD 13 million funded by JICA and EDF, one to build/ improve a fishing complex, the other to provide support to artisanal fishermen.

Vegetation rehabilitation: one project is a USD 9.9 million proposal to be funded by JICA and the GoS to fix sand dunes by afforestation and protect inland pastures along the entire Niayes coast, and to put in place a regime for the sustainable collection of firewood from the plantations. This project will be implemented in the context of Article 12 of the Kyoto Protocol, and is confined to plantation work. It will not address the need for sustainable management systems by local communities.

Conservation : Three projects for USD 8.4 million will contribute to this output. The first funded by the GoS is for the purchase of fire-fighting equipment; the second project funded by FFEM and FDS (which will likely terminate before the project starts) will contribute somewhat to the improved management of Niokolo-koba National Park; and the third funded by the EU will support Natural Resource Management in the Niger and Gambia River Basins (AGIR) and will cover PNNK to some degree.

Monitoring & Evaluation, and Environmental Education: There is one project for just under USD 7 million funded by JICA, to monitor fish stock levels off the coast of Senegal. In addition, in the past, NASA has increased the capacity of CSE to establish training facilities for monitoring carbon sequestration in West Africa (USD 1 million). Japan is currently financing a national environmental education program for a total cost of USD 2.8 million.

In summary, the baseline situation is such that pressure on biological and natural resources will continue to grow, while ongoing action will focus primarily on increasing living standards and devising short term solutions for natural resource problems. Concrete actions have been carried out with the participation of several development partners, NGOs, various economic associations (GIE) and Village Associations, as well as numerous youth and women groups. However, in most cases, these measures have failed to meet expectations. There has been a lack of sectoral integration, resulting in technological packages/systems that are non-replicable outside of laboratories or demo plots. There has been limited adoption by the population due to distortions in economic and policy incentives. And there has been limited involvement of the stakeholders in planning, monitoring and evaluation processes

### *ALTERNATIVE*

The Alternative GEF scenario will build on the baseline by testing and applying an ICD model at each site, promoting integrated eco-regional planning, promoting C sequestration and avoidance of C emissions, and removing the legal, policy, and technical barriers to IEM. In the VTs, production systems will be intensified, land use will be rationalized and food and energy self-sufficiency will be promoted in order to enhance natural resource management and reduce pressure on protected areas. In the CNRs, participatory, integrated, management plans for sustainable use and conflict resolution will be promoted in order to create buffer zones, and alternative techniques for income diversification through sustainable harvesting of biological resources will be demonstrated. In the PAs, a co-management model will be tested for the first time in the Sahel including mechanisms for the equitable sharing of benefits accruing from conservation. Furthermore, the project will build institutional and technical capacities, will demonstrate innovative incentives for conservation, and will monitor impacts on biodiversity and carbon balances over the ten year period.

### GEF INCREMENT

The rationale for GEF intervention in the Alternative is to :

- To retain connectivity between, and promote suitable land uses around PAs by building the capacity of Rural Councils and VTs to plan and implement the principals of local land use planning, and eco-regional planning in village lands;
- to demonstrate, remove barriers, and create the opportunity for co-management of PA resources in order to provide incentives for local community involvement in biodiversity conservation and CBNRM, and foster custodianship of PA resources by local communities through the equitable distribution of PA resources,
- to encourage sustainable harvesting (not already covered by baseline activities) to improve rural incomes in village lands;
- to encourage complementary land uses, and to augment a buffer between commercially oriented land uses in village lands, and conservation in PAs, by promoting planning, designation and management of Community Nature Reserves;
- to improve the enabling environment for sustainability of project results.

In keeping with the GEF's incremental cost rationale the following broad principals of separation between co-financed and GEF funded activities have been adopted. The GEF will finance all project activities to:

- review and draft legislation
- augment the capacity of PA authorities, and local communities to co-manage the project's target PAs for biodiversity conservation and maintenance of carbon sinks;
- create the institutional structures, legal means and procedures for equitable distribution of benefits from PA resources;
- enable Rural Councils to adopt and implement IEM and eco-regional planning principals in development and NRM plans;
- encourage local communities to designate, plan and manage Community Nature

- Reserves using IEM principles; and
- remove barriers and demonstrate techniques and approaches for intensification of production systems and make the use of the natural resources more sustainable and profitable.

Co-financing will cover:

- all recurrent costs to enforce legislative changes introduced by project activities;
- all recurrent costs of PA planning and management in keeping with the GEF's financial sustainability principals;
- all recurrent costs of local level land use planning (VT);
- all capital, labour and material inputs of the sustainable use activities the project is removing barriers for; and
- all costs to replicate throughout the project area those activities the GEF is financing the costs of demonstration for.

#### LOCAL VS. GLOBAL BENEFITS AND COSTS

The following matrix provides a summary of the expected costs and benefits accruing from the project.

Table 2a. Expected costs and benefits to local and global levels

Component	Cost (USD)	Intervention summary	Local Benefits	Global Benefits
<i>Output 1:</i> Policy and legal framework adapted to IEM	Baseline		Legislation is distorting incentives promoting optimal land use, encouraging unsustainable resource usufruct practices	Continued degradation of ecosystems due to overexploitation of biological resources resulting in extinction of species and loss of globally significant habitat
	Alternative	Draft, enact and enforce legislation enabling co-management of PA's, amend land tenure law, harmonize sectoral policies and make EIA compulsory	Incentives promoting sustainable use of biological resources, and a steady income stream from these resources	Legal enabling environment created to sustain contiguity of wildlife corridors between PA's and PA co-management, and pressure on PA resources reduced, thereby enabling conservation of important habitats endangered and endemic species within them.
<i>Output 2:</i> Sustainable development and NRM in VTs	Baseline	Short term measures to increase livelihoods and solve more pressing sectoral problems.	High income streams generated from natural resource usufruct, over the short term, but deteriorating over the long term, as soils, and ecosystem functions degraded	Accelerated deterioration of ecosystems in village lands, their ability to trap carbon, increasing pressure on juxtaposed PA's, and leading to the extinction of globally significant species.
	Alternative	Intensification of agricultural production, NRM, eco-regional planning, demonstration for new sustainable harvesting regimes to adding value to NRM products, and scaling up activities demonstrated.	IEM and eco-regional planning to make best use of ecosystem functions, and generate sustained incomes	Contiguity of wildlife corridors, and reduced pressure on PA resources, thereby conserving important habitats and conserving endangered and endemic species within them; and leveraging the capacity of the productive environment to sequester and retain carbon.
<i>Output 3:</i> Conservation and sustainable management of CNRS	Baseline	Limited amount of vegetation rehabilitation.	Incompatible land uses around PAs, poor use of harvesting, hunting and eco-tourism potential in PA buffer zones, leading to a loss of potential income from the natural resource base and land degradation.	Pressure on PA resources leading to loss of globally significant habitat, extinction of endangered and endemic species, and loss of carbon sink potential.
	Alternative	Community Nature Reserve planning, designation; and barrier removal and demonstration of new sustainable use activities including vegetation rehab.	Bio-compatible and sustainable income generated in buffers zones, and avoiding wasteful conflict between different interest groups for effective NRM	Buffer generated around PAs reducing pressure, conserving PA habitats and endangered species inside and outside PAs, and enhancing carbon sequestration in buffer zones
<i>Output 4:</i> Sustainable conservation and co-management of natural resources in PAs	Baseline	Some activities in two national parks (PNNK and PNDS) for improving infrastructure, management plans, and eco-tourism.	Continued degradation of plant cover in PAs, exposing village lands to sand storms, soil erosion, fires and risks of floods with attendant disasters.	Continued degradation of ecosystems in World Heritage sites, Biosphere reserves and Ramsar sites, and of globally significant species living in these ecosystems, together with a reduced capacity of PA habitats to sequester and hold carbon sinks.

Component	Cost (USD)	Intervention summary	Local Benefits	Global Benefits
	Alternative	Training, institutional strengthening, capacity building, and installation of infrastructure for improved enforcement and co-management of PA's	Co-management of PA resources creating win-win situations with local benefits from equitable distribution of benefits from PA use, and protection of watersheds and village lands.	Conservation of ecosystems and global biodiversity in World Heritage sites, Biosphere reserves and Ramsar sites, and of globally significant species they contain, together with increased mitigation of greenhouse gas emissions and enhanced carbon sequestration.
<i>Output 5: Participatory monitoring &amp; evaluation of the ecosystems</i>	Baseline	Some monitoring of fisheries and wildlife resources.	Poor understanding of the anthropogenic impact on biodiversity, and the potential from IEM to local uses	Rapid loss of endemic and globally threatened species due to lack of knowledge.
	Alternative	Participatory M&E for adaptive management; creating data base on biodiversity and carbon balance.	Improved knowledge of local benefits from biodiversity conservation and sustainable use, and better use of project resources.	Improved protection and sustainable conservation of endemic and globally threatened species; improved knowledge and capacity to monitor carbon sequestration in arid lands.

## PRINCIPLES GUIDING INCREMENTALITY

The distinction between the GEF increment and co-financing during implementation is given in more detail below, by project output, and is summarized in Annex 3b.

*Output 1:* The GEF will fund the review and recommendation phase of output 1, while the GoS will fund all enactment, adoption, and enforcement of the new legislation.

*Output 2:* Under output 2 the GEF will fund all start-up costs to develop IEM and eco-regional planning overlays for village and coastal development and natural resource management plans. This will include generating broad based consensus on usufruct rules; capacity building and assistance to Rural Councils, VTs, Fisheries Management Committees and local populations in eco-regional planning; and developing institutional and procedural means and capacity for conflict resolution. Co-financing will cover the operational costs of implementing and replicating those plans. The GEF will fund barrier removal and demonstration for; conflict resolution mechanisms; developing fuel wood alternatives; introduction of sustainable soil and water conservation techniques in arable and pastoral land uses; intensifying and diversifying rural production systems; training and community mobilization in effective bush fire control; sustainable oyster collection techniques; aqua-culture and fish processing. Co-financing will cover all recurrent costs of these activities. The demonstration and barrier removal rational is explained in more detail below.

*Output 3:* Similarly the GEF will fund all start-up costs of developing participatory management plans for Community Nature Reserves in buffer zones of the park; including survey and consultation work for the plans; capacity building and institutional strengthening of Rural Councils and VTs to monitor, enforce and implement the management plans; creating the institutional structure for a micro-credit scheme and equitable sharing of hunting and eco-tourism profits. Co-financing will cover future operational and running costs of implementing the plans. The GEF will fund the demonstration and barrier removal costs of all sustainable use activities in the output; including bush fire control; bee-keeping; eco-tourism; and marine and non-timber forest product harvesting, processing and marketing. The rational for funding these activities are detailed below. Co-financing will cover the cost of all material investments and running costs of these sustainable use activities.

*Output 4:* the GEF will fund all new infrastructural development to strengthen PA management not covered by the AGIR project; including physical delimitation of boundaries; construction of guard and observation posts and encampments; bridges and fords; transport and communications and upgrading park training centers. Already planned co-financing will contribute to some of this infrastructure and bear the full cost of maintenance for all infrastructure. The GEF will fund the costs of all capacity building, training, institutional strengthening of PA authorities and civil co-management teams, and the development of participatory PA management plans to facilitate more effective enforcement of PA resources; co-management; cost recovery and equitable distribution of funds gathered from utilization of PA resources. GEF and co-financing will share the cost of legal modifications and bio-surveys. Co-financing will cover all salaries of PA staff, including recruitment of eco-guards. As with the other outputs the GEF will fund demonstration and barrier removal costs of all sustainable activities; including bee-keeping, straw mowing, and controlled grazing.

*Output 5:* the GEF will fund all costs of collecting additional baseline data, to monitor the impacts of the project, and training a team in biodiversity and carbon sequestration survey techniques, as well as participatory M&E. Co-financing will cover the salaries of staff during and after the close of the project to facilitate long term monitoring of the project's impacts.

*Barrier Removal and Demonstration Rational for Sustainable Use Activities.*

A number of techniques have been developed and tested successfully in rural areas of developing countries, which would increase the sustainability and productivity of farming systems in village lands, and reduce pressure on PA resources. However they are not currently normal practice among farmers in the project's target area. Other techniques are either innovative or need incremental innovations to adapt them to the Senegalese context. The GEF will fund all the costs for promoting these techniques, training and providing technical advice to farmers in the adoption of these techniques, while all material inputs, and recurrent costs will be covered through co-financing. Where investment costs are prohibitive the GEF will provide access to loans through the project's micro-credit scheme. The techniques being promoted under the project are described briefly below (and in more detail in Annex XI).

- *Sustainable sedentary farming models:* this includes techniques that have been tested elsewhere in Africa, such as : encouraging mixed livestock and arable farming to enable farmers to maintain soil fertility with manure and feed livestock with fodder; field rotation and composting to maintain soil fertility and fix nitrogen; promote agro-forestry to boost organic soil content from leaf litter; reduce wind and water erosion of soils, provide shade for crops, and utilize space more efficiently through fodder and NTFP production, from tree canopies. The GEF will fund all the costs for testing and fine-tuning these techniques in the project sites, and training and providing technical advice to farmers in the adoption of these techniques, while all material inputs, and recurrent costs will be covered through co-financing.
- *Livestock Fattening:* Consistent with the mixed farming model above, the GEF will fund costs of training farmers in sedentary intensive small ruminant fattening techniques, including livestock nutrition and phyto-sanitary regimes and provide access to loans for small start-up investments through the project's micro-credit facility.
- *Pasture management:* Traditional transhumance strategies are being hindered as pastoralists lose access to pasture as exclusionary rights are allocated to the cultivators to convert pasture. The project will modify land tenure laws to accept pastoralism as a legal land use, and provide training in rest and rotation strategies, and planning of pastoral investments and corridors, to enable sustainable pastoralism to co-exist with emerging agricultural land use patterns. Co-financing will finance all pasture improvement and rehabilitation.
- *Windbreaks and green fire breaks:* planting field and pasture hedges reduces soil erosion by wind and water, and depending on the species, protects crops and pasture resources against fire, provides non-timber forest products, and fodder for livestock. As above, the GEF will fund all the costs for promoting these techniques using endemic species, training and providing technical advice to farmers in the adoption of these techniques, while all material inputs, and recurrent costs will be covered through co-financing.
- *Reforestation and regeneration:* Some native species have better investment returns than fast growing exotics, because they yield a number of timber and non-timber forest products, such as nuts

and fodder. However they take longer to return a yield on the initial investment, because they are slower growing. Because this activity can take up to 8 years to demonstrate, the GEF will provide matching funds for farmers to invest in native species, through the project's micro-credit scheme, to encourage the uptake of this practice and demonstrate its effectiveness over the longer term. Also, the GEF will demonstrate appropriate techniques for reclamation of saline affected lands, for improved biodiversity conservation and C-sequestration.

- *Aqua-culture:* Aqua-cultural models ranging from the simple to the more intensive will be demonstrated. For example ox-bow lakes and hand-dug ponds filled during the rains can hold rain and flood water long enough to fatten and harvest some species of fish, such as *Tilapia nilotica*. The GEF will fund the costs to provide assistance and training to local entrepreneurs in bio-friendly aqua-cultural techniques, and provide loans through the project's micro-credit scheme to buy fish and other inputs.

- *Charcoal production:* The project will promote a green tax on wood inputs to charcoal production to encourage efficiency gains in the conversion process. The GEF will fund loans through its micro-credit scheme enabling producers to purchase low cost equipment to improve the efficiency of charcoal production by up to 30%. The equipment will also reduce the risk of accidental bush-fire caused by the conversion process.

- *Beekeeping:* New techniques in honey production are now available that do not require "smoking" the Bees from the hive. Instead a chemical compound can be used. The compound is cheap and avoids the risk of accidental bush-fires. The GEF will finance demonstrations, and training in the use of this technique to encourage its use, and make micro-credit available for the purchase of equipment. Although more costly than using fire, if collectively undertaken this technique will reduce the risk of losing pollinating flowers the bees depend upon to make honey.

- *Eco-tourism and hunting:* these are strategically important activities to the project, since they are compatible with IEM objectives, and can be practiced in PA's and surrounding buffer zones, and raise revenue for conservation management. While there is potential in Senegal for eco-tourism and hunting they have not as yet taken off. The GEF will finance activities to promote tourism in Senegal, develop, introduce and enforce eco-tourism codes of conduct for operators PA's and buffer zones, and Community Nature Reserves. Tourist operators will cover all capital and operating costs of practicing tourism and hunting.

- *Processing, packaging, storing and marketing natural resource based products:* As with the above, if regulated, collecting non-timber forest, rangeland and marine products can be compatible with conservation, and generate revenues for conservation management. The GEF will finance the cost of developing, introducing and enforcing, sustainable NTFP and fish collection techniques and levels. The GEF will also provide training in new or modified techniques to process and package NTFP, rangeland and marine products to increase value and, and provide micro-credit for the purchase of equipment.

## SCOPE OF ANALYSIS

The scope of analysis includes the geographic, institutional, market, policy and legislative factors impacting the projects target areas, as well as the costs and benefits generated from the project activities. This includes: (a) all 4 project sites, there buffer zones, and connecting corridors; (b) all stakeholders in the area; (c) local businesses in the four project areas utilizing natural resources on (d) local and national government; (e) governments policy, legislation and plans; (f) NGO's; and (g) other donors active in the four project areas. The temporal scope covers a 10 year period, although most of the baseline can only be predicted up to about 6 years. Table 2a summarizes the national and global benefits and costs.

## COSTS

The total project costs are USD 37.364 million. Project co-financing amounts to 73% of this total. The feasibility study has allocated 100% of the budget and co-financing to specific activities and outputs. Together with the baseline activities, the total alternative scenario will cost USD 263.500 million, of which the total project costs amount to 12%. This is an IEM project building on a substantial baseline complemented by significant co-financing. The GoS is fully committed to sustaining the impacts of the project in the long term, and has shown that commitment through various policy changes, as well as committing cash (equivalent about 10% of GoS co-financing).

### ANNEX 3: Project Logical Framework Analysis

Objectives/Outputs	Objectively Verifiable Indicators	Verification Sources	Critical Conditions
<p><b>Overall Objective:</b></p> <p>Conserve and sustainably use globally significant biodiversity and enhance carbon sequestration in four representative ecosystems of Senegal to generate both global benefits and national benefits from sustainable use and equitable sharing of benefits.</p>	<p>Presence of globally significant animal and plant species increased by 50% at each site by Y10</p> <p>Amount of carbon sequestered increased by 30% in all sites by Y10.</p> <p>At least 50% of local stakeholders accruing significant benefits from sustainable use by end of Y7</p>	<p>Independent evaluations.</p>	<p>Current institutional and political stability continues to hold in the country.</p> <p>Current pattern of rainfall continues to hold or improves.</p> <p>Unforeseen externalities do not occur, such as civil strife in Casamance or in neighbouring countries (forcing transhumants and other refugees into cross border areas).</p>
<p><b>Component 1: Policy and legal framework adapted to participatory IEM</b></p>			
<p>1.1. Legal obstacles to IEM and sustainable use of biological resources removed</p>	<p><i>Land tenure laws to allow transfer of private land title, by Y3.</i></p> <p>CNRs legalized by Y3.</p> <p>Co-management text for PAs drafted and approved by end of Y3.</p>	<p>Official Journal of Senegal</p>	<p>Government political situation continues to be amenable to policy reform.</p>
<p>1.2. Sectoral development policies encourage IEM</p>	<p>Agricultural, pastoral, forestry, hunting and coastal development policies encourage conservation initiatives that are equitable to all actors by end of Y2.</p> <p>Pastoralism is recognised as a criterion for land development in RC and VT procedures by Y3.</p> <p>Wood tax to be instituted by Y3.</p>	<p>Direct observation, reports from Project, DEFCCS, DPN, eco-guards and CERPs.</p>	
<p>1.3 Community ownership of biological resources in CNR legally recognised.</p>	<p>Effective transfer of authority responsibilities for community reserves by end of Y2.</p> <p>Land tenure regime modified to allow effective devolution of ownership by Y3.</p>	<p>RC deliberations on woodland use planning</p>	
<p>1.4 Effective environmental impact assessments in project sites</p>	<p>EIA Unit of ME trained in EIA monitoring by Y3.</p> <p>EIA guidelines improved to incorporate biodiversity issues by Y3.</p> <p>Environmental impact studies conducted for each future project in the project sites as early as end of Y2.</p>	<p>Official Journal of Senegal</p>	

Objectives/Outputs	Objectively Verifiable Indicators	Verification Sources	Critical Conditions
<b>Component 2: Sustainable development and Community Based Natural Resource Management in Village Territories</b>			
2.1. Stakeholders more aware, better trained and informed of techniques, tools and strategies for sustainable management of biological resources	<ul style="list-style-type: none"> <li>Environmental awareness-raising, training, information and communication programme elaborated and implemented in 100 villages by end of phase 2 of which 40 in phase 1 and 60 in phase 2.</li> <li>50 Village Trainers or Ecogardes identified and trained regularly by end of phase 2, of which 40 in phase 1 and 60 in phase 2.</li> </ul>	Direct observation, reports from Project, DEFCCS, DPN, eco-guards and CERPs.	No major changes in global trading patterns and international prices for commodities such as gum arabic, meat, cereals.  No major structural changes in decentralized institutions of Senegal (RC, VT, etc.).
2.2. VTs delimited and appropriate plans for local level land use planning, and eco-regional planning developed for IEM ("Management Plans")	<ul style="list-style-type: none"> <li>100 VTs mapped of which 40 in phase 1 and 60 in phase 2.</li> <li>100 VT Management Plans are produced and adopted by consensus of which 40 in phase 1 and 60 in phase 2..</li> </ul>	Direct observation, reports from Project, CSE, DEFCCS, DPN et CERPs, and RC minutes	
2.3 Effective cooperation between various stakeholders to apply rules of good IEM	<ul style="list-style-type: none"> <li>100 Local Management Committees created and adopted by all stakeholders by end of phase 2, of which 40 in phase 1 and 60 in phase 2.</li> <li>4-5 RC committees established for eco-regional planning by by end of phase 1.</li> <li>VT and RC leadership trained in eco-regional and land use planning by Y3.</li> <li>RC development plans modified to reflect eco-regional concepts, by Y5.</li> </ul>	Direct observation, reports from Project, DEFCCS, DPN, eco-guards, CERPs, and RC minutes	
2.4. Local management plans integrate appropriate pastoral issues and investments	<ul style="list-style-type: none"> <li>All VTs in the Ferlo region and at destination point of transhumant livestock have a pastoral management plan adopted and respected by all by the end of Phase 2.</li> <li>3 transhumant corridors are established between Ferlo and Niokolo areas and adopted by residents and transhumants, by Y5.</li> <li>.Uncontrolled clearing of rangelands stopped in all VT by Y3.</li> <li>10 ponds and 5 boreholes created and managed by local pastoral management committees by Y6.</li> <li>Minimum grazing fee (estimated CFAF 50 /head/month) and water fee (estimated CFAF 100/head/month) instituted in all improved pastoral units by Y5.</li> <li>Semi-intensive enrichment and rotation system around ponds and boreholes demonstrated in Ferlo pasturelands, by Y4, and replicated through co-financing by Y7.</li> </ul>	Projects, DEFCCS, eco-guards CERPs, and RC minutes	

Objectives/Outputs	Objectively Verifiable Indicators	Verification Sources	Critical Conditions
2.5. Supply-demand balance in domestic wood energy controlled in VTs and CNRs	<p>100 VTs have a positive balance between supply and demand of wood energy by Y10.</p> <p>At least one village nursery created in each 100 VT by Y4, and replicated in Phases 2 and 3.</p> <p>Individual and collective woodlots created in 100 VT by Y5, of which 40 in phase 1 and 60 in phase 2, and replicated in Phases 3.</p> <p>Windbreaks and live hedges planted at a rate of 100km/year in all project from Y4 onwards.</p> <p>10,000 improved stoves manufactured and used by local communities, of which 1000 demonstrated in Phase 1, and rest replicated in Phases 2 and 3.</p> <p>50 groups of local communities trained and using improved techniques for wood cutting and carbonization, of which 10 in Phase 1, and 40 in Phase 2.</p>	Direct observation, reports from Project, DEFCCS, and CERPs.	
2.6. Land and marine coastal ecosystems development and management plan elaborated and implemented	<p>55 VT local management plans for coastal ecosystems conservation elaborated and under implementation, by Y5, of which 45 in the Niayes and 15 in Saloum Delta.</p> <p><b>800 ha of saline soils reclaimed and managed along the estuaries and in deltas, of which 100 in Phase 1, 500 in Phase 2 and 200 in phase 3.</b></p> <p>3000 ha of mangrove regenerated through direct seeding and with temporary restricted access, of which 500 demonstrated in Phase 1, 1500 in Phase 2 and 1000 in Phase 3.</p> <p>Sustainable techniques for oyster collection, without damaging mangroves demonstrated and adopted by 45 villages in Y3.</p> <p>30 VTs protecting fresh water resurgence sites in Saloum Delta to protect manatee habitat, of which 5 sites demonstrated in Phase 1, and extended to 25 in Phase 2..</p>	Projects, DEFCCS, eco-guards CERPs, and RC minutes	
2.7. Human pressures on fishing resources reduced in coastal VTs	<p>All management plans for coastal VTs include good management rules respected by all by the end of Phase 2.</p> <p>At least 50 fishermen converted to eco-guards for alternative income, trained and operational by Y3.</p> <p><b>At least 10 aquaculture sites functional by Y4.</b></p> <p>Techniques for improved fish processing and marketing (dried, smoked, salted shrimp, fish and oysters) demonstrated in 30 VTs through micro-projects by end of Phase 2, of which 10 in phase 1 and 20 in phase 2.</p>	Projects, DEFCCS, eco-guards CERPs, Fisheries Service, and RC minutes	

Objectives/Outputs	Objectively Verifiable Indicators	Verification Sources	Critical Conditions
2.8. Bush fires managed in VTs, and integrated with PA and CNR fire management plans.	50% reduction of uncontrolled fires in VTs in Y5; 80% reduction in Y7; 95% reduction in Y10. <b>An Information and Rapid Warning System for eco-guards established in all VTs</b> by end of phase 2, of which 40 in phase 1 and 60 in phase 2; All eco-guards equipped with communication systems by Y2. All 100 VTs have operational fire “vigilance” committees by end of phase 2, of which 40 in phase 1 and 60 in phase 2.	Projects, DEFCCS, eco-guards CERPs, and RC minutes	
2.9. Rural production systems intensified and diversified	<ul style="list-style-type: none"> <li>• Productivity of production systems doubled through use of sustainable production techniques by Y10.</li> <li>• 1000 ha of arable land fertilised with improved composting, of which 250 ha demonstrated in Phase 1, and 750 replicated in Phase 2.</li> <li>• 7000 ha of land under intensified integrated agro-sylvo-pastoral systems, of which 2500 in Phase 1, and 4500 in Phase 2, and replicated in Phase 3.</li> <li>• 1,000 micro-projects for income diversification (processing, intensification, marketing, etc.) implemented through local credit system, of which 100 in Phase 1, 600 in Phase 2 and 300 in Phase 3.</li> <li>• 1000 horticultural units in Niaye are protected from active dunes through windbreaks, hedges and other techniques, by Y10, of which 100 in Phase 1, 600 in Phase 2 and 300 in Phase 3.</li> <li>• A mechanism to monitor and share information on market dynamics is established between VTs, RCs and wholesalers, by Y5.</li> <li>• 100 pilot VTs encouraged to promote cultural and artistic diversity (carving, weaving) to benefit tourist trade, by Y5, and replicated to 200 more villages by Phase 3.</li> <li>• Women account for at least 50% of the micro-projects in all years.</li> </ul>		
2.10. Appropriate credit and savings schemes developed and implemented in VTs.	<ul style="list-style-type: none"> <li>• 1000 credit and saving schemes operational by end of phase 2, of which 400 in phase 1 and 600 in phase 2 and replicated in phase 3.</li> <li>• Each of the 100 pilot VT establishes a committee for M&amp;E on operation of credit schemes, including auditing, and evaluation of impact on biodiversity and sustainable livelihoods.</li> </ul>	Projects, DEFCCS, eco-guards CERPs, Fisheries, Agriculture and Livestock Services, and RC minutes	
2.11. Appropriate soil and water conservation techniques applied in VTs	<ul style="list-style-type: none"> <li>• 400 km of erosion control and revegetation, of which 40 demonstrated in Phase 1, 200 in Phase 2, and 160 in Phase 3.</li> <li>• 800 ha of wetlands protected and restored of which 80 in Phase 1, 400 in Phase 2, and 300 in Phase 3.</li> </ul>	Direct observation, reports from Project, DEFCCS, and DA	

2.12. Conflicts between crop farmers and livestock breeders managed	<ul style="list-style-type: none"> <li>• Reduce conflicts by 40% in Y6, and 70% by Y10.</li> <li>• Leaders of 100 VTs, 4 RCs and associated Pastoral Management Committees trained in conflict management by Y3.</li> <li>• At least one Adjudication Court set up in each VT to handle conflicts by Y5.</li> </ul>	Direct observation, reports from Project, DEFCCS, and DA
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Component 3: Conservation and sustainable management of Community Natural Reserves		
3.1. CNRs established around PAs to serve as buffer zones	<ul style="list-style-type: none"> <li>• 20 CNRs are delineated, and legally recognised (including protocols) by RCs, of which 8 in Phase 1, 12 in Phase 2. .</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes
3.2. CNRs have a participatory plan for management of biological resources, implemented with cooperation of all parties concerned	<ul style="list-style-type: none"> <li>• 20 CNRs have adopted plans for participatory management of biological resources and implementation of plans has begun, of which 8 in Phase 1, and 12 in Phase 2 and replicated in phase 3. .</li> <li>• <b>Each of the 20 CNR regularly conducts participatory M&amp;E.</b></li> <li>• <b>Eco-guards entirely financed through user fees and collection of fines, by Y7.</b></li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes
3.3. Sustainable use regimes demonstrated and implemented for selected resources	<ul style="list-style-type: none"> <li>• <i>Identified and proven alternative techniques for sustainable harvesting and processing (charcoal, honey, wild fruits, gum arabic, hay harvesting, medicinal plants) are demonstrated in and around 20 CNR by end of Phase 2 and systematically used in CNRs by Phase 2 of which 8 in Phase 1, 12 in Phase 2. And replicated in phase 3.</i></li> <li>• <i>A manual containing rational techniques for the management of biological resources produced by the end of Y3.</i></li> <li>• <i>Fuelwood exploitation in CNRs is sustainable by Y6.</i></li> <li>• <i>Regeneration of vegetation with local species (and temporary restricted access) in CNR at a rate of 400 ha/year starting in Y3.</i></li> <li>• <i>100 km of dune fixation completed, of which 20 in Phase 1, 60 in phase 2, and 20 in Phase 3.</i></li> </ul>	Direct observation, reports from Project, DEFCCS, DPN, eco-guards, CERPs, and RC minutes
3.4. Management plans for control of fire elaborated and implemented, and integrated with VT and PA fire management plans.	<ul style="list-style-type: none"> <li>• 1000 km of firebreaks opened, maintained, and bordered with plantations of non-deciduous fruit trees, of which 400 in Phase 1 and 600 in Phase 2.</li> <li>• Yearly hay collection from firebreaks by local communities in all CNRs.</li> <li>• 100 fireless bee keeping micro-projects demonstrated and implemented in all sites by Y6. of which 40 in Phase 1, and 60 in Phase 2 and replicated in phase 3.</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes
3.5. Local credit and savings schemes (from Component 2) adapted to sustainable use actions	<ul style="list-style-type: none"> <li>• At least 1000 micro-projects financed related to sustainable use, by Y10 of which 400 in Phase 1, 600 in Phase 2 and replicated in phase 3. .</li> <li>• 100 VT and 20 CN R management committees institute a system of incentives for resource users and penalties for offenders of which 40 in Phase 1, and 60 in Phase 2 and replicated in phase 3. .</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes

<b>Component 4: Sustainable co-management for conservation of biodiversity in PAs</b>			
4.1. PAs delimited and marked.	<ul style="list-style-type: none"> <li>The 4 main PAs are delimited by boundary markers by actors by end of Phase 1</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes	Turnover of staff in PA system and DPN kept at a reasonable minimum.
4.2. Infrastructures and equipment improved in PAs	<ul style="list-style-type: none"> <li>All equipment for PA agents and eco-guards in each of the 19 sites (communications, GPS, transportation) are in place by end of Y2.</li> <li>All PA operation and management infrastructures (guard camps, pontoons, vehicles, water trucks, observation towers) are completed by end of Y3.</li> <li>All infrastructure aimed at increasing biodiversity values (ponds, salt stations) are in place by end of Phase 1.</li> <li>All infrastructure for ecotourism enhanced by Y3.</li> <li>2 training centers at Dalaba and Thies restored, equipped and operational by Y2.</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes	No major changes in boundaries of formal PA system during life of project.
4.3. Village eco-guards serving as intermediaries in the integrated management of VTs, CNRs and PAs trained and operational.	50 village eco-guards are provided each year with appropriate training in community-based biodiversity conservation techniques and approaches.	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes	
4.4. PA natural resources managed jointly with riparian populations	<ul style="list-style-type: none"> <li>Local management committees are involved in the adoption and implementation of co-management plans at each of the 19 project sample sites by phase 3 of which 4 PA in Phase 1, 6 in Phase 2 and replicated in 9 other in phase 3. .</li> <li>19 PAs have new or improved co-management plans by phase 3 of which 4 PA in Phase 1, 6 in Phase 2 and replicated in 9 other in phase 3. .</li> <li>4 Inter-RC management committees established and functional by end of phase 1.</li> <li>100 Village committees to combat poaching around PAs and in CNRs created and supported by eco-guards by phase 2 of which 40 in Phase 1, and 60 in Phase 2 .</li> <li>Former poachers encouraged to switch to sustainable use micro-projects.</li> <li>Controlled grazing operations demonstrated and organised on selected land units inside PA and during appropriate periods, to reduce biomass in firebreaks and assist in germination of certain forest species by end of Phase 1.</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes	
4.5. Enhanced knowledge of PA biodiversity, co-management and IEM used for management planning.	<ul style="list-style-type: none"> <li>Data on biodiversity and participatory M&amp;E of co-management taken into account in adaptive management of PAs.</li> <li>Capacity built for eco-regional planning and IEM among all PA staff in 19 PAs.</li> </ul>	Direct observation, reports from Project, CSE, DEFCCS, DPN, CERPs, and RC minutes	
4.6. Bush fires managed in PAs and integrated with VT and CNR plans	<ul style="list-style-type: none"> <li>4000 km of firebreaks opened/maintained by Y10 of which 250 in Phase 1, 2000 in Phase 2 and 1750 in 9 other in phase 3. .</li> <li>40 village groups and all PA staff trained to apply appropriate techniques in using fire as management tools by Y3.</li> <li>Fire early warning and prevention system (with local communities) put into place by end of Y2 in all PAs.</li> </ul>	Projects, DEFCCS, DPN, eco-guards, CERPs, and RC minutes	

4.7. PAs have the required resources to assume operating costs and be self-supporting	<ul style="list-style-type: none"> <li>• Each PA effectively reaches self-reliance by Phase 3.</li> <li>• Entrance fees increased gradually until Phase 2.</li> <li>• Government contribution to 19 PA budgets increased by at least 100% by Y10 of which 10% in phase 1, 40% in phase 2, and 100% in phase 3. .</li> </ul>	Direct observation, reports from Project, CSE. DEFCCS, DPN, CERPs, and RC minutes	
<b>Component 5: Participatory monitoring and evaluation of the ecosystems</b>			
5.1. M&E of biodiversity and natural resources in PAs and peripheral areas	<ul style="list-style-type: none"> <li>• Regular inventories of plants and animals, as well as animal migration and biodiversity status, and land use, conducted every other year until Y10.</li> </ul>	Direct observation, reports from Project, CSE. DEFCCS, DPN, CERPs, and RC minutes	Local knowledge is still viable and conducive to documentation.
5.2. M&E of carbon sequestration in all project sites	<ul style="list-style-type: none"> <li>• Regular carbon inventories in all project sites , on a yearly basis until Y10.</li> </ul>		
5.3. Local knowledge taken into consideration in biodiversity monitoring and evaluation, and adaptive management.	<ul style="list-style-type: none"> <li>• Studies on local knowledge of biodiversity, land use, fire, pastoralism, etc., conducted and results being applied in VTs, CNRs and PAs starting in Y2.</li> </ul>	Direct observation, reports from Project, CSE. DEFCCS, DPN, CERPs, and RC minutes	
5.4. Participatory mechanisms to monitor and evaluate project activities elaborated and implemented	<ul style="list-style-type: none"> <li>• Capacity built for participatory M&amp;E in both VT and PA communities, and applied each year.</li> </ul>	Direct observation, reports from Project, CSE. DEFCCS, DPN, CERPs, and RC minutes	
5.5. Dissemination of lessons learnt	<ul style="list-style-type: none"> <li>• Networking and exchange visits maintained regularly between 4 project sites until Y10.</li> <li>• Dissemination workshops established including other Associated Projects; once every 2 years.</li> <li>• Regular information fed to mass media at national scale, and locally through rural radio, schools, local theatres, and other cultural events.</li> </ul>	Direct observation, reports from Project, CSE. DEFCCS, DPN, CERPs, and RC minutes	

## Annex 4a. STAP Review

Project Number: 1148  
Project Title: **Integrated Ecosystem Management in Four Representative Landscapes of Senegal**  
STAP Reviewer: Dr. Kenton Miller, Vice President for International Conservation and Development, WRI, Washington D. C.  
Date: February 24, 2001

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### Key Issues:

- 1. Scientific and Technical Soundness of the Project.** Project design draws upon current theory and practice of Conservation Biology and Landscape Ecology. It reflects current scientific guidelines to shift management scale to that of whole ecosystems and landscapes. On the social side, it reflects current guidelines from research and practice in terms of shifting to decentralized approaches to wildland management, including participatory mechanisms with resident communities.
- 2. Identification of the Global Environmental Benefits and/or Drawbacks of the Project.** The benefits to the global community from success are clearly identified, namely the long-term protection and maintenance of the wild flora and fauna unique to the greater ecosystems (Ecoregions) found in Senegal. This includes the biota of the coastal, estuarine, and riverine ecosystems targeted by the project. With project success, the global benefits will expand to regions beyond the four project field sites through demonstration and replicability.
- 3. Fit of the Project within the Context of the Goals of GEF, Operational Strategies, Program Priorities, and relevant Conventions.** Project fits well within the goals, strategies and priorities of the GEF. It also fits well within the objectives and provisions of the Climate, Biodiversity, and Land Degradation Conventions.
- 4. Regional Context and Replicability.** The project represents an important experiment in the design, testing, and application of new models for biodiversity conservation while fostering positive carbon balances, and the reduction of land degradation. It has a clear focus on poverty reduction and achieving more sustainable livelihoods. The selected project sites are reasonably similar to ecosystems found elsewhere in neighboring countries. Thus, the project is of direct interest and potential replicability to the greater region of West Africa.
- 5. Sustainability of the Project.** The odds of achieving sustainability are reasonably high for several reasons. First, the project plans to extend over a 10-year period, allowing for meaningful M&E, and adaptive management. Second, plans include mechanisms for the self-finance of the protected areas, the community-managed buffer zone reserves, and the village-level programs. Third, the project proposes to develop mechanisms to capture rents from the natural resources, and ways to distribute them so as to generate stewardship among local residents. Fourth, the project has the engagement of national, regional, and local government, NGOs,

and local communities. And fifth, the sources of support are diverse suggesting broad-based involvement of donors and technical assistance groups.

6. **Contribution to Improved Definition and Implement of GEF's work.** Again, this project is an important experiment in the design, testing and application of current conservation theory and practice. The lessons learned from this project can have major implications for future GEF-supported projects. Unfortunately, while mentioned briefly early on in the project brief, the document does not expand on or explain how the "lessons learned" will be analyzed, synthesized, and then shared within and around Senegal, and beyond. This is an important point that warrants some further elaboration in the document.

### **Secondary Issues:**

7. **Linkages to other Focal Areas.** The project includes clear linkages to carbon management opportunities and the reduction of land degradation. One could imagine some specific reference to watershed management and water conservation.

8. **Stakeholder Involvement.** Efforts during the PDF B appear to have provided adequate involvement of stakeholders, particularly in the selection of the four project sites, in overall project design, and within the project sites. Then, the project brief provides for continuing and expanding stakeholder engagement in resource management, sharing in both the exercise of authority and responsibility.

9. **Capacity Building.** Generally, the proposal covers adequately the steps to be taken for building capacity at local, regional and national levels. I would like to have seen greater clarity on just how capacity will be built in the areas of "ecoregional planning", and management planning. This will be a massive effort requiring hundreds of trained individuals to meet project goals.

10. **Innovativeness of the Project.** As noted above, this project is clearly innovative in seeking to apply current science and practice in the biological, ecological, social, economic, and institutional aspects of wildland management. It is very ambitious and the risks are not negligible; however, by extending the work over 10 years, the odds are high for success.

### **Specific Comments:**

1. **Project Management Capacity.** The project features a very large number of activities in various geographic locations, with many communities. It is not clear to me who will actually work on the ground to work with all these communities, and how will they be trained? Surely, the project will require hundreds of workers trained in all the many fields involved. There must obviously be a sequenced series of training activities to build the cadres necessary for implementing all the diverse activities. This is a potential bottleneck for project delivery unless well managed. It would be helpful to have a flow chart showing how the project planners envision building this capacity over a schedule consistent with plans for project implementation.

2. **Limited Entry.** In several places, starting on p. 8, para 18, there is reference to the problem of preventing settlement and entry into reserves and parks. In Annex XI. 1, reference is made to the "bias against non-resident transhumants." There is little chance of project success if the capacity to control land use is not established. Why not have a bias against non-resident mobile communities? Otherwise, as with earlier ICDP's and buffer zone projects, people will move into areas where livelihoods hold greater promise than their current situations thereby diluting project gains. This needs clarification.

3. P 9, para 21, has an apparent contradiction. **Poaching** has led to the disappearance of certain wildlife species...due in great part to various causes including "rigidity of the legal status of these areas." What does this mean?
4. P 11, para 30. **Transfer of Authority to local communities**. Later on p 18, point 1.3.2, transfer of authority and responsibility. Surely you mean this later throughout the document; that is, transferring only authority without responsibility lacks the *raison d'etre* for decentralization and devolution –to promote stewardship.
5. P 12, para 37. **Perverse Policies**. The first sentence is very significant and warrants some explanation. The government removes subsidies for traditional agriculture and as a result pressures increase on wildlands by expanding extensive land uses. Why reduce the subsidies if they are perverse to biodiversity conservation?
6. P 15, para 51. **Lessons Learned** Here and elsewhere, reference is made to lessons learned. This is a particularly important aspect of the project. There will be much learning. How will this be captured, analyzed, synthesized, and shared within Senegal and beyond? (see also p 21, para 71; p 24, para 84, etc.)
7. P 16-17, para 56. **Spatial Units**. This is a very sound scheme.
8. Same. **Village Territories**. The vision at the end of this paragraph is extremely optimistic!
9. P 18, para 60. **Eco-regional Planning**. Here and elsewhere reference is made to this approach to planning. Is it widely understood what this means? I doubt that many PA managers are aware of this; more known is the "ecoregion" scheme of WWF and employed by TNC as a useful way to classify units of land for conservation purposes. Perhaps a note is needed to explain the approach. Is it the same as "bioregional planning" as employed in Australia, west coast USA and Canada, etc.?
10. P 21, para 71. **Biodiversity Evolution**. The third sentence is not clear.
11. P 22, para 75. **Good, sustainable NRM** Sounds rather subjective.
12. P 22, para 76. **Revenues**. How will local people pay for grazing and watering fees? Do they gain sufficient cash income?
13. P 24, para 83. **Feasibility Study**. Are there still more feasibility studies to come?
14. Annex II. Under Global Environment Objective paragraph, "...introduce eco-regional planning and buffer zone management principals in areas between Pas." This sounds like **corridors and connectivity**, which does not show up in the document until p 4 of Table IIa, and in p 3 of the GEF increment. Could use this language here and be more specific and direct. Packaging such an important concept under "eco-regional planning" obfuscates the point which has significant implications for land use planning.
15. P 3 of Annex II, under GEF Increment, second bullet: what are **PA resources** that can be equitably distributed? Good to list a few to avoid the impression that you mean extraction of timber, hunting, etc.
16. P 8 of Annex II, under Barrier Removal, ninth Bullet: suggests that there will be **hunting in PAs**. Would be good to explain which category of PA to avoid the impression that National Parks will be opened to hunting.
17. Annex III. Point 1.3, insert "and **responsibility**" after authority.
18. Annex III, p 10: **Overall Objective**. Correct word "generate".
19. P 25, 4.5.3. Not clear how to use M&E to adapt management, as presented here.

20. P 25, 5.1. **Inventory**. Who and how will all this inventory work be done?
21. P 25, 5.1.5. What does this mean?
22. Annex Via, p 36: The project calls for a very large number of **management plans**. Who will lead these exercises? How will they be trained? Are these local people, expatriates? This could easily become a bottleneck to progress.
23. Phase III. For VTs and CNRs, the language here says "provided with management plans." Surely you mean that they themselves will develop their management plans, no?
24. P 54. **Mining Policy**. You might want to reference the IUCN/World Commission on Protected Areas Policy on Mining and Protected Areas, and the IUCN Resolution on Mining and Protected Areas, Amman, Jordan, October 2000.
25. P 72. **Capturing Rents**. How will local people, the VTs and CNRs capture rents from ecotourism, hunting, and other fees? Especially if, as noted here, ecotourism expenditures are gathered as package deals in the home country of the traveler?
26. P 73. **Profits**. Still not clear from where the "profits" will come?

This is an outstanding project design, and I look forward to following its implementation.

## Annex 4b. Response to STAP Review

The STAP review has recognized the innovativeness and scientific soundness of the project design. In addition, it has highlighted the project's fit with GEF program priorities; contribution to GEF's work; and the potential sustainability and replicability of the project. Several constructive comments were provided on improving the clarity of the proposal, and these have all been addressed in this revised proposal. These are :

- **Lessons learnt (point 6 of Key Issues, and point 6 of Specific Comments):** *How will the lessons learnt be analyzed, synthesized, and then shared within and around Senegal?* Already quite a lot of lessons learnt have been distilled into the innovative design of the project. Annex XI is devoted to summarizing these and showing how the project will build upon these lessons learnt. In addition, lessons learnt during project implementation will be distilled through the M&E processes (para. 85). An entire component (5) is devoted to synthesizing and disseminating these lessons learnt. The project's Scientific and Technical Committee (para. 81) will be instrumental in ensuring high quality analyses and syntheses, and in assisting in dissemination in scientific journals and professional networks (para. 72). The project will engage dedicated personnel for M&E (both project staff and in local communities), the details of which will be presented in the Project Document.
- **Linkages to watershed management and water conservation (point 7 of Secondary Issues):** Throughout the Brief, 'natural resources' refers to land, water and biological resources, and NRM refers to their management. As an integrated ecosystem management project, water resources and watershed management are included whenever there is reference to natural resources. Most of the activities will address watershed management as it is a major factor in drylands (e.g. output 2.4; and Component 3); water conservation will be a major issue in rehabilitation of vegetation (e.g. output 2.11).
- **Specific comments 1, 13, 20 and 22:** Details on operationalizing the project design (e.g. project staffing, sub-contracts, partnership arrangements, training modalities, who will lead what, etc.) will be detailed out in the UNDP Project Document (PRODOC). STAP review comments on scheduling of training are very constructive and will be taken into account in the PRODOC. This will be developed during a "feasibility" stage during approximately one month after Council approval of the project. These are not research or scientific studies, but standard consultations on operationalizing a project design.
- **Clearer definition of 'eco-regional planning' (point 9 of Secondary Issues; point 9 and 14 of Specific Comments):** This is a very good point as it highlights the different definitions that exist for this term. In the context of this project, the term is used to combine two different scientific streams : (a) classical regional planning (including economic stratification; regional land use planning; population and infrastructure nodes and links; etc.) and (b) bio-regional planning, (including corridors and connectivity between protected areas). The first aspect is currently part of government planning processes, however it does not incorporate biological and ecosystemic factors. Therefore, the project will incorporate these additional concepts into classical regional planning. This will indeed require considerable capacity building, which has been envisaged in components 2,3, and 4, but the focus in Phases 1 and 2 will be on demonstrating the eco-regional linkages only between two landscapes : Ferlo and Niokolo, where the highest linkages exist. In Phase 3, capacity building will continue as needed and it is expected that the Government will continue to incorporate the approach in other landscapes. Annex XI now includes a section describing this approach, and paragraphs 45, 57 to 60 et 68 have been revised accordingly.

- **Concerns about capacity building:** Any project that intends to promote an innovative approach has to involve considerable capacity building. As the project is spread over 10 years, ample time is available to not only build the capacity in crucial areas (eco-regional planning; management plans for VTs, CNRs and PAs; innovative technologies; participatory M&E; etc.), but also to monitor the effectiveness of the exercise, and take remedial action where necessary. Most of the initial capacity building (Phases 1 and 2) will focus on building expertise within national ministries, regional authorities, Rural Councillors, protected area staff, and VT Councillors. This will be carried out first by international experts as trainers of trainers, and then by national and local experts for wider dissemination. Hands-on experience in developing land use and management plans will be crucial in internalizing this capacity at all levels. The project will provide long term technical advisors for this (national and where necessary international). Other beneficiaries in these early phases are local communities in the selected sites, and their capacity will be built through environmental awareness campaigns and hands-on experiences. These operational details will be finalized in the Project Document.
- **Greater clarification (Specific comments points 3,4,5,10,11, 17,18, 19, 21, 23,24):** All of these points are well taken and the relevant paragraphs and texts have been clarified and/or modified.
- **Limited Entry (point 2 of Specific Comments):** The reference to not having a bias against non-residents is based on experience in pastoral natural resource management projects elsewhere in the Sahel (e.g. northern Burkina) and in Morocco, where it has been shown that non-residents who traditionally have access rights must not be excluded. This does not mean that they are accorded the same status as residents, but that their rights and responsibilities should be clearly defined. Land users who have no traditional rights can only have access pursuant to negotiation with residents. The project will work to establish fair and equitable rights and responsibilities of stewardship.
- **Revenues (point 12 of Specific Comments):** The calculation of revenues from grazing and water fees in the Ferlo (para.77 and Annex XI) are based on estimated fees that stakeholders have agreed to pay, during the PDF B. This should be seen as a “willingness to pay” exercise, and final fee levels will be determined in a participatory fashion during project implementation. Livestock sales in the Ferlo are considerable, and the local economy is sufficiently based on a cash system to allow payment of these fees. A parallel GTZ project has had some initial success in ensuring collection and management of fees, and the GEF project will build on this important breakthrough.
- **PA resources (points 15 and 16 of Specific Comments):** The PA resources refer to all sustainable harvesting resources, such as fuelwood, non-timber products, medicinal plants, thatch, as well as hunting. The range and degree of utilization of these resources depends on the type of protected area (NP, SPR, WR, FR) and rules and regulations to be established in the management plans of these areas. This ranges from strict protection in core areas of NPs, to some form of sustainable harvesting of natural resources in the other categories.
- **Management Plans (point 22 of Specific Comments):** There will be different kinds of management plans covering Village Territories (mostly land use planning and zoning, access rights and responsibilities); CNRs in corridors and buffer zones (mostly boundary demarcation, access rights and responsibilities); and PA management plans (ranging from strict conservation to sustainable use regimes). These will be developed by relevant stakeholders : in VTs by village leaders in consultation with CERP and RCs; in CNRs by the latter and also in consultation with PA staff; and in PAs by PA staff and peripheral village leaders. Capacity will be built through national and some international expertise over the first 5 years. Details on how these will be done will be contained in the PRODOC.

- **Capturing rents and making profits (points 25 and 26 of Specific Comments):** Rents from eco-tourism refer to sharing park entrance and other fees between PA and peripheral VTs. Although most ecotourism is a package deal gathered in home country of the traveler, there is significant scope for income generation at the local level through : sale of crafts; offering touristic attractions, such as fêtes, dances and theatrical shows; and offering accommodation and other services. Other sources of revenue will be from granting controlled hunting licences (both for CNR and PAs), and from fines and confiscations. This has been clarified in Annex XI.

**ANNEX 5: Details on Baseline funding for ongoing activities at project sites**

Project Outputs Contribution to	Baseline Projects	Total Funding (US\$ million)	Starting Year	Duration Year	Activities	GOS (US\$ million)	Beneficiaries (US\$ million)	Development Partners (US\$ million)	
					Planned			Costs	Institution
<b>Output 1: Policy and legal framework adapted to participatory IEM</b>									
<b>Subtotal O1</b>									
<b>Output 2: Sustainable development systems and community based natural resource management in Village Territories</b>	Promotion of Agricultural Intensification	7.100	On 1998	On 2003	Promotion of private and collective initiatives for agricultural intensification and transformation.	0.398	1.181	5.521	IDA
	Village Management and Organization	1.754			Restoration of the productive capacities of farmlands, and institutional strengthening of VT in Peanut Basin.	0.022		1.732	IFAD
	Agricultural Development in Matam (PRODAM)	3.771	03/93	7	PRODAM works in the northern Ferlo on the Senegal River to promote 1] food security and increase of income; 2]insertion of returning expatriates; 3] improved irrigation on small plots; 4] promotion of animal traction and diversification of agriculture; 5]livestock improvement and rangeland management; 6] strengthening Village organizations and capacities through a participative approach; 7] infrastructure development.	0.044		2.892	IFAD
								0.834	BOAD
	Improvement of Agricultural Services	84.141	On 2000	6	Reorganization of the Ministry of Agriculture and Livestock, improving the National Agricultural Researches Fund, supporting Counseling for the Rural World (ANCAR), and supporting peasant organizations	38.351		45.790	WB
	Rural Self-Promotion	2.122			Assistance to farmer's organizations in the Peanut Basin and capacity building on improved marketing and processing.	0.044		2.078	FRG / GTZ
	Rural Infrastructure	21.122	On 2001	4x3	Support for the process of rural decentralization, organization of a rural investment fund, rural roads, and monitoring and evaluation.			21.122	WB
Village Self-Management and Dev	10.960			Strengthening capacities for economic planning, organization, and management of the VT and intensification of the agricultural production in the Peanut Basin.	1.478	0.244	7.998	IFAD	

Project Outputs Contribution to	Baseline Projects	Total Funding (US\$ million)	Starting Year	Duration Year	Activities	GOS (US\$ million)	Beneficiari es (US\$ million)	Development Partners (US\$ million)	
					Planned			Costs	Institution
								1.240	BOAD
Nat. Project to Fight Poverty	0.103				Stimulate growth with implementation of labor intensive micro-projects and community works. Improve the supply of basic social services and analyze the impacts of public policies on populations and encourage better coordination of social investments.	0.103			
Local Development Funds	2.098	On 1997	4		Development and the implementation of municipal investment plan for Kédougou, and local development plans for its suburbs. Partnership with the Agency for Popular Credit to finance income generating activities in Kédougou.			0.254	UNDP
Project to Fight Poverty	8.167	On 1998	4		Build capacity in government, civil society, private sector and local governments to better fight against poverty. This UNDP assisted project intervenes in Diourbel, Tambacounda, Dakar, and Saint Louis. With assistance from the LIFE program, a line of financing is provided for micro-credit for sustainable income generation. The project works through a partnership with the American Foundation for Development, the Senegalese Association for Credit support, and AFRICARE .	0.782		7.385	AfDB
Rehabilitation of Borehole Equipment	2.433				Rehabilitation of 5 boreholes and promotion of community organizations for management in Northern Ferlo. Communities and government match funds to cover recurring costs.	0.114		2.319	Belgium
Reinforcement of Borehole Management	9.914				Creation of boreholes, maintenance of the equipment, and training and sensibilization of the local communities in suburbs of Dakar.	0.141	1.620	8.153	CFD
Fight Against Locusts ( LOCUSTOX)	2.393				Locust control using chemical and biological methods, in all agricultural systems in the country.	0.015		2.378	Netherlands AIEA DPV
Community-based NRM	10.836 (+1.000)	01/94	7		Assist 30 rural communities to identify decentralized approaches to and plan for effective natural resources management and stimulation of economic growth. The objective is to secure the participation of rural communities in the identification, planning, utilization, and protection of natural resources to : 1) define rural community management issues in a holistic framework; and 2) to make available to local government structures the means to strengthen their capacity for effective intervention. Some activities will be carried out in the UNDP-GEF project sites and these will be re-programmed to constitute co-financing for the project	1.639	3.409	5.788	USAID

Pastoral Self-Promotion in the Ferlo	5.090 (+0.400)	On 1994	16	Strengthening educational system notably basic education and technical training for transhumants and agropastoralists; increase capacities for management of pastoral investments; institute a pastoral land tax; and assist in drought adaptation. The Project is at present in its 2nd phase ( 1999-2003 ) and covers mainly the northern and western Ferlo. Some activities will be carried out in the Sylvo-Pastoral Reserves which will be re-programmed to constitute co-financing for the project.	0.019		5.071	FRG / GTZ
Forestry Sector Support Programme	9.995 (+0.594)			Project will improve planning, restoration and management of classified forests of Senegal with technical supports to Ministry and local governments. Some activities will be carried out in the UNDP-GEF Project Sites and will be re-programmed to constitute co-financing for the project.	4.386		5.609	Netherlands
Self-Promotion of NRM	1.643			Improvement of the management of the natural resources in Sine Saloum through rural advisors, peasant associations and other village structures.	0.007		1.636	FRG / GTZ
Support to Farmer Entrepreneurship	3.739	On 2000		Increase horticultural processing and marketing in Niayes, and some assistance to the regeneration of the filao ( <i>Casuarina equisetifolia</i> ).	0.354		3.385	CIDA
Support Artisanal Fisheries	7.983	On 2001	4	Infrastructure improvement for artisanal fishing (loading and landing sites) along the "small coast" from Mbour to Ziguinchor, and in the islands of Saloum; training of fishermen organizations, and intensification of production.			5.029	EDF
Saint Louis Fishing Complex	5.267			Rehabilitation of Saint Louis fishing port.			5.267	Japan
Environmental Education and Information (PFIE)	2.770	1990	11	Environmental awareness and training program for schools, training of trainers in primary schools; development of environmental education tools and materials for teachers, school children, and parents; training for seedling, nurseries and school afforestation; exchange field trips in Sahelian countries for parents, school children, and teachers.			2.770	Japan
National Forest Seeds (PRONASEF)	2.936			Research on forest seeds and seedlings quality and resistance to drought, and dissemination for better success in afforestation programs. Community training on nursery development and implementation. Creation of a selected national forest seeds and seedling stock.			2.936	Japan
Research and development of improved bee keeping	0.329			Research on alternative options for bee keeping activities without fire, and dissemination of new adapted techniques on bee keeping along with incentives to adopt these new techniques.			0.329	Japan
<b>Subtotal O2</b>		<b>206.666</b>			<b>47.897</b>	<b>6.454</b>	<b>152.315</b>	

<b>Output 3: Conservation and sustainable management of Community Nature Reserves.</b>	Coastal Zone Reforestation	<b>9.888</b>	07/2001 5x2	The project objective is dune stabilization in the northern littoral zone (Zone des Niayes), which includes the regions of Thies and Louga, and aims to protect basins and wetlands and, as a consequence, will improve quality of life for local inhabitants. Measures will seek to minimize dune mobility. Protection of littoral belts consisting of 2,037 ha of dunes over a period of ten years by way of a contract with a private firm to stabilize dunes and protect basins and wetlands. The project is implemented in the context of climate change and specifically in relation to Article 12 of the Kyoto Protocol. About one fourth of the project will be redirected to address the UNDP -GEF project objectives, and therefore will count as co-financing.	<b>0.132</b>		<b>9.756</b>	JICA
<b>Subtotal O3</b>		<b>9.888</b>			<b>0.132</b>	<b>0.000</b>	<b>9.756</b>	
<b>Output 4: Sustainable conservation and co- management of natural resources in Protected Areas</b>	Equipment for Fighting Against Bush Fires	3.906		1] prevention of wild fires through awareness raising; 2] organization and equipment of village committees (hand tools) 3] opening firebreaks in PAs and VTs; 4] use of water cisterns where possible.	3.906			
	Rehabilitation of Niokolo -Koba National Park	0.608	05/1997 4	The project will create effective ecological, economic, institutional, and social management regimes for PNNK and its buffer zones, including: 1) rehabilitaton works for park infrastructure, 2) capacity building for national parks, 3) strengthening programs for enhanced tourism , 4) management of hunting in the buffer zone. Activities of the project meet some but nt all the infrastructure and capacity building needs of PNNK and cover only 16,000 sq. km. of rural communities in the northwest and southwest portions of the park.			0.608	FAC / FFEM
	Support to integrated NRM in the Niger and Gambia River Basins (AGIR)	3.877 (+1.105)	On 2000 4	Studies and evaluation of management of the biological resources of the PNNK; Investments in the improvement of infrastructures and equipments of the PNNK ; Support for socio economic activities and production intensification, elimination of illiteracy, improved communication. Some activities of this project will be redirected to address UNDP -GEF project goals, and therefore will count as co-financing.			3.877	CCE-8TH FED
	ENDA TM	N/A	Since 1977	Ongoing Enda Energy is a program of the Enda Tiers Monde organization. Designed to promote efficient energy use through research and advocacy at all levels.				

	Centre of Ecological Monitoring (CSE)	N/A	Ongoing Since 1989	GIS data base of Senegal for the National Program of Fight Against the Poverty; Long term studies of the state of environment and socio economic changes in the Kolda and Niayes regions after the reference studies of 1989 with Canadian cooperation.				
	DRPF / ISRA	N/A		Research on technologies for sustainable management of the natural resources concerning notably agro forestry, forest fallows, restoration of the soil fertility through leguminous plants, the rotation of crops, and other intensification techniques.				
<b>Subtotal O4</b>		<b>8.391</b>			<b>3.906</b>	<b>0.000</b>	<b>4.485</b>	
<b>Output 5: Participatory Monitoring and Evaluation of the ecosystems</b>	Fishery Research Ship	6.942	2000	Evaluation of species stock and environmental habitat evolution in industrial fisheries, marine ecological research, fish species migration studies used to determine fishing quotas.			6.942	Japan
<b>Subtotal 05</b>		6.942					6.942	
<b>GRAND TOTAL</b>		<b>231.887</b>						

## ANNEX 6a : PROJECT PHASES

Indicative benchmarks and financing plan for each phase are provided in Table VIa according to the major outputs of the project. The breakdown of measurable indicators per phase is given in Annex III (Logical Framework). The benchmarks and indicators will be fine-tuned if necessary during the feasibility study prior to project start-up. Table VIb provides a breakdown of the project financing according to the three phases and per output.

### Annex 6 a. Phases and Benchmarks

PHASE (US\$ million)	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	OUTPUT 5
<b>ONE</b>  <b>(3 years)</b>  <b>GEF = 4.000</b> <b>GoS = 2.269</b> <b>UNDP = 1.650</b>	All legal and policy instruments established to encourage community based biodiversity conservation	100 VTs delimited, and provided with participatory land management plans.	CNRs legally established; protocols drawn up between VT and RC.	19 PAs mapped, boundaries marked, equipped with basic infrastructure.	Data bank on project sites designed and established.
	Capacities for environmental impact studies created; EIAs systematically conducted prior to implementation of any new project	Capacity for eco-regional planning established and functional in RCs.	Capacity of local communities enhanced for adaptive planning , monitoring and enforcement	Capacity of PA, CERP, and other civil servants enhanced for co-management and eco-regional planning.	Monitoring protocols drawn up and initiated; baseline information on biodiversity in VT, CNR and PA exists.

<p><b>EU = 0.770</b>  <b>JICA = 0.900</b>  <b>Dutch = 1.934</b>  <b>CIDA = 0.700</b>  <b>IFAD = 3.000</b>  <b>UNCDF = 2.000</b></p> <p><b>TOTAL = 17.223</b></p>		<p>Appropriate models for local level micro-credit schemes created and tested.</p> <p>Pilot NRM activities not requiring prior removal of legal, policy and capacity barriers are conducted, using micro-credit where necessary.</p> <p>Sustainable harvesting regimes established for selected resources in CNR and PAs.</p> <p>Pastoral needs and issues integrated in all plans, including establishment of corridors.</p> <p>Design elements for early warning systems for fire management developed; eco-guards, PA agents and village vigilance committees trained through experiments and trials.</p>	<p>Study on integration of local knowledge in management plans completed and results incorporated into VT, CNR and PA plans.</p> <p>Biodiversity indicators also take into account local knowledge.</p>
	<p>Environmental Awareness, training, information and communication programme is elaborated and initiated in all project sites.</p>		
	<p>Independent Monitoring and Evaluation at end of Phase 1.</p>		

<p><b>TWO</b></p> <p><b>(4 years)</b></p> <p><b>GEF = 4.320</b>  <b>GoS = 2.438</b>  <b>UNDP = 1.251</b>  <b>EU = 0.335</b>  <b>JICA = 1.600</b>  <b>Dutch = 1.066</b>  <b>UNCDF = 1.500</b></p>	<p>Legal and policy changes disseminated to wide stakeholdership.</p>	<p>100 more VTs are delimited and provided with participatory land management plans.</p>	<p>20 CNRs delimited, and provided with participatory management plans that are integrated with VT and PA plans.</p>	<p>19 PAs provided with co-management plans, which are also adopted by local stakeholders.</p>	<p>A second inventory of biodiversity in all project sites conducted.</p>
	<p>Transboundary agreements reached in the case of Niokolo-Koba</p>	<p>Local level micro-credit systems systematically applied in all 100 VTs.</p> <p>Micro-projects comply with participatory approved sustainable harvesting regimes and generate alternative income.</p> <p>Fire management and early warning systems in place and operational.</p> <p>Incidence of uncontrolled fire reduced by 50%.</p> <p>Mechanisms and incentives for financial sustainability of project activities tested.</p>	<p>VT, CNR, and PA management plans modified as required.</p>		

<b>1.500</b> <b>IFAD = 1.000</b>  <b>TOTAL =</b> <b>13.510</b>	Environmental awareness, training, information and communication programme continued and extended to 100 more VTs.				
	Analysis of interim lessons learnt carried out and disseminated within and outside project				
	Independent Monitoring and Evaluation at end of Phase 2.				
<b>THREE</b>  <b>(3 years)</b>  <b>GEF = 1.400</b> <b>GoS = 3.609</b> <b>UNDP = 0.342</b> <b>JICA = 0.798</b>  <b>TOTAL =</b> <b>6.149</b>	Legal and policy framework, including EIA system, reviewed and revised if necessary.	100 more VTs are delimited and development of participatory land management plans.	20 more CNRs delimited and provided with participatory management plans that are integrated with VT and PA plans.	Financial sustainability of all PA system assured.	A third inventory of biodiversity in all project sites conducted. VT, CNR and PA plans revised where necessary.
	Environmental awareness, training, information and communication programme continued and extended to 100 more VTs.				
	Analysis of all lessons learnt carried out and disseminated within and outside project.				
	Mechanisms and incentives for financial sustainability of project activities applied.				
	Preparation of total disengagement of project.				
	Independent Monitoring and Evaluation at end of Phase 3.				
<b>PDF B = 0.482</b>					
<b>GRAND TOTAL = 37.364</b>					

## ANNEX 7. Description of biodiversity status at Project Sites

### Site Selection

In 1998, during the formulation of the Senegalese biodiversity strategy and its action plan (BSAP), there was a consensus that more than 90% of plant and animal species, almost all endemics, and critical habitats are found in 4 major ecosystems in the country. The BSAP conservation priority entails protection and sustainable use of the habitats and species found in these four key ecosystems and to involve local communities in the care taking of biodiversity resources. Henceforth in 1999 and 2000 during the PDF B, participants at regional and national workshops followed suit to make and confirm original site selection to cover (a) most representative habitats of the country, (b) inside and outside protected areas boundaries, (c) in a manner to involve and entrust conservation of biodiversity primarily in the hands of adjacent communities to the protected areas, and (d) to provide global benefits from carbon sequestration. This is crucial as most threats to vegetation and globally significant biodiversity in Senegal originate from resource and land use by the villagers that surround protected areas, it is essential to improve productivity of the land and optimize resource use through community management. The critical habitats found in the four main ecosystems of the country are respectively: (1) steppes, grassland and woodland savannahs in the north and eastern region covering the Ferlo; (2) dry sub-guinean open forests in the south of the country around the Niokolo Koba National Park; (3) coastal and littoral habitats, also known as the Niayes ecosystem made of coastal dunes, which are located along the country's Atlantic coastline; (4) and the land and marine ecosystems of the Saloum Delta and Lower Casamance National Parks, whose habitats span from palm groves, bamboo groves, mangroves and wetlands.

The Table A7-1 provides a summary of the protected area status of these four ecosystems, and the samples selected for the first phase of the project. Table A7-2 provides the population, number of villages in the project area and the sample selected for the first phase. As a result of a GoS decision on 5<sup>th</sup> February 2001, the IEM project will focus its activities on sites and villages on terrestrial ecosystems. The following is a description of the four landscapes, their protection status, and the specific sites to be selected in Niayes and Saloum.

### Site I: Ferlo

The eastern Ferlo site has a total of 84 protected areas covering 4,156,680 ha of relatively undisturbed shrub savanna. The sample PA chosen in this site are : (a) the North Ferlo Faunal Reserve (332,000 ha), which is under DPN (Directorate of National Parks) management; (b) the South Ferlo Faunal Reserve (663,700 ha); (c) two adjacent classified forests (54,980 ha); and (d) 5 sylvo-pastoral reserves extending over a total of 1,514,000 ha. There are 14 other sylvo-pastoral reserves in western Ferlo. Depending on the soil and relief, species such as *Acacia senegal*, *Commiphora africana* and *Combretum glutinosum* appear and may even dominate. The most common grass are *Cenchrus biflorus*, *Schoenefeldia gracilis* and *Dactyloctenium aegyptium*. The lateritic Ferlo region shows a relatively dense tree stratum, dominated by *Pterocarpus lucens*, often in relatively pure formations. These are associated with other species such as *Acacia seyal*, *Combretum mivranthum*, and *Combretum nigricans*, depending on soils and relief. The soils are mainly of the ferruginous type over the entire area, with intersected sandy valleys and sandy clay depressions, adjacent to which the villages and camps are generally established. The lower vegetation stratum is dominated by *Loudetia togoensis* on gravel soils. Under normal rainfall conditions, these form pastures that meet livestock feeding needs, but bush fires destroy much of the grass biomass. Dry biomass production ranges from a maximum of 1,280 kg of dry matter per hectare in the Tiel pastoral unit to 837 kg of dry matter per hectare in the Téssékré pastoral unit. Average production revolves around 0.58 UBT per hectare while average real load is approximately 0.37 UBT per hectare (PRODAM, 2000). The vegetation in former stream valleys shows signs of the presence of important gallery forests up to a relatively recent past. These vast ecosystems are the only remaining locations in Senegal with wild ostriches, under severe threat. The Ferlo Reserves are also one of 12 sites in the world with Dama-Mhorr gazelles. The region also provides habitats and wintering grounds for several migratory palearctic bird species. The Ferlo reserves constitute preferred site for

transhumant and sedentary pastoralism, particularly centred around waterholes. The Ferlo site includes 4 community reserves (RCs) with 162 villages and a total population of approximately 87,400. Bush fires are frequent in the Ferlo.

Several animal species have disappeared from the Ferlo including *Damaliscus lunatus*, *Gazella dama*, *Hippotragus equinus*, *Panthera pardus*, *Giraffa camelopardus*, *Crocodilus niloticus* and *Orycteropus afer*. The Ferlo area used to provide winter quarters for large herds of wildlife moving northward from the Niokolo-Koba National Park. These migrations were observed in the winter seasons and lasted until the end of the rainy seasons. The obstacles to wildlife migration from PNNK to the Ferlo area are related to: (1) extensive livestock often practised by farmers who kill wild carnivores to protect their herds and even herbivores for food; (2) encroachment on wild habitats by wells and boreholes with frequent breakdowns of equipment causing livestock concentration and overgrazing over several tens of square kilometers; (3) rapid drying of ponds with livestock concentration around remaining ponds; (4) implantation of new villages fragmenting the natural habitats for the migrating wildlife; (5) collection of ostrich and guinea fowl eggs; (6) capture of juveniles; and (7) late bush fires that destroy forage (PDF B, 2000).

The endemic plant species of the Ferlo are: *Abutilon macropodum*, *Digitaria aristulata*, and *Nesaca dodecandra*. The endangered plant species of the Ferlo that appear on the IUCN red lists are: *Justicia niokolo-kobae*, and *Digitaria aristulata*. Threatened animal species in the Ferlo reserves include: *Lycaon pictus*; (African wolf), *Felix leo*; (Lion), *Taurotragus derbianus*; (Derby eland), *Syncerus caffer*; (Buffalo), *Hippotragus equines*; (Roan antelope), *Hippopotamus amphibious*; (*Hippopotamus*, *Loxodonta africana*; (Elephant), *Pan troglodyte* (Chimpanzee), *Neotis cafra denhami*; (Denham bustard), *Bucorvus abyssinicus*; (Land calao), *Terthopius ecaudatus*; (Bateleur eagle), *Dendrocygma viduata*; (White-faced whistling duck), and *Polemaetus bellicosus*; (Martial eagle).

## Site II: Niokolo-Koba National Park and surroundings

Located in the south-east of Senegal, Niokolo Koba project zone has 6 PAs that occupy a total area of 2,981,250ha including the Niokolo-Koba National Park with an area of 913,000ha, which is surrounded by four Classified Forests (CF) covering 132,250 ha, and the Falémé Hunting Reserve covering 1,936,000 ha.. Niokolo-Koba National Park (NKNP) has been designated as both a World Heritage Site and a Biosphere Reserve. It is adjacent to the Badiar National Park in Guinea of a total surface area of 194,000 ha, both form a large ecological complex, that is one of the largest conservation area in west Africa. On the Senegalese side of the border, this ecological complex is girded by nine community reserves (CR) containing a total of 304 villages with a population of approximately 92,000 people. The sample PAs chosen for this project zone are : PNNK and 4 Classified Forests.

Niokolo-Koba comprises representative large extents of the savannas habitats of the country; and these are mainly grassland (dominated by *Andropogon* and *Pinnisetum*), shrubland (dominated by *Combretum glutinosum* and *C. nigricans*), open woodland (dominated by the woody *Bombax*, *Azelia*, *Pterocarpus*, *Xerroderris*; and *Diheteropogon* for grass species); and closed woodland (dominated by the following trees: *Pterocarpus*, *Terminalia*, *Erythrophleum*) savannas, and open (dominated by *Pterocarpus*, *Anogeissus*, and *Piliostigma*) and closed gallery forests, which make up to 78% of the Senegalese gallery forests.

Niokolo-Koba National Park contains 1,500 out of the 2,100 species of flowering plants known in Senegal. There are also 80 mammal species (out of 192 in Senegal), 330 bird species, 36 reptilian species, 2 amphibian species, 60 fish species and myriad of invertebrate species. Niokolo-Koba is also the last refuge for elephants in Senegal. It contains endemic and threatened species as follows. The endemic plant species of Niokolo-Koba are: *Acalypha senensis*, *Bauhinia senegalensis*, *Cyperus laberiticus*, *Ilysambles cangesta*, *Indigofera leptoclada*, *Lauvembergia villosa*, and *Nesaea dodecandra*. The endangered plant species of NKNP, which appear on the IUCN red list, are: *Hygrophila micrantha*, *Justicia niokolo-kobae*, *Cyperus calocarpum*, *Indigofera leptoclada*, *Berhantia senegalensis*, *Measa nuda*, *Pavetta cinereifolia*, and *Striga bilabiaba*. The highly threatened animal species of Niokolo-Koba are: (for the mammals) *Lycaon pictus*; (wild dog), *Felix leo*; (Lion), *Taurotragus derbianus*; (Derby eland), *Syncerus caffer*; (Buffalo), *Hippotragus equines*; (Roan antelope), *Hippopotamus amphibious*; (*Hippopotamus*), *Loxodonta africana*;

(*Elephant*), and *Pan troglodyte* (*Chimpanzee*); and *Neotis cafra denhami*; (*Denham bustard*, *Bucorvus abyssinicus*; (*Land calao*), *Terthopius ecaudatus*; (*Bateleur eagle*), *Dendrocygma viduata*; (*White-faced whistling duck*), and *Polemaetus bellicosus*; (*Martial eagle*) for the birds.

### Site III: Niayes Coastal Habitats

The Niayes are located along the northern coast of Senegal. They consist of a series of interdunal depressions bordered by coastal and continental sand dunes with sub-guinean climate that occurs only north of the 13th parallel. The Niayes project site has 8 PAs covering 29,411 ha of sub-guinean forests in the heart of the Sahel and includes six classified forests (CFs) covering 25,880 ha, two (national parks) NPs covering 2,720 ha, and one 16-ha botanical reserve. The area stretches over some 135 km along the Atlantic coast. With its humid climate of the sub-guinean type, the Niayes are characterized by a complex flora, unique in the Sahel with one of the highest occurrence of endemics in West Africa (Sambou, B.2000). The Niayes extends the coast of Senegal from Dakar to Saint Louis. They stretches over nearly 180 km and cover a narrow width from 30 to 35 km. The Niayes are bordered by eight community reserves (RCs) and have 449 villages with 200,500 people.

The sample of PA chosen in the Niayes site include 4 CFs and one Wildlife Reserve in terrestrial habitats characterized by a succession of dunes and interdunal depressions frequently containing ponds, that appear as the water table rises. The Niayes distinguish themselves from the rest of the country by a humid, maritime climate and strong, but relatively constant winds. The climate is of the sub-canary type, dominated by marine trade winds and the monsoon. Average yearly temperatures range between 23.7 and 27° C. Average rainfall varies from 300 to 500 mm, generally with a three-month rainy season. There is no specific hydrological regime in the Niayes. The depth of the water table varies between 0 and 60 metres, although there are areas where water is brackish to salty. Ancient sea arms have been transformed into depressions or lakes such as Lakes Retba, Tamna, Notto, Meckhé and Loumpoul-Kayar. Humid interdunal depressions alternate with the sand dunes, corresponding either to actual interdunal spaces or to traces of former hydrological networks. These low-lying areas are flooded by runoff from the water table during the rainy season. They dry up subsequently more or less rapidly according to their position. The hydrological regime often varies from one Niayes to the next, but in all of them the humidity level is particularly high. As a result, the Niayes region is a unique site, the richest one in terms of biodiversity north of the 13th parallel.

The dunes, which are sterile and active on the coast (white dunes), stabilize gradually as one progresses towards the interior (red dunes) with the appearance of a very fragile vegetation cover. In the interdunal depressions, the soils are rich and suited for the cultivation of vegetables and fruits, which constitute the mainstay of the production system. The Niayes constitute the vegetable gardens of Senegal, and their productive environment integrates on-shore fishing, livestock farming and pluvial crops which are of major importance outside the flooded depressions during the rainy season.

The vegetation is of the sub-guinean type, with *Elae guinensis*, that dominates in the southern section of the Niayes. However the vegetation has been severely degraded due to human activities and droughts, which have now caused a drop in the water table level, gradual salinization and an acceleration of the encroachment on biodiversity rich dunes from cultivation of low-lying vegetables. Despite measures implemented to protect the area, the viability of these unique habitats remains uncertain. The Niayes habitats were originally abundant and very diversified, but their vegetation is in sharp regression, both in area covered and in the number of species.

The flora of the Niayes contains over thirty families for a total of nearly eighty broadly distributed ligneous species. The Niayes habitats contain nearly 20% of the entire flora of Senegal, a diversity level encountered nowhere else in Senegal nor north of the 13th parallel. Of the 31 plant species endemic to Senegal, 13 were found in the Niayes and 10 of them are threatened. The threatened species are: *Ceropegia praetemissa*, *Ceropegia senegalensis*, *Polycarpeae linearifolia*, *Polycarpon prostratum*, *Salicornia senegalensis*, *Lipocarpa prieuriana* var. *crassifolia*, *Scirpus grandispiscus*, *Scleria chevalieri*, *Eriocaulon inundatum*, *Rhynchosia albae-pauli*. The three endemic species, as yet not threatened, are: *Crotalaria sphaerocarpa*, *Urginea salmonea* and *Ficus dicranostyla*. The two species of the genus *Ceropegia* are also included in the

1996 CITES list. Two other non-endemic species (*Pluchea lanceolata* and *Digiraria arstulata*) are considered threatened in Senegal according to IUCN (1997 Red List).

The fauna of the Niayes is poor, probably because these habitats have already been severely degraded mainly in the northern section of the area, however, in the Gueumbeul Game Reserve and the Langue de Barbarie National Park, animal diversity is remarkable. The Gueumbeul Game Reserve is located near the coast, in the Rao District, some 12 km away from Saint-Louis. The Niayes are globally significant as a wintering area for thousands of birds, mainly waders. Important species found in the game reserve include the avocet (*Pluvialis squatorala*), the European spoonbill (*Platalea leucorodia*) and the greater plover (*Charadrius hiaticula*). The Langue de Barbarie National Park is located at the mouth of the Senegal River, 25 km south of Saint-Louis. It contains many marine avifauna, including numerous grey pelicans (*Pelecanus rufescens*), white pelicans (*P. onocotalus*), 3,000 pairs of grey-headed gulls (*Larus cirrhophalus*), the Caspian tern (*Hydroprogne caspi*), the royal tern (*Thalasseus maxims*), 2,000 species of slender-billed gulls (*Larus genei*), the Hansel tern (*Gelochelodon nilotica*) at the northern limit of its nesting area, the sooty tern (*Sterna fuscata*) and the little tern (*Sterna albifrons*) at the southern limit of its nesting area. The park is also a sanctuary for ducks and migratory waders. The marine fauna of the Niayes includes the green turtle, (*Chelonias mydas*), the leatherback turtle (*Dermochelys coriacea*), the loggerhead turtle (*Caretta caretta*) and the common dolphin (*Delphinus delphis*), all of them globally threatened and protected, which are sold for food on local markets and in the Saloum Delta.

The Niayes provide habitats both to a number of endemic species and globally threatened species included on the IUCN Red List. The threatened species are: *Ceropegia praetemissa*, *Ceropegia senegalensis*, *Polycarpeae linearifolia*, *Polycarpon prostratum*, *Salicornia senegalensis*, *Lipocarpa prieuriana* var. *crassifolia*, *Scirpus grandispiscus*, *Scleria chevalieri*, *Eriocaulon inundatum*, *Rhynchosia albae-pauli*. The three endemic species, as yet not threatened, are: *Crotalaria sphaerocarpa*, *Urginea salmonea* and *Ficus dicranostyla*. Two other non-endemic species (*Pluchea lanceolata* and *Digiraria arstulata*) are considered threatened in Senegal according to IUCN (1997 Red List). Important species found in the protected areas of the Niayes include the avocet (*Pluvialis squatorala*), the European spoonbill (*Platalea leucorodia*) and the greater plover (*Charadrius hiaticula*).

The endemic plant species found in the Niayes are: *Ceropegia praetemissa*, *Crotalaria sphaerocarpa*, *Ficus dechranostyla*, *Laurembergia villosa*, *Lipocarpa priemiana*, *Polycarpeae linearifolia*, *Rhynchosia alba-pauli*, *Sakucarnia senegalensis*, *Scirpus grandicuspis*, *Urginea salmonea*, and *Vernonia bambilarcusis*. Threatened bird species found in the Niayes include: *Pluvialis squatorala*; (Avocet), *Platalea leucorodia*; (European spoonbill), *Charadrius hiaticulata*; (Greater plover), *Pelecanus rufescens*; (Grey pelican), *Pelecanus onocotalus*; (White pelican), *Larus cirrhophalus*; (Grey-headed gull), *Hydroprogne caspi*; (Caspian tern), *Thalasseus maxims*; (Royal tern), *Larus genei*; (Slender-billed gull), *Gelochelodon nilotica*; (Hansel tern), *Sterna fuscata*; (Sooty tern), and *Sterna albifrons*; (Little tern). The threatened turtles found in the Niayes are: *Chelonias midas*; (Green turtle), *Dermochelys coriacea*; (Leatherback turtle), *Caretta caretta*; and (Loggerhead turtle). Also the common dolphin, *Delphinus delphis*, is thereatened and found in the Niayes.

Based on a GoS proposal, this project will concentrate on the in-land (red dune) areas as well as the Wild Reserve of Guembeul, while all other coastal areas will be included in the GEF/WB CZM project.

#### **Site IV: Saloum Delta and Lower Casamance National Parks**

The second project site cover both the Lower Casamance and Saloum Delta National Parks and their vicinities. The Lower Casamance National Park (5,000 ha.), the last rainforest in Senegal. It is home to over 50 mammal and 200 bird species. There are monkeys, such as Campbell's and the colobus monkeys, and several species of antelopes, such as the yellow-back duiker. The park also provides important nesting grounds for many bird species and a refuge for several eagle species. Biodiversity degradation in the Saloum Delta originates from overgrazing, logging, erosion, bush fires and drought.

The Saloum Delta National Park (SDNP) extends over a total area of 180,000 ha consisting of three major habitat types: (a) mangroves and wetlands, (b) dry forests and savannas, and (c) the ocean, estuarine delta

and islands of sand strings. The park is part of the Saloum Delta Biosphere Reserve. It is covered on two thirds of its territory by the largest mangroves in Africa. These mangroves serve as regulators for floods and tides. They also provide reproductive habitats for numerous species of fish, dolphins, sirens, waterfowl and palearctic migratory birds. The park has also been designated a Ramsar site. Not far from the Saloum Delta National Park is located the Keur Samba Dia Biosphere Reserve (800 ha). Also 4 Classified Forests (CF) are adjacent to the SDNP covering 53,140 ha, in addition to coastal and insular areas that are contiguous to the park. The agricultural system is characterized by a southern multi-cropping regime, with pastoral, fishing and hunting activities on the increase due to favourable arable soils and better rainfall patterns than in the rest of the country. The complex consists of three Community Reserves (CR) with 99 villages surrounding the Saloum Delta National Park, with a population of 45,800. Despite numerous and intense anthropogenic pressures, the site still contains a number of endemic species and globally threatened species. Three of the 31 species endemic to Senegal can be found in the area. These endemics are *Lipocarpa prieuriana*, *Scleria chevalieri* and *Ficus dicranostula*. Threatened and rare species are (IUCN 1999 list): *Eriocaulon inundatum*, *Hygrophila micrantha*, *Uvaria thomsasii*, *Kigelia africana*, *Albizia ferrutinea*, *Treculia africana*, *Pouchetia africana*, *Fagara rubescens*, *Parinar excelsa*, *Diospyros frrea*, *Mesneurum benthamianum*, *Tetrapleura tetraptera*, *Malacantha alnifolia*, and *Bridelia micrantha*.

Mangroves extend over 75% of the surface area of the Delta of Saloum National Park. Mangroves occupy part of the estuary (muddy grounds under daily tide influence) and grows in the intertidal zones, in particular in the low muddy sections of the channels. Its flora consists essentially of *Rhizophora racemosa* and *Rhizophora harissonii* (large trees bordering the bolongs), *R. mangle*, and *R. racemosa*, *Avicennia africana* and *A. nitida*. *Laguncularia racemosa* and *Conocarpus erectus* are considerably less represented and occupy an area exceptionally flooded by syzygy tides. There are also salt-tolerant vegetation (*Sesuvium portulacastrum* and *Philoxerus vermicularis*). The southern part of the mangroves is luxuriant, particularly well protected and contains tall mangrove trees. It provides resting and sleeping shelter for many bird species. It is also a refuge for several animals, such as hyenas, and spawning and feeding grounds for fish.

The dry forests and savannas of the Delta of Saloum National Park are characterized by the presence of Guinean species in a biogeographically Sudanian area. These habitats consist mainly of gallery forests, open forests, savanna woodland and shrub savanna. The Fathala Classified Forest is the most important forest formation. The most common species of upland trees include: *Daniellia olivieri*, *Pterocarpus erinaceus*, *Prosopis africana*, *Terminalia macroptera*, *Lannea acida*, *Cordyla pinnata*, *Bombax costatum*, *Khaya senegalensis*, *Parkia biglobosa*, and *Sclerocaria birrea*. There are also *Azelia africana* and *Ceiba pentandra*.

The islands of sand strings and terraces contain diversified flora with Guinean species at the northern edge of their distribution area. The *Phoenix reclinata*, *Lophira lanceolata* and *Prosopis africana* stands found there are probably the last ones in the country and the sub-region. According to Lykke (1996), in the Fathala forest, there are at least 400 plant species, 160 tree species belonging to 39 families. The most diversified families are Moraceae (13 species), Cesalpiniaceae (12 species), Mimosaceae (11 species), Combretaceae (11 species), Anacardiaceae (8 species), Rubiaceae (6 species), Euphorbiaceae (6 species), and Meliaceae (5 species). There are also wildlife species dependent upon terrestrial plant formations, except for the clawless otter (*Aonyx capensis*), the marsh mongoose (*Herpestes paludinosus*), the African green monkey (*Cercopithecus aethiops*) and, obviously, the manatee, all of which have adapted to mangrove formations (A. Dupuy, 1982).

In the waters of the three delta/sea arms of the Saloum Delta, fish populations are dominated, both in numbers and in biomass, by a small number of species belonging to the *Clupeid*, *Pristigasterid*, *Gerreid* and *Carrangid* families. They are essentially estuarine forms of marine and estuarine fish species (as defined by Albaret and Diouf, 1994). Specific abundance is relatively high in the Saloum Delta, as evidenced by a comparison of the number of species recorded in the Saloum Delta and the numbers observed in 60 estuarine and lagunar environments world-wide which shows only six of those with higher specific abundance (Diouf, 1996).

The most diversified fish families found in the estuaries of the delta are *Carrangid* (11 species), *Mugilid* (7 species), *Haemulid* (6 species), *Cichilid* and *Clupeid* (4 species each), followed by *Ariid*, *Cynoglossid*, *Dasyatid*, *Ephipidae*, *Polynemid*, *Soleid* and *Sparid* (3 species each). Another factor accounting for the wealth of species in the delta is the high habitat diversity (major arms, numerous *bolongs* of all sizes, presence of mangroves on certain banks and absence on others, diverse bottom sediment, and space and time variations in physico-chemical factors).

Fishery resources include marine vertebrates, consisting of fish (cartilaginous and bony) and mammals. Cartilaginous fish (sharks and rays) are represented by 80 species belonging to 30 families. Bony fish (*teleosteans*) number nearly 470 species and 110 families. Inventoried marine mammals include whales (*Balaenoptera*), dolphins (*Delphinus tursiops*) and manatees (*Trichechus senegalensis*). Other mammal species were also observed (in this Senegalese designated exclusive economic zone of the delta), such as porpoises, pilot whales (*globicephales*) and monk seals.

Marine invertebrates (molluscs and crustaceans) are represented by bivalve, gastropod and cephalopod species. Among the crustaceans are some fifty species of lobsters, crayfish, slipper lobsters, shrimp, crabs and stomatopoda. However many marine species are still little known mainly due to their current lack of economic interest. The species populating the deep ocean floor (lower edge of continental slope and large abyssal plain) have not been inventoried as these depths are thought to be poor in biological resources. The littoral fringe area also contains several marine invertebrate groups which have been the subject of very few inventories (sponges, sea cucumbers, sea urchins, starfish, corals, molluscs and various coelenterata).

Three fish species or groups of species have disappeared or have become extremely rare: the tarpon (*Tarpon atlanticus*), the sawfish (*Pristis spp*), and the straw-fish (*Rhynchobatus lubberti*). This is probably linked to fishing pressures, all the more so as the last two species have low fertility and very long gestation periods. Some species have become rare, including: (1) manatees, decimated by human populations but also impacted by the disappearance of fresh water resurgences; (2) *Lisa bandialensis*, formerly very abundant according to fishermen, but currently limited to a few (2 or 3) *bolongs*, the main one being that of Baguadadi. This species is highly dependent on fine sandy sediment and would be endemic to the Sine Saloum; (3) red carps (or *yaakh*) and groupers (*Epinephelus aenus*) or Thiof, highly sought after by Senegalese consumers, and almost as much *Lutjanus spp*, also in marked regression.

Several littoral species around the Saloum Delta have decreased in numbers. This is true particularly of sharks, *Caranx hippos*, *Tilapia guineensis* and turtles. The reduction in numbers of marine turtles is linked to disturbances in their nesting areas and their overexploitation. It should also be noted that within the Saloum Delta, these are protected species, but that they are nevertheless captured, sold and eaten by local populations. Sharks and rays, whose fins have a high commercial value, are subject to intense fishing pressures.

Endemic plant species in the Saloum Delta are: *Alechva basserei*, *Crotalaria aphaerocarpa*, *Eriocanlan inumdatum*, *Ficus dichanostyla*, *Laurembergia villosa*, *Lipocarpa priemviana*, *Polycarpaea linearifolia*, and *Scirpus grandicuspis*. Endangered and IUCN red listed plant species for the Saloum Delta site are: *Hygrophyla chevalieri*, *Livaria phomasii*, *Scleria chevalieri*, and *Lipocarpa priemviana*. Highly threatened animal species include: *Caranx hippos*; (Shark), *Trichechus senegalensis*; (Manatee), *Souza teuszii*; (Hump-backed dolphin), *Delphinus delphis* (Common dolphin), *Delphinus tursiops*, *Balaenoptera* (Whale), *Aonyx capensis*; (Clawless otter) *Herpestes paludinosus*; (Marsh mongoose), *Cercopithecus aethiops* (African green monkey). The endangered fish species are: *Tilapia guineensis*; (*Tilapia*), *atlanticus*; (*Tarpon*) *Pristis spp*; (*Sawfish*), *Rhynchobatus lubberti*; (*Strawfish*), *Lisa bandialensis*, *Epinephelus aenus* (*Grouper*), *Lutjanus ssp*.

Based on a GoS proposal, this project will select villages and landscapes in the dry savanna and mangrove habitats only, leaving the remainder for the GEF/WB CZM project.

## ANNEX 8: Detailed Socio-Economic Context of the Senegal Protected Areas Project

### Introduction

Four sites have been selected for the implementation of the Senegal protected areas project. These sites are the following: (a) Ferlo Game Reserves and vicinities; (b) Niokolo Koba National Park and surroundings; (c) the Niayes coastal habitats; and (d) Basse Casamance and Saloum Delta National Parks and adjacent areas. This annex presents the socio-economic context for each of these four project sites, and some concluding remarks.

### ***Ferlo Game Reserves and Vicinities***

The first Senegal protected areas project site is centered around two Ferlo Game Reserves, one in the north and the other in the south, and it also encompasses four community reserves (CRs) and 162 villages with a population of 87,400. The Ferlos and their surroundings constitute the livestock center for Senegal, and they are known as the sylvo-pastoral zone. Over the past five years, the Ferlo have contained 676,000 heads of cattle, 1,096,000 sheep, 96,000 horses and 78,000 asses, on average.

Traditional socio-economic activities of the sylvo-pastoral zone revolve around three main axes: livestock, agriculture and tapping of Arabic gum. However the situation is more complex, as these three axes can be combined with two distinct lifestyles the sedentary and nomadic ones. On the one hand people like the Wolof, Toucouleur and Sarakollé are sedentary and they cultivate by clearing the land; and on the other hand there are nomadic Peuhl, who are transhumant pastoralists. Indeed, this is an oversimplification, as the first lifestyle does not exclude livestock production, and the second one implies forest clearing to some extent, as some motivated pastoralists of the Ferlo also practice crop farming. The Peuhl of the Ferlo sylvo-pastoral zone complement their livelihood through livestock farming that provides a relatively important share of their subsistence. Crop farming, essentially of grain, is the mainstay activity that allows sedentarians to meet their basic needs. Gathering and collecting gum Arabic from acacias (*Acacia senegal*) complement the income of sedentary and nomadic households. The two Ferlo reserves hold together an intricate socio-economic system that is hinged around livestock that make movements between the northern and southern reserve, following rainfall patterns, availability of forage and water, cereal cultivation cycles, and tapping activities for the collection of Arabic gum.

First of all, livestock is accorded greater value than any other economic activity in the sylvo-pastoral zone, as livestock is the preferred way of saving wealth and regulating social relationships. Besides sedentary livestock, there is the traditional pastoralism, that is characterized by continuous mobility of the animals and people as a strategy for risks abatement. Risks are linked to climate, health, policy and environmental conditions that often happen to be harsh. Fortunately livestock movements are well adapted to the stress from the Sahelian environment, as a land use strategy transhumance makes the most out of the potential and biological diversity of the Sahel. In addition, it provides pastoralists with the opportunity to enter into exchange relationships with farmers and to take advantage of the various local markets, found along their transhumance path, to sell livestock products and by-products (milk and dairy products) wherever needed.

Livestock plays a central role in pastoral activities, it ensures food and income. Also livestock plays a crucial role in regulating the constitution and dismantlement of the social groups in that it structures all exchanges, such as gifts, loans and other forms of mutual aid. Herd management based on mobility (nomadism and transhumance) result in regrouping the animals when environmental constraints are acute, and oblige the herd to move away, where water and forage can be found. Pastoralists with large herds tend to keep their animals away from crop areas and their home base of origin. Transhumant

households that possess several hundreds of heads of cattle (or small ruminants) settle with their livestock close to large ponds/ waterholes and devote all of their time to pastoral activities. For these groups, the herd locations vary from year to year depending on resource availability; on the contrary, the vast majority of farmers are sedentary.

Transhumants as well as sedentary farmers cultivate cereal crops, while they look after their herds. Herds are actually under strict supervision only at night. In the day time, cattle are not closely watched, and the farmers as well as the transhumants take care of their crops. The animals are generally left free to graze but away from the fields. At the end of the day, the shepherd bring livestock back to camp. Then, after the evening meals, herds are taken back to pasture and they are watched by another shepherd, who returns to camp in the early morning. During the entire wet season, animal movements remain circumscribed to the camp vicinity. The water resources and pasture lands available within 4 to 5 km around the living quarters are generally sufficient to meet livestock needs. During the wet season, livestock is often brought to the Waalo areas to lick salt.

At the end of the wet season, waterholes dry off and cause changes in the herd movements. Movements become increasingly long and stressful as forage reserves are depleted. While the transhumants move, the sedentary farmers do not move during the dry season. Also certain groups of transhumants elect to stay, and their cattle use their fallow fields to fertilize the soil. Immediately after the harvest, young herders build shelters in the fields (one or two huts made from millet stalks covered with straw). In the evening, the animals are gathered on a specific section of the field. In order to keep the herd together during the night, some herders make fire in the middle of the field, while others tie up the calves to tree stumps with ropes. The herd is moved periodically from one section of the field to the other in order to fertilize the entire parcel. When the livestock belongs to the sedentary field owner, the animals are kept in the field until sowing. When the herd is transhumant, land fertilization may cease sooner due to the depletion of forage or an elder decision to move to other areas that have received early rains.

During the dry season, nomadic people generally apply the “centrifugal grazing method” which consists in making the livestock to graze the periphery of the boreholes, and in letting it move gradually to more remote areas, far away from waterholes. Thus, as soon as the ponds dry up, most pastoralists leave their wintering sites to move closer to permanent water supply points. This would shorten the distance to be covered from the watering point to the grazing grounds, thus leaving more time to search for food. Centrifugal grazing allows to limit waste, which are caused by trampling the soil in the paths that lead to the waterholes. Land use in the sylvo-pastoral systems of Senegal is organized around water for livestock, and it pays attention to a careful use of the land around the watering point.

Access to the remote dry-season pastures is facilitated by a hydraulic infrastructure along the transhumant pathways. Several boreholes were placed in service over the past decades. Also cemented wells were constructed, most of them at the pastoralists’ initiative but with support from the Water Department and NGOs. The increased water supply brought about improved control and land management, with the advantage of reducing the distance the herds need to cover between each watering. The disadvantage is that the enhanced availability of water attracts numerous pastoralists from surrounding areas, resulting in the overgrazing and saturation of the space in the well-watered sectors, while other places remain practically unused. Competition for access to water and pastureland between the sedentary and nomadic pastoralists is particularly keen around certain boreholes, e.g. at Ranérou, Gaay Kaadar, and Luumbi. Around these watered sectors, transhumant herders set up their temporary camps 10 to 15 km away from the borehole, and they get readily access to good pastures and still get access to the waterhole within a walking distance for the livestock. However, the sedentary pastoralists claim that this transhumant strategy is conducive to the reduction of overall pastoral space. Sedentary pastoralists, while recognizing that they cannot legally oppose the seasonal settlement of transhumants on their territories, they complain with despair of the influx of transhumant livestock that come to pasture their rangelands and depart when there is no grass left, leaving the land and their own livestock in poor conditions. In the south-eastern of the sylvo-pastoral

area, more particularly in Lambango and Denndudi, measures have been taken to regulate the movements of outside herds. The Egge Egge and alike transhumant herders arriving in large numbers during the dry season are restricted to a few sectors, and they are not allowed to access the best available grazing grounds. This confines the transhumant livestock on a relatively small portion of the territory, leaving sufficient grazing area for the sedentary users.

In other areas, sedentary users do not seek to penalize the transhumant newcomers, but they organize themselves to prevent competition among themselves. Such a competition might prove favourable to incoming herds. At Gaay Kaadar, Njayeen Fuuta and Ranérou, for example, newcomers must use pre-existing camps or settle in harvested fields and refrain in any event from settling near farmed pasturelands. In order to circumvent the control exercised on land by sedentary users, some Egge Egge transhumants go to the Water and Forestry Department in charge of the wildlife/game reserves to request permission to use these public grounds. Granting permission to graze on public grounds has drawn protests from the sedentary pastoralists, who have demanded that local regulations be followed, even in the public grounds. Conflicts over pastureland and waterholes between local and outsiders remain unresolved and dormant, and on and often incidents flare-up and cause grievance between sedentary and transhumant herders.

The traditional livestock systems here have evolved from experiences gained from transhumant to sedentary and vice-versa. As an example, according to sedentary pastoralists, the increase in the number of sheep and goat herds is due to the massive influx of Waalwaalbe families, traditionally specialized in sheep and goat farming. Since the climate crisis of 1972-73, these transhumants have settled in the area, although without fixed camps. Their nomadic lifestyle, even restricted, and the perpetual mobility of the herds explain, to a large extent, the good results of this system of animal farming. Their successes have motivated sedentary livestock farmers to start raising, with restricted mobility, sheep and goats. This situation has been also in response to the dramatic droughts that occurred in the area over the past few years. Indeed, repeated droughts have proven the remarkable resistance of small ruminants, their ability to recover and grow rapidly in numbers, and their contribution for food and commercial purposes. Pastoralists willingly recognize the advantages of small livestock production. Sheep and goats serve as a short-term investment within family farms, both a highly profitable and easily realizable one. This livestock is present in all categories of farms and constitute a means, according to the classical scheme, to reinforce the cattle herds or to limit their expansion.

Cattle raising can contribute to the inception and development of smaller ruminant farming. Indeed a number of households have purchased small ruminants with the proceeds from the sale of cattle or by exchanging cattle for sheep/goats. Small ruminant farming constitutes a means to protect the income derived from gathering activities and sales of surplus crop production. If small ruminant farming appears very interesting under present conditions, its development is nevertheless difficult because of diseases and herding style. Contrary to cattle which is allowed to graze freely most of the time, smaller livestock must be strictly controlled throughout the year. The generalized presence of crops around camps requires close surveillance of sheep and goats during the growing season. These also need to be closely watched during the other seasons because of predators such as hyenas and jackals, and to limit the risks of theft. For these very reasons, small ruminants are taken back to the camp at the end of the day and gathered in pens close to human quarters for the night.

Extensive livestock farming is practised in the Ferlo region, with transhumance varying in range and in duration according to availability and quality of water and therefore of rainfall regime. During good rainfall years, the livestock is concentrated around the ponds where forage and water are to be found. Hamlets become established in the vicinity of large ponds, with subsistence (grain) and commercial crops that are marketed weekly. Animal farming are concentrated first around ponds before moving toward permanent water points as the rain generated ponds dry up. Then livestock concentrations become so high that large degraded areas are found over a radius of several kilometres around the wells and boreholes. The degradation of the sylvo-pastoral ecosystems is compounded by frequent breakdowns of hydraulic equipment resulting in higher herd concentration, hence more

severe degradation of the vegetation cover. As a result, the grazing grounds around the boreholes are of poor quality. The toxic and neglected plants by the animals, such as *Calotropis procera* and *Ademium obesum* thrive and expand to reach hundreds of hectares at places. To solve this problem, large herd owners chose transhumance as a strategy, with departures generally linked to the quality of local winter conditions. During rainy seasons, the abundance of forage and availability of water in the ponds allow livestock farmers to keep their herds longer in the Ferlo region. At the same time they remain confident that when the rain dry out in the Ferlo, they would still find enough water during the long trek southeast to the Niokolo-Koba National Park. However delayed departure from the Ferlo imposes strong pressures on the sylvo-pastoral ecosystems and along the transhumance corridors. This also leads to conflicts with sedentary farmers in the villages located along the transhumance corridors, whose resources are taken away as a result of the large numbers of livestock that exceed rangeland carrying capacity. Such conflicts are frequently the cause of numerous arson fires set either by sedentary populations to save their water supply or by transhumants as a reaction to the opposition manifested by the sedentary farmers.

On the contrary, less rainfall in the rainy season induces an early departure from the Ferlo region to ensure the herds will still find water in the ponds along the transhumance pathways. The early transhumance movements reduce degradation of rangelands in the Ferlo and along the transhumance corridors, but they transfer the pressures to the Niokolo-Koba National Park where large transhumant herds reside over a longer period of time, with negative consequences on wildlife such as poaching and competition for food and water, including mutual contamination and spreading of disease between domesticated livestock and wildlife due to the use of the same water points.

Another movement of transhumance in the Ferlo poses threats to ecosystem and biodiversity conservation. It concerns the herds from the Niayes and the lateritic Ferlo that move into the sandy Ferlo areas. This erratic transhumance is unorganized and becomes essentially nomadism, where the herds roam haphazardly the land in search of forage and water, selecting the best pastures. Such nomadic movements may even force the larger herds to leave the Ferlo area early in the season, even under good rain conditions. The consequences of this type of transhumance include excessive pruning of certain woody species such as *Pterocarpus lucens* and *Pterocarpus erinaceus*, trampling of the soil and grass cover, and excessive tapping of the acacias (*Acacia senegal*) for Arabic gum which the transhumant herders sell for additional income. In many areas, the impact of grazing results in favouring the growth of invasive thorny species, that degrade the pasturelands.

New settlements by incoming migrants and their clearing of valley-bottom land for cultivation as well as exploitation of Arabic gum are causing loss of wildlife habitats. Despite that Senegalese Law prohibits new settlements in reserves, people are not abiding by the Law. Also anarchic well permits in the reserves have attracted migrant populations to settle permanently in these away from authorized transhumant corridors, and that is causing more wildlife habitat loss or degradation. In the northern Ferlo, transhumants are coming from everywhere, including Mauritania, and they settle down anywhere regardless of the Law. In the south, new settlements are blocking the paths used by the wildlife migrating from and back to the Niokolo Koba National Park (NKNP). Finally transhumance corridors to the PNNK are subject to poaching on wildlife by transhumant herders to feed themselves and to protect their livestock.

The second major axis for socio-economic activities in the Ferlo is the tapping of Arabic gum from Acacias, especially *Acacia senegal*. At the end of the rainy season, farmers identify plots inside and outside the Ferlo Game Reserves, where they tap Arabic gum from the tree that are ready for exploitation. People pay attention not to have uncontrolled fires that would burn the trees being tapped, hence gum exploitation combats bush fires. It also combats overgrazing, mostly from small ruminants, that may strip out the bark of the Acacias being tapped. Unfortunately, when large herds of transhumant livestock reach an area being tapped for Arabic gum there clashes between transhumants and gum farmers. Also when the herders settle in unfenced gum tree stands, the goats eat the bark, thus reducing gum production, leading to conflicts with the gum tappers. The latter do

everything they can to chase the livestock farmers as soon as they see them near their trees; in such cases, the transhumant herders depart but only after setting fire to the disputed plots.

Production systems are now marked by the development of new gathering activities, more particularly those concerning gum arabic, jojoba (*Ziziphus mauritiana*) and sump fruit (*Balanites aegyptiaca*). Gum marketing channels are almost entirely controlled by a group of Wolof and Moor traders. Due to the depletion of gum tree stands in the western Ferlo area, these activities have shifted southwards. Eastern Ferlo holds considerable potential and is one of the main areas for gum production. The stands are so dense that in certain sectors, (in particular around Ranérou), natural gum tree stands do not appear to be entirely exploited. Traditionally, tapping activities were conducted mainly by poor local families or some Moorish groups from outside the area. But for the past few years, they are practised by all social strata and categories. This generalization of gathering activities is the result of two major causes:

- difficulties encountered by the populations within the current climate conditions, which encourage them increasingly to look for additional income that they reinvest in the purchase of various equipment (cultivation and transportation, lighting) or livestock, such as sheep and goats; and
- the drop in gum production during drought years that rekindled interest in that activity, due to a marked increase in producer prices.

Arabic gum tree stands are appropriated like other natural resources. Due to their abundance, family domains are usually quite extensive, which enables certain families to lend part of their holdings to neighbours or parents; the latter frequently attempt to claim ownership based on the National Domain Law which stipulates that the land belongs to those who develop it.

The third and last main axis around which evolves socio-economic activities in the Ferlo is agriculture. Contrary to the nearby Jeery area where precipitation is low and irregular, the Ferlo region enjoys relatively high rainfall. Rainfed agriculture therefore occupies a more important place than irrigated cultivation or on washed terrain by receding floods in the Waalo. Groundnut production is prohibited in the reserves. Short-cycle millet, which does not suffer too much from low rainfall, is the most common crop and constitutes the staple food for the Ferlo populations. Cultivated areas are significant and cereal fields extend over 2 to 3 hectares for each household.

The fields located within sylvo-pastoral reserves, away from the hamlets, are cultivated using a shifting cultivation system. Mixed crops are grown on each parcel, depending on the type of soil and location. Millet is grown in association with beans, groundnuts and/or hibiscus on sandy clay soils. Late sorghum is grown in valley-bottom areas that have clay soils. Soil fertility is maintained using various techniques including:

- extended grazing on a given parcel to fertilize the soil with animal excreta;
- trampling the soil by feeding livestock which facilitates soil improvement after harvesting;
- fallow periods to rest the land; and
- crop rotation.

### III. Niokolo Koba National Park and Surroundings

The second project site is Niokolo-Koba National Park and surroundings made up of 9 RCs containing 304 villages with a total population of approximately 92,000 people in the south-east of Senegal. Economic activity is dominated by the primary agricultural sector, as the vast majority (91%) of the active population in the Tambacounda region is involved in agriculture, either at the subsistence or commercial levels. Despite the low occupation rate of arable land in the region, around 3.9% only, agricultural activities strongly mobilize the population during the entire rainy season and

much of the dry season. Food crops consist of cereals (millet, maize, sorghum and rice) for rural and urban household consumption. They extend over 58% of the cultivated areas, of which 72% for millet and sorghum and 25% for maize. Agriculture is barely mechanized and use high labor intensity; crop farming contribute as much as 40% of the GDP in the area.

Peanut production is the major commercial crop, a secondary one being cotton. Peanut occupies over 85% of the areas under cultivation, with strong extension towards the Tambacounda and Bakel Districts. Cotton and peanut have benefited from State policies that require obtaining export receipts in order to secure support for general development in the region of Niokolo-Koba. New settlement (Koumpentoum, Kaffrine and Koussanar) strongly contributed to the sustained eastward expansion of the groundnut basin, while the construction of earth roads reinforced cotton production with SODEFITEX. The migrations encouraged by a new land settlement policy after the soils in the traditional groundnut basin became depleted contributed to massive clearing in the protected areas. In certain places, this led to the rapid desertification of large expanses in the forest habitats near Niokolo-Koba. Such practices, which were based on slash-and-burn cultivation, severely disturbed the natural habitats and pasturelands, which were systematically cleared for these commercial crops.

The livestock sector contributes 30% to GDP of the area, an indication of the importance of this activity in the forest ecosystems where nearly three quarters of the country's livestock find forage and water during the dry season. The area residents increasingly practice livestock farming, not only cattle but also sheep and goats. Between 1982 and 1996, the livestock grew by 65.56%, i.e. an average 6.6% of annual growth rate. Average annual growth rate was 2.85% for cattle and 6.95% for sheep and goats. This positive trend was attributable to the implementation of livestock farming extension programmes such as PDES initially, then PICOGERNA. Competition between livestock and crop farming forced livestock to marginal areas, and which in turn made the herders lead livestock to use the forest and community reserves and even strict protected areas such as Niokolo-Koba National Park, where feeding and watering conditions were better. Frequent preying on the livestock by wild carnivores has brought about intense poaching by the villagers to protect their herds. In addition, in many cases, at the edge of the PAs where the forest cover is dense, transhumant herders prefer to set fires to eliminate parasitic insects, which are feared to decimate their herds. Even though these fires help regenerate some pastures located within the PAs, this action appear to shift the forces where livestock seem to win the competition over wildlife.

Timber harvesting is almost entirely carried out in this Niokolo-Koba area, and it contributes to meeting the needs for household energy in the major cities of western Senegal, whose population is rapidly increasing. Forestry operations generate approximately 6% of the GDP. It should be noted that 95% of the revenues come from logging. A total of 55% of the country's domestic energy needs are met with wood and charcoal (UNDP, 1999:204), almost all of which is extracted and produced in the Niokolo-Koba project site. Carbonization of trees for charcoal is carried inefficiently in traditional open ovens, which are prone to setting bush fires. In addition, the poorer population groups surviving mainly on PA resources also use fire for clearing. Due to the lack of income generating alternatives, villagers increasing in numbers practice logging and produce charcoal during the dry season and sell their products by the roadside. Other socio-economic survival strategies include, beside poaching, Arabic gum tapping or gathering, honey production in south-eastern Senegal; these operations using fire in the production of honey also contribute to starting bush fires. Such rudimentary methods lead to the ecosystem degradation and sometimes destruction.

Trophy hunting is significant in the region and it generates consistent revenues. To ensure wildlife population control at the national park periphery, some forest reserves have been leased out with a view to ensuring rational use of surplus fauna and limiting the damage caused by wildlife in the VTs. However, the distribution of these areas around the PAs gives rise to problems regarding coordination and harmonization of the game cropping activities. The management of these leased areas, some of which are adjacent to the national park, is not necessarily entrusted to professionals, so that some lessees are unable to manage rationally the leased areas due to lack of capacities. In addition to the attraction of quick profits, this impotency leads to abuses. Also lack of demarcation of national park

boundaries, trophy hunters cross into the parkland to kill wildlife. Poaching is also carried out by transhumant and sedentary livestock farmers to protect their herds from predators, as well as by agriculturalists to protect their crops. Their pretext is that there are no State provisions to compensate for damages caused by wildlife. Poaching has claimed loss of certain species, such as the giraffe and the topi and for the decrease in elephant and antelope numbers. The lack of human and physical resources in the PAs, the rigidity of the legal status of the PAs and the low interest in conservation by the population exacerbate the situation.

Mining operations could become the most important economic activity in years to come near Niokolo-Koba National Park. Over the past five years, south-east Senegal's mining potential has been attracting exploration and exploitation. Few multinational mining companies have begun work under licenses granted by the State; they are now a major source of jobs in the area, which is reducing unemployment around NKNP. In 1988, the labor force in the area numbered 142,605 people, of whom 135,052 were employed (94.7%) and 7,552 unemployed (5.3%). The labor force accounted for 38% of the total population; 73.8% were males and 88.7% rural. The unemployment rate in the area is an estimated 3.5%, which is relatively low compared to the 15% national rate. However, in south-eastern Senegal there still is one area, the Kédougou District, where 80% of the households and 89% of the individuals live under the poverty line. If this situation develops further, it may have to be taken into consideration in eco-regional planning and developing strategies to conserve biodiversity, as it is likely that mining industries will attract more people in this region, and who would exert more pressures on the NKNP biodiversity. Guidance from the IUCN/World Commission on Protected Areas, policy on Mining and Protected Areas, and the IUCN Resolution on Mining and Protected Areas (Amman Oct 2000) may be relevant.

Overall, the viability of the PNNK is in jeopardy due to the extent of the pressures exerted by the population within and around the park. The main cause for this situation is the non-participation of the population in the management and conservation of animal and plant resources, despite new attempts at relaxing PNNK regulations. There is a dire need to seek ways to involve the neighbouring populations in PA management

#### **IV. Saloum Delta**

The third project site is the Saloum Delta and Basse Casamance National Parks. This project site covers 2 national parks, and 3 community reserves (CRs) that contain a total of 99 villages with 45,800 people. In 1997, the Saloum Delta area was home to an estimated 610,000 people, with an annual population growth rate of 2.8%. The population is characterized by its extreme youth: 55% of the total population is under 30 years of age. Population density ranges from 21 to 61 inhabitants per square kilometre, according to the District commissioner. The two major ethnic groups are the Serer and the Mandingo. Family "squares" consist of large homesteads under the authority of the older male. Within these family units, social organization varies from one group to the other and responsibilities for control of the resources are distributed according to gender.

Economic activities comprise fishing, salt extraction, agriculture, livestock farming, and a putative tourism industry. Fishing and trade are the main economic activities in the Saloum Delta. Local people belong mostly to the Niominka, who have a high sense of collective property, which is the key factor in their successful economic sector. Women are in charge of gathering activities and processing of fish products for sale. The Niominka have no cast system and observe perfect equality between the individuals, the only differentiation being based on know-how and knowledge of the sea. Horizontal and vertical solidarity, i.e. between the villages and the islands, is very strong and deeply rooted in attitudes.

Fishing activities concern all species of fish, molluscs, crustaceans and cetacea present in the area. They take place in the Saloum Delta sea arms (Saloum, Diomboss and Bandiala). Fishing resources hold considerable potential and have enabled the riparian populations to develop important fishing

operations. Fishing in the bolongs (along the sea front between the mangroves) is of the traditional type. People in the Saloum Delta are now reporting a drop in fisheries production due to over fishing and lower rainfall. Also there difficulties linked to the fisheries operations, such as under-development, under-equipment, and insufficient means of conservation and marketing for women in charge of these activities. In addition, the use of beach seines with small mesh size gravely compromises resource replenishment. The fishing center of Missirah at the border of the SDNP (Saloum Delta National Park) has regularly recorded annual landings of 12,000 tons from community fishing ever since its creation in 1979. However, this sustained production dropped to 2,000 tons only in 2000. This situation caused considerable hardship for all actors in the fishing sector, from fishermen to fishmongers and to women in charge of processing (drying, smoking), storing and marketing the catch. In order to be successful, the GEF alternative will need to build on these lessons from experience to achieve sustainable development and conservation of the marine, coastal and littoral biodiversity.

Gathering of molluscs, oysters and shells, another feminine activity, is made in the bolongs, mangrove and mudflats, and it contributes to the large consumption wood resources for fish smoking. Both oyster gathering, performed by cutting off the roots of mangroves, and processing of molluscs, oysters and shells involve the consumption of significant quantities of fuel wood.

Salt extraction is another significant activity, carried out in village lands at the periphery of the reserve, in the Fimela district in particular. This age-old activity is generally managed by women, although men are becoming more and more involved since the drought years, more specifically since the decrease in incomes from fishing and commercial agriculture.

Among the Mandingo, agriculture is the dominant activity, with the older male generally in charge of managing production. Men generally cultivate on the plateau cash crops, while women work in the valley bottoms by growing rice for household consumption and vegetables as a supplemental source of income. Major food crops are pearl millet, sorghum, rice and maize. Commercial crops include groundnuts, cotton, cashew nuts and, to a lesser extent, soybean. During the dry season, valleys and the lowlands are used to grow vegetables.

Extensive livestock farming is also well developed in the area, despite the presence of the tsetse fly. Cattle is of the trypano-tolerant N'dama breed in the south, with zebu and gobra breeds in the north. Sheep and goats are also here. The main constraints on livestock farming include lack of water, risks of botulism, endo-parasitic diseases and lack of rangelands.

Despite the high tourism potential, with at least 25 islands in the Saloum Delta and the high demand from the younger population, tourism industry remains practically non-existent to this day, except for three private enterprises tapping only a minimal percentage of the ecotourism potential.

Generally, the relationship between PA authorities at the selected sites and peripheral population groups is of a conflictual nature. One of the main sources of these conflicts is the absence of a buffer zone. The fields cultivated by the population are adjacent to the PAs. As a result, predation on livestock and damage to crops due to wildlife (hyenas, warthogs, monkeys and ground squirrels) pose problems, especially as forestry legislation does not explicitly provide for compensation for damages caused by wildlife. Human populations are sometimes confronted with difficulties in accessing certain commodities that are rare in the village lands and abundant in the PAs (fuel wood, straw, medicinal plants, fruit). The benefits accruing to the population from conservation in the PAs are not sufficient to encourage greater popular involvement in management. The lack of operational consultation mechanisms between the various PA actors and lack of consistency of legal and regulatory provisions in effect in neighbouring countries adjacent to the selected sites such as Guinea and the Gambia also hinder conservation efforts. In addition, the close proximity to the parks of the areas under lease and the relatively high cost of customary hunting permits encourage poaching. Within the current socio-economic context, the parks' tourism potential, which could benefit both the parks and the riparian population, remains insufficiently developed.

Mangroves constitute the main habitat in the Saloum Delta, but they are subject to massive destruction from fuel wood gatherings and cutting off the roots to harvest oysters. Furthermore, excessive salinity due to repeated droughts causes high fish mortality in the mangroves. Also changes in ocean currents between Toubacouta and Niodior unearth large numbers of tree roots. The fresh water resurgences in the mangroves make the waters brackish, allowing them to support dolphins, dugongs and manatees, which are severely threatened from socio-economic pressures. This mangrove is a unique environment with rich biodiversity and fertile soils, without which many of the villages and the Saloum islands and vast expanses of coastline forests would be submerged.

## V. The Niayes Coastal Habitats

The fourth project site is the Niayes coastal habitats that comprise 8 community reserves (RCs) along few core forest reserves. This project site covers 449 villages with a total population of approximately 200,500 people. The intensity and diversity of the pressures clearly explain the increasing speed of biodiversity erosion in the Niayes area. This area once very rich in natural resources has suffered substantial loss of biodiversity. It is both an ecologically fragile environment and a horticultural production area. The Niayes are an important source of vegetable products for Dakar and all of Senegal, providing 2/3rds of Dakar's consumption and 89% of the national production of vegetables. This production supports more than 150,000 people, who earn much of their income from it. The area has great potential, but freshwater is a scarce resources and the production systems remain archaic. The main produces are tomatoes, maize, lettuce, onions, carrots, beets, sweet potatoes, cabbages, strawberries, beans and to a lesser extent rice. Average agricultural plot size is approximately 0.5 ha; and because of droughts and urban extension cultivated areas in the Niayes are reduced from year to year. Beside off-season crops, the depressions of sand dunes and surrounding areas are under constant exploitation, producing vegetables crops and fruits.

The Niayes are also used for extensive cattle and sheep and goat farming. There are an estimated 90,000 heads of cattle in the Dakar region alone. Most of the time, the cattle out of the Niayes is forced to move, partly during the rainy season when most of the land is flooded and also during the dry season because of the lack of forage and to avoid conflicts with vegetable growers. Niayes' livestock migrate to the neighbouring sylvo-pastoral area, where it takes the form of nomadic grazing, with no fixed home base in a village, but rather following randomly the best pastures. This in turn pushes the large Ferlo herds towards the NKNP. Industrial and semi-industrial poultry farming is sharply on the increase in the Niayes area, relying mainly on imports of chicks and hatching eggs.

Fish population has generally decreased in the Niayes ponds and lakes. Some formerly abundant species, such as *Protopterus*, have become very rare. Purse seining used at sea has strong negative impacts on the aquatic fauna. Due to the very small mesh size, many juveniles are captured. The boats illegally plying the coastal area constitute a threat on biodiversity and community fisheries. Turtle nesting grounds on the coast, mainly in the central and northern Niayes, are severely disturbed. Pollution from chemical industry appears to affect the aquatic fauna. As advocated by the local populations, it would be wise to consider creating marine protected areas to allow a reconstitution of the stocks undergoing strong regression as evidenced by increasingly smaller catches in spite of an improvement in traditional fishing equipment. Likewise, strengthening the Fisheries Monitoring Project (Projet de Surveillance des Pêches - PSP) is needed in order to limit illegal fishing by boats and to save jobs in the communities.

In addition, organization, training and diffusion of adapted techniques benefiting all actors in the fishing sector (i.e. fishermen, fishmongers and women in charge of marketing and processing the fish at the Kayar fishing centre) are needed to ensure the sustainability of the activities envisioned under the GEF alternative for the conservation of biodiversity in traditional fisheries. The sustainability of the GEF alternative in the area will depend to a large extent on the durability of the filao strip, established on 150 kilometres several decades ago and showing signs of ageing. This ageing causes serious regeneration problems due to the considerable thickness of the accumulated litter preventing the seeds from reaching the soil.

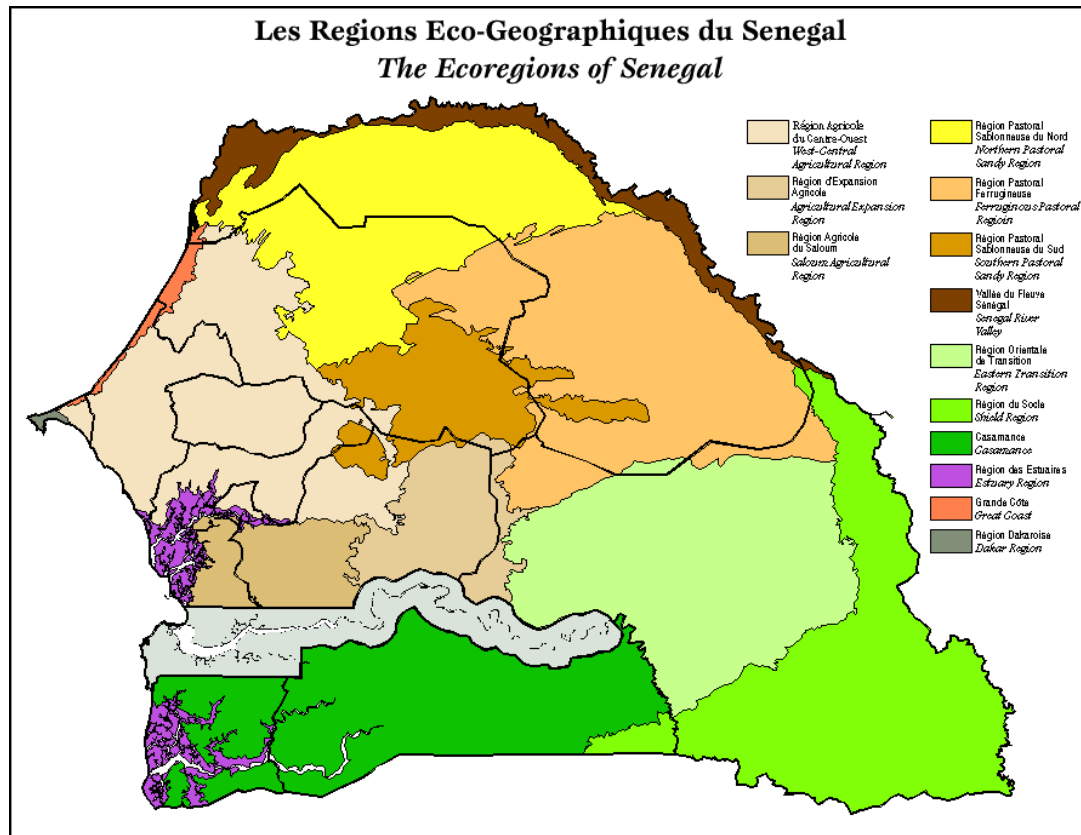
Overall, the socio-economic situation in the Niayes area is characterized by: (1) water balance deficit linked to drought and resulting in a drop of the water table due to excessive withdrawal; (2) poor management of vegetable cultivation with bad drainage and soil salinization; (3) strong migrations of human populations into the area, leading to land clearing and erosion within an already fragile ecosystem; and (4) overfishing due to the lack of control and poor management of fisheries.

## **VI. Concluding Remarks**

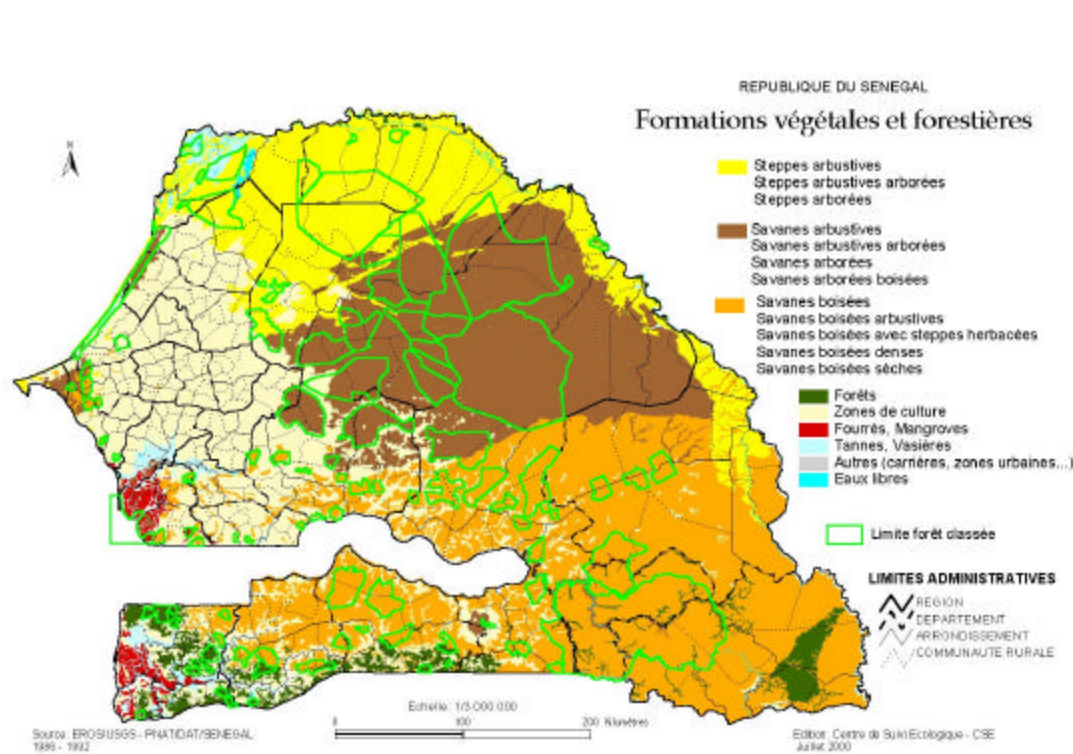
Despite the creation of an extensive (more than 40% of the country's land mass) PA system extending over more than 12 million hectares, the negative consequences of the socio-economic situation on biodiversity conservation have prompted Senegal to consolidating its approaches and reviewing its policy and institutional context with a view to introducing changes to adapt them to sustainable development and adopting participatory biodiversity conservation strategies. Senegal expect from the international community and GEF, assistance to achieve its goal of biodiversity conservation of its unique, endemic, specific and eco-systemic assemblages that have worldwide bearings and recognition.

Increasing pressures and competition over resources in the Ferlo reserves pose threats to the survival of the wild flora and fauna. In view of these threats, the government of Senegal has come to the conclusion that the preservation of the Ferlo will have to go through its classification as a Biosphere Reserve. This would make it possible to organize interventions around majors objectives, namely: (1) to conserve biodiversity and the natural environment; (2) ongoing monitoring of the condition and evolution of the resource; (3) actions targeting the population in the form of information and training; (4) development initiatives likely to have lasting influence on the standard of living of the local populations; and (4) sustainable management of hydraulic installations and waterholes, an essential condition to the survival of livestock farming and the sylvo-pastoral ecosystem of the Ferlo. The GEF alternative will thus need to capitalize on the lessons from experience to ensure favourable conditions for long term conservation and sustainable development. The positive impacts of the GEF alternative will be felt in the forest ecosystems of eastern Senegal, containing the NKNP, a complex with which the Ferlo area maintains systemic relationships, involving transhumance, animal migration and bush fire management. The northern sylvo-pastoral ecosystems of Ferlo and the eastern forest ecosystems of Niokolo-Koba are two different ecological entities, still united by their complementarity through the transhumance and shifting use during different times of the year. Such complementarity must be taken into consideration in the management of these two biodiversity rich areas of Senegal, and it is important to favor optimal rotation of the use of forage and water resources, which neither entity could achieve in isolation year round. Without the traditional rotation system hinged upon agriculture, tapping and gathering activities and transhumance, the large demand by humans and livestock as waged against rangeland low carrying capacities especially during the dry season, semi-sedentary livestock farming cannot be sustainable in the Ferlo nor the Niokolo-Koba area alone.

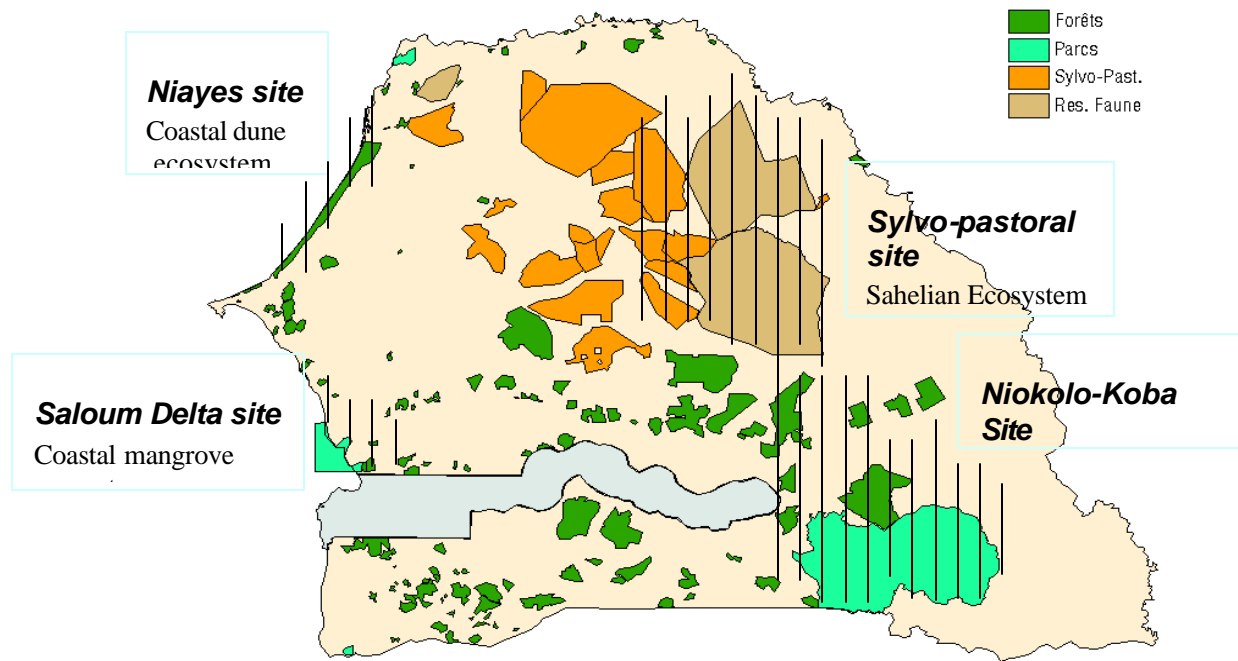
## ANNEX 9a. ECOREGIONS OF SENEGAL



## ANNEX 9b. MAJOR ECOSYSTEMS AND CLASSIFIED FORESTS OF SENEGAL



**ANNEX 9c : Map of Senegal's protected area system and location of four project sites**



## ANNEX 10a. THREATS AND ROOT CAUSES ANALYSIS

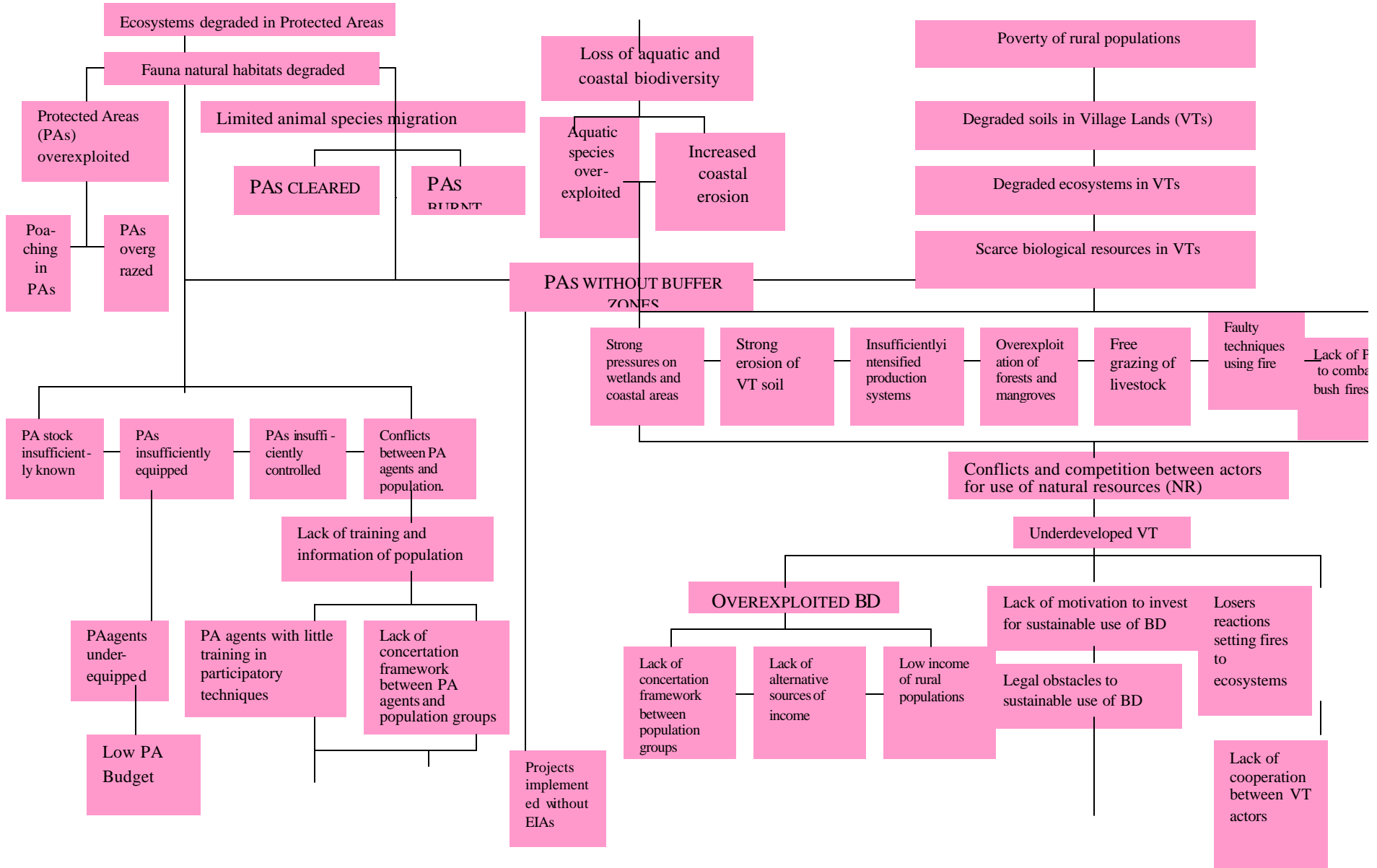
<b>PROBLEM</b>	<b>THREATS</b>	<b>ROOT CAUSES</b>	<b>ALTERNATIVE STRATEGY</b>
<p>Loss of globally significant biodiversity in protected areas</p> <p>Fragmentation of protected area System</p> <p>Land degradation in and around protected areas</p> <p>Decreased rates of natural regeneration of endemic fish and tree species.</p>	<p>Cultivation encroaching onto protected areas</p>	<ul style="list-style-type: none"> <li>▪ Population increase (local and Due to immigration)</li> <li>▪ Lack of environmentally and economically appropriate techniques for agricultural intensification</li> <li>▪ Unclear procedural rules and uncertain tenure for land use planning</li> <li>▪ Lack of alternatives for income generation</li> </ul>	<p>✓ Legal and policy framework strengthened to better devolve land use planning and enforcement; to reconcile sectoral inconsistencies; and create incentives for sustainable agriculture (Output 1).</p> <p>✓ Appropriate techniques for agricultural intensification tested, demonstrated and replicated (Output 2)</p> <p>✓ Local land use planning capacities strengthened (Output 2)</p> <p>✓ Capacity and institutions for eco-regional planning enhanced (Outputs 2,3,4)</p> <p>✓ Alternative incomes generated through credit system in support of intensification (Output 2).</p> <p>✓ Capacity of local authorities enhanced for participatory M&amp;E and adaptive management (Output 5).</p>

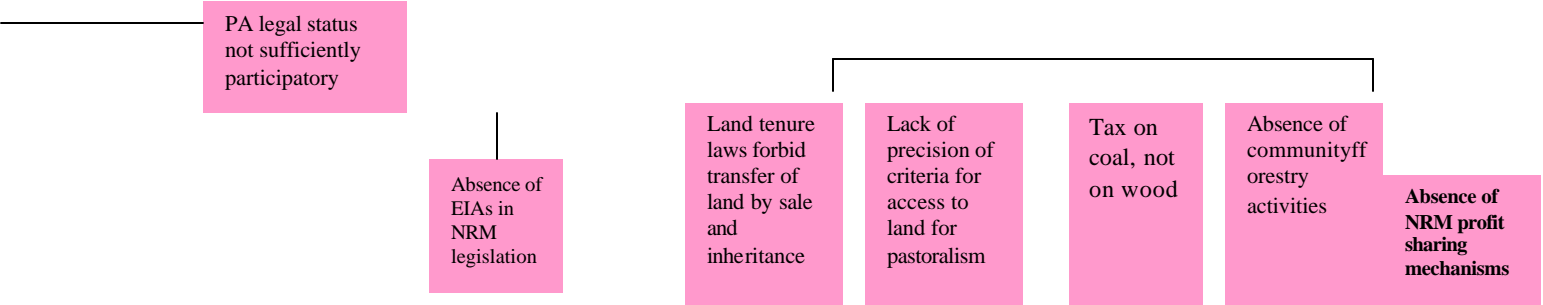
<p><i>Excessive fuelwood harvesting in and around protected areas</i></p>	<ul style="list-style-type: none"> <li>▪ <i>Conversion of woodland to crops</i></li> <li>▪ <i>Population increase and high demand for fuelwood</i></li> <li>▪ <i>Destructive harvesting practices (woodland and mangrove)</i></li> <li>▪ <i>Lack of participation and incentives for protected area management</i></li> <li>▪ <i>Lack of legislation for co-management</i></li> <li>▪ <i>Lack of consistency in tax law</i></li> </ul>	<ul style="list-style-type: none"> <li>✓ <i>Appropriate fuelwood harvesting techniques demonstrated and replicated (Output 2,3,4)</i></li> <li>✓ <i>Community and private woodlots demonstrated and replicated (Output 2)</i></li> <li>✓ <i>Sustainable harvesting regime established, implemented and monitored in CNR and PAs (Outputs 3,4)</i></li> <li>✓ <i>Legislation clarified for co-management of PA (Output 1,4)</i></li> <li>✓ <i>Inconsistencies in tax laws reconciled (Output 1)</i></li> </ul>
<p><i>Excessive hunting of predators and other wildlife</i></p>	<ul style="list-style-type: none"> <li>▪ <i>High demand from poachers for customary leases</i></li> <li>▪ <i>Mismanagement of public concessions</i></li> <li>▪ <i>No compensation for damage to crops or livestock</i></li> <li>▪ <i>Lack of participation and incentives for protected area management</i></li> </ul>	<ul style="list-style-type: none"> <li>✓ <i>Co-management of PA and benefit sharing instituted as incentive for protection of wildlife (Output 4)</i></li> <li>✓ <i>Sustainable harvesting regimes and benefit sharing systems established for wildlife in CNRs</i></li> <li>✓ <i>Eco-guards established (Output 3,4)</i></li> <li>✓ <i>PA management and infrastructure strengthened (Output 4)</i></li> </ul>

<p><i>Overgrazing by domestic animals in and around protected areas</i></p>	<ul style="list-style-type: none"> <li>▪ <i>Conversion of pasture to crops</i></li> <li>▪ <i>Badly managed water resources</i></li> <li>▪ <i>Lack of appropriate intensification techniques</i></li> <li>▪ <i>Unregulated transhumance and conflicts on land access and land use</i></li> <li>▪ <i>Lack of participation and incentives for protected area management</i></li> </ul>	<ul style="list-style-type: none"> <li>✓ <i>Needs of pastoralists and transhumants enshrined in local and eco-regional planning (Output 2,3)</i></li> <li>✓ <i>Selective and targeted investments in pastoral infrastructure (Output 2,3)</i></li> <li>✓ <i>Appropriate techniques for intensification demonstrated around boreholes (Output 2,3)</i></li> <li>✓ <i>Grazing and water fees instituted in improved pastures, and contributing to VT revolving funds (Output 2)</i></li> <li>✓ <i>Eco-guards established (Output 3,4)</i></li> <li>✓ <i>Participatory M&amp;E established for adaptive management (Output 5)</i></li> <li>✓ <i>Local knowledge incorporated in all planning and M&amp;E (Output 5)</i></li> </ul>
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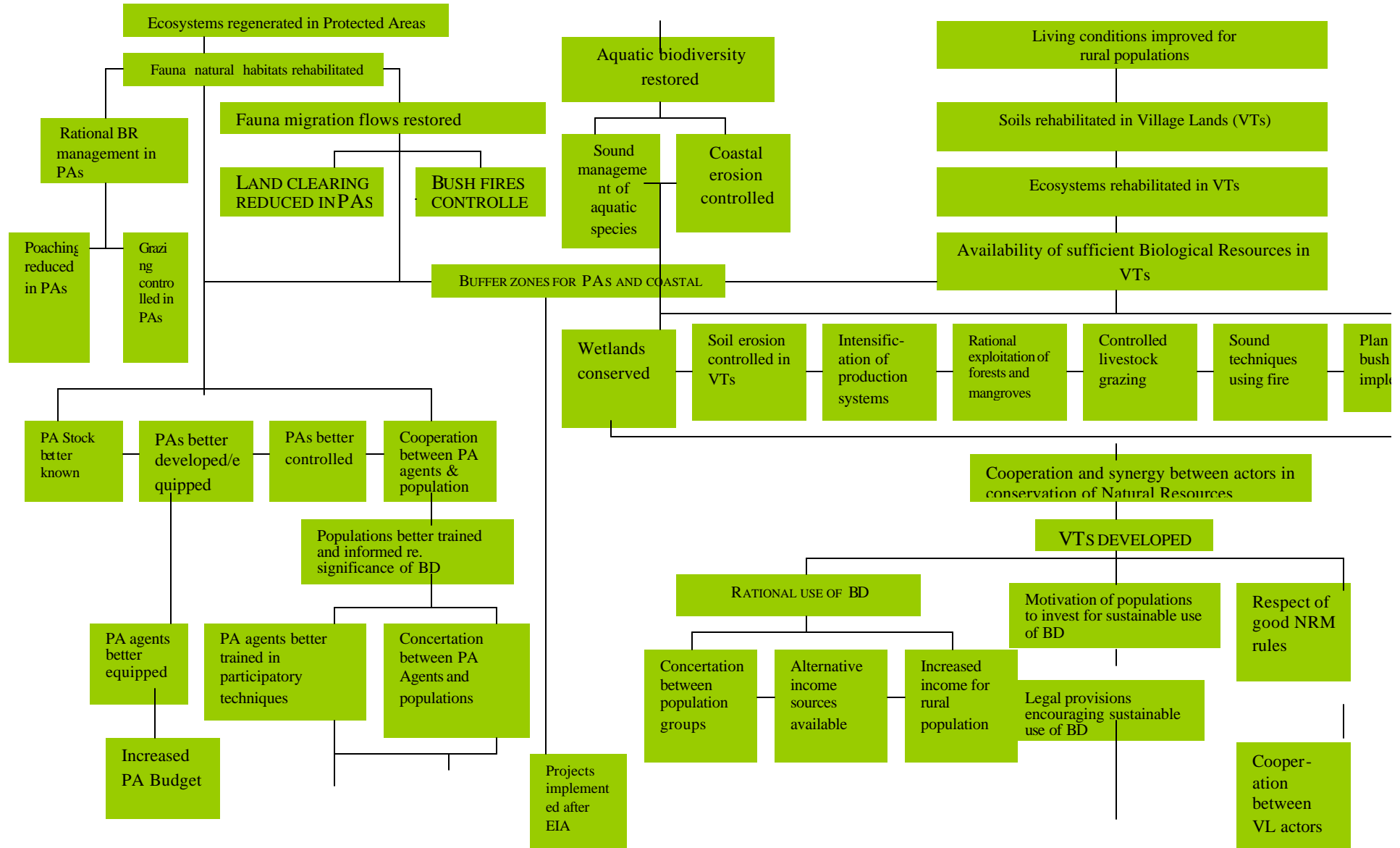
<p><i>Excessive and uncontrolled</i> bush fires damage ecosystems and biological resources</p>	<ul style="list-style-type: none"> <li>▪ <i>Traditional use of fire (clearing, pasture regeneration, honey harvesting, charcoal production) is not efficient.</i></li> <li>▪ With population increase, traditional use is of scale beyond that required for healthy system</li> <li>▪ Lack of traditional, or modern, means to combat fire at these scales, without coordination.</li> <li>▪ Lack of participation and incentives for protected area management; and lack of effective management of VT and CNR.</li> </ul>	<ul style="list-style-type: none"> <li>✓ <i>Fire-less technologies promoted for charcoal, beekeeping, etc. (Output 2)</i></li> <li>✓ <i>Firebreaks created, and maintained through controlled grazing and selective biomass harvesting (Output 2,3,4)</i></li> <li>✓ <i>Appropriate techniques for fire management tested, demonstrated and replicated in VT, CNR, and PA (Outputs 2,3,4)</i></li> <li>✓ <i>Local community and PA staff , including eco-guards, capacities strengthened (training, equipment) for fire management (Output 3,4)</i></li> <li>✓ <i>Traditional village “vigilance” committees re-established, coordinated, and operational for early warning systems (output 3,4).</i></li> </ul>
<p><i>Excessive and unsustainable</i> Harvesting of marine and non-timber resources</p>	<ul style="list-style-type: none"> <li>▪ <i>Inefficient and destructive harvesting technologies</i></li> <li>▪ <i>Habitat conversion in mangroves</i></li> <li>▪ <i>Lack of alternative income generation</i></li> </ul>	<ul style="list-style-type: none"> <li>✓ <i>Sustainable harvesting regimes tested, demonstrated and replicated for selected resources (Output 2,3)</i></li> <li>✓ <i>Alternative incomes generated through credit system in support of intensification (Output 2).</i></li> </ul>

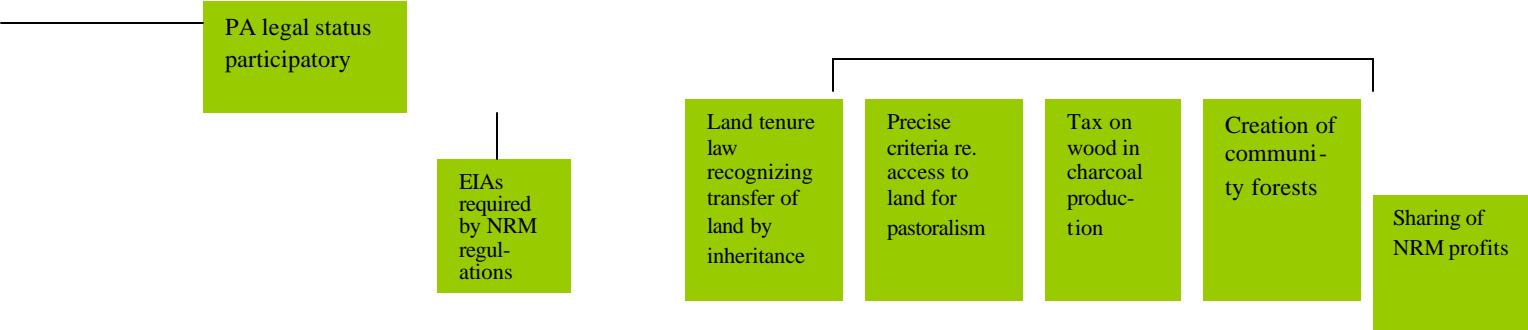
### Annex 10b: Problem and Solution Trees: Problem Tree





### Solution Tree





## ANNEX 11: Project Technical Specifications and Strategies

The activities to be conducted within the GEF alternative at the legal, policy and institutional levels in the VTs, the CNRs and the PAs are aimed at applying sustainable solutions to the biodiversity degradation problems that were identified. Those proposed activities will help to remove the obstacles to sustainable development which are not addressed in the baseline and ensure the sustainability of the measures implemented and their success into the post-project phase. The technical specifications and strategies are based on a review of lessons learnt in Senegal and elsewhere. They were also reviewed by all stakeholders in the PDF B process. Many of the techniques below have been tested elsewhere, some also in Senegal. However, they have often not been replicated spontaneously. This is either because the technology still needs improvement, or there are policy, technological, financial or other barriers to their widespread adoption. In the case of the former, the project will endeavour to show innovative improvements, and in the case of the latter, the project will assist in lifting these barriers.

### **1. Legal, policy and institutional issues**

Promoting pilot activities for PA joint management will require amending the present legal status of the PAs and adapting it to allow effective popular participation. In addition, once present obstacles to participation have been removed, the legal provisions will need to be revised in order to guarantee access to and ownership of community biological resources and equitable sharing in the profits achieved in the PAs. In this regard, the criteria for development, which is the basis for land attribution or retirement will also need to include livestock farming, whether individual or collective as confirmed by one or several of the local pastoral management committees both at the Ferlo site and at other project sites. Furthermore, it will be necessary to legalize the CNRs by means of a real transfer of authority and responsibility and by instituting them by a decision of the RC or RCs concerned.

At policy level, development policies will have to be made equitable for all categories of actors and stakeholders in the area of natural resource management. In particular, the current bias against pastoralists in policies and laws has to be lifted. This is crucial to the success of the cooperation and concertation mechanisms. In addition, a review of the current development policies in the agricultural, pastoral, forestry and hunting sectors, will be conducted in order to identify and remove the obstacles to encouragement of individual and community initiatives for the sustainable management of biological resources. Experience elsewhere in Africa shows that lifting these legal and policy barriers is a prerequisite for sustainable natural resource management.

In order to ensure synergistic effects between project activities and the expected outputs of other projects to be implemented at project sites, the GEF alternative provides for mandatory Environmental Impact Assessments (EIAs) for all future projects so as to limit their adverse effects and to preserve and reinforce the results achieved as regards sustainable biodiversity conservation.

### **2. Micro-credit and savings schemes**

Lessons learnt have shown that activities that generate alternative incomes often need initial capitalization to take off and become financially sustainable. Micro-credit projects have been tested in Senegal. Experience shows that revolving community systems are sustainable only when : (a) potential users contribute to their capitalization; (b) funds are tightly managed by competent and trust worthy local people (including businessmen); (c) checks and balances are established through communal oversight to avoid abuse ensure timely repayment of loans; (d) micro-projects are vetted stringently according to business principles, to ensure adequate rates of return, before acceptance; (e) links to local development banks are established so as to encourage borrowers to graduate to the commercial sector.

### 3. Eco-regional planning

Classical regional planning (including economic stratification; regional land use planning; population and infrastructure nodes and links; etc.) has been part of the baseline for many years. Recent policies on decentralization have mandated the regional governments and Rural Councils to conduct regional planning, within the framework of a national plan. However, current regional planning approaches do not incorporate biological and ecosystemic factors. On the one hand, there is a need to incorporate bio-regional approaches (including corridors and connectivity between protected areas), and on the other, to incorporate IEM principles. This will ensure that population pressure and movements (migration, transhumance) between one landscape and the next are adequately planned and managed in order to allow all development and conservation needs to be effectively integrated and addressed. In the context of this project, the two neighboring landscapes of Ferlo and Niokolo offer a golden opportunity to test and demonstrate these principles, because of their proximity, the presence of a system of classified forests in the corridors, and relatively lower population pressure (compared to the linkages between Niaye and Ferlo landscapes, for example). The project will build capacity for eco-regional planning at all relevant local, regional and national levels.

### 4. Intensification of production systems

These activities will target crop production, livestock production and fish production. They will be aimed at encouraging the stakeholders, to increase soil productivity so as to reduce the pressures on natural ecosystems, and reduce excessive land clearing.

Tree planting through spreading organic manure in the fields: In the Ferlo and Forest areas, forestry research has demonstrated that 30 to 40 individuals of *Acacia albida* in a field can increase millet production by 40 to 50% annually. This is due to the following facts: (1) this tree is a legume, therefore capable of fixing nitrogen in the soil with its root nodules; (2) litter mineralization is considerably faster than for many other species; (3) the tree is native to the southern hemisphere and one of the few trees in the Sahel to keep its foliage during the dry season, thus providing shade which attracts livestock, also drawn by its fruit which it finds very palatable; (4) this species is among the few that drop their foliage during the rainy season, thus providing humidity to activate the mineralization process while providing water for crops under the canopy. *Acacia albida*, a companion of agrarian societies, generally germinates only after the seeds have transited through ruminants' digestive tract, because of its very tough tegument. By feeding the seeds of these species to animals and spreading the manure over the fields, one promotes the regeneration of these species in the fields. This is an innovative idea that requires field testing before dissemination.

Agro-forestry: This consists in integrating trees in agricultural production systems. The best option with this technique is to use legume species that are capable of fixing nitrogen, as are most of the species of the *Acacia* genus. The trees are placed in a row to allow passage for mechanized implements whether drawn by animal or by tractors. The optimal density is 100 trees per hectare on the average, i.e. one tree every 10 meters. Generally, the species used in this field plantation technique are multi-purpose species which, beside increasing crop yields, also produce fruit, forage and gum, while serving as windbreaks and stabilizing the soil. Among the species used in this manner are *Acacia albida*, *Cordia pinnata*, and *Parkia biglobosa* which are all local species in Senegal, as well as cashew trees (*Anacardium occidentale*), strongly adopted by farmers in the Saloum Delta. The main constraint to widespread adoption has been the lack of land security.

Windbreaks and live hedges: These consist in planting two or three rows of trees or shrubs in offset position orientated perpendicularly to prevailing wind direction. They may be located at the periphery or within the fields, delimiting sections of crops. They provide the advantage of reducing wind speed and

water runoff speed, increasing water infiltration, mineralizing the litter or fixing nitrogen, and protecting crops against free-grazing animals if the windbreak is sufficiently dense. Windbreaks and live hedges also lend themselves to multiple uses depending on the species and can produce fruit, gum, oil, forage and sustainable income. In order to avoid whirlwind effects on crops, the windbreak must be permeable to the wind. Current obstacles to the use of these techniques are the difficulties linked to land transfer, as these land improvement activities are medium- to long-term investments. Also, knowledge on seedling production of native species is limited and needs assistance.

Ecological farming: This consists in integrating crops, animal breeding and forestry (agro-sylvo-pastoralism) using conservation farming and organic farming techniques. A plot where livestock was kept pasturing in the post-harvest phase during the dry season becomes enriched with manure. Seeds from the desired plant species which were fed to the livestock are collected and sown on the same plot which will be cultivated over a three-year period while fertilizing it with manure from the animals that are kept in pens. During the next season, the animals are pastured on another plot for three consecutive years to enhance tree regeneration. The first plot may then be used for pasturing after the harvest while the second or third plots, depending on land availability (sylvo-pastoral ecosystems and forest ecosystems) is temporarily off-limits to animals. This rotation is complemented by two-year forest fallows. Under this land management regime, the plots are fertilized, used for crops, then for trees in alteration over different periods. Combined with crop rotation, this method produces the highest reported yields per space unit. The major constraint for this innovation is the lack of land security, and some technical know-how.

Compost pit techniques: In agricultural areas where organic fertilization with livestock manure is a limiting factor, the project will undertake pilot activities demonstrating the use of compost pits using agricultural by-products and biological household waste. These products are buried and placed in a cement compost pit which is covered while allowing some ventilation. Regular watering activates the mineralization process. Compost pits are located either in the fields or next to the dwellings. After complete mineralization, compost is retrieved from the pits and spread on the fields. This is a very common technique in Senegal's Peanut Basin which has the highest rural density on the poorest soils, where it is being adopted by the populations with good results. The main constraint is the information/extension services to be provided and the cost of construction of the pit which can be used for over five years. Applying a reduced (almost halved) quantity of compost by surface area produce better results than chemical fertilizer while preserving soil texture and fertility sustainably. In addition, these positive effects are cumulative over time. These techniques may be advocated for farmers in the Delta and Niaye.

Rock bund technique for soil and water conservation: It consists in constructing small dikes (rock bunds) placing a line of stones on hills in a perpendicular orientation to the slope, in order to reduce the speed of surface runoff during the rainy season. The technique can be applied to one or several fields in the same catchment area, at village level for instance. This is where the technique is most efficient as it reinforces individual actions undertaken in each field. This technique enhances water infiltration and organic matter and silt retention. It is a proven technique to rehabilitate degraded soil and increase land potential in the VTs. The major constraint is that it requires hard work to collect the stones and great care to construct the dikes. Such initiatives can be supported and encouraged. In addition, it should be noted that maintenance work is far less demanding and that once they are constructed, the farmers see their profits, which ensures sustainability. The constraint lies at the initial stage in convincing the stakeholders of the benefits of the technique. The project will do so with awareness raising techniques, including organising cultural events, shows, competitions, etc. Farmers will also be encouraged to take micro-loans to hire labourers for the work.

Livestock pasturing: Efforts will be made, in the Ferlo area in particular, to encourage the pasturing of livestock in the fields after the harvest. Both livestock owners and less wealthy households will be encouraged to avail themselves of this option. The latter will thus exchange agricultural by-products in their fields against livestock pasturing for a duration to be negotiated. Such pasturing adds value to agricultural by-products by fertilizing the fields with organic manure, an ecologically sound and valuable operation. It has been established that this technique more than double the yields, for cereal crops and commercial crops alike. The only constraint regarding this natural fertilization technique is that the livestock must be allowed in some fields, while the owners of other surrounding fields need their agricultural by-products to feed their own pen livestock such as sheep or goats. Concertation mechanisms may provide a solution, as will encouragement of widespread use of live hedges using impenetrable euphorbias and acacias.

Sheep and cattle fattening: This is a type of pastoral intensification which consists in taking forage to the animal instead of the traditional, opposite approach. As it causes less energy loss for the animals, the methods increases weight gain considerably over a short period of time, particular when couple with close phytosanitary control. This is a very profitable technique, one adopted by several livestock farmers and even crop farmers. The most popular form is sheep fattening for the annual Tabaski feast, but cattle fattening is also practised. The animals may be bought during the “junction” period, when prices reach their lowest level, and are then fattened for resale, realizing upwards of 100% profit per head. The main constraints are providing information and making the initial investment.

Aquaculture: Aquaculture refers to techniques aimed at using aquatic biological resources (shrimp, oyster or fish) while reducing pressures on PA resources. One type of aquaculture consists in delimiting an area in a body of water where animal raising activities are conducted according to sustainable resource management principles. For fish farming, for instance, in a marigot or cut-off meander or a seasonal stream fed by rainwater, the outlet is blocked to retain water as long as possible; the fish are fed appropriately and captured selectively by size, either medium or large, according to market objectives. Ultimately, after a while, as the reservoir is drying out, all fish needs to be removed gradually in order to avoid asphyxia. This technique can provide considerable amounts of animal protein with very little recurring expenses, but has rarely been tried in Senegal. The fish may be sold fresh or processed before marketing. This type of operation is profitable both at the individual and community levels. The main requirement is training; few other means are required. The technique can be used in areas with favourable rainfall regime and preferably near fisheries so as to benefit as much as possible from initial transfers when the rains begin.

Pisciculture: This refers to fish farming in artificial ponds where juvenile individuals are introduced and fed appropriately. This technique provides animal protein while limiting pressures on the natural environment. The activities extend over a relatively longer period of time as the bottom is less permeable than in natural bodies of water as used for aquaculture, and the expenses far greater. These operations have shown profits depending on the species and demand. The main constraint here is the high start-up cost. The most widely used species in pisciculture in Senegal is *Tilapia nilotica*.

Processing and marketing of plant, animal and fish products: Micro-projects aimed at income diversification will encourage to a large extent activities related to the processing of products from market gardening and fruit-trees, as well as animal products such as curdled milk, butter and cheese, and fishery products, with dried, smoked and salted shrimp, fish and oysters and their packaging. Processing of gathering products such as palm oil and cashew nuts and production of jams and fruit juices will also be encouraged in order to alleviate pressures on the natural environment. In addition, storage and marketing operations carried out by women groups will also be encouraged, to benefit the most disadvantaged groups. The current constraint to such operations are financial, as well as lack of information on markets.

## 5. Extensive production and sustainable harvesting

Pasture improvement: This is an income-generating activity which also produces environmental benefits as it conserves biodiversity and regenerated the ecosystems. It consists in developing the pastures and enriching them on a rotational basis. A number of pasture units are placed off-limits to grazing and enriched both with palatable species such as *styloxantes* and with shrub or tree forage species such as *Acacia senegal*. After a pre-determined period of time, the enriched sections are opened to grazing and other blocs previous used are enriched and placed off-limits. In this regard, over the 10-year duration of the project, it will be possible to assess the results of such rotation as regards both sustainable development and conservation. This rotation system provides quality forage at all times while protecting the natural habitat of wild fauna species, which incidentally also benefit from this quality forage. In addition to this benefit for the wild fauna, pastureland management is also favourable to environmental balance and provides income from the sale of gum arabic. In view of the high international demand for this product from breweries, the pharmaceutical sector and confectionery, sustainability is insured as a result of the high price of gum, in excess of US\$2.00 per kilogram. The obstacle to the realization of these pastureland improvements is the fact that pastoralism is not explicitly included in legal provisions as a land-development criterion and therefore is not considered as such by land-use planners, who allocate land according to such criteria. Therefore no land has ever been allocated either individually or collectively for pastoral use by the RCs. Pastureland access is open and free of charge to anyone and, as a consequently, no pastoralist is inclined to investing or become involved in the management of such land. As a result, pasturelands are not only increasingly degraded, leading to transhumance over longer distances with the attendant conflicts, but they are also subjected to clearing for cultivation thus relegating the livestock on mediocre soils. This technique also includes grazing and water fees on improved pastures, which should generate revenues which are put back into communal management of the system.

Plantation of green firebreaks: These are plantations of two or three rows separated with alleys along a firebreak either at the perimeter of an area or within an area to form compartments, with evergreen forest species with low flammability. One such species is *Anacardium occidentale*. These green firebreaks are also multi-purpose as the fruit of the tree is eaten raw or dried and its seed, the cashew nut is roasted and consumed as snack food. There are outlets for these products and the high national and international demand far exceeds supply. The income derived from this tree is durable, as one tree can yield up to 300 kg of cashew nuts and for a minimum of 20 years. In the Saloum Delta area where the species was introduced with GTZ support, 10 years after project completion, the villagers continue to plant it using their own money because of the substantial income it provides. According to the villages income per hectare is higher for *Anacardium* than for groundnut or cotton. Due to its rapid growth, the species covers the soil quickly and serves as an effective windbreak for crops while improving the environment. The constraint regarding replication is the initial investment due to the high price of seeds for farmers and their lack of knowledge regarding its culture. In this regard, the national forestry seed project has already been a good experience, but it does not assume the costs of planting of this species.

Reforestation and forest regeneration: The baseline situation in Senegal shows strong preferences for exotic species because of their faster growth rate compared to local species. However, local species are better suited to regenerate the ecosystems, of which they are natural components providing habitat and food for the fauna. These often multiple-use local species are competitive over the long term and are drought resistant. While eucalyptus can be harvested much sooner, and 2 or 3 times for the same tree owing to stump regeneration, local species begin to yield products between 18 to 20 years of age. Although in the long term local species generate greater economic and financial gains due to their multiple uses, this waiting period alone is enough to discourage investment. In this context, in order to

remove the obstacles to reforestation with local species, there is a need for supportive research activities on local species silviculture, the creation of private and community tree nurseries for endemics, sustainable management technologies for these species as well as dissemination and diffusion of lessons learned in this area. In addition, another obstacle to be removed is that of transfer of land ownership by inheritance.

Streamlining charcoal production and consumption: Charcoal has become the most widely used source of household energy in Senegal, both in rural and urban areas. Its production using still rudimentary processes restricts supply and conversely increase the weight of demand. As few Senegal's forest have a management plan, logging for carbonization purpose is conducted according to the needs, without taking into consideration actual forest production capacity. There is thus a need to streamline charcoal production and consumption. Current production methods are of the open kiln type, often starting forest fires, requiring 5 kg of wood to produce 1 kg of charcoal. There does exist improved carbonization techniques which were successfully tested in Senegal by USAID in the 80's, but despite the 30% savings in wood consumption obtained using improved kilns with a metal chimney for the same amount of charcoal produced plus pyroligneous by-products, the local charcoalers failed to adopt these techniques. This is due to the fact that taxes are levied on the finished product instead of the raw material (wood) which should be taxed in order to promote the use of these improved techniques. Support is also needed for the initial investment required to purchase a chimney. On the consumption side, the Malagasy stoves currently used are being replaced by improved stoves burning both charcoal and fuel wood, with a 40% gain in efficiency. The initial investment is, again, the obstacle preventing widespread adoption of these stoves, although this additional investment is rapidly recouped thanks to the lower fuel consumption.

Rangeland Management: Based on the experience from previous projects implemented in the sylvo-pastoral area, both sedentary and transhumant pastoralists who have traditional access rights must together invest and become involved in stewardship of activities to improve range management, and create and manage ponds and boreholes in rangelands. This willingness on the part of both categories of pastoralists was noted during the PDF-B consultation process and resulted in acceptance of grazing fees on parcels developed by the project at a rate of CFAF 50 per head of cattle/per month and watering fees at a rate of CFAF 100 per head of cattle/per month. According to the statistics of the Directorate of Livestock for 1999, the figures for the livestock population in the Ferlo area during the dry season is given in the Table below.

In view of these numbers, the fees paid for grazing and watering during the 9 months of the dry season are expected to generate a total of US\$3,756,000, demonstrating the potential financial sustainability of this option, providing resources beyond pasture regeneration and water supply point management requirements which will cover expenses for animal health and salaries for the elected members of the pastoral unit local management committees.

Livestock	Number	Costs of watering and grazing for 9 months (@CFAF150/head/month) In US\$ millions
Bovines	676,000	1.303
Sheep	1,096,000	2.113
Horses	96,000	0.185
Asses	78,000	0.150
Camels	2,750	0.005
Total		3.756

It should be noted that this figure is a minimum, as: (1) Fees currently paid in the PRODAM pastoral units are for pastures that were not improved with valuable fodder plants capable of increasing growth and milk production, and (2) The herds are supposed to remain in the area even during the rainy season when Ferlo pastures are of better quality, which brings the total time to 12 months, i.e. US\$5,008,000 per year if all Ferlo area livestock benefited from the creation of pastoral units and organization of pastoral management committees. Therefore, economic durability is ensured since the recurring costs both for the management of water points such as ponds and boreholes and for animal health services can be assumed entirely by user fees. One remaining requirement is to strengthen the organizational structure, including enhancing the cooperation between stakeholders, and the dissemination of the pasture enrichment techniques which will result in better milk production and therefore ability to pay fees.

Improved Stoves. The project envisions consolidating existing techniques and experiences in promotion of improved stoves, by lifting the constraints to which ongoing projects are confronted, including removing economic and institutional constraints to encourage private and local authorities' initiatives. As for the populations, the adoption of these techniques is already a reality, for as far as improved stoves are concerned (*Diambar* stoves), local markets have stocks of these products which have been manufactured by local craftsmen and the sale of which is satisfactory. Despite their increasing prices as a result of the considerable gains provided in terms of comfort (smokeless and less fire risk), wood and charcoal savings and the limited financial means of the actors concerned, these improved stoves are very successful, an evidence of their adoption.

Village woodlands and woodlots. Protection of Village woodlands has been practiced for decades in Senegal due to shortages in woody products in certain areas (e.g. woody areas have been shielded from grazing animals, notably in *Mont Rolland, Thiamène Til*; and traditional conservation of Sacred Woods). The development and implementation of village lands development and management plans will enhance the effectiveness of these woodlands. Some sites can be used to plant community trees to be exploited collectively and equitable sharing of the profits. Depending on the villages, the dominant objective could be production or shielding the villages against winds and especially against the different forms of erosion

Leasing of community hunting zones: These leasing activities will concern the hunting zones located in the territories devolved to RCs for management. Formerly a State responsibility, as a result of the transfer of authority in NRM, these activities are now within the purview of the local communities. The RCs will thus have to collect culling fees on a number of prolific animals, during the hunting season. In addition to those high fees paid by hunting tourists, private promoters are leasing hunting lodges to house the tourists in these areas. In the PNNK area and in the Saloum Delta alike, this is an emerging sector. During the hunting season, one single lodge can accommodate up to 20 hunters per week, collecting receipts in excess of US\$7,300 per week. Data for the past five years provided by the lessees show that the number of hunters is on the rise at a rate of more than 10% per year. This sector is organized by clubs planning the tourists' stay entirely from their departure to their return to their homeland.

A study of two existing hunting sites shows a total of US\$ 935,625 per hunting season for 12 hunting camps. Similar figures are expected to accrue for hunting licenses in CNRs, once the infrastructure and management system have been developed by the communities with the project's assistance.

Hunting Camps and Homes	Number of Visits	Cost of Stays at a Rate of US\$ 375 Per Person and per Week Stay
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Camp du Lion	200	75000
Camp du Wassadou	150	56250
Relais de Kedougou	250	93750
Campement Diaou	230	86250
Campement Oumar Sow	175	65625
Campement Goumbayel	200	75000
Campement de Salemata	250	93750
Campement de Thiokaye	180	67500
Relais Tomboronkoto Mako	220	82500
Relais Batankokouta	190	71250
Gite du Bandiala	250	93750
Gite le Caiman	200	75000
<b>Total</b>	<b>2495</b>	<b>935625</b>

In view of the sustainable profits generated by this activity, it is expected that the villagers will be able to protect biodiversity in the PAs as it is the excess game animals from the PAs that spill over into the leased community areas. The creation of Community Nature Reserves at the level of the villages bordering the PAs will allow those villages to participate in the development of ecotourism, where they will find promising outlets for other types of products such as artefacts, thus diversifying income sources. At the same time, these Community Nature Reserves will provide connections between the various PAs, contributing to environmental balance between the ecosystems.

## 6. Protected Area management and sustainability

Co-management: This will be an innovation in Senegal, where the current legal status of the National Parks left little room for such an approach. The GEF alternative, by removing the legal, policy and institutional obstacles (Output 1), will lay the foundation for genuine stakeholders' participation and co-management of the National Parks. In Senegal, co-management responsibilities could be shared between a Steering Committee, an Implementation Committee, and a Management Committee.

The Steering Committee will be the entity in charge of guiding the programme, making decisions and validating the recommendations issued by the other committees. It will consist of representatives of DPN, DEFCCS, administrative authorities for the region or regions concerned, traditional and religious leaders of the RC adjacent to the Park, and individuals in charge of specialized institutions dealing with the conservation of biological resources. It will be convened at least once a year.

The Implementation Committee will be responsible for defining the general method to be applied to implement the programme, reviewing the various work plans and outputs, and supervising the monitoring and evaluation of the activities. Its membership will include the Rural Councillors of the RCs concerned and experts in the appropriate areas pertaining to the conservation of biological resources. This committee may be chaired by the presidents of the adjacent RCs on a bi-annual or annual rotation basis.

The Management Committee will provide its support for the execution of the programmes by coordinating in the field the activities of the sub-committees in charge of plant and animal resources. These sub-committees will consist of the various actors intervening on the ground, including women's groups, socio-professional organizations, transhumant livestock farmers, sedentary livestock farmers,

areas lessees, hotel managers, forest farmers, bee keepers, fishermen, crop farmers and processors of biological resource by-products.

Co-management will thus enable the actors and stakeholders to carry out all conservation activities in the PAs according to a specific work plan based on compromise decisions. In this regard, bee keeping, ecotourism, straw harvesting, consumption of forage by resident or transhumant livestock, harvest of various fruit in the multiple use firebreaks and supervision of the lessees activities will be carried out in conformity with rules adopted by all. In addition, as regards the distribution of profits from conservation, the populations will receive from the PAs an income representing equitable sharing of these profits. With variations depending on the sites and efforts put into conservation by the parties, a percentage of the receipts to be returned to the communities will be determined by the stakeholders themselves on a negotiated basis. Such profits will thus provide support for sustainable development in the VTs and the CNRs while serving to ensure the durability of the activities. Eventually, with the concertation framework, the SFIECE programme and the support of the eco-guards, the NPs are expected to achieve self-sufficiency as a result of the co-management regime. In addition, VT artistic and cultural products will be developed and promoted within the PA ecotourism activities.

Ecotourism: The GEF alternative will place particular emphasis on the development of ecotourism recognizing the fact that it is one of the very few options generating income from conservation without extracting resources from nature. The selected sites afford innumerable ecotourism potentialities. There are concerns over the limited financial resources currently generated by the entrance fees paid at national parks (NP), and calls for increasing these fees. Based on the current statistics provided by the National Parks Department, controlled entries in the main national parks located in project areas of intervention amount to 5000 on average annually for *Niokolo-Koba* National Park (NKNP) and 3000 for PNDS. Assuming that project activities will improve the biodiversity status of PAs, these entries are expected, at minimum to increase constantly by about 10% annually. Senegal compared to its neighbors boasts a larger tourist trade. Current entrance fees to these parks are very low. If one compares with the rates applied by the private sector (e.g. *Bandia* Reserve, where the entrance fee is CFAF 7,000 per person and per entry), an entrance fee CFAF 5,000 per person and per day appears to be reasonable. Based on these assumptions and with an average base of 3 days per visit and constant entrance rates, the expected income from the main national parks over the next ten years can be broken down as follows:

**Estimated Income generated by Controlled Entries  
in *Niokolo-Koba* National Park NKNP over a Ten-Year Period**

<b>Years</b>	<b>Number of Entries</b>	<b>Cost per 3- Day Visit in US\$</b>	<b>Total Income in US\$</b>
A1	5000	21.429	107143
A2	5500	21.429	117857
A3	6050	21.429	129643
A4	6655	21.429	142607
A5	7321	21.429	156868
A6	8053	21.429	172555

A7	8858	21.429	189810
A8	9744	21.429	208791
A9	10718	21.429	229670
A10	11790	21.429	252637
Total	79687		1707581

### Estimated Income generated by Controlled Entries in *Saloum* Delta National Park (SDNP) over a Ten-Year Period

Years	Number of Entries	Cost per 3-Day Visit in US\$	Total Income in US\$
A1	3000	21.429	64286
A2	3300	21.429	70714
A3	3630	21.429	77786
A4	3993	21.429	85564
A5	4392	21.429	94121
A6	4832	21.429	103533
A7	5315	21.429	113886
A8	5846	21.429	125275
A9	6431	21.429	137802
A10	7074	21.429	151582
Total	47812		1024549

Controlled entries in the two main national parks will generate a total of US\$ 2,732,130. To this should be added GOS' annual contribution to the budget of all PA project sites. Based on the statistics of the past two years, this contribution amounts to US\$ 658,286 or a total of US\$ 6,582,857 for the ten years' period for all 18 PAs. This can be calculated as roughly equivalent to \$1.2 million for the two parks mentioned above.

Rents from eco-tourism, referring to sharing park entrance and other fees between PA and peripheral VTs, are expected to accrue to local communities. Although most ecotourism is a package deal gathered in home country of the traveler, there is significant scope for income generation at the local level through : sale of crafts; offering touristic attractions, such as fêtes, dances and theatrical shows; and offering accommodation and other services. Other sources of revenue will be from granting controlled hunting licences (both for CNR and PAs), and from fines and confiscations.

The GEF alternative is expected to make the parks, World Heritage sites and Biosphere reserves more attractive which would result in a significant increase in the number of visitors. According to this scenario, total receipts beyond baseline contributions are likely to exceed \$2.5 million with the total cost for the component for PA management improvement reaching US\$7,485,000. In other words, the durability of PA management will be assured, eventually, by the PAs' self-sufficiency once the legal obstacle to self-management has been removed (Output 1). The joint management initiative involving the local communities will help to enhance PA tourism potentialities, which will translate into improved biodiversity conservation and increased durability of the joint management activities, in particular as a result of the sharing of the profits from PA conservation. In this regard, an annual percentage of the profits to be determined in consultation with the stakeholders will be allocated to neighbouring VTs as a

return and reinvested in the sustainable management of VT and CNR resources, feeding back into PA conservation (Outputs 2 and 3). To ensure a positive effect of this return, it would be advisable to conduct a study involving all of the actors so as to factor in, on an inversely proportional basis, the number of recorded infractions to the rules constituting illegal use of the PAs. Such a system would encourage the VT populations to cooperate and abide by the PA management rules and to denounce any individual, whether local or foreign, about to breach the regulations established and adopted by all stakeholders.

Bee keeping: Honey production will simultaneously generate sustainable income and protect the PAs where this activity is conducted. Conservation in this context is due to the fact that in the event of a forest fire, the bee keepers will be the first ones to want to extinguish it because of the threat to their production. Honey production while improving the local diet will also generate sustainable income through sales. The only obstacles to bee keeping is the lack of access to initial micro-credit for the populations of the isolated villages located at the PA periphery. The durability of this activity resides in its economic and financial profitability. For bee keeping, the initial funds required are for the purchase of a protective suit and chemicals to put the bees to sleep for 35 minutes. All told, this fireless bee keeping technique requires an initial investment of US\$100, plus the honeycombs. As one hive can yield at least 25 kg of honey and the price of honey is US\$11 per kg, profit for one hive is US\$175. For one season, a bee keeper can tend a minimum of 5 hives, with two harvest per season, making a net profit of US\$1,750 per season. The honey production season goes from March to July, which is also the latest period for forest fires, when they are most threatening. Bee keepers therefore take basic precautions to minimize the risks of fires which would destroy their hives using firebreaks.

Hay harvesting: As a consequence of village land degradation, straw to build or repair huts in the villages has become a scarce therefore expensive, commodity and its harvesting in the PAs, the only place where it is still available, is a lucrative activity. As a result, despite explicit prohibition on straw harvesting in the NPs and the dangers of confronting parks agents, the populations indulge in this activity either for their own personal use or to sell the straw which is in high demand as the hut roofs have to be redone every other year to remain water tight. The GEF alternative, while eliminating the obstacles to a conservative management of biological resources, will test the option of involving the riparian populations in the cleaning of peripheral firebreaks and of amending NP legal status so that they may use the straw collected in this manner to use or sell as they please. Such an activity will protect the ecosystems against bush fires and generate substantial sustainable income. The only obstacle is the current legal status of the NPs and nature reserves which prohibits the use of resources in these areas under any form whatsoever.

## ANNEX 12a. PUBLIC INVOLVEMENT

### 1. Brief preparation and PDF B process:

The Senegal Protected Areas (SPA) project is a country driven initiative taken during the national biodiversity strategy formulation process. The SPA project received a GEF pdf B grant and co-financing from the Government of Senegal (GoS) as well as UNDP. The pdf B process was undertaken for 18 months between 1999 and 2000. The project preparatory activities included: (1) a series of consultations among country's biodiversity stakeholders regarding the selection of project sites and the significance of biodiversity for sustainable development; (2) participatory rural appraisal (PRA) exercises, that involved 150 villages and over 2,000 residents of four selected project sites, to gather biophysical and socio-economic data; (3) an objective oriented planning (ZOPP) exercise at each of the four project sites with the grassroots to determine the problems, solutions, results and actions required to conserve biodiversity at each site; and (4) a ZOPP synthesis workshop that lasted 5 days with 41 delegates, who were representing their constituent stakeholders from the four project sites.

Among the stakeholders that participated in the ZOPP exercises were representatives from public services and the LCs involved, village leaders, rural animators, transhumant and resident livestock farmers, tree farmers, fishermen, women's groups concerned with vegetable gardening and processing of sea products, lessees of hunting areas, vegetable producers, hotel managers, hunting camp managers, NGOs, staff of ongoing baseline projects, researchers, national consultants and the pdf B project technical staff. The ZOPP exercises resulted in a consensus on the problems of biodiversity and their root causes, solutions tree, expected outputs to meet the stated objectives, and activities to produce the expected outputs (see Logical Framework in Annex IV). Also indicators, their source of verification and risks were assessed during these workshops. The project site workshops were conducted in the national languages, but the national workshop was held in French, and they made it possible to quantify and budget the activities and to complete the project logical framework with full participation of the stakeholders. Baseline and incremental costs were assessed by national consultants with support from the project staff and finalization by UNDP-GEF headquarters; (6) resource mobilization efforts were led by the ME for co-financing among the country's bilateral and multilateral donors; and (7) the project team drafted a brief (see references in Annex XIX) and made its translation from French into English. A letter of endorsement of the project by the Operational Focal Point (see Annex I) was then obtained. The draft brief was distributed to the donor community and members of the project steering committee. The discussions that followed with these institutions in addition to those held with ME and the country designated GEF Focal Point led to the finalization of the project brief.

The project covers four sites which were selected because of the presence of unique ecosystems relatively well conserved, their interconnectedness and the wealth and diversity of biological resources therein. The four sites correspond to ecological and socio-economic complexes that extend over a total 5.7 million ha of Protected Areas including 989,000 ha of National Parks, 266,250 ha of Classified Forests and 995,988 ha of Reserves. As one of its output, the project will be creating an additional 100 Community Reserves (CRs) as identified with the stakeholders during the PDF-B activities. Adjacent to these areas is a total of 24 Rural Communities including 1,014 villages with a total population of over 425,000 people to be involved in the project. The population includes various socio-professional categories that make out their living upon PA products. Some clear protected areas land for agriculture or grazing grounds, other collect fuel wood, undertake commercial logging, gather forest fruits, hunting for food or trophy, and many more work as hunting guides, tour guides or staff at the hotels located on park land or its periphery.

In supporting this PA biodiversity project, the GoS' objective is to provide sustainable benefits to a maximum number of people over the long term, while fostering development options for future generations. This will require a sustainable use of biological resources as recommended in the PNAE, the SNCB and the PNACB on which the present project is based. For this purpose, stakeholders will be full involved in the planning, development and management of both VTs and PAs to implement community-based biodiversity conservation and sustainable use. Participatory sustainable development of the VTs adjacent to the PAs is assumed here to serve as a socio-economic shield against the activities of poachers and illegal users of the PAs, while ensuring stakeholders' cooperation in the definition, adoption and respect of rules for the sustainable use of natural resources.

Participatory sustainable use will be based on four principles. First it will entail (1) encouragement of individuals and community initiatives by strengthening the stakeholders' capacities; (2) identification and implementation of incentives for conservation by reinforcing capacities through an SFIECE programme aimed at promoting the value of conservation in productive activities; (3) generation of income thanks to a credit programme for micro-projects about sustainable use of biological resources at all stages of production, transformation, conservation and commercialization, also integrating ecotourism activities; (4) promotion of the local know-how and artistic diversity in key selected activities, such as wood carving; and (5) promotion of improved control of the local institutions by the stakeholders and end-users by ensuring their training in planning, community-based co-management, monitoring, and evaluation of measures for the sustainable use of biological resources.

## **2. Project beneficiaries**

The project beneficiaries are the users of the goods and services pertaining to biological resources. They include mainly the poor rural dwellers, who depend on PA biological resources for their survival, as well as several socio-professional categories around the protected areas. Overall, project will involve and reach out a total of 24 RCs, 1,014 villages and 425,517 people. The benefits will consist of training, capacity building, co-management, conflict resolution, and equitable redistribution of wealth and services that accrue from sustainable use/management of biodiversity resources. The primary target population consists of the riparian groups (local communities) that live at the edge of the PAs, but at large there are five groups to benefit from the project. These include: (a) the poor rural dwellers; (b) the professional biodiversity resource users; (c) the civil servants and the civil society; (d) the private sector; and (d) future generations.

The first group of communities living around PAs contain the poorest segment of the rural population in Senegal. They often are landless, without much to invest or to purchase agricultural equipment and inputs. They daily see PAs as the main cause of their misgivings. Most of these live below poverty levels (<US \$1 per day) especially the women and the youth, who are the most vulnerable segment of the society. For this group, the project will first try to bring about their sympathy from their participation in PA co-management. Then the project will foster their food security by promoting better living conditions that are necessary for them to participate in generating global conservation benefits and sustainable development. The project will build on the baseline pertaining to poverty alleviation in identifying the obstacles to development and bringing appropriate solutions.

The second group of beneficiaries will be the professional resource users comprising forest operators, hunting zone lessees, agro-pastoralists, beekeepers, various women groups (vegetable gardening and fruit farming), fishermen, and actors in the processing, packaging and marketing channels of gathering, agricultural, fishing and dairy products. The project will bring to them the input they need to perform well in their sector of society by initiating catalytic initiatives, such as micro-credit schemes and alternative source of income that are compatible with biodiversity conservation.

The project will also benefit a third group of public servants and the staff of the civil society made essentially of the PA agents, the eco-guards, CERP technical agents, NGOs, and other baseline projects. These would be provided training, extension services, demonstration of techniques for the sustainable use of biological resources, income diversification, alternative income sources, and sharing in the benefits derived from conservation.

The fourth group of beneficiaries, the private sector will also benefit from the positive effects of the project, in particular from eco-tourism and the distribution of cultural and artistic products from the villages benefiting hotels keepers, restaurant owners and village groups engaged in marketing of such artefacts as woven materials, baskets, sculptures and dyed fabrics.

Finally by safeguarding the ecological processes and the contemplative value of landscape and biodiversity conservation is assumed to provide development options for the last and fifth group, the future generations. The project will also ensure that benefits are redistributed in the VLs by establishing social infrastructures such as boreholes, hillside reservoirs, anti-salinization dykes and other hydraulic installations, and by assuming the recurrent operating costs. This redistribution will ensure the durability of the activities undertaken in the VLs, providing benefits to a great number of people over the long term, thus integrating future generations. The benefits will improve social cohesion and economic, cultural, biological and physical conditions, at the village, VT, CNR, RC, regional, national and even international levels when there are global environmental benefits

### **3. Strategies for Community and Public Involvement During Project Implementation**

Strategic approaches to community and public participation during project implementation were identified, detailed, adopted, and validated by the stakeholders during the PDF-B consultation processes, and they are described below. First of all, for each of the RCs adjacent to PAs, a plan for biological resource management will be made on the basis of the existing watershed plans in order to improve the management of natural resources without conflict and duplication of efforts. This will entail the participation of the RC leadership, especially its president, and the rural councillors of the village when it encompasses a whole RC and its watershed. For those watersheds involving several RCs, concertation will be sought among villages, and an inter-RC management committee will be created. All RCs adjacent to PAs will be represented on a Local Natural Resource Management Council (LNRMC); one representative for each RC will be elected by the rural councillors to sit on the board governing the PA in their vicinities; members of the governing board will assume chairmanship on a rotational basis. Secondly, at each RC level, plans for the management of natural resources of the PAs and VTs will be elaborated in a participatory manner to ensure integrated development.

In each village, a Village Group for the Community-Based Conservation of Natural Resources and Environmental Protection will be created. Each village group will include at least one representative of the Rural Councillors and will form several committees, particularly a Management Committee, Bush Fires Control Committee and a Vigilance Committee to monitor infractions to the rules elaborated for the VT planning and management. In connection with these local organizations and institutions, project activities will include the following set of strategies for public involvement:

- a) The formulation of a SFIECE programme and its implementation in cooperation with agents of the CERPs and technical services involved in natural resource management. The purposes of the SPIECE programme are: (1) to provide to villagers needed explanations on the project objectives, expected outputs, activities and role for each category of stakeholders; (2) to raise awareness of stakeholders about financial and environmental benefits and their bearings on the project expected outputs; (3) to define the roles and responsibilities of each

category of stakeholders; (4) to define clearly the role of the concertation committees that would reinforce solidarity of the stakeholders to ensure synergy of their activities for the sustainable improvement of living conditions and to mitigate conflicts; (5) to seek consensus in decision making for the management and sustainable use of biological resources; (6) to implement community-based monitoring and evaluation of project activities and their adaptation to the evolving biophysical conditions as well as socio-economic values that would be integrating local knowledge and know-how; (7) to ensure transparency of the decision-making processes to obtain popular approval of project activities; (8) to adopt and disseminate successful pilot activities in areas not directly involved in the project.

- b) Prospective village trainers will be identified, to receive training in management, communication and dissemination of new techniques and technologies for the sustainable management of biological resources. Once trained, these village trainers will become members of the local NRM Councils and of the Village Groups for Community-Based NR Conservation; they will play a key role within the village committees according to their areas of competence;
- c) Each of these Village Groups will be represented on the Local NRM Council by one elected member to represent the interest of the villages in generating win-win solutions, while also promoting conservation concerns during RC meetings/deliberations;
- d) Regular meetings will be held for collective discussion on activities regarding the planning, development and management of natural resources both at RC and VT levels, in order to take into account everybody's concerns;
- e) Project implementation agreements will be negotiated and signed between the RCs and villagers' leadership and other villagers' organizations;
- f) A map depicting the limits of village lands will be established and for each VT, a land use plan as well as a plan for the management of natural resources will be elaborated with the rules and provisions for implementation of those plans through own financing form villagers' savings and credit schemes out of conservation oriented micro-projects;
- g) A map of the PAs will be established and their limits will be materialized on the ground; for every PAs, a Governing Council involving the adjacent RCs will be instituted, with RC representatives assuming chairmanship on a rotation basis;
- h) A Project Steering Committee will be established for each of the four project sites with one representative of each adjacent RC to PAs;
- i) Study tours will be organized for rural stakeholders to visit project sites in other VTs to promote exchanges of experience and expertise regarding sustainable use of biological resources;
- j) Community Nature Reserves will be delimited and their sustainable management will be instituted through promotion of eco-tourism and leasing of hunting areas under the control of eco-guards and tour guides recruited from the villages;
- k) All these actions will also involve both the staff of the public domain especially those of the NPs, the agents of the Water and Forestry Service and, at the grassroots community levels, the agents of the CERP multidisciplinary teams and locals NGOs. These agents will

establish the SFIECE programme and provide technical and methodological guidance to implement the activities; they will also participate in inter-group visits. This structural organization will contribute to ensure the success of post-project activities in view to sustain the entities involved at the grassroots levels;

- l) Under the project implementation agreements, the RCs will guarantee access to land to people living around the PAs in order to benefit from eco-development without opposing conservation of biodiversity;
- m) Both at RC and VT levels, monitoring and evaluation committees will be instituted to assess the nature of the products and benefits obtained from alternative income-generating activities linked to conservation, to identify the weaknesses to remedy them, and to identify existing potentials to promote them and disseminate lessons learned;
- n) In each VT, project disengagement will be effective after three years and the monitoring and evaluation committees will work in close collaboration with the project team to capitalize on lessons learned, in order to increase the chances of success of VT activities during the project maturity phase;
- o) At each RC level, annual discussions will be held on the results obtained from socio-economic development and sustainable conservation of natural resources to disseminate lessons learned;
- p) The VTs, where project disengagement has been successfully completed, will contribute advice and conduct information exchanges to other VTs where activities are underway so that they may benefit from their experience;
- q) Information garnered throughout the project will be recorded in socio-economic and biophysical databases to serve other projects, NGOs and village groups outside the 4 project sites to ensure dissemination of learned lessons; and
- r) The project will also report regularly on its achievements to ME and UNDP for consideration within the Country Cooperation Framework and programmes implemented with other development partners.

#### **4. Stages to Ensure Community Participation**

In order to ensure the durability of the expected outputs, the activities identified with the stakeholders during the formulation of the logical framework will necessitate: (1) legal backing of initiatives in connection with the sustainable management of biological resources; (2) strengthening stakeholders' capacities through the project's Environmental, Training, Information, Education and Communication programme together with planning, development and management activities; (3) integration of local knowledge and know-how during the project implementation, and evaluation and monitoring stages. For this purpose, the project will build respectively on the needs, capacities, knowledge of the grassroots actors in seven stages.

The seven stages of the process required to achieve the objectives of community-based biodiversity conservation will be as follows:

#### **PHASE ONE**

Stage 1: Preparation stage. It consists of all preliminary activities required for the implementation of a good project, including in particular:

- Selection of public entities and NGOs which need to be involved in animation, organization and training of the grassroots actors;
- Organization of the Rural Councils of the various concerned RCs at each site into Local NRM Councils;
- Organization of the populations of VTs adjacent to PAs in structured groups with specific committees;
- Identification and selection of rural trainers to be trained by the project;
- Elaboration of the SFIECE programme;

Stage 2: RC and VT recruitment stage. This stage will gradually involve the RCs and VTs adjacent to PAs and will include the following activities:

- Implementation of SFIECE programme to clarify the expected benefits and eligibility criteria of RCs, Villages and Groups to the savings and credit programmes for the implementation of alternative options designed to generating income from conservation.
- Elaboration and signature of implementation agreements with RCs;
- Elaboration and signature of protocols with VTs concerned, with counter-signature of the RC or RCs involved;
- Realization of VT and PA maps;
- Materialization of VT and PA limits;

Stage 3: Planning stage. It involves community activities to elaborate the plans for development and sound management of natural resources and their validation. This includes:

- Survey of traditional knowledge, local knowledge and know-how in the area of community-based conservation of natural resources;
- Elaboration of VT development plan including establishment of Community Nature Reserves;
- Elaboration of the VT and PA resource management plan;
- Elaboration of community rules for natural resource management;
- Evaluation of the VT and PA plans as formulated, through public discussions;
- Validation of each VT and PA development and management plans by the village(s) and RC(s) involved;
- Taking stock of VT and PA natural resources to establish the pre-project baseline;
- Elaboration of a community-base natural resource conservation programme including a participation plan specifying in detail the roles and responsibilities of the stakeholders;
- Establishment of a local entity in charge of the project involving RCs and VTs, with elaboration of the Local project organization chart;

## PHASE TWO

Stage 4 : Implementation of the community-based programme for the conservation of natural resources. This stage will include the following activities:

- Continued implementation of the SFIECE programme;
- Establishment of the savings and credit scheme with definition of eligibility criteria;
- Dissemination of eligibility criteria for micro-project credits to be entrusted to a local bank in order to avoid negative reactions on the part of the grassroots partners toward the project in case credit is denied;
- Instauration of the various decision-making, supervisory and control entities both at RC and VT levels;
- Participatory monitoring and evaluation and capitalization of lessons learned;

- Dissemination of lessons learned through inter-group visits, discussions and publications on acquired knowledge and monitoring of biodiversity;
- Equitable sharing in the profits derived from conservation activities; and
- Strengthening cooperation by fostering solidarity among stakeholders;

Stage 5: Leveraging stage. This will consist of actions to leverage the results obtained in order to ensure the continuation of conservation activities into the post-project stage. Activities of the fifth stage will include:

- Strengthening the role of Village Groups and Committees in local decision-making regarding the planning, development and sustainable management of natural resources;
- Convening periodic meetings between stakeholders, with RC involvement; and
- Strengthening the vigilance committees for sustainable natural resource management.

### **PHASE THREE**

Stage 6: Project disengagement stage. Activities included in this sixth stage are those required prior to project disengagement. They will vary according to the findings of the monitoring and evaluation and the capitalization of lessons learned.

Stage 7: Disengagement stage. This will mark the total pull-out of the project and termination of financial support and guidance activities. After project disengagement in given RCs and VTs, the allowed actions there will be those to extract lessons learned in order to enhance chances of success for the next VTs to benefit project support.

## ANNEX 12b. PARTICIPATORY MONITORING AND EVALUATION PLAN

The project will comply with both UNDP and GEF requirements for monitoring and evaluation. As a result of the emphasis placed on results-based management, it has become mandatory for all GEF projects to develop a detailed Monitoring & Evaluation workplan at the inception of the activities. The M&E component will cover **biodiversity, carbon sequestration and livelihood indicators**. This workplan will allow for a critical assessment of the project performance by showing the schedule of the activities, their cost and the expected outputs and achievements according to the established benchmarks and milestones. The workplan will be the main tool for monitoring and evaluating the progress of the project.

While distinct, Monitoring and Evaluation are yet “interactive and mutually supportive” activities.

### **Project M&E Activities, Timeframes, and Responsibilities<sup>2</sup>**

ACTIVITY	RESPONSIBILITIES	TIMEFRAMES
1. Drafting Project Planning Documents: Prodoc, Logframe (including indicators)	PCU, together with Government, UNDP/GEF staff, project development specialists and other stakeholders	During project design stage
2. Participatory M&E Plan	PCU, together with Government UNDP/GEF staff, project development specialists and other stakeholders	During project design stage
3. Inception Report	PCU and Field Team	At the beginning of project implementation
4. Work Plan	PCU and Field Team	Annually
5. Annual Programme/ Project Report (APR)	The Government, <b>UNDP Country Office</b> , Executing Agency, Project Team, UNDP/GEF Task Manager <sup>3</sup> , and Target Groups	Annually
6. Tripartite Review (TPR)	The Government, <b>UNDP Country Office</b> , Executing Agency, Project Team, UNDP/GEF Task Manager, and Target Groups	Annually
7. Tripartite Review Report	<b>UNDP Country Office</b>	Annually, immediately following TPR

<sup>2</sup> The unit in bold has the lead responsibility.

<sup>3</sup> *UNDP/GEF Task Managers* is a broad term that includes regional advisors, sub-regional coordinators, and GEF project specialist region or in HQ.

8. Project Implementation Review (PIR)	<b>UNDP Country Office</b> , UNDP/GEF headquarters, Project Team, GEF's M&E team, UNDP/GEF Task Manager	Annually, between June and September
9. End-of-phase, Final and Ex-post evaluations	Project team, <b>UNDP/GEF headquarters</b> , UNDP/GEF Task Manager, UNDP Country Office	At the end of each phase and end of project implementation; Ex-post, about two years after project completion
10. Terminal Report	<b>UNDP Country Office</b> , UNDP/GEF Task Manager, PCU	At least one month before the end of the project
11. Audit	<b>Executing Agency</b> , UNDP Country Office, PCU	At least once in the life of the project (see section on audit)

### A. Annual Programme/Project Report (APR)

#### *Purpose*

The Annual Programme/Project Report (APR) replaces the Project Performance Evaluation Report (PPER) in 1997. The APR is designed to obtain the independent views of the main stakeholders of a project on its relevance, performance and the likelihood of its success. The terms *relevance*, *performance* and *success* will be used in project according to UNDP definitions. The main stakeholders are the target groups, project management, the key government agency responsible for the project, and UNDP.

The APR aims to:

- provide a rating and textual assessment of the progress of a project in achieving its objectives;
- present stakeholders' insights into issues affecting the implementation of a project and their proposals for addressing those issues; and
- serve as a source of inputs to the Tripartite Review (TPR) and to the preparation of country office reports as well as the annual and triennial reviews of the country cooperation framework.

The main project stakeholders participate in the preparation of the APR. The APR must be ready and circulated to UNDP/GEF for review /comment, two weeks prior to the TPR.

### B. Tripartite Review (TPR)

#### *Purpose*

The Tripartite Review (TPR) is the highest policy-level meeting of the parties directly involved in the implementation of a project. The participants include: the Government, UNDP, project management, the direct beneficiaries and other stakeholders. They consider the progress of a project based on the Annual Programme/Project Report (APR). Tripartite review meetings are carried out once a year while a *terminal* tripartite review is held in the last month of project operations.

The terminal tripartite review considers the implementation of the project as a whole, paying particular attention to whether the project has produced the outputs foreseen, and decides whether any actions are still necessary in order for the immediate and development objectives to be achieved.

The UNDP Resident Representative prepares the tripartite review report (TRR) and circulates it to the participants within two weeks of the TPR. The TRR must provide a succinct discussion of issues and problems, decisions made, and the work plan for the following year, or in the case of a terminal TRR, any follow-up to the project. See Tripartite Review Report Form. The executing agency ensures that the parties concerned implement decisions made at the TPR.

### **C. Project Implementation Review (PIR)**

#### *Purpose*

A major tool for monitoring the GEF portfolio and extracting lessons learned is the annual GEF Project Implementation Review (PIR). The PIR has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons learned from ongoing projects.

Mandated by the GEF Secretariat to all Implementing Agencies, the PIR is a key element within GEF's Monitoring Strategy and is a primary source of information about the performance of GEF projects. The data and information gathered through the PIR are the basis for analyzing the portfolio and reporting to the GEF Council. Through the PIR, the GEF stakeholders and donors get a comprehensive picture of the GEF portfolio. PIR findings are also used to launch more specific studies or in-depth reviews.

Due to the special setting of the Global Environment Facility as a trust fund with three different implementing agencies (UNDP, UNEP and the World Bank), the annual PIR monitoring exercise will be undertaken in addition to other regular UNDP M&E requirements like the Annual Programme/Project Report (APR), Tripartite Review Meetings (TPRs) and mid-term and final evaluations.

### **D. End-of-phase, Final and Ex-post Evaluations**

Three kinds of evaluations will be conducted in the project: end-of-phase, final, and ex-post. The project team, and country office are responsible for organizing the evaluations, while independent specialists carry them out. The **end-of-phase evaluations** will place according to the table below. These evaluations will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; present lessons learned about project design, implementation and management; and evaluate whether the project has achieved the stated benchmarks (Table 12b) upon which the next phase of GEF funds will be disbursed.

The **final evaluation**, which occurs at the end of project implementation, will focus on the same issues as the end-of-phase evaluations but also will look at early signs of potential impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. It should also provide recommendations for follow-up activities.

Finally, an **ex-post evaluation** will take place two or more years after the completion of the project. This type of evaluation is preferred for clusters of projects in a particular sector or

geographical location or that concentrate on a specific theme in order to generate generic lessons and identify relevant policy issues. The ex-post evaluation focuses on sustainability of project results and lessons learned (best and worst practices, intended and unintended costs and benefits, applicability of lessons at sectoral and thematic levels, and across geographical boundaries) as the basis for policy formulation and future programming.

## E. Terminal Report

### *Definition and Purpose*

The terminal report is an overall assessment of a project by its stakeholders that will be prepared by the PCU towards the completion of a project. The APR for the final year serves as the terminal report. In addition to having the same purposes as the APR, the terminal report also aims to serve as a source of initial lessons from experience and to recommend follow-up activity when necessary.

**Table 12b. Phasing plan, evaluation process, and benchmarks.**

Phase	Duration and Period	Evaluation Mission	Period	Indicators	Estimated cost (\$)
Phase 1	3 YEARS  Y1-Y3	<ul style="list-style-type: none"> <li>- MJEHP</li> <li>- DEFCCS ;</li> <li>- DPN ;</li> <li>- DEEC ;</li> <li>- DA ;</li> <li>- DIREL ;</li> <li>- DCL;</li> <li>- PCR</li> <li>- Village leads;</li> <li>-Rural Producers;</li> <li>-Ecotourism;</li> <li>- MEF ;</li> <li>- UNDP</li> <li>- UNDP-GEF;</li> </ul>	4 <sup>th</sup> Quarter of Year 3	All 13 technical consultation studies are done and their results are being implemented;	70,000
				- A sensitizing, training, and extension service programme is developed and being implemented within a concerned actors training plan;	
				- 16 Ecoguardes are identified, trained, and operational in 40 VT, 8 CNR, and 4 PA;	
				- Legal texts encourage local communities and individual initiatives for sustainable use of natural resources;	
				- 8 CNR involving a set of 40 villages are legally created, their limits are marked and they are fit with a local management plan;	
				- 4 PA have their limits marked and are fit with a participatory management plan;	
				- Development and implementation of biological resources Data Bank;	
				- Concerned actors with capacities building in sustainable use of natural resources;	
				- Biofriendly and sustainable natural resources use techniques and technologies are identified and are being implemented in micro-credits set of activities;	
				- Pastoral Unites are legally affected to herders so as to give them incentive to invest and sustainably manage pasture lands;	

Phase	Duration and Period	Evaluation Mission	Period	Indicators	Estimated cost (\$)
				Development and implementation of monitoring of carbon sequestration - Recommendations for next phase are developed;	
Phase 2	4 YEARS  Y4-Y7	- MJEHP - DEFCCS ; - DPN ; - DEEC ; - DA ; - DIREL ; - DCL; - PCR - Village leads; -Rural Producers -Ecotourism ; - MEF ; - UNDP - UNDP-GEF ;	Third trimester 2007	- Follow up of phase 1 recommendations implementation. New changes on legal and political texts for population encouragements for sustainable use of NRM are known by all concerned actors; - 20 CNR and their 100 adjacent VT are legally constituted, their limits are materialized are they are fitted with participatory management plans being implemented; - Micro-projects are using sustainable techniques for a sustainable use of natural resources; - Ecoguards ensure population training along with technical advises to rural producers and in CNR implementation plans from where they are getting paid from the yields of these CNR management; - 4 AP are fitted with local participatory management plans adopted and being implemented; - Improved rural populations life conditions; - improvement in biodiversity and carbon sequestration status in the Pas and NRC - Project's lessons of experience along with other projects and NGO are capitalized for a satisfactory project disengagement preparation e - Next phase recommendations for success of after project phase.	50,000
Phase 3	3 YEARS	- MJEHP - DEFCCS ; - DPN ; - DEEC ; - DA ; - DIREL ; - DCL; - PCR - Village leads;	Fourth trimester 2007	- Monitoring and evaluation of recommendation of phase 2 for project sustainability ; - 20 RNC involving a total of 100 villages have their local management plans adopted and being implemented - 25 Ecoguards are getting paid by micro-project project activities in CNR and in VT;	50,000

Phase	Duration and Period	Evaluation Mission	Period	Indicators	Estimated cost (\$)
	Y7-Y10	-Rural Producers -Ecotourism; - MEF ; - UNDP - UNDP-GEF		- 10 AP local management plans are being implemented and 9 new PA have their local management plans being implemented with cofinancing projects. improvement in biodiversity and carbon sequestration status in the Pas and NRC - Effective sustainability of TV and CNR activities.	

## ANNEX 13a: IMPLEMENTATION ARRANGEMENTS AND ORGANIGRAMS

The project will be executed under the National Execution modality by the Ministry of Environment (ME) with the assistance of UNDP. Ministry of Economy and Finance (MEF) will provide financial supervision and will open a bank account for the project. GoS will undertake to transfer a total of US\$1.050 million in budgetary allocations to this bank account, in three equal installments to coincide with the beginning of each project phase.

The project will be implemented by a streamlined Project Coordination Unit (PCU) based in Dakar and placed under the direct technical oversight of the Ministry of Environment (DPN), and under the supervision of UNDP-GEF, UNDP-Senegal, and the MEF. The PCU will be responsible for the design, planning, monitoring, evaluation and adaptation of the project to the new visions of the stakeholders and for the timely production of the expected outputs. Four streamlined Field Units will also be established in each project zone. The Field Units will work directly through PA, CERP and other Ministry agencies, as well as local NGOs.

Under DPN supervision, the NP Curators concerned, together with the Regional Inspectors of Water and Forestry Agriculture, Livestock and Fisheries together with their staff will be the linchpins for project implementation on the ground in their areas of competence. PA agents will focus on the NPs and surrounding areas including the CNRs. The Water and Forestry agents will focus on the Classified Forests and CNRs in synergy with the NP agents and the Livestock Service agents. Finally, the agents in charge of agriculture and fisheries, with support of the Livestock and Water and Forestry Services, will

focus their activities on the VTs to ensure the environmentally sound intensification of the production systems. At VT level the CERP and NGO team will ensure the implementation of the project, acting in connection with the parks' curators, and the eco-guards. In this regard, a series of capacity-building activities will be conducted in particular for the benefit of DPN and DEFFCS so that by project completion, the capacities required to ensure appropriate sustainability of the activities will be in place.

The Project Steering Committee (PSC) is formed by CONSERE which is an entity in charge of coordinating government actions as regards the management of the interfaces between development and environmental protection. CONSERE is presided over by the Prime Minister and its Secretariat is provided by the Ministry of Environment. This body also includes the Ministry of the Interior overseeing NGOs and CERPs in order to ensure consistency and integration of grass root actions. UNDP/GEF and/or UNDP-Senegal will also be part of the Project Steering Committee.

A Scientific and Technical Committee will be established to include prominent members of the academic and research establishment in Senegal. The role of this Committee will be to evaluate project impact and provide guidance on technical specifications, in particular bringing to the attention of the project staff pertinent innovations that could be tested or replicated in the project site during its 10 years.

Annex 13b and 13c provides a matrix of roles and responsibilities for each of the project partners, entities, and staff; as well as Terms of References. Annex 13d provides Terms of References for studies to be undertaken immediately upon project start-up. Other TORs will be developed by the PCU and approved by the Steering Committee as needed.

### **Cooperation and Co-financing arrangements**

GoS has agreed to commit US\$ 1.050 million from its national budget for the project. Other co-financing is considered in-kind and will entail : staff salaries, premises, equipment, etc. Given the participatory nature of the project, it is expected that local communities will also contribute in-kind resources (labour, minor equipment, land), but these have not been quantified. UNDP has committed US\$ 1.650 from the core resources of its 2002-2004 CCF to the project. Assuming that the project will show successful results during its first phase, it is likely that such cash co-financing will continue in the next two CCF cycles. UNDP co-financing is expected to gradually diminish towards the third phase so as to ensure an orderly phase-out.

Cooperation and synergies will be built with the GEF/WB project for Coastal Zone Management currently under preparation. These modalities will include for example : coordination through CONSERE at the national level; joint project meetings in Niaye and Saloum at regular intervals; and common choice of local implementing agencies, such as IUCN in Saloum.

In addition, the co-financing arrangements with six projects have already been negotiated. These projects are the AGIR (Transboundary project for Niokolo-Koba National Park and Badiar National Park in Guinea); the Coastal Zone Afforestation Project for Niaye (JICA), the PAEP in Niayes (CIDA); the PADMIR in Niayes (UNCDF); the PRODAM for the Ferlo (IFAD); and the Dutch/IUCN project support to PNDS.

The AGIR project will start March 2001 and run for four years. Based on an agreement reached with the AGIR project in February 2001, that project will use its co-financing for zoning of the PNNK, construction of a ferry, rehabilitation of dirt roads, and construction of eco-tourism camps. It will also support the Dalaba Training Center (equipment, training of trainers); and conduct awareness raising actions in surrounding villages.

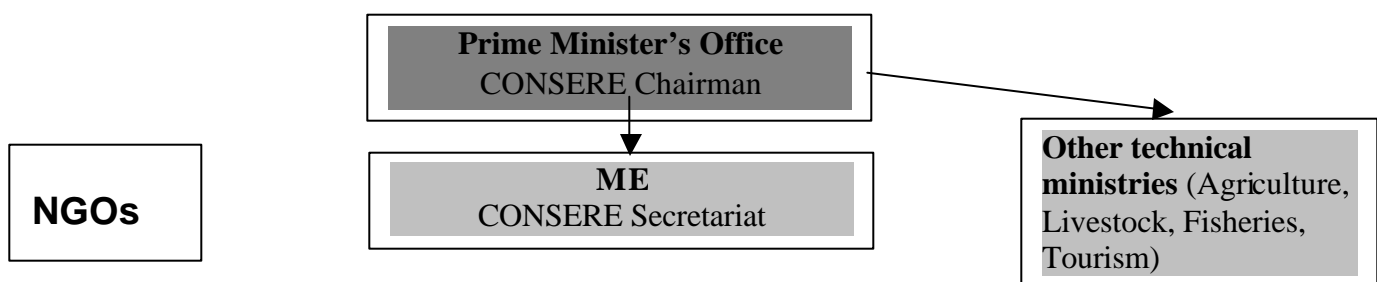
Based on agreement reached with the Niayes Coastal Afforestation Project, the co-financing from this project will bear the cost of large-scale sand dune fixation in the coastal region of Thies and Louga (through a subcontract with the private sector). The GEF project will bear the cost of community based windbreaks around inter-dunal vegetable gardens, which will help to extend the impact of the large scale afforestation closer to the communities. The JICA project will start in 2001 and will run for 10 years, for a total cost of US\$13.192 million. It is expected to result in 2037 hectares of fixed sand dunes or 101.850 km wide by 200 m strip of tree plantations. Only one fourth of this plantation is expected to directly cover the GEF project site, therefore co-financing is estimated at US\$3.298 million.

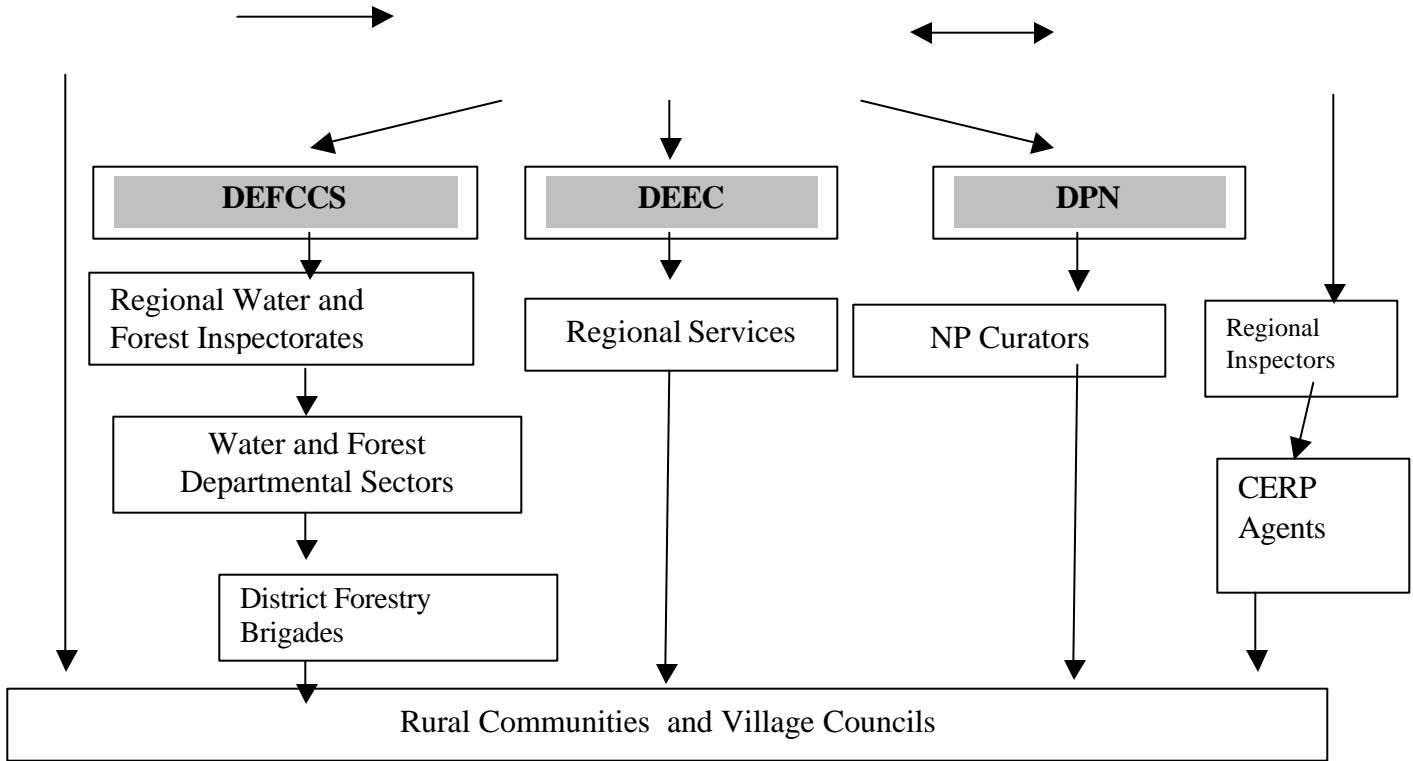
In the PNDS, the Netherlands funded project (through IUCN) will start in 2002 and run until 2004, for a total of US\$ 2 million. Negotiations have been held to re-align this support so as to constitute co-financing for the UNDP-GEF project. The IUCN/Dutch project will cover activities related to some of Component 2 and Component 3, and all Component 4 activities only in the Saloum Delta. The two projects will arrange yearly coordination meetings between the project field units, and further coordination will be ensured at the national level through CONSERE and the Project Steering Committees. Wherever possible, joint monitoring and evaluation activities will be conducted.

The FFEM and FAC are financing a project for support to PNNK for \$608,000. The project started in 1997 and will terminate soon. It has helped PNNK in some preliminary infrastructure development (e.g. sign posts, gate, etc.) ; initiated discussion on co-management planning with PNNK staff; and conducted preventive awareness campaigns in a few selected villages in the northern and western borders of the Park where threats to biodiversity are not very strong. By the time the GEF project comes on line, it is expected that the FFEM project will have been completed. However, if the FFEM project is re-financed for a second phase, then cooperative arrangements will be established in order to avoid duplication and build synergies.

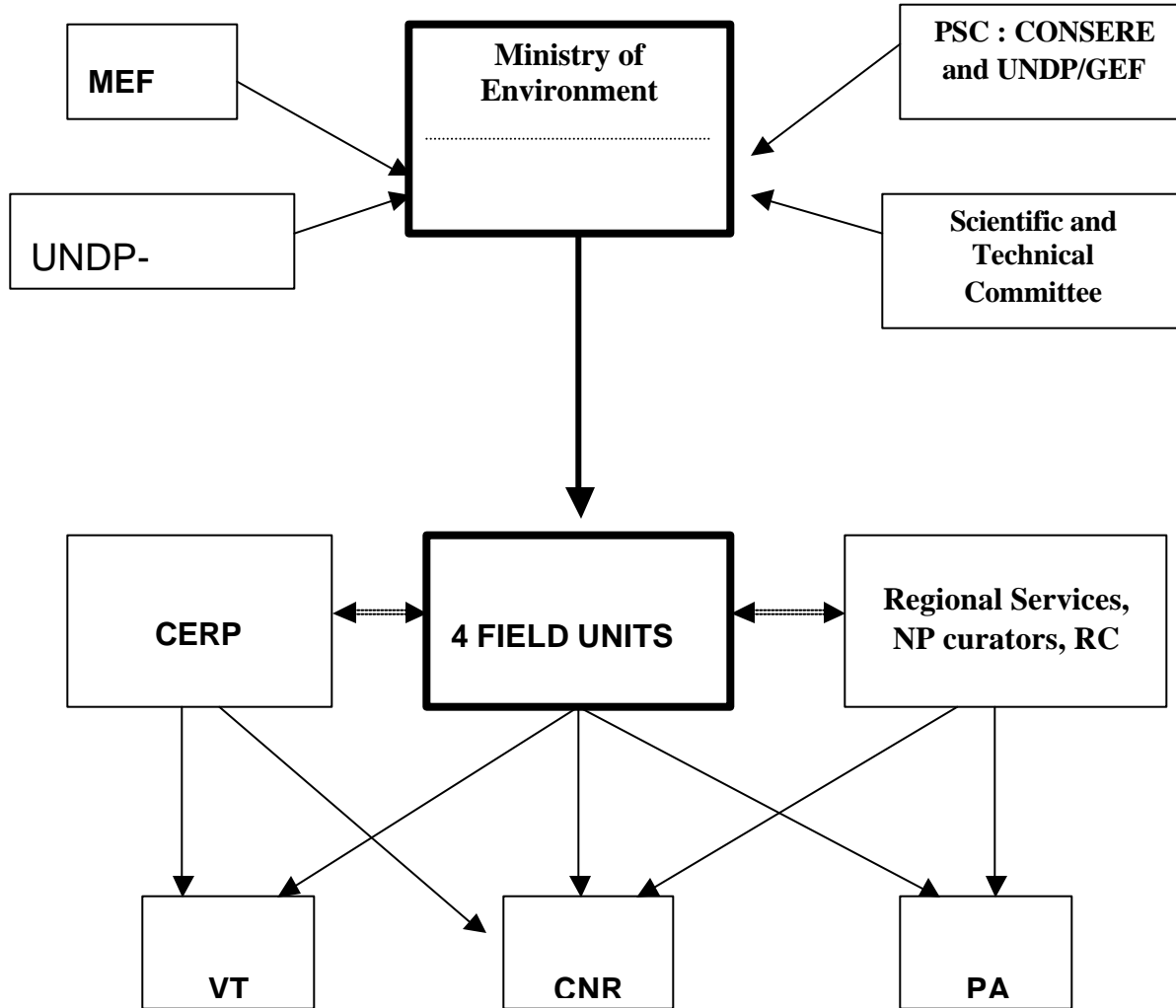
The project will be closely coordinated with the 10 projects listed as Associated Projects, by having yearly coordination meetings, and in closely designing interventions so as not to duplicate efforts.

### Environmental Management Institutions in Senegal





## Project Organizational Chart and Implementation



## ANNEX 13b : INSTITUTIONAL FRAMEWORK AND RESPONSIBILITIES FOR PROJECT IMPLEMENTATION

Composition, roles and responsibilities of actors of the Institutional Framework for Implementation of the Integrated Management Project for Ecosystems in Protected Areas in Senegal

Actors	Composition	Roles and responsibilities	Observations
1. MJEH	Cabinet Office of the Minister	<ul style="list-style-type: none"> <li>• Project technical and administrative monitoring;</li> <li>• Follow-up and supervision of project implementation;</li> <li>• Ensures that project objectives are achieved.</li> </ul>	
2. MEF	<ul style="list-style-type: none"> <li>• DCEF</li> <li>• DDI</li> <li>• DP</li> </ul>	<ul style="list-style-type: none"> <li>• Expenditure authorization at the national level;</li> <li>• mid-term and final evaluation of project activities;</li> <li>• Commission financial audits;</li> <li>• Participate in expenditure control.</li> </ul>	
3. UNDP/GEF Other Development Partners	UNDP UNDP/GEF Other Development Partners	<ul style="list-style-type: none"> <li>• Mobilize financial resources;</li> <li>• Participate in audits and evaluations;</li> <li>• Ensure that project implementation is in accordance with procedures in force in various systems (United Nations, European Union);</li> <li>• Overall technical follow-up of the project.</li> </ul>	
4. CP	MJEH, MAEUASE, MEF, MEF, MCTL, MMEH, MINT, CONSERE ; MAE, PNUD	<ul style="list-style-type: none"> <li>• Approve the financial and technical programme (PETF);</li> <li>• Approve annual budget. Overall project supervision;</li> <li>• Overall programme directions;</li> </ul>	<ul style="list-style-type: none"> <li>• The CP meets twice a year for ordinary sessions, and for extraordinary sessions whenever needed and convened by its President (MJEH);</li> <li>• The Secretariat is serviced by PCU;</li> </ul>

Actors	Composition	Roles and responsibilities	Observations
		<ul style="list-style-type: none"> <li>• Annual evaluation of project activities</li> </ul>	<ul style="list-style-type: none"> <li>• The Steering Committee gives an opinion on the renewal of the coordinator's mandate;</li> <li>• Members of the Steering Committee are ministry representatives.</li> </ul>
5. PCU	<ul style="list-style-type: none"> <li>- 1 Coordinator</li> <li>- 1 Administrative and Financial Assistant</li> <li>- 1 Assistant Socio-Economist</li> <li>- 1 Follow-up and Evaluation Assistant (database management)</li> <li>- 1 Secretary</li> <li>- 2 Drivers</li> <li>- 2 Service Staff (Maintenance and Reprography)</li> <li>- 2 Security boards</li> </ul>	<ul style="list-style-type: none"> <li>• Design, Planning and technical, administrative and financial implementation of the project;</li> <li>• Acquisition of equipment and supplies and recruitment of staff, including field staff;</li> <li>• Supervision, monitoring, follow-up and internal evaluation and financial documents;</li> <li>• Coordination of all project activities</li> </ul>	<ul style="list-style-type: none"> <li>• Mobilization of human and material resources</li> <li>• Preparation of documents in due time for the mobilization of financial resources;</li> <li>• Delivery of expected products (progress and annual reports)</li> </ul>

<p>6. CST</p>	<p>All the National Technical Departments involved in natural resource management and environmental affairs (DPN, DEFCCS, DEEC, DOPM, DA, DIREL, DPCA, DSER, DIPT); Africa 2000 Network; Research and training institutions and any other individual or structure PCU may call on, depending on needs.</p>	<ul style="list-style-type: none"> <li>• Participation in strategic planning and design of the various project activities;</li> <li>• Provision of human and material resources needed for implementation.</li> <li>• Participation in follow-up and evaluation of project activities</li> <li>• CSTs are jointly accountable as to the delivery of products;</li> <li>• CST members are jointly accountable concerning product delivery;</li> </ul> <p>CST gives opinions on technical and scientific aspects of the project at the request of PCU.</p>	<ul style="list-style-type: none"> <li>• The CST president is appointed ad hoc, according to issues to be addressed;</li> <li>• The SCT Secretariat is serviced by PCU;</li> </ul> <p>National technical Department (DPN, DEECCS, DEEC, DOPM, DA, DIREL, DPCA, DSER, DIPT)</p> <ul style="list-style-type: none"> <li>• The other National Departments will be consulted when needed;</li> <li>• Expenses for participation of CST members (when applicable) and CP members in workshops will be refunded in accordance with appropriate rates;</li> </ul> <p>Memorandums of agreement with PCU will be signed to this end.</p>
<p>7. DTN</p>	<p>DPN, DEFCCS, DEEC, DOPM, DA, DIREL, DPCA, DSER, DIPT</p>	<ul style="list-style-type: none"> <li>• Participation in strategic planning and design of the various project activities;</li> <li>• Provision of human and material resources needed for implementation.</li> <li>• Participation in follow-up and evaluation of project activities</li> <li>• CSTs are jointly accountable as to the delivery of products;</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• The DTNs will be closely associated to all stages of project implementation;</li> <li>• Other DTNs will be associated depending on needs;</li> <li>• To this end, memorandums of agreement will be developed and signed with PCU</li> </ul>
<p>8. PLU</p>	<p>- 1 Project Field Assistant - 1 Driver for each site</p>	<ul style="list-style-type: none"> <li>• Organization of a pluridisciplinary team responsible for on-site implementation of the programme and made up of various partners at the regional level (water resources and forests, agriculture,</li> </ul>	<ul style="list-style-type: none"> <li>• Under the supervision of PCU;</li> <li>• ULP reports directly to PCU</li> </ul>

		<p>livestock resources, grassroots development;</p> <ul style="list-style-type: none"> <li>• Participation in follow-up, monitoring and evaluation of project activities;</li> <li>• Preparation of quarterly status reports;</li> <li>• Establishment/organization of concertation frameworks at the regional and local levels;</li> <li>• Participation in operational planning of project activities</li> </ul>	
9. SR	IREF, CPN, DRDR, IRP, SRT, SRDB, DREEC, IREL	<ul style="list-style-type: none"> <li>• Implementation of project activities;</li> <li>• Participation in operational planning;</li> <li>• Participation in project follow-up and evaluation;</li> <li>• Mobilization of human, material and financial resources and participation in the implementation of the annual workplan</li> </ul>	•
10. CL	Rural Councils Rural Communities City Councils	<ul style="list-style-type: none"> <li>• Facilitation of project implementation;</li> <li>• Approval of activities planned, within the limits of their competence;</li> <li>• Participation in the implementation of project activities;</li> <li>• Participation in the mobilization of human, material and financial resources</li> </ul>	
11. Projects and NGOs	Projects and NGOS active in projects areas.	<ul style="list-style-type: none"> <li>• Support to activities jointly identified</li> </ul>	<ul style="list-style-type: none"> <li>• Formalization of partnership, joint indirect financing, harmonization and synergy in actions</li> </ul>
12. Local Management Bodies	Village Committees on natural resource management; Vocational associations.	<ul style="list-style-type: none"> <li>• Active participation in programming, implementation, follow-up and evaluation of project activities</li> </ul>	
13.	GIEs, Private structures,	<ul style="list-style-type: none"> <li>• Active participation in the implementation</li> </ul>	

Populations	Individuals ; GPF, village and Community organizations; Youth production groups.	of project activities	
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## ANNEX 13c. Terms of references for Project Staff

### ***TERMS OF REFERENCE OF PCU***

#### **1) COMPOSITION OF PCU**

PCU comprises the following staff members:

- 1 Project Coordinator;
- 1 Administrative and Financial Assistants;
- 1 Socio-Economist;
- 1 Monitoring and Evaluation Officer;
- 1 Secretary;
- 2 Drivers;
- 2 Servicing staff for maintenance and reprography

#### **2) MISSIONS AND TASKS:**

- Ensure the design, planning, technical and financial implementation of the project;
- Implement decisions made by the Steering Committee;
- Supervise, monitor and follow-up programme implementation;
- Draft technical and financial documents;
- Coordinate all project activities;
- Organize partnership and capitalize on the expertise available in national technical Departments, projects, NGOs and the Scientific and Technical Committee.

#### **3) OPERATING PROCEDURES:**

- Staff recruited as regular members and based in Dakar;
- Field missions on a regular basis, according to programme formulation and follow-up of activities;
- Initiatives for mobilizing human resources need and foster partnership.

## ***TERMS OF REFERENCE OF PROJECT TEAM MEMBERS***

### **1. PROJECT COORDINATOR:**

#### **Functions :**

The incumbent will be responsible for:

- managing, implementing and coordinating all project activities;
- designing, planning, following up and evaluating the programme in collaboration with the Socio-Economist and field assistants, along with other partners;
- Fostering partnership;
- Integrating, coordinating and leading teams members;
- Achieving project objectives.

#### **Qualifications:**

- Hold a Master's Degree or Ph.D. in Natural Resource Management;
- A minimum of 15 years of experience in Natural in the design and planning of development projects and programmes;
- Sound knowledge of UNDP and FEM procedures for an efficient management of extra charges and baseline costs;
- Experience in the design and implementation of biodiversity preservation projects;
- Communication skills;
- Physically fit to work under pressure;
- Sound computer skills and fluency in French and English.

### **2. ADMINISTRATIVE AND FINANCIAL ASSISTANT:**

#### **Functions :**

Under the supervision of the Coordinator, the Administrative and Financial Assistant is responsible for:

- performing administrative, book-keeping and financial tasks in accordance with national implementation procedures;
- preparing tax and social statement;
- managing human resources, contractors and fixed assets, in accordance with the Senegalese legislation;

- providing expenditure documents;
- taking action so that the project account is credited in due time;
- providing quarterly and annual financial statements;
- managing fixed assets and material and logistic resources
- providing in due time monthly financial reports;
- participating in project internal audits.

**Qualifications:**

- Advanced degree in accountancy (DECS);
- A minimum of 5 years of experience in the administrative and financial management of development projects;
- Sound knowledge of UNDP's accounting procedures and national implementation procedure and national accounting;
- Sound knowledge of procurement procedures, in accordance with the Senegalese legislation;
- Computer skills and perfect command of French and English.

**3. MONITORING AND EVALUATION OFFICER :**

**Functions :**

Under the supervision of the Coordinator, the Follow-up and Evaluation Assistant, will:

- establish a database connected to the sites through a network;
- develop/identify software and hardware for collection and analysis of biophysical and socioeconomic data needed for the follow-up of project performance in terms of the change in conditions of living of actors at the grassroots level as well in biodiversity and greenhouse gas sequestration in each of the sites;
- submit quarterly integrated progress reports highlighting project-achievements and weaknesses;
- follow-up, update data and maintain, the database;
- draft a management chart or PCU concerning critical parameters to be monitored on a regular basis for the smooth conduct of the project;
- make recommendations for better on-site performance, in light of the socioeconomic data collected;
- strengthen technical capacities in database management and follow-up/evaluation.

**Qualifications:**

- A university degree or equivalent in computerized data management and analysis;

- Sound knowledge of geographic information systems;

#### **4. FIELD ASSISTANTS (NATIONAL EXPERTS):**

##### **Functions :**

Under the supervision of the Coordinator, the field assistant will:

- coordinate the work of the multidisciplinary team responsible for programme implementation and bringing together various partners at the regional level;
- participate in implementation, follow-up, supervision and evaluation;
- participate in the operational planning of project activities;
- establish/organize a concertation framework at the regional and local levels;
- coordinate, integrate and sets the direction of all on-site activities;
- submit reports to the Coordinator.

##### **Qualifications:**

- A university degree or equivalent in natural resource management relevant to wildlife management for the Niokolo-Koba site, to pastoralism for the Ferlo site, to agro-forestry/soil conservation for the Niayes, and to forestry and forest management for the Saloum Delta site;
- A minimum of 15 years of practical experience in the field considered;
- A strong background in rural development activities and participatory methods;
- Communication skills;
- Be physically fit to serve under difficult circumstances;
- Agree to live in rural areas and to work with grassroots actors.

#### **5. SPECIALIST IN PARTICIPATORY APPROACHES/ SOCIO-ECONOMIST**

Under the supervision of the Coordinator, the specialist on participatory approaches/socio-economist, will :

- Animate the pluridisciplinary project team and project partners at local , regional and national levels in participatory approaches
- Concretize the agreements reached with project partners on their contribution to the project's LFA
- Participate in the elaboration, implementation of agreements reached with local communities and local governments, for natural resource management and micro-credit

- Assist with the identification of institutions and persons to be involved in implementation of the project activities
- Organize and facilitate self-evaluation sessions with local population
- Propose and carry out the best methods for participatory approaches for the project's various activities
- Assist in developing and implementing the capacity building elements of the project
- Amalgamate and extract lessons learnt from other experiences in participatory approaches
- Plan and supervise socio-economic surveys of the local situation
- Establish and animate local project agents for participatory approaches
- Assist in all project planning and reporting exercises
- Report to the Coordinator as and when required.

### **Qualifications:**

- University diploma or equivalent in Social Sciences and/or economics, with a technical degree in Technical Communication,
- Specialisation in participatory techniques, and knowledge of the rural sociology of the project sites
- At least 10 years of professional experience
- Have practical experience in rural animation, rural participatory approaches
- Have good communication skills and speak at least two of the local languages in the project zone
- Physically able to handle field situations
- Able to accept to live among local communities in project site

## **6. SPECIALIST ON MICRO-CREDIT**

Under the supervision of the Coordinator, the Specialist on micro-credit will:

- Execute the administrative, contractual and financial tasks related to the establishment of the private and collective micro-credit contracts for demonstration activities in natural resource management and participatory sustainable management of biodiversity,
- Explore and establish the necessary savings and loan scheme appropriate to the local situation as co-financing to the micro-credit schemes, for long term financial sustainability
- Establish with local communities the local system of micro-credit
- Build capacity for micro-credit establishment at the local level, including self-evaluation of the programme
- Include gender sensitivity in all activities, in order to ensure women's participation and equitable sharing of benefits
- Prepare trimestrial and annual financial reports on the micro-credit system
- Participate in the internal audit of the project and micro-credit programme

**Qualifications:**

- Minimum Superior Diploma in Accounting
- At least 5 years of experience in the management of micro-credit and savings and loan projects
- Familiar with UNDP and Government administrative procedures, and NEX arrangements
- Knowledge of Senegal laws on management of contracts
- Excellent knowledge of information technology
- Knowledge of both French and English

**7. SECRETARY :**

**Functions :**

Under the supervision of the Coordinator, the Secretary will:

- perform usual secretariat tasks: telephone switchboard, incoming and outgoing mail, typewriting, document set-up, photocopy, preparation for various documents (letters, reports, etc), management of schedules and appointments, filing and equipment records;
- manage the project library.

**Qualifications**

- Diploma in secretarial services (BTS);
- Experience in shorthand writing;
- A minimum experience of 5 years as principal secretary;
- Solid command of computer applications and of French and English keyboards.

**8. DRIVER :**

**Functions :**

Under the supervision of the Coordinator, the Driver will:

- be responsible for staff professional journeys;
- maintain vehicles and keep a record of vehicle use;
- perform, when needed, tasks usually entrusted to messengers of office assistants.

### **Qualifications**

- Qualified driver/mechanic;
- Driving license for private road as well as heavy-duty vehicles of more than 5 years;
- Experience in driving for field missions;
- Fluency in French.

## **9. SECURITY GUARD :**

### **Functions :**

- **Care taking** of office equipment and supplies;
- Care taking of equipment in the project compound;
- Watching of entrance to offices out of working hours.

### **Qualifications**

- Experience in office care taking;
- Member of a registered security company;
- Fluency in French.

## **10. POSTAL MESSENGER**

### **Functions :**

Under the supervision of the Coordinator, the Postal Messenger is responsible for:

- messenger services;
- delivery of project outgoing mail and parcels;
- document photocopy at the request of project staff;
- maintenance of photocopier.

## **Qualifications**

- Experience in messenger services;
- Fluency in French.

## **EXTERNAL BACKSTOPPING**

*After the first stage of the project, during which institutional constraints should be overcome, involvement of a United Nations volunteer on each of the 4 sites will be considered for the second stage, which is in fact a stage of demonstrations. The volunteers will collaborate with the field assistant. During this operational stage, U.S. Peace Corps volunteers will be sought in order to assist CERP agents.*

The project will also engage national and international consultants as and when required. The expected number and expertise is provided in the Input budget. The terms of references for these consultants will be developed by the PCU.

## ANNEX 13d : TERMS OF REFERENCE OF STUDIES TO BE CARRIED OUT

### **STUDY 1 : LIFTING INSTITUTIONAL BARRIERS MANAGEMENT OF PROTECTED AREAS**

#### 1. BACKGROUND AND JUSTIFICATION

The Global Environmental Facility (GEF) and UNDP have provided support to the Senegalese Government, in particular the Ministry of Youth, Environmental Affairs and Sanitation (MJEHP) in the formulation of an Integrated Ecosystems Management Project (IEMP) on four characteristic sites. These sites are examples of the three major types of the country's ecosystems : forest, sylvo-pastoral and coastal ecosystems.

These sites are : the Ferlo Wildlife Reserve in the northern part of Central Senegal, the Niokolo-Koba National Reserve in the South-East, the Niayes coastal ecosystems along the northern coast , and National Reserves of Basse Casamance and Saloum Delta along the southern coast.

The programme also assisted stakeholders in the identification of major constraints to sustainable development and biodiversity preservation.

To overcome these problems, GEF adopted for each of the sites an integrated strategic planning approach to the development and management of village estates, the establishment and sustainable management of community natural parks (CNRs) serving as buffer and joint management areas of PAs which are biodiversity sanctuaries. The purpose is to lift legal, political, technical and methodological barriers to the sustainable management of biological resources at each of the three levels of intervention. In village estates, production systems will be intensified and food and energy self-sufficiency promoted with a view to poverty reduction. In CNRs, alternative methods for the diversification of sources of income and the development of biological resources will be adopted, based on compromise and cooperation with stake-holders. In protected areas, a joint management system will be set up, with a fair mechanism for sharing the benefits of conservation. These demonstration activities will then be replicated by all stakeholders.

To achieve the objectives set, IEMP will have to undertake consultations on major issues relating to the sustainable development of biological resources and the promotion of community activities for participatory biodiversity preservation, capitalizing on previous studies. In this context, it is planned to carry out a study on "Lifting Institutional Barriers to the Sustainable Development of Natural Resources".

## 2. OBJECTIVES OF THE STUDY

The study will allow identification of legal constraints, make recommendations for action and corrective measures likely to contribute to the adoption of rules and regulations based on a participatory approach to the joint management of protected areas. The study will make recommendations for the revision of the tax system (set quotas and taxes on gross product and not final product), and the selection of the most energy-yielding species to avoid waste.

## 3. METHODOLOGY

Taking into account the central role to be played by participation of communities as well as individuals in the project strategy, involvement of stakeholders in implementation is a prerequisite to both efficiency and appropriation of achievements by the various categories of stakeholders.

## 4. MISSION\_:

- Provide a summary of legal constraints identified in the framework of the PDF B;
- Inventory codes and other regulations dealing with natural resources preservation (Forests, Environment, Water resources, hunting, land tenure, convention on biodiversity, etc.);
- Compare them with the imperative of joint biodiversity management;
- Submit proposals for corrective measures with a view to lifting barriers to the development of agriculture, forestry, pastoralism, fisheries, land resource, etc.);
- Submit proposals with a view to incorporating pastoralism in the development of land resources;
- Define conditions for the promotion of community and individual initiatives in VTs, CNRs and PAs;
- Define conditions for the establishment of CNRs (institutional framework);
- Define conditions for the recognition of CNRs (legal procedures, technical standards, negotiations);
- Specify participatory approaches to the joint management of protected areas;
- Inventory and assess the role of appropriate technologies in the fields of biological resource preservation and national production of charcoal and energy saving;
- Specify procedures for the replication of achievements in the joint management of protected areas, especially CNRs.

## 5. QUALIFICATIONS :

The study is to be carried out by a pluridisciplinary team comprising three consultants with a strong experience in socio-economics, agropastoralism, environmental law and management of protected areas.

The following qualifications are requested:

- specialist in environmental law, with sound knowledge of codes, conventions and regulations dealing with biodiversity preservation and sustainable management of natural resources;
- socio-economist with sound knowledge of rural development and experience in communication and small-scale credit schemes;
- specialist in agropastoralism with strong experience in the integrated management of agrosylvopastoralism in village estates, protected areas, game ranching and cropping.

6. DEADLINE :

The study must be completed in 45 days.

7. COST :

The study will cost 3 man/month.

8. PERIOD :

The study is to be carried out before full project inception. Consultants will submit a summary report in the form of proposals for the amendment of legal provisions. The report will highlight recommendations made with a view to lifting existing barriers. The report will include an executive summary. Consultants will work in close collaboration with the project coordination and management unit.

9. WORKING LANGUAGES :

The report will be produced in French and in local languages spoken around protected areas.

10. RELATIONSHIP WITH THE OTHER STUDIES

This first study is product N° 1 and is of critical importance to the other studies planned and whose usefulness depends on the lifting of constraints to sustainable development, especially in the promotion of private and community initiatives for the sustainable management of renewable natural resources.

## **STUDY 2 : CARTOGRAPHY AND MANAGEMENT PLANS FOR VILLAGE TERRITORIES AND ADJACENT CNRs.**

### **1. BACKGROUND AND JUSTIFICATION**

The Global Environmental Facility (GEF) and UNDP have provided support to the Senegalese Government, in particular the Ministry of Youth, Environmental Affairs and Sanitation (MJEHP) in the formulation of an Integrated Ecosystems Management Project (IEMP) on four characteristic sites. These sites are examples of the three major types of the country's ecosystems : forest, sylvo-pastoral and coastal ecosystems.

These sites are : the Ferlo Wildlife Reserve in the northern part of Central Senegal, the Niokolo-Koba National Reserve in the South-East, the Niayes coastal ecosystems along the northern coast , and National Reserves of Basse Casamance and Saloum Delta along the southern coast.

The programme also assisted stakeholders in the identification of major constraints to sustainable development and biodiversity preservation.

To overcome these problems, GEF adopted for each of the sites an integrated strategic planning approach to the development and management of village estates, the establishment and sustainable management of community natural parks (CNRs) serving as buffer and joint management areas of PAs which are biodiversity sanctuaries. The purpose is to lift legal, political, technical and methodological barriers to the sustainable management of biological resources at each of the three levels of intervention. In village estates, production systems will be intensified and food and energy self-sufficiency promoted with a view to poverty reduction. In CNRs, alternative methods for the diversification of sources of income and the development of biological resources will be adopted, based on compromise and cooperation with stake-holders. In protected areas, a joint management system will be set up, with a fair mechanism for sharing the benefits of conservation. These demonstration activities will then be replicated by all stakeholders.

To achieve the objectives set, IEMP will have to undertake consultations on major issues relating to the sustainable development of biological resources and the promotion of community activities for participatory biodiversity preservation, capitalizing on previous studies. In this context, it is planned to carry out a study on Cartography and Management Plans for Village Terriotrie s and Adjacent CNRs.

### **2. OBJECTIVES OF THE STUDY**

- draw up a map defining the initial status of territories as they relate to protected areas, CNRs to be established and other existing pastoral units, using aerial surveys and satellite images;

- develop scalable maps integrating pastoral units and CNRs being established;
- assess the various land management systems, grazing areas, water works and humid areas;
- provide maps of PAs, potential CNRs and adjacent VTs;
- develop the framework for integrated participatory management plans for the villages concerned in each of the three complementary units (PAs, CNRs and VTs);
- submit proposals on best land management practices.

### 3. METHODOLOGY

Taking into account the central role to be played by participation of communities as well as individuals in the project strategy, involvement of stakeholders in implementation is a prerequisite to both efficiency and appropriation of achievements by the various categories of stakeholders. To this end, the consultant will submit a detailed proposal for promoting the participation of stakeholders in the implementation, follow-up and evaluation of activities and achievements concerning integrated management plans for PAs.

### 4. MISSION :

To take stock of recent cartographic works relevant to project sites;

To develop with stakeholders through participatory methods land-use plans and land distribution maps; and

To submit proposals for an alternative and participatory management of PAs, CNRs and VTs in :

- ◆ areas dedicated to agriculture, pastoralism and fishing;
- ◆ tourism and recreational areas, environment and marginal lands;
- ◆ development centres (urban structure);
- ◆ other economic sectors;
- ◆ water management;
- ◆ industry, energy;
- ◆ communication;
- ◆ intrazonal coherence (among sub-zones).

In addition, the study will:

- submit proposals for a participatory operational land-use management scheme. To this end, there is need to draw up a tentative participatory pattern of land-use in areas to be developed and to provide details of potential physical and socioeconomic constraints;
- submit proposals for a participatory and interactive land development plan for PAs, CNRs (as is the case with biosphere areas), as well as VTs bordering on the CNRs, to reduce pressure on PAs;
- submit proposals on the institutional management framework of areas developed and on aspects relating to consultation and stakeholders collaboration;
- identify measures conducive to rational management, including the possibility to enforce penalties for breach of rules;
- set up a tax system for slaughtering and grazing, with a follow-up plan;
- submit workable proposals for a sustainable development of watering points, making the most of enrichment technologies for grazing lands with species adapted to production and biodiversity;
- submit proposals for a participatory recovery strategy of saline soils;
- develop participatory plans for the restoration and management of mangrove areas, including demonstration on oyster-harvesting methods;
- specify the patterns of village groupings and other stakeholders through committees against fire and poaching;
- define a participatory method for sensitization on project achievements among populations and other stakeholders.

## 5. QUALIFICATIONS :

The study will be carried out by a multidisciplinary team of consultants with strong knowledge of cartography, land development, management of estates and protected areas, and group dynamics.

The following qualifications will be sought:

- soil scientist/cartographer;
- cartographer/image analyst;
- cartographic officer/GPS/remote sensing;
- specialist in land development/pastoralism;
- social scientist with strong experience of participatory methods;
- specialist in forest planning with experience in the management of humid coastal areas.

6. DEADLINE :

The study is to be completed in 3 months.

7. PERIOD :

This study may be carried out during the first year of project implementation.

The consultants will collectively submit a consolidated report highlighting the various aspects in their fields of expertise along with maps.

8. COST :

The cost of the study is 8 man/months.

9. WORKING LANGUAGE :

The report will be produced in French and in local languages spoken around protected areas.

10. RELATIONSHIP WITH THE OTHER STUDIES

All the thematic studies dealing with the implementation of management plans from technical, economic as well as methodological (participatory methods) will capitalize on this second study.

## ANNEX 13e. TERMS OF REFERENCES and Responsibilities for PROJECT PARTNERS

### TERMS OF REFERENCE OF PROJECT TECHNICAL PARTNERS

#### *Ministry of Economy and Finance :*

#### **Composition :**

Representing the Government before development partners, the Ministry of Economy and Finance comprises, among others, three departments playing a central role in the planning, implementation, follow-up, monitoring and evaluation of projects and programmes, namely:

- The Department of Planning (DP), which is mainly entrusted with project evaluation;
- The Department of Economic and Financial Cooperation (DCEF), which ensures congruence between national procedures and those of financial partners, based, in particular, on compliance with national implementation procedures;
- The Department of Debt and Investments (DDI), which is the approving body and which ensures the follow-up and control of expenditures of projects.

These departments collaborate to ensure the economic and financial supervision of projects.

#### **Mission and Tasks :**

In accordance with the specific mission of these departments, the Ministry of Finance is responsible for:

- National approval of expenditures;
- Mobilizing funds needed for projects, in line with national implementation procedures;
- Book-keeping supervision;
- Commissioning of administrative and financial audits;

- Drafting, on behalf of the Government, mid-term and ex-post evaluation of project activities.

### **Operating Procedures:**

The Ministry of Economy and Finance is responsible for the proper implementation of project financial and accounting aspects, through national implementation procedures, which govern the various procedures to be followed and forms of support to and supervision of project activities by the Ministry.

### **Ministry of Youth, Environmental Affairs and Sanitation**

#### **Composition :**

The Ministry of Youth, Environmental Affairs and Sanitation includes several departments and projects involved in various environmental and natural resource management activities. Some of these structures play a leading role in the preservation of biodiversity and constitute beneficiaries as well as core actors in the project:

- The Department of National Reserves (DPN) which is entrusted with the management of national reserves and a number of wildlife and biosphere reserves;
- The Department of Water Resources, Forests, Hunting and Soil Conservation (DEFCCS), which is responsible for forest reserves and the monitoring of protected forest estates and certain reserves and zones of interest for game;
- The Department of Environmental Affairs and Classified Premises (DEEC), which plays an important role in pollution and environmental nuisance control;
- Various forestry projects and programmes dealing with desertification control, land resource management and biodiversity preservation and operating on the various sites of the project.

These structures, in particular national departments, constitute top-ranking partners in the project for design, implementation and replication.

#### **Mission and Tasks :**

The Ministry responsible for environmental affairs thus undertakes several missions in collaboration with the project, the most important of which can be summed up as follows:

- ensuring the administrative and technical supervision of the project;
- presiding over meetings of the Steering committee and reconciling the interests of the various project institutional partners, harmonizing their interventions and ensuring a rational pooling of their resources for a satisfactory implementation of the project;
- ensuring project follow-up and supervision;
- ensuring that project objectives are achieved;
- recruiting project coordinator and experts through the selection of job applications;
- signing the coordinator's contract after selection by the recruitment commission (for new candidates) or after a proposal for the renewal of a contract by the steering committee (for those already serving);
- participating in annual tripartite reviews as a supervisory body.

### **Operating Procedures :**

The Ministry intervenes through its various departments, especially DPN and DEFCCS which are responsible for the management of protected areas and fully participate in project implementation. The Ministry is the project's supervisory body.

## **UNDP/GEF and the other Development Partners**

### **Composition :**

The development partners providing support to the project are:

- UNDP/Senegal;
- UNDP/GEF

### **Mission and Tasks :**

Among other missions they have to perform, development partners will:

- mobilize financial resources projected in the project Brief;
- participate indirectly in the control of project expenditures;
- participate in audit missions commissioned by UNDP and to periodic project evaluations;
- ensure that the project is implemented in accordance with rules applicable within GEF and the United Nations System;
- ensure the overall technical follow-up of the project;
- participate in the meeting of the Steering Committee.

### **Operating Procedures :**

UNDP/GEF intervenes financially and administratively through the Ministry of Economy and Finance, which is a focal point for development partners, according to procedures agreed on.

From a technical standpoint, UNDP/GEF supervises project implementation through its national office (which is member of the Steering Committee), and also through its regional office and headquarters, in the form of follow-up missions and technical reports.

### ***Steering Committee :***

### **Composition :**

The Steering Committee comprises various partners directly involved in project implementation, namely:

- The Ministry of Youth, Environmental Affairs and Sanitation, which ensures the administrative and technical supervision of the project;
- Technical ministries involved in environmental and natural resource management, such as: the Ministry of Agriculture and Livestock resources; the Ministry of Fisheries; the Ministry of Culture, Tourism and Recreational Affairs; the Ministry of Energy, Mining and Water Resources Development; the Ministry of the Interior, which monitors CERPs and local authorities laying an active role in project implementation; the Ministry of Economy and Finance, which is responsible for the financial supervision of the project and is Government's focal point for development partners;
- UNDP, both as a development partner and as GEF representative, another major partner;

- CONSERE, through its Permanent Secretariat (under the responsibility of the Ministry in charge of Environmental Affairs), a body coordinating the country's environmental policies;
- PCU, which coordinates project activities.

### **Mission and tasks :**

The Steering Committee will be responsible among others, for:

- overall guidance;
- the approval of technical and financial decisions (PETF) proposed by the project coordinator;
- the approval of the annual budget;
- the overall supervision of the project, through planning, programming, follow-up and evaluation of project activities;
- the on-going and annual progress evaluation, mainly through the approval of the annual technical report or the organization of tripartite review meetings;
- giving and advisory opinion on the renewal of the coordinator's contracts, leaning on individual performance.

### **Operating Procedures:**

- The Steering Committee meets twice a year in ordinary sessions to review the status of project activities in the framework of technical follow-up, and auditing. The review of progress made in a year takes place at the second annual meeting;
- The Committee may hold extraordinary sessions convened by its President at the request of one of its members;
- As a supervisory body for technical and administrative aspects of the Project and as one of the main beneficiaries of project activities, the Ministry responsible for Environmental Affairs presides over Steering Committee meetings;
- The Steering Committee Secretariat will be serviced by the Project Coordination Unit, especially the Coordinator;
- The Steering Committee may seek expertise from institutions or individuals to provide support in project activities.

### ***Scientific and Technical Committee (STC) :***

### **Composition :**

As can be inferred from its name, the task of this committee is to provide scientific and technical backstopping. It brings together development, research and training structures involved in environmental and natural resource management, viz.:

- The Department of national reserves;
- The Department of Water Resources, Forests, Hunting and Soil Conservation;
- The Department of Fisheries;
- The Department of Agriculture;
- The Department of Livestock Resources;
- The Department of Environmental Affairs and Classified Premises;
- Public and private research institutions;
- Training institutes, including university institutes;
- Any other structure or resource-person needed by PCU.

### **Mission and Tasks:**

The mission of the CST is to ensure project backstopping in various areas, including;

- planning of technical activities;
- design of strategies;
- the most appropriate technical and technological options for project performance;
- evaluation of technical studies carried out by project experts and consultants.

### **Operating Procedures:**

As an advisory body, the Committee intervenes at the request of PCU. It gives advisory opinions and guidance on the scientific and technical aspects of the project. This Committee holds meetings whenever needed, under the chairmanship of a member appointed forthwith. Its Secretariat is serviced by PCU.

## ***TERMS OF REFERENCE OF DTNs***

### **1) Composition :**

The National Technical Departments fully involved in all stages of project implementation are the following: DEFCCS, DPN, DA, DIPT, DSER, DOPM, DIREL, and DEEC. Other departments may be involved, according to needs.

### **2) Mission :**

- Participate in the development and management of protected and peripheral areas;
- Participate in strategic planning and design of project activities;
- Provide human and material resources needed for implementation;
- Participate in follow-up and evaluation of project activities;
- Joint accountability in implementation and achievements;
- Support the implementation of activities relevant to intensive production systems.

### **3) Operating Procedures :**

- Development of memorandums of agreement formalizing interventions;
- Ad hoc intervention, depending on the expertise needed for specific tasks and activities in their respective fields.

## ***TERMS OF REFERENCE OF REGIONAL SERVICE (SR)***

### **1) Composition :**

The Regional Services involved in project activities are the following: IREF, CNP, DRDR, DRP, DRT, SRDB and DREEC, IRSV. Depending on needs, other Regional Services (SRs) may be involved.

### **2) Missions :**

- Support ULP and local populations in the implementation of project activities;
- Participate in the operational planning of project activities;
- Participate in the follow-up and evaluation of project activities;
- Mobilize human material and financial resources for the implementation of the workplan and the achievement of project objectives.

### **3) Operating Procedures :**

- Formalize interventions through memorandums of agreement;
- Intervene as the need arises.

## ***TERMS OF REFERENCE OF LOCAL AUTHORITIES (CL)***

### **1) Composition :**

Rural communities, City authorities and Rural Communities and the Local authorities fully involved in programme implementation.

### **2) Mission :**

- Promote the participation of local populations in project activities and focus on solving the problems identified;
- Build a dynamic and transparent partnership framework conducive to the participation of local populations in achieving project objectives;
- Facilitate programme implementation;
- Approve activities falling within their competence;
- Participate in the mobilization of the human, material and financial resources needs;
- Rural Communities ensure that populations leaving in the periphery of PAs have access to the land and benefit from more productive environmental development interventions.

### **3) Operating Procedures :**

- Concertation through CRD, CDDs and CLDs;
- Regional and local concertation framework;
- Ad hoc visits and meetings;
- Launching of the programme;
- Drafting and signature of performance contracts with CRs and representatives of stakeholders.

## ***TERMS OF REFERENCE OF PROJECTS AND NGOs***

### **1) Composition :**

Projects and NGOs active on the project sites will be associated to implementation.

### **2) Missions :**

- Provide technical and financial backstopping to the programme on project sites;
- Reinforce a core partnership enabling capacity-building so that local organizations can serve as an effective bridge in the implementation of project activities;
- Support the implementation of activities identified in partnership;
- Contribute to capacity-building among actors.

### **3) Operating Procedures :**

- Formalization of partnership through memorandums of agreements;
- Ad hoc interventions;
- Concertation framework;
- Co-financing of activities.

## ***TERMS OF REFERENCE OF LOCAL AGENTS***

### **1) Composition :**

Local agents involved in project implementation are those of CERPs, projects, NGOs and national reserves.

### **2) Missions :**

- Organize and implement activities at the grassroots level;
- Provide backstopping to populations in project implementation;
- Participate in the training and education of relays (groupings, associations) to ensure local developments;
- Participate in programming, follow-up and evaluations.

### **3) Operating Procedures :**

- Ad hoc mobilization of NGOs and project agents.

## ***TERMS OF REFERENCE OF LOCAL MANAGEMENT BODIES (OLGs)***

### **1) Composition :**

The management bodies on which programme implementation will lean are: village committees for natural resource management, occupational associations, and federations.

### **2) MISSION :**

- Participate actively in project activities;
- Participate in the identification and launching of activities;
- Participate in biodiversity management and preservation in protected and peripheral areas;
- Participate in programme follow-up and evaluation.

### **3) Operating Procedures :**

- Concertation framework;
- Mobilization of representatives of various bodies;
- Material and financial contribution, according to their means;
- Drafting, signature and implementation of performance contracts with those concerned in village estates.

## **AGREED TERMS OF REFERENCE FOR LOCAL STAKEHOLDERS**

### **1) Composition :**

Populations are involved in the implementation and management of project activities individually or through organized groPUs such as GPFs, village and community organizations, and youth associations.

### **2) MISSION :**

- Participate in the planning, management and sustainable development of natural resources on project sites;
- Fulfill their commitments as to achieving project objectives;
- Participate actively in project implementation;
- Set up active and functional organizations capable of facilitating programme implementation;
- Participate in the dissemination of activities in areas not directly concerned.

### **3) Operating Procedures :**

- Mobilization of various representatives of organizations, along with local leaders;
- Promotion of activities for the benefit of individuals and communities;
- Financial and material support according to their possibilities.

## ANNEX 14: Thematic Areas and Types of Project Activities

<b>Thematic Areas</b>							
<b>Biodiversity</b>		<b>Climate Change</b>		<b>International Waters</b>		<b>Ozone Protection</b>	
Conservation 4		Energy conservation (prod./distribution) 4		Transboundary Analysis		Monitoring:	
in situ 4	Ex situ	ESCO's		Efficient Designs4	Strat. Action Plan Development	ODS phase out (Production)	
Sustainable Use 4		Solar:		Freshwater Basin		ODS Phase Out (Consumption)	
Benefit-sharing 4		Biomass: 4		Marine Ecosystem 4		Other:	
Agrobiodiversity		Wind:		Wetland Habitat 4			
Trust fund		Hydro:		Ship-based			
Ecotourism 4		Geothermal:		Toxic Contaminants			
Biosafety		Fuel cells:		Demonstration 4			
Policy & Legislation 4		Methane recovery:		Fisheries Protection 4			
Buffer Zone Dev. 4		Other: Carbon sequestration 4		Global Support:			
<b>b. Categories of General Interest</b>							
Investment 4		Technical Assistance 4		Targeted Research 4		Land Degrad. 4	
Technology Transf. 4		Small Islands		Info/Awareness 4		Private Sector 4	

## ANNEX 15. PROJECT DETAILED INPUT BUDGETS

INTEGRATED ECOSYSTEMS MANAGEMENT PROJECT GEF BUDGET CONTRIBUTION TO PHASE 1										
Ligne	Description		Phase 1		Year 2		Year 3		Total Ph 1	
Budget		Executing Agency	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2
			HM	\$	HM	\$	HM	\$	HM	\$
			x 1000	x 1000	x 1000	x 1000	x 1000	x 1000	x 1000	x 1000
<b>10.00</b>	<b>Project international Staff</b>									
11.00	International Consultants									
11.01	GEF monitoring expert	UNOPS	0.5	8.00		0.00	0.5	8.00	1.0	16.00
11.02	data bank development expert	UNOPS	0.5	8.00		0.00	0.5	8.00	1.0	16.00
11.03	GEF carbon sequestration expert	UNOPS	0.5	8.00		0.00	0.5	8.00	1.0	16.00
11.04	GEF land degradation expert	UNOPS	0.5	8.00	0.5	8.00	0.5	8.00	1.5	24.00
11.03	GEF biodiversity expert	UNOPS	0.5	8.00	0.5	8.00	0.5	8.00	1.5	24.00
<b>11.99</b>	<b>Sub-Total</b>		<b>2.50</b>	<b>40.00</b>	<b>0.5</b>	<b>16.00</b>	<b>2.50</b>	<b>40.00</b>	<b>6.00</b>	<b>96.00</b>
<b>13.00</b>	<b>Administrative support Staff</b>									
13.01	PCU Administrative and Finance Assistant	NEX	12.0	15.00	12.0	15.00	12.0	15.00		45.00
13.02	Secretary to Project Coordination Unit (PCU)	NEX	12.0	9.60	12.0	9.60	12.0	9.60		28.80
13.03	PCU Drivers	NEX	24.0	6.00	24.0	6.00	24.0	6.00		18.00
13.04	Field Site Drivers	NEX	48.0	12.00	48.0	12.00	48.0	12.00		36.00
13.05	PCU Guardians	NEX	24.0	4.80	24.0	4.80	24.0	4.80		14.40
13.06	PCU Mail Orderly-Messenger	NEX	12.0	2.16	12.0	2.16	12.0	2.16		6.48
13.07	PCU Temporary assistance services	NEX	12.0	1.20	12.0	1.20	12.0	1.20		3.60
<b>13.99</b>	<b>Sub-Total</b>		<b>144.0</b>	<b>50.76</b>	<b>144.0</b>	<b>50.76</b>	<b>144.0</b>	<b>50.76</b>	<b>0.0</b>	<b>152.28</b>
<b>15.00</b>	<b>Monitoring and Evaluation</b>									
15.01	International Consultants for project evaluation missions	UNOPS	0.0	0.00	0.0	0.00	0.5	30.00		30.00
15.02	International Trips and DSA	UNOPS	0.0	25.00		10.00	0.5	25.00		60.00
<b>15.99</b>	<b>Sub-Total</b>		<b>0.0</b>	<b>25.0</b>	<b>0.0</b>	<b>10.0</b>	<b>1.0</b>	<b>55.0</b>	<b>0.0</b>	<b>90.0</b>
<b>16.00</b>	<b>Field Missions</b>									
16.01	DSA project Staff Techn Support Missions	NEX	4.0	77.20	4.0	77.20	4.0	77.20		231.60
16.02	National Consultants DSA	NEX	15.0	37.00		0.00		0.00		37.00
<b>16.99</b>	<b>Sub-Total</b>		<b>19.00</b>	<b>114.20</b>	<b>4.00</b>	<b>77.20</b>	<b>4.00</b>	<b>77.20</b>	<b>0.00</b>	<b>268.60</b>
<b>17.00</b>	<b>Project National Staff</b>									
17.11	Project National Coordinator	NEX	12.0	27.60	12.0	27.60	12.0	27.60		82.80
17.12	Specialist in Micro-credits/Community Savings	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.13	Monit, Evaluation /Management of Data Bank	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.14	Expert in wildlife	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.15	Expert in Mangroves Management	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.16	Expert in Agriculture and Soil Conservation	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.17	Expert in Pastoralism	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.18	Expert in Aternative income generation	NEX	12.0	20.40	12.0	20.40	12.0	20.40		61.20
17.18	Specialists in Participation/ Socio-economics	NEX	48.0	72.00	48.0	72.00	48.0	72.00		216.00
<b>17.19</b>	<b>Sub-Total</b>		<b>144.00</b>	<b>242.40</b>	<b>144.00</b>	<b>242.40</b>	<b>144.00</b>	<b>242.40</b>	<b>0.00</b>	<b>727.20</b>

<b>17.20</b>	<b>Project National Consultants</b>									
17.21	Legal and Political Barriers Removal for NR Sustainable use and Management	NEX	0.0	0.00		0.00	3.0	12.29		12.29
17.22	Environmental Impact Assessment Guidelines for Biodiversity Conservation	NEX	4.0	15.72		0.00	4.0	15.72		31.44
17.23	Environmental Awareness, training, Communication, and Dialogue among concerned actors for sustainable conservation of biological resources in all selected VTs	NEX	4.0	15.72		0.00	4.0	15.72		31.44
17.24	Environmentally sound techniques for sustainable natural resources management	NEX	4.0	15.72		0.00	4.0	15.72		31.44
17.25	Capitalization of Micro-credit sustainability	NEX	2.0	8.86		0.00	2.0	8.86		17.72
17.26	mangrove management, species behaviour and their interrelationships with marine ecosystems	NEX	3.0	12.29		0.00	3.0	12.29		24.58
17.27	Sustainable VT and CNR sustainable development financing in selected project sites	NEX	2.0	8.86		0.00	2.0	8.86		17.72
17.28	PA planning and co-management for sustainable biodiversity conservation	NEX	4.0	15.72		0.00	4.0	15.72		31.44
17.29	Local Knowledge know-how on biological resources conservation	NEX	3.0	12.29		0.00	3.0	12.29		24.58
17.30	Biological Resources Data Bank Development and Management	NEX	3.0	12.29		0.00	3.0	12.29		24.58
<b>17.32</b>	<b>Sub-Total</b>		<b>29.00</b>	<b>117.47</b>		<b>0.00</b>	<b>32.00</b>	<b>129.76</b>		<b>247.23</b>
<b>19.00</b>	<b>TOTAL COMPONENT</b>		<b>338.5</b>	<b>589.83</b>	<b>292.5</b>	<b>396.36</b>	<b>327.5</b>	<b>595.12</b>	<b>6.0</b>	<b>1581.31</b>
<b>20.00</b>	<b>SUB-CONTRACT</b>									
21.01	Devel Integ Land Use Management Plans	NEX	4.0	75.00		0.00		0.00	4.0	75.00
22.02	NKNP partic biod cons	NEX				350.00			0.0	350.00
23.01	SDNP partic biod cons	NEX				122.52			0.0	122.52
24.01	FGR partic biod cons	NEX				160.00			0.0	160.00
25.01	Promotion sust use of biol resources in CNRs	NEX		23.29					0.0	23.29
26.01	Study barriers to PA management	NEX		20.00						20.00
27.01	Subcontract :Cartography of VTs and CNRs	NEX		45.00						45.00
27.02	Subcontract: Carbon Sequestration monitoring in selected project sites	NEX	3.0	12.29		0.00	3.0	12.29		24.58
27.03	Subcontract: Demo Alternative Sust income gen in VTs	NEX		30.00					0.0	30.00
<b>28.99</b>	<b>Sub Total</b>		<b>4.0</b>	<b>205.6</b>		<b>632.5</b>	<b>0.0</b>	<b>0.0</b>		<b>850.4</b>
<b>29.00</b>	<b>TOTAL COMPONENT</b>		<b>4.0</b>	<b>205.58</b>	<b>0.0</b>	<b>632.52</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>850.39</b>
<b>30.00</b>	<b>Training</b>									
32.01	Groupe training and capacity building	NEX	4.0	20.0	40.0	200.0	40.0	172.0		392.00
32.02	Conferences, Debates, Workshops, and Seminars at local, national and international levels	NEX	7.0	28.0	40.0	160.0	40.0	140.0		328.00
<b>32.99</b>	<b>Sub-Total</b>		<b>11.00</b>	<b>48.00</b>	<b>80.00</b>	<b>360.00</b>	<b>80.00</b>	<b>312.00</b>	<b>0.00</b>	<b>720.00</b>
<b>39.00</b>	<b>TOTAL COMPONENT</b>		<b>11.0</b>	<b>48.00</b>	<b>80.0</b>	<b>360.00</b>	<b>80.0</b>	<b>312.00</b>	<b>0.0</b>	<b>720.00</b>
<b>40.00</b>	<b>Equipment</b>									
	<b>International purchases</b>									
45.01	Four Wheel Drive Land cruiser	UNOPS	1.0	38.00	0.0	0.00	0.0	0.00	1.0	38.00
45.02	Hilux Dual Cockpit 4WD Toyota	UNOPS	3.0	69.00	0.0	0.00	0.0	0.00	3.0	69.00
45.03	Equip PAs with water trucks for rapid intervention in PAs, CNRs and VTs	UNOPS								0.00
45.04	Improve transportation equipment for PA agents	UNOPS	5.0	90.0						90.00
45.05	Multimedia Desktop computers with softwares	UNOPS	6.0	12.00	0.0	0.00	0.0	0.00	6.0	12.00
45.06	Multimedia Laptop computers	UNOPS	5.0	10.00	0.0	0.00	0.0	0.00	5.0	10.00
45.07	Laser High Capacity printer	UNOPS	1.0	2.10	0.0	0.00	0.0	0.00	1.0	2.10

45.08	Laser inkjet printers	UNOPS	6.0	11.40	0.0	0.00	0.0	0.00	6.0	11.40
45.09	Audio-visual equipment for awareness, seminars, workshops and training	UNOPS	5.0	15.00	0.0	0.00	0.0	0.00	5.0	15.00
45.10	High Speed Photostat Copying Machines	UNOPS	5.0	10.00	0.0	0.00	0.0	0.00	5.0	10.00
45.11	Scanning machines	UNOPS	5.0	7.50	0.0	0.00	0.0	0.00	5.0	7.50
45.12	Photographic equipments and diapositive film rolls	UNOPS	5.0	2.50	0.0	0.00	0.0	0.00	5.0	2.50
	<b>Sub-Total</b>		<b>47.00</b>	<b>267.50</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>42.00</b>	<b>267.50</b>
	<b>Local purchases</b>									
45.13	Office material and equipment	NEX		10.00						10.00
45.14	Motocycles for field staff	NEX	16.0	3.20						3.20
45.15	Office Equipment use and upkeep	NEX		23.00		23.00		23.00		69.00
45.16	Supply of Office Consummable	NEX		10.00		10.00		10.00		30.00
45.17	Equip PA agents for early warning comm sys	NEX		55.00						55.00
45.18	Provide PA agents with GPS equipment	NEX		20.00						20.00
45.19	equip training centres at Dalaba and Thiès	NEX				94.20				94.20
45.20	Equip local community with fire control and suppression tools	NEX	4.0	12.0	8.0	24.0	8.0	24.0		60.00
45.21	Equip VT with local nurseries tools	NEX	10.0	40.0	10.0	40.0	10.0	40.0		120.00
<b>45.99</b>	<b>Sub Total</b>		<b>30.0</b>	<b>173.2</b>	<b>18.0</b>	<b>191.2</b>	<b>18.0</b>	<b>97.0</b>	<b>0.0</b>	<b>461.40</b>
<b>50.00</b>	<b>Miscellaneous</b>									
52.00	Reporting Costs									
52.01	Reports	NEX	1.0	10.00	1.0	10.00	1.0	10.00		30.00
52.02	Annual Audit	NEX	1.0	3.80	1.0	3.80	1.0	3.80	3.0	11.40
52.03	Steering Committee /TPR meetings	NEX	1.0	10.00	1.0	10.00	1.0	10.00		30.00
52.04	Scientific and technical Committee meetings	NEX		6.00		6.00		6.00		18.00
<b>52.99</b>	<b>Sub-Total</b>		<b>3.00</b>	<b>29.80</b>	<b>3.00</b>	<b>29.80</b>	<b>3.00</b>	<b>29.80</b>	<b>3.00</b>	<b>89.40</b>
<b>5299</b>	<b>TOTAL COMPONENT</b>		<b>80.0</b>	<b>470.50</b>	<b>21.0</b>	<b>221.00</b>	<b>21.0</b>	<b>126.80</b>	<b>45.0</b>	<b>818.30</b>
<b>53.00</b>	<b>Sundries</b>			10.00		10.00		10.00		30.00
<b>99.00</b>	<b>TOTAL BUDGET</b>			<b>1323.91</b>		<b>1619.88</b>		<b>1056.21</b>		<b>3970.00</b>
	Lines executed by UNOPS; total		453.5							
	UNOPS 8% fee		36.28							
	<b>TOTAL UNOPS</b>		<b>489.78</b>							

INTEGRATED ECOSYSTEMS MANAGEMENT PROJECT GOS BUDGET CONTRIBUTION TO PHASE 1										
Ligne		Description	Phase 1						Total	
Budget	Execuig		Year 1		Year 2		Year 3		Phase 1	
	Agency		HM	\$	HM	\$	HM	\$	HM	\$
				x 1000		x 1000		x 1000		x 1000
15.00		<b>MISSION</b>								
15.01	NEX	EVALUATION MISSIONS		80.00		80.00		80.00		240.00
15.10		<b>Sub Total</b>		<b>80.00</b>		<b>80.00</b>		<b>80.00</b>		<b>240.00</b>
15.99		<b>TOTAL COMPONENT</b>		<b>80.00</b>		<b>80.00</b>		<b>80.00</b>		<b>240.00</b>
20.00		<b>SUB-CONTRACT</b>								
21.00	NEX	Devel Integrated Land Use Management Plans								
22.00	NEX	NKNP Pilote Infrastructures implementation and co-management for participatory biodiversity conservation	1.0	90.00	1.0	90.00	1.0	90.00		270.00
23.00	NEX	SDNP Pilote Infrastructures implementation and co-management for participatory biodiversity conservation	1.0	90.00	1.0	90.00	1.0	90.00		270.00
24.00	NEX	FGR Pilote Infrastructures implementation and co-management for participatory biodiversity conservation	1.0	90.00	1.0	90.00	1.0	90.00		270.00
26.00	NEX	Pilot CNR management plans implementation for sustainable use of biological resources	1.0	90.00	1.0	90.00	1.0	90.00		270.00
27.00	NEX	Promoting Alternative Sustainable income generation in VTs	1.0	90.00	1.0	90.00	1.0	90.00		270.00
29.00		<b>Sub Total</b>	<b>5.00</b>	<b>450.00</b>	<b>5.00</b>	<b>450.00</b>	<b>5.00</b>	<b>450.00</b>	<b>0.00</b>	<b>1350.00</b>
29.00		<b>TOTAL COMPONENT</b>	<b>5.0</b>	<b>450.0</b>	<b>5.0</b>	<b>450.0</b>	<b>5.0</b>	<b>450.0</b>	<b>0.0</b>	<b>1350.0</b>
30.00		<b>Training</b>								0.00
32.00	NEX	Groupe training and capacity building	1.0	18.00	1.0	60.00	1.0	18.00		96.00
32.10	NEX	Conferences, Debates, Workshops, and Seminars at local, national and international levels	1.0	18.00	1.0	60.00	1.0	18.00		96.00
32.99		<b>Sub-Total</b>	<b>2.00</b>	<b>36.00</b>	<b>2.00</b>	<b>120.00</b>	<b>2.00</b>	<b>36.00</b>	<b>0.00</b>	<b>192.00</b>
39.00		<b>TOTAL COMPONENT</b>	<b>2.0</b>	<b>36.0</b>	<b>2.0</b>	<b>120.0</b>	<b>2.0</b>	<b>36.0</b>	<b>0.0</b>	<b>192.0</b>
40.00		<b>Equipment</b>								
45.00		<b>Local purchases</b>								
45.01	NEX	Office Rooms, material and equipment	1.0	1.62	1.0	1.62	1.0	1.62		4.86
45.02	NEX	1 Motocyclette	1.00	1.62	1.00	1.62	1.00	1.62	0.00	4.86
45.03	NEX	Equip local community with fire control and suppression tools	1.0	53.00	1.0	53.00	1.0	53.00		159.00
45.04	NEX	Equip VT with local nurseries tools	1.0	52.00	1.0	52.00	1.0	52.00		156.00
45.99		<b>Sub Total</b>	<b>4.00</b>	<b>108.24</b>	<b>4.00</b>	<b>108.24</b>	<b>4.00</b>	<b>108.24</b>	<b>0.00</b>	<b>324.72</b>
51.00		<b>Miscellaneous</b>								
51.01	NEX	Reports								
51.02	NEX	Annual audits	1.0	10.00	1.0	10.00	1.0	10.00		30.00
52.02	NEX	Steering Committee meetings	1.0	18.00	1.0	24.00	1.0	24.00		66.00
52.03	NEX	Scientific and technical Committee meetings	1.0	18.00	1.0	18.00	1.0	30.00		66.00
51.99		<b>Sub-Total</b>	<b>3.00</b>	<b>46.00</b>	<b>3.00</b>	<b>52.00</b>	<b>3.00</b>	<b>64.00</b>	<b>0.00</b>	<b>162.00</b>
51.99		<b>TOTAL COMPONENT</b>	<b>7.00</b>	<b>154.24</b>	<b>7.00</b>	<b>160.24</b>	<b>7.00</b>	<b>172.24</b>	<b>0.00</b>	<b>486.72</b>

99.00		TOTAL BUDGET	14.00	640.24	14.00	730.24	14.00	658.24	0.00	2028.72
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<b>INTEGRATED ECOSYSTEMS MANAGEMENT PROJECT UNDP BUDGET CONTRIBUTION TO PHASE 1</b>										
Ligne	Description	Agency	Phase 1						Total	
			Year 1		Year 2		Year 3		Phase 1	
Budget	Exec.	HM	\$	HM	\$	HM	\$	HM	\$	
			x 1000		x 1000		x 1000		x 1000	
<b>15.00</b>	<b>Monitoring and Evaluation</b>									
15.01	International Consultnat project eval missions	UNOPS	0.5	30.00			0.0	0.00	30.00	
15.02	International Trips and DSA	UNOPS	0.5	19.80			0.0	0.00	19.80	
<b>15.99</b>	<b>Sub-Total</b>		<b>1.0</b>	<b>###</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>	<b>49.80</b>	
<b>19.00</b>	<b>TOTAL COMPONENT</b>		<b>1.00</b>	<b>49.80</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>49.80</b>	
<b>20.00</b>	<b>SUB-CONTRACT</b>									
21.00	Devel Integ Land Use Management Plans	NEX							0.00	
22.00	NKNP partic biod cons	NEX							0.00	
23.00	SDNP partic biod cons	NEX							0.00	
24.00	FGR partic biod cons	NEX							0.00	
26.00	Promotion sust use of biol resources in CNRs	NEX			4.0	300.00	8.0	500.00	803.98	
27.00	Demo Alternative Sust income gen in VTs	NEX	10.0	100.00	15.0	247.51	20.0	399.80	747.31	
<b>29.00</b>	<b>Sub Total</b>		<b>10.00</b>	<b>###</b>	<b>19.00</b>	<b>547.51</b>	<b>28.00</b>	<b>899.80</b>	<b>1551.29</b>	
<b>29.00</b>	<b>TOTAL COMPOSANTE</b>		<b>10.00</b>	<b>###</b>	<b>19.00</b>	<b>547.51</b>	<b>28.00</b>	<b>899.80</b>	<b>1551.29</b>	
<b>54.00</b>	<b>Support Services</b>								0.00	
54.02	UNDP Services	NEX		3.00		16.43		25.50	44.93	
<b>54.99</b>	<b>Sub-Total</b>			<b>3.00</b>	<b>0.00</b>	<b>16.43</b>	<b>0.00</b>	<b>25.50</b>	<b>44.93</b>	
<b>59.00</b>	<b>TOTAL COMPONENT</b>			<b>3.00</b>	<b>0.00</b>	<b>16.43</b>	<b>0.00</b>	<b>25.50</b>	<b>44.93</b>	
90.10	UNOPS Services	UNOPS		3.98		0.00		3.98	3.98	
<b>99.00</b>	<b>TOTAL BUDGET</b>		<b>11.00</b>	<b>156.78</b>	<b>19.00</b>	<b>563.94</b>	<b>28.00</b>	<b>929.28</b>	<b>1650.00</b>	

## **ANNEX 16. PROJECT WORKPLAN**

ANNEX XVI: PROJECT WORKPLAN

Project activities	Phase 1				Phase 2			Phase 3			
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	
<b>10 Personnel International du Projet</b>											
11 Project International Staff											
11.51 International Consultants	↔		↔				↔				
<b>13 Support Administratif</b>											
13.01 Administrative Support Staff	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.02 Administration & Finance Assistant	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.03 Secretary to Project Coordination Unit	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.04 UCP Drivers	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.05 Sites Drivers	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.06 UCP Guardians	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.07 Mail Orderly-Messenger	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
13.08 Cleaners	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
15.01 voyages internationaux	↔		↔				↔			↔	
<b>16 Missions de terrain</b>											
16.01 International Travel Cost	▶									▶	
16.02 International Trips											
<b>17 Personnel National du Projet</b>											
17.00 Project Local Staff	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.01 Project Local Coordinator	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.02 Local Socio-Economist Expert	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.03 Local Expert on Follow Up-Evaluation and Management of Data Bank	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.04 Local Expert for the Niokolo-koba Site	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.05 Local Expert for the Saloum Delta Site	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.06 Local Expert for the Niaves Site	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
17.07 Local Expert for the Ferlo Site	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
<b>2 SUB-CONTRACT</b>											
<b>2.1.0.0 Policy and legal framework adapted to</b>											
2.1.10 <i>Legal obstacles to sustainable use of biological</i>											
2.1.1.1 Identify legal constraints on natural resource	↔										
2.1.1.2 Integrate amendments proposed in legal study to		↔	↔								
2.1.1.3 Adapt land tenure system so as to provide incentive		↔	↔								
2.1.1.4 Integrate pastoralism as eligible criterion for land		↔	↔								
2.1.1.5 Develop co-management text			↔	↔							
2.1.1.6 Legally acknowledge co-management text											
2.1.1.7 Enact, adopt and enforce proposed legislation											
2.1.2.1 Identify and propose policy amendments to remove			↔	↔							
2.1.2.2 Adapt development policies to protect forest.											
2.1.2.3 Adopt and implement above recommended policies	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
2.1.3.0 <i>Community ownership of biological resources</i>											
2.1.3.1 Develop and disseminate idea of private and		↔									
2.1.3.2 Transfer authority on CNRs											
2.1.4.0 <i>Effective environmental impact assessments/ studies</i>											
2.1.4.1 Develop/improve EIA guidelines for Biodiversity	↔										
2.1.4.2 Increase capacity in ME to monitor EIA on	↔		↔				↔			↔	
2.1.4.3 Enact, adopt and implement EIA guidelines	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
<b>2.2.0.0 Sustainable development syst. &amp; Community</b>											
2.2.1.0 <i>Stakeholders more aware, better trained and</i>											
2.2.1.1 Elaborate an awareness, training, information and	↔			↔				↔			
2.2.1.2 Train trainers in awareness, training and	↔			↔				↔			
2.2.1.3 Implement the awareness, training, information and	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	
2.2.1.4 Identify, elaborate and disseminate lessons from											
2.2.2.0 <i>UTs delimited and appropriate plans for local level</i>											

## **ANNEX 17 : PROJECT SITES**

### **DETAILED SITE SELECTION PROCESS**

For each of the intervention sites of the project representing samples of different types of ecosystems, a spatial approach in three complementary geographical units was retained with a view to sustainable preservation of biodiversity. As shown in the Project Brief, these units include PAs, CNRs and VTs.

Concerning PAs, the selection procedure is specified in the Project Brief. For each of the four sites, these PAs represent samples of the ecosystems concerned and are also the most dense in terms of biodiversity, which justifies the selection.

As for the CNRs and the VTs, they were selected during feasibility studies in the framework of a mission carried out in May 2001 by CONSERE, Project Coordinating Unit (PCU), DPN, DEFCCS, DEEC, DP, along with cooperating projects involved through a memorandum of agreement for a joint financing of activities planned with respect to the GEF component of this project (see Annex XXI). The cooperating projects concerned include PRODAM for the site in the Ferlo, CECI for the Niayes, UICN for the Saloum Delta and AGIR for the Niololo Koba.

For each of the sites of intervention of the project, field research was based on contacts previously made field assistants with populations and local authorities in the identification of potential CNRs areas.

Furthermore, CNRs are selected, as far as possible, within village lands contiguous to Pas, and at the same time not used for agriculture. VTs on the other hand are productive landscapes associated with villages that are involved in community use of natural resources in the selected CNRs. CNRs are generally grasslands and savannahs where multipurpose harvesting takes place. These CNRs will therefore be able to provide both a buffer as well as a corridor extending the Pas thus providing benefits for both biodiversity conservation as well as activities related to planning, development and sustainable management of natural resources (See Annex XI dealing with Technical Specifications). On each site, the project will adopt the project strategy in VTs and CNRs, in order to reduce pressure on contiguous PAs. The management of CNRs and VTs will be integrated through sustainable use/management plans. This approach will likely induce synergy and efficiency in activities to be undertaken in each of the three spatial intervention units. Criteria for the selection of CNRs and VTs are as follows:

#### **Criteria for the Selection of CNRs**

1. Adjacent to VTs and directly contiguous to PAs to serve as buffer zones;

2. A spatial position of these buffer zones that makes it possible to interconnect PAs in order to establish corridors for the migration of fauna;
3. Stakeholders willingness to cooperate on the basis of consensus and compromise so that rules for sustainable community management of natural resources are not violated;
4. Communities willing to convert such areas, on the bases of decisions made by Rural Councils, into community reserves (preliminary work already done)

### **Criteria for the Selection of VTs**

1. All villages involved the selected CNRs
2. VTs already involved with partner projects (for confirmation of co-financing)

### ***DETAILED DESCRIPTION OF SELECTED SITES***

The feasibility mission conducted intensive discussions with all stakeholders, and visited all selected sites to ensure local community ownership. The feasibility mission identified the following specific sites:

#### **1. Sylvo-pastoral Ecosystems:**

##### **1.1. PAs**

Confirmation of the selection of two wildlife reserves of Northern and southern Ferlo, in addition to the three sylvo-pastoral reserves nearest to these wildlife reserves.

##### **1.2 CNR :**

CNRs were selected in pastoral areas in and adjacent to the sylvo-pastoral reserves to serve as pastoral units (UP) for the preservation of adjacent wildlife reserves against pressures resulting mainly from pastoralism.

In collaboration with the PRODAM team, the mission for feasibility studies retained 6 CNRs or PUs in the Ferlo for demonstration sites. In connection with the PUs selected, VTs adjacent to these units were included. A total of 5 CNRs or PUs were selected around

the 4 sylvo-pastoral reserves adjacent to the 2 wildlife reserves. There are 15 pastoral areas adjacent to the PUs selected, in line with forecasts presented in the Project Brief. The PUs and pastoral villages selected for demonstration activities using the GEF component, and additional funding from PRODAM, are as follows.

Pastoral Unit or RNC	TV adjacent
1. Malandou Pastoral Unit	1.1. Malandou Pastoral Areas 1.2. Houdahi Pastoral Areas; 1.3. Fété Fowrou Pastoral Areas
2. Péthiél Pastoral Unit	2.1 Péthiél Pastoral Areas; 2.2 Gassé Barkédji Pastoral Areas; 2.3 Hodi Arno Pastoral Areas; 2.4 Mbélogne Pastoral Areas;
3. Windou Diohi Pastoral Unit	3.1.Namari Pastoral Areas; 3.2.Lora Pastoral Areas; 3.3.Sossobé Pastoral;
4. Ranérou Pastoral Unit	4.1. Ranérou Pastoral Areas; 4.2. Fourdou Pastoral Areas 4.3. Niarvel. Pastoral Areas
5. Loumbi Pastoral Unit	5.1. Loumbi Pastoral Areas; 5.2. Mbélogne Pastoral Areas;
6. Deudondi Pastoral Unit	The choice of pastoral areas in this sixth UP will be made in collaboration with PRODAM, once the 15 pastoral areas are established.

It is expected that these PUs will cover individually, as is currently the case with PRODAM, an average of 70,000 ha, i.e. a total of 350 000 ha for the 5 Pus, or 13.94% of the 2 504 700 ha concerned in the Ferlo zone.

## 2. Niokolo-Koba National Reserve

### 2.1. AP

The AP selected is the Niokolo-Koba National Reserve (PNKK), which is one the largest national

reserves in West Africa. With respect to the large area covered by this reserve (913 000 ha) and the diversity of pressures resulting from the main socioeconomic activities carried out in the peripheral areas of the PNNK, 5 CNRs were selected, all of them located around the PNNK, so as to reduce pressure on the reserve, while interconnecting the PNNK with 2 PAs, including the Ndiambour FC on the one hand, and with the Falémé ZIC on the other.

## 2.2. CNRs

The selection of the 5 CNRs made in collaboration with the AGIR Project is as follows:

1) Mansadala RNC ; 2) Médina Gounass RNC; 3) Linkerng RNC; 4) Niemeiniké RNC; 5) Kamonmeri RNC.

It is expected that each of these 5 CNRs will cover an average of 15 000 ha, i.e. a total of 75 000 ha or 7,17% of the PAs making the sample in this site to cover 1 045 250 ha. The Mansadala RNC connects the PNNK with the Ndiambour Forest Reserve, while that of Kanoumeri, is a link between the PNNK and the ZIC (Game Reserve).

## 2.3 TV :

Based on the selection of these 5 RNC, 30 villages, all of which are adjacent to the CNRs, were selected in collaboration with AGIR in the framework of the additional joint financing. In relation to these 5 CNRs, the list of the 30 villages is as follows:

RNC	TV
1. <i>Mansadala RNC</i> North of PNNK for pastoral purposes with a view to reducing pressure in the reserve. This RNC connects the PNNK with the <i>Diambour</i> Forest Reserve.	1. Mansadala ; 2. Bantancountou ; 3. Medina Fouga ; 4. Gamon ; 5. Diénou Diala ; 6. Sitouama
2. <i>Missirah Gounass RNC</i> North-West of PNNK to be dedicated	1. Missirah Gounas

RNC	TV
to restoration, in particular with palm trees in the reserve. This RNC connects the PNNK with the <i>Kantora</i> Forest Reserve.	<ol style="list-style-type: none"> <li>2. Faas ;</li> <li>3. Sounatou ;</li> <li>4. Saré Dayefa ;</li> <li>5. Médina Gounass ;</li> <li>6. Kouvar</li> </ol>
3. <i>Linkering</i> RNC, South-West of PNNK for pastoralism with a view to reducing pressure in the reserve.	<ol style="list-style-type: none"> <li>1. Thiafène ;</li> <li>2. Linkering ;</li> <li>3. Kalifourou ;</li> <li>4. Wadiyatoulaye ;</li> <li>5. Kankouyama ;</li> <li>6. Kael</li> </ol>
4. <i>Niéméniké</i> RNC, South-East of PNNK, with a view to reducing pressure resulting from populations' activities in villages bordering on the reserve. This RNC contiguous to PNNK is adjacent <i>Katonouméri</i> RNC. The latter is in turn adjacent to the Falémé ZIC (Area of interest for game)	<ol style="list-style-type: none"> <li>1. Niéméniké ;</li> <li>2. Mako ;</li> <li>3. Badon ;</li> <li>4. Maryamkanfi ;</li> <li>5. Maragoukoto ;</li> <li>6. Bafoundou</li> </ol>
5. <i>Kanouméri</i> RNC, North-East of PNNK, for the sustainable development of forest and wildlife resources in the reserve. This RNC connects the PNNK with the Falémé ZIC, through the <i>Niéméniké</i> RNC, which is contiguous to it.	<ol style="list-style-type: none"> <li>1. Kanoumeri;</li> <li>2. Diakaba ;</li> <li>3. Bounsankoba ;</li> <li>4. Koumoutourou ;</li> <li>5. Binbou ;</li> <li>6. Niandassara</li> </ol>

It is expected that extension activities will, after a certain period, be carried out by populations themselves and initial projects will be able to cover all the 3 others PAs around the PNNK.

In sum, for the PNNK site, each of these CNRs should an average of 15 000 ha i.e. a total of 75 000 ha for the 5 CNRs. This area of land represents 7.17% of a sample stretching over 1 045 250 ha.

### 3. The Niayes

#### 3.1. PAs:

The Niayes rehabilitation classified area was established by Decree 2565 of April 4, 1957. It is rehabilitated through a series of 2 or 3 rows of *Casuarina equisetifolia* (filao) and constitutes a line of demarcation between projects for the preservation of land ecosystems biodiversity and coastal and marine biodiversity.

#### 3.2. CNRs:

In this case, CNRs are made up of dunes and interdunes between the rehabilitation area and the VTs. These dunes and interdunes offer great biodiversity. However, they are threatened by the movement of sand. Many plants and shrubs, even certain trees, are completely covered by sand. These CNRs cover on average 200 ha where Guinean, Soudanian and Sahelian species are seriously threatened. These CNRs cover an area of 1 000 ha, i.e. 4.29% of the total area of this sample of 23 262 ha.

#### 3.3. TV

In relation to these 5 CNRs, villages adjacent to each of them were selected. This selection was made with the PRL, in the framework of partnership for joint financing. In addition, pilot villages of CECI projects are taken into account. The situation in the 5 CNRs and the 41 adjacent villages is as follows;

RNC	Adjacent Villages
1. RNC de <i>Dieuleuk</i> in the region of Thiès	1. Dieuleuk Peul; 2. Dieuleuk Wolof ; 3. Notto ; 4. Toula ; 5. Keri ; 6. Ngadiaga ; 7. Gouye Diama ; 8. Keur Mbir ; 9. Keur Mbatta.
2. <i>Fass Boye</i> in the region of Thiès	1. Darou Fall ;

RNC	Adjacent Villages
	<ol style="list-style-type: none"> <li>2. Darou Ndoye;</li> <li>3. Diogo;</li> <li>4. Ndiline;</li> <li>5. Darou Ndiaye;</li> <li>6. Darou Salam ;</li> <li>7. Andal ;</li> <li>8. Gnalor ;</li> <li>9. Thialle ;</li> </ol>
<p>3. <i>Kébemer</i> RNC in the region of Louga</p>	<ol style="list-style-type: none"> <li>1. Mbibasse ;</li> <li>2. Khonkhe Yoye ;</li> <li>3. Thiokhomate;</li> <li>4. Ndiobène;</li> <li>5. Diourmel;</li> <li>6. Ndiogomaye;</li> <li>7. Ndiagne;</li> <li>8. Fote;</li> <li>9. Lompoul</li> </ol>
<p>4. RNC de <i>Potou</i> dans la région de Louga</p>	<ol style="list-style-type: none"> <li>1. Potou ;</li> <li>2. Sage Sayoro ;</li> <li>3. Gnayame;</li> <li>4. Keur Koura Diéri;</li> <li>5. Keur Guedji;</li> <li>6. Daldagou;</li> <li>7. Soukoundou;</li> <li>8. Maka Mor Madiké;</li> <li>9. Mouril</li> </ol>
<p>5. <i>Ngaina</i> RNC</p>	<ol style="list-style-type: none"> <li>1. Ngaina Lebou ;</li> <li>2. Mbabara ;</li> <li>3. Dieulé Mbame ;</li> <li>4. dieuleuk ;</li> <li>5. Gueumbeul ;</li> <li>6. Diama Toubé ;</li> </ol>

RNC	Adjacent Villages
	7. Toug Wolof ; 8. Toug Peul ; 9. Ndiakhère.

#### 4. Saloum site

##### 4.1. PA :

Regarding this site, a needs assessment contained in a letter Number 01202/ME of April 12, 2001 resulted in a policy measure stating that the PA to be integrated in the interventions of UNDP-GEF project include the terrestrial area of the PNDS, i.e. the Fathala forest reserve and mangrove areas adjacent to this unit.

##### 4.2. CNRs

In view of the shortage of arable land and of pressures resulting from agricultural activities in forest areas and the disruption of ecosystems between the reserve and the PAs around, the mission selected the 4 CNRs, all of which are contiguous to the reserve, so as to serve as buffer zones. The development and management of these zones will be in line with procedures set for formal reserves. The replication of interventions by the technical services concerned and populations is expected to cover activities geared towards the sustainable management of natural resources in the areas contiguous to each of the 4 forest reserves around the PNDS and selected as CNRs. These CNRs include Nema, Mammsariako, Aidara and Djinack.

##### 4.3 TV

Around the PNDS, 4 CNRs and 10 villages were selected, in line with plans contained in the Project Brief. These CNRs and contiguous VTs are as follows.

CNRs	Corresponding VTs
1. <i>Nema</i> RNC, North of the PNDS	1. Néma Ba ; 2. Nema Nding; 3. Missirah.
2. <i>Massarinko</i> RNC, South of the PNDS	1. Karang Socé 2. Massarinko

CNRs	Corresponding VTs
3. <i>Aidara</i> RNC, for the sustainable development of forest resources contiguous to the PNDS	<ol style="list-style-type: none"> <li>1. Aidara;</li> <li>2. Saroudia ;</li> <li>3. Sam ;</li> </ol>
4. <i>Djinack</i> RNC, for the reclamation and sustainable development of mangrove areas	<ol style="list-style-type: none"> <li>1. Djinack ;</li> <li>2. Djatako</li> </ol>

Because of constraints relating to agricultural lands on this site, it is expected that each of the 4 CNRs around the PNDS will cover on average 1 500 ha, i.e. a total of 6 000 ha or representing 7.89% of the land area of the PNDS (76 000 ha).

On the whole, it is expected that CNRs in sample sites will cover 502 000 ha, i.e. 13.64% of the total area of the 4 samples (3 680 552 ha).

The exact area covered by each of the CNRs will be known after delimitation and cartography activities planned for the two first years of stage 1.

## 5. Workplan for CNRs during the Three Project Phases

The planning of the gradual involvement of CNRs and VTs concerned is as follows:

### 5.1. Phasing

During the first year, activities will be carried out for delimitation and the preparation of a plan for the development and management of natural resources in the VTs of a series of 4 CNRs (1 in each site), along with 20 villages around them. This new generation of CNRs and corresponding VTs will be run for 5 years, then the project will withdraw. During the second year, a second generation of CNRs and VTs will appear through demonstration activities and will last 5 years. Lessons learnt from withdrawal from first-generation CNRs and VTs will enable to ensure the success of activities within second-generation CNRs and VTs area withdrawal.

Gradual recruitment and withdrawal, while capitalizing on the experience gained, will take place until project completion. This approach will thus enable to cover the greatest number of CNRs (20) and VTs (100) during the project's operational stage and to ensure success. Furthermore, this will enable to better disseminate results. On the whole, the coverage of CNRs and corresponding VTs by project are as follows.

Years	Number of CNRs involved by series and by year				Total # of CNRs	Stage
Year 1	4				4	STAGE 1
Year 2	4	4			8	
Year 3	4	4			12	
Year 4	4	4	4		16	
Year 5	4	4	4	8	20	STAGE 2
Year 6	Withdrawal	4	4	8	16	
Year 7	& capitalization		4	8	12	
Year 8	on the experience		4	8	12	
Year 9	gained in the			8	8	STAGE 3
Year 10	Post-project period					

### 5.2. Plan for the incorporation of the 100 VTs corresponding to the 20 CNRs

Years	Number of VTs incorporated by series and by year				Total # of VTs	Stage
Year 1	20				20	STAGE 1
Year 2	20	20			40	
Year 3	20	20			60	
Year 4	20	20	20		80	
Year 5	20	20	20	40	100	STAGE 2
Year 6	Withdrawal	20	20	40	80	
Year 7	& capitalization		20	40	60	
Year 8	on the		20	40	60	
Year 9	Experience gained			40	40	STAGE 3
Year 10	in the post-project stage					



## ANNEX 18a. DIRECT AND REPROGRAMMED CO-FINANCING

### DIRECT CO-FINANCING :

The total of budget items in terms of direct contributions to the project is US\$ 22.391 millions for the project stages covering a period of 10 years. This includes **US\$10.070 millions from GEF**, **US\$ 8.397 millions** contributed by the **Senegalese Government**, and **US\$ 3.294 from UNDP**. From the government contribution, US\$ 7.266 will be contributed in kind in the form of part-time salaries of agents from technical services for their participation in implementation and follow-up activities at the national, regional and local levels. This contribution by the Senegalese Government is complemented by another cash contribution of US\$ 1.050 millions to cover the purchase of equipment for nurseries and fire-fighting to village committees organized for this purpose. The contribution negotiated with UNDP totals US\$ 3.294 millions, including US\$ 1.650 for Phase 1.

### REPROGRAMMED CO- FINANCING:

During the feasibility stage of project preparation, discussions were held with 6 ongoing and planned projects in the system boundary. These discussions have resulted in negotiated agreements on re-programming these 6 projects so that a portion of their project financing directly contribute to the GEF Alternative. This has been called “reprogrammed co-financing” and is considered as “real” co-financing for the project. The total amount of reprogrammed co-financing negotiated with and financed by projects underway in the 4 project sites is US\$ 15.603 millions.

Site	Project	Donor	Amount in US\$ millions	Duration
Ferlo	PRODAM	<i>IFAD</i>	4.000	2002-2006
<b>Niokolo-Koba</b>	AGIR	EU	1.105	2001-2004
Niayes	PRL	JICA	3.298	2001-2010
	PAEP	CIDA	0.700	2001-2003
	PADMIR	UNCDF	3.500	2001-2005
Saloum Delta	PMEPNDS	Netherlands	3.000	2000-2004

Total			<b>15.603</b>	
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**Letters of confirmation of all co-financing can be found in Annex 18b.**

**ANNEX 18B. LETTERS OF CONFIRMATION OF CO-FINANCING FROM ALL SOURCES**

(SEE ATTACHED « .TIF » FILES) as follows :

*PRODAM, IFAD*

AGIR, EU

PRL, JICA

PAEP, CIDA

PADMIR, UNCDF

PMEPNDS, Netherlands

Government of Senegal

UNDP

**ANNEX 19. MINISTER OF ENVIRONMENT AGREEMENT ON COMPLEMENTARITY BETWEEN UNDP-GEF AND WB-GEF PROJECTS.**

(SEE ATTACHED « .TIF » FILES)

## ANNEX 20: REFERENCES

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