COVER NOTE

Project Title: "Desert Margin Programme (DMP)"
Date: 22 October, 2001

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
1. Country Ownership		
• Country Eligibility		• The participating countries have all ratified the CBD – see cover page.
• Country Driveness	Clear description of Project's fit within: • National reports/communications to Conventions • National or sector development plans. • Recommendations of appropriate regional intergovernmental meetings or agreements.	• The DMP would build on the existing National Action Programmes (NAPs) of the CCD which have clearly indicated the need to carry out targeted actions in the sustainable use and conservation of biodiversity of the drylands at priority sites, see paragraphs 7-10.
• Endorsement	• Endorsement by national operational focal points	• Section 5 of the cover page specifies the dates of endorsement by all participating countries GEF Operational Focal Points.
2. Program & Policy Conformity		
• Program Designation & Conformity	Describe how project objectives are consistent with Operational Program objectives or operational criteria	• The project is consistent with the objectives of Operational Program #1 (Arid and Semi-Arid Ecosystems), it addresses biodiversity issues of global significance and is also of relevance to the OP12 on Integrated Ecosystem Management as well as OP13 on Conservation of Biodiversity important to Agriculture, through its focus on carbon sequestration and conservation of biodiversity within the managed/productive landscape, see paragraph 12.
• Project Design	Describe: • Sector issues, root causes, threats, barriers etc affecting global environment • Project logical framework, including a consistent strategy, goals, objectives, outputs inputs/activities, measurable performance indicators, risks and assumptions • Detailed description of goals, objectives, outputs and related assumptions, risks and performance	• The sector issues, root causes, barriers and threats to be addressed by this project are described in paragraphs 3-5. The arid ecotone between deserts and semi-arid areas is increasingly affected by degradation, either as a result of human-induced pressure spreading out from degraded semi-arid areas or as a result of less understood ecological and atmospheric inter-linkages between the two ecotones (see Annex M on the process of ecosystem degradation and breakdown in agricultural land), see the root cause analysis for each of the nine countries involved in Annex L.

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
	indicators • Brief description of project activities, including an explanation how the activities would result in project outputs (in no more than 2 pages) • Global environmental benefits of the project. • Incremental cost estimation based on the project logical framework • Describe project outputs (and related activities & costs) that result in global environmental benefits • Describe project outputs (and related activities & costs) that result in global and national environmental benefits • Describe project outputs (and related activities & costs) that result in national environmental benefits • Describe the process used to jointly estimate incremental cost with in-country project partner • Present the incremental cost estimate. If presented as a range, then a brief explanation of the challenges and constraints and how these would be addressed by the time of CEO endorsement.	• The overall objective of the DMP is to arrest land degradation in Africa's desert margins through demonstration and capacity building activities developed through unravelling the complex causative factors of desertification, both climatic (internal) and human-induced (external) and the formulation and piloting of appropriate holistic solutions. Seven project components have been identified : (1) ecological monitoring and evaluation; (2) biodiversity conservation and sustainable use; (3) sub-regional, national and local capacity-building; (4) alternative livelihoods; (5) policy and legal framework; (6) extension of sustainable natural resource management; (7) stakeholder participation. The outputs and activities are detailed in the logical framework matrix (see Annex B). • The incremental costs analysis in paragraphs 50-53 and Annexes Aa and Ab describes the domestic and global benefits to be expected from the project. The project will make a significant contribution in reducing land degradation in the marginal areas and help conserve biodiversity. It will use its regional network of sites to understand regional patterns and trends in land degradation, including loss of biodiversity and their causes, identify best practices from the nine participating countries, test best practices and develop national strategies to scale-up successful approaches.
• Sustainability (including financial sustainability)	Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors	Issues regarding sustainability are discussed in paragraphs 42 – 45. The ecological and financial sustainability of the overall project relie on the set-up of a participatory framework, the development of alternative livelihoods and national resource management strategies, and the creation of strong national partnerships and local constituencies for raising and managing funds.
• Replicability	Describe the proposed approach to replication (for e.g. dissemination of lessons, training workshops, information exchange, national and regional forum etc.) (could be within project description)	The whole project design will ensure replicability of good land management practices in other similar ecosystems.
• Stakeholder Involvement	• Describe how stakeholders have been involved in project development • Describe the approach for stakeholder	• The project involves a wide range of stakeholders including local communities, grassroot orgnaizations, service providers, local and international research institutions, international community involved

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
	involvement in further project development and implementation	indevelopment assitance programmes, etc. (see paragraphs 46-47 and Annex E). They were all involved in the project preparation through consultations, country visits, stakeholder workshops, etc. Further details on stakeholder consultations at site level will be provided at appraisal. • DMP will have two levels of activity : (I) national activities jointly implemented at the country level by the National Agricultural Research Systems (NARS), International Agricultural Research Centres (IARCs) and Advanced Research Institutes (ARIs) led by National Coordination Committees which will be interacting with the local stakeholders: and (ii) sub-regional/regional activities implemented by IARCs and ARIs, see paragraphs 48-49 and Annexes F and G.
• Monitoring & Evaluation	• Describe how project design has incorporated lessons from similar projects in the past • Describe approach for project M&E system, based on the project logical framework, including the following elements: • Specifications of indicators for objectives and outputs, including alternate benchmarks, and means of measurement. • Outline organisational arrangement for implementing M&E • Indicative total cost of M&E (may be reflected in total project cost).	• Project design has benefited from the various stakeholder workshops which have taken place for the preparation of the project. • Monitoring and evaluation will be conducted at two levels. Ecological monitoring will be conducted throughout the project with special emphasis in year one and two. The second type of monitoring will be done to assess progress made by the project, see paragraphs 54-59. • The cost of M & E of project progress is reflected in the full project cost and amounts to approximately US$250,000.
3. Financing		
• Financing Plan	• Estimate total project cost. • Estimate contribution by financing partners. • Propose type of financing instrument	• Total project cost is estimated at US$49,507,307- see cover page. • Estimated contribution from financing partners is US$18,165,307 in cash and US$15,000,000 in kind- see cover page. • Grant financing.
Implementing Agency Fees	Propose IA fee	• 382,000 US $ flat fee plus multicountry premium of US$50,000 to cover additional costs for evaluation missions and monitoring and evaluation in 9 countries and 19 sites.
• Cost-effectiveness	• Estimate cost effectiveness, if feasible • Describe alternate project approaches considered	• Cost-effectiveness will be ensured in DMP trough key mechanisms that will promote adaptive management practices incorporating the

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
	and discarded	capacity to respond to change (demonstartion sites providing a wide range of socio-economic and biophysical conditions and a strong comparative base for information on appropriate responsive mechanisms). In addition, only economically viable and environmentally friendly best practices will be promoted.
4. Institutional Coordination & Support		
IA Coordination and Support • Core commitments & Linkages	Describe how the proposed project is located within the IA's • Country regional/global/sector programs • GEF activities with potential influence on the proposed project (design & implementation)	• The project has been developed and will be implemented within the framework of UNEP's Early Warning and Assessment Programme. • The project has been closely designed to complement activities of existing GEF funded projects in DMP countries such as the Mangement of Indigenous Vegetation for the Rehabilitation of Degraded Rangelands in Africa (Botswana, Kenya, Mali). The TSBF's project on below-ground biodiversity both managed by UNEP, the Integrated Ecosystem Management in four representative landscapes of Senegal managed by UNDP.
• Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate.	• Describe how the proposed project relates to activities of other IAs and 4 RDBs in the country/region. • Describe planned/agreed coordination, collaboration between IAs in project implementation.	• Project implemented by UNEP with support of UNDP. • Both UNEP and UNDP to be represented in overall steering committee and executive committee.
5. Response to Reviews		
Council	Respond to Council comments at pipeline entry	N/A
Convention Secretariat	Respond to comments from Convention Secretariat.	N/A
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	(1) Exact activities to be supported under GEF funding – see Annex I: Budget by Output and Activity. A more detailed breakdown will be given at appraisal. (2) Linkages between GEF and non-GEF activities and the roles of various collaborators - see Annexes E: Public Involvement Plan and G: Project Management Structure. (3) Explanation of how this project will address the needs of the specific countries targeted in this project – additional clarification on linkages between DMP and implementation of the National Action Programmes under the CCD are given in paragraph 8 in the Brief.

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
		(4) Documentation of consultation with the relevant stakeholders at the various demonstration sites – information on this is given in the country reports and further details will be provided at appraisal. (5) The project has been phased into three phases – see Annex I for phasing of specific activities.
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBss on draft project brief.	See Annex C1
STAP	Respond to comments by STAP at work program inclusion.	See Annex C1
Review by expert from STAP Roster	Respond to review by expert from STAP roster	See Annex C

PROJECT BRIEF

1. IDENTIFIERS

PROJECT NUMBER:	*[Implementing Agency Project Number not yet assigned]*
PROJECT TITLE:	**Regional (Burkina Faso, Botswana, Kenya, Mali, Namibia, Niger, Senegal, South Africa, Zimbabwe): Desert Margin Programme, Phase I**
IMPLEMENTING AGENCY:	United Nations Environment Programme (UNEP) with support from United Nations Development Programme (UNDP)
EXECUTING AGENCY:	ICRISAT
REQUESTING COUNTRIES:	Regional - Africa: Burkina Faso, Botswana, Kenya, Mali, Namibia, Niger, Senegal, South Africa, Zimbabwe
ELIGIBILITY:	CBD Ratification: Botswana (12 Oct., 1997), Burkina Faso (2 Sept., 1993), Kenya (26 July, 1994), Mali (29 March 1995), Namibia (16 May 1997), Senegal (17 Oct., 1994), South Africa (2 Nov., 1995), Zimbabwe (11 Nov., 1994), Niger (25 July 1995). UNCCD Ratification: Senegal (26/07/95); Mali (31/10/95); Niger (19/01/96); Burkina Faso (26/01/96); Botswana (11/09/96); Namibia (16/05/97); Kenya (24/06/97); Zimbabwe (25/09/97); South Africa (30/09/97)
GEF FOCAL AREAS:	Biological Diversity with relevance to Climate Change and the Cross-Cutting Issue of Land Degradation
PROJECT DURATION:	6 years: 2+2+2
GEF PROGRAMMING FRAMEWORK:	Operational Programme 1 on Arid and Semi-Arid Ecosystems with relevance to OP12 on Integrated Ecosystem Management and OP13 on Conservation of Biodiversity important to Agriculture

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2. SUMMARY:

The overall objective of the DMP is to arrest land degradation in Africa's desert margins through demonstration and capacity building activities. The GEF increment to this project will enable the programme to address issues of global environmental importance, in addition to the issues of national economic and environmental importance, and in particular the loss of biological diversity, reduced sequestration of carbon, and increased soil erosion and sedimentation. Key sites harbouring globally significant ecosystems and threatened biodiversity have been selected in each of the nine countries to serve as field laboratories for demonstrations activities related to monitoring and evaluation of biodiversity status, testing

of most promising natural resources options, developing sustainable alternative livelihoods and policy guidelines and replicating successful models. The project will make a significant contribution in reducing land degradation in the marginal areas and help conserve biodiversity. Guidelines and recommendations domains and supportive national policies that address biodiversity concerns will be set in place in implementing countries.

3. COSTS AND FINANCING (MILLION US $)

GEF:	Project: Phase 1(2 years)	$ 4,987,134
	Phase 2 (2 years)	$ 5,617,044
	Phase 3 (2 years)	$ 5,365,822
	PDF A:	$ 25,000
	PDF B:	$ 340,000
	SUBTOTAL GEF:	$16,335,000
CO-FINANCING:	Governments in cash:	$ 665,307
	Contributions from Bilateral Donors at country level:	$ 4,372,000
	Other sources by Agency:	
	IARCs	$ 2,500,000
	ARIs	$ 1,500,000
	GTZ	$ 1,000,000
	Norway	$ 1,000,000
	USAID	$ 1,000,000
	IFAD	$ 2,000,000
	IDRC	$ 1,500,000
	JAPAN	$ 1,000,000
	DANIDA	$ 1,000,000
	EU	$ 1,000,000
	Subtotal Co-financing in cash:	**$18,537,307**
	Governments in kind:	**$15,000,000**
	Total Co-financing by phase:	
	Phase 1	$10,231,999
	Phase 2	$12,063,899
	Phase 3	$11,241,409
Total Project Cost:		**$ 49,507,307**

4. ASSOCIATED FINANCING (MILLION US $)

Burkina Faso	$ 4,720,652
Botswana	$ 240,000
Namibia	$ 412,580
Senegal	$ 1,994,000
Mali	$ 1,032,300
Niger	$ 4,292,856
South Africa	$ 1,997,953
Kenya	$ 31,464
Zimbabwe	$ 3,750,000
IARCs + ARIs	$ 10,065,000
Total	**$ 28,358,055**

5. OPERATIONAL FOCAL POINT ENDORSEMENT(S)

- **Senegal:** Name: Ms. Fatimata Dia TOURE, Director of Environment and Classified Establishments-Ministry of Environment; Date: Letter of Endorsement No. 0076/MJEPH/DEEC of 7 September 2001

- **Niger:** Name: Oumarou Elhadji, Secrétaire Ministere du Plan; Date: Letter of Endorsement dated 17 September 2001.17 – Name: Sala Hassane Amadou, President du CNEDD; Date: Letter of Endorsement No. 0962 dated 12 September 2001.

- **Burkina Faso:** Name: Jean-Baptiste Kambou, Ministere de l'Environnement et de l'Eau, Focal Point, GEF; Date: Letter of Endorsement no. 01616/MEE/FEM dated 14 September 2001

- **Mali:** Name: Salif Kanoute, Ministere de l'Equipement de l'Amenagement du Territoire de l'Enviornnement et de l'Urbansims, Focal Point GEF; Date: Letter of Endorsement no 248/MEATEU/STP-CIGQE dated 26 September 2001.

- **South Africa:** Name: Dr. Crispian Olver, Director General, Department of Environmental Affairs and Tourism, Focal Point GEF; Date: Letter of Endorsement no A24/21/3/5 dated 8 August 2001.

- **Namibia:** Name: Tangeni Erkana, Permanent Secretary, Ministry of Environment and Tourism, Directorate of Environmental Affairs, Focal Point GEF; Date: Letter of Endorsement no GEF DMP SEPT 2001 dated 27 Septemeber 2001.

- **Kenya:** Name: B.O. K'Omudho, Director, National Environment Secretariat, GEF Focal Point; Date: Letter of Endorsement no NES/CONF/07/10VOL.III dated 28 September 2001.

- **Botswana:** Name: M. Mphati for Permanent Secretary, Ministry of Agriculture; Date: Letter of Endorsement no A 12/1/1 VI, dated 28 September 2001.

- **Zimbabwe: Name:** M.T. Chinamora, GEF National Focal Point, Secretary for Environment and Tourism; Date: Letter of Endorsement dated 28 September 2001.

6. IA CONTACT: Mr. Ahmed Djoghlaf, Executive Coordinator, UNEP/GEF
Co-ordination Office, UNEP, Nairobi, Tel: 254 2 624153;
Fax: 254 2 520825; Email: ahmed.djoghlaf@unep.org

ACRONYMS AND ABBREVIATIONS

ACMAD	African Centre of Meteorological Applications for Development
AGRHYMET	Centre régional de formation et d'application en agrométéorologie et hydrologie opérationnelle
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CAZRI	Central Arid Zone Research Institute
CEH	Center for Ecology and Hydrology
CCD	Convention to Combat Desertification
CGIAR	Consultative Group on International Agricultural Research
CILSS	Comité permanent inter-états de lutte contre la sécheresse dans le Sahel
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CNRST	Conseil national de recherche en science et technologie
DAR	Department of Agricultural Research
DEDC-PAC	Dryland Ecosystems and Desertification Control Programme Activity Centre
DMP	Desert Margins Program
DRFN	Desert Research Foundation of Namibia
DRSS	Department of Research and Specialist Services
ENDA	Environment and Development Activities
FFA	Framework for Action
GCM	General Circulation Model
GCTE	Global Change in Terrestrial Ecosystems
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEWEX	Global Energy and Water-balance Experiments
GLASOD	Global Assessment of Soil Degradation
GNP	Gross National Product
HAPEX-Sahel	Hydrological Atmospheric Pilot Experiment in the Sahel
IAWGD	Interagency Working Group on Desertification
IARC	International Agricultural Research Center
IBSRAM	International Board for Soil Research and Management
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICASALS	International Centre for Arid and Semi-Arid Land Studies
ICRAF	International Centre for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IER	Institut d'économie rurale
IFDC	International Fertilizer Development Centre
IFPRI	International Food Policy Research Institute
IGBP	International Geosphere Biosphere Programme
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
INCD	International Negotiating Committee for a Convention to Combat Desertification
INERA	Institut national d'études et de recherches agricoles
INRAN	Institut national de recherche agronomiques du Niger
INSAH	Institut du Sahel
InSC	Interim Steering Committee

IPCC	Inter-governmental Panel on Climate Change
IPGRI	International Plant Genetic Resources Institute
ISC	ICRISAT Sahelian Center
ISNAR	International Service for National Agricultural Research
ISRA	Institut senegalaise de recherche agricole
ISRIC	International Soil Reference and Information Centre
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
NARS	National Agricultural Research System(s)
NARES	National Agricultural Research and Extension System(s)
NCC	National Coordination Committee
NDA	National Department of Agriculture
NGO	Non-Governmental Organization
NRM	Natural Resource Management
IRD	Institut de Recherche pour le Developpement (France)
PACD	Plan of Action to Combat Desertification
RFI	Range Forage Institute
SADC	Southern Africa Development Community
SALWA	Semi-Arid Lowlands of West Africa
SALT	Savannes a long terme
SAT	Semi-Arid Tropics
SPAAR	Special Program for African Agricultural Research
SSWNMRI	Systemwide Soil, Water and Nutrient Management Research Initiative
TAC	Technical Advisory Committee (of the CGIAR)
TSBF	Tropical Soil Biology and Fertility
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCOD	United Nations Conference on Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNSO	UNDP Office to Combat Desertification and Drought
WANA	West Asia North Africa
WCRP	World Climate Research Programme
WMO	World Meteorological Organization

BACKGROUND AND CONTEXT

1. The Desert Margins Program (DMP) has been developed in response to a recommendation made to the international research community at UNCED to consider specific contributions for implementation of the three International Conventions on Biodiversity, Climate Change, and Desertification. Three key areas were identified: (1) poverty alleviation; (2) increased agricultural production; and (3) environmental protection. Following this step, a CGIAR task force was appointed to prepare a report on the CGIAR response. The task force recommended that the CGIAR should undertake four global initiatives, including a Global Marginal Soils Initiative. The first effort at addressing the value and desirability of developing a Desert Margins Program (initially called DMI) to combat land degradation started in June 1993, just around the time negotiations for the INCD got under way.

2. Land degradation is recognized by the United Nations Convention to Combat Desertification (UNCCD) as a loss of both economic and environmental potential. In addition to the domestic costs of declining food productivity and increasing poverty, dryland soil degradation results in loss of globally significant biodiversity, genetic resources, a significant reduction in carbon storage, and increased sedimentation of rivers and lakes, thereby contributing to the degradation of international water systems.

3. Degradation of dry lands occurs as a subtle, dispersed, and continuous process, particularly in semi-arid areas far away from the desert fringes. However, the arid ecotone between deserts and semi-arid areas is also increasingly affected by degradation, either as a result of human-induced pressure spreading out from degraded semi-arid areas, or as a result of less understood ecological and atmospheric inter-linkages between the two ecotones. The true extent of permanent land degradation is not known; nor are the relative contributions of the various human and climatic factors understood well enough to prescribe sustainable long-term counter measures. We know however that both human and climatic factors contribute to dryland degradation in a number of complex, interactive ways (Annex M):

- First, direct anthropogenic pressures, such as overgrazing, over-cultivation, mismanagement of irrigated land, and deforestation can cause a decrease in vegetation cover, exposing vulnerable soils to erosion and affecting hydrological regimes (Annex D). Semi-arid soils (loams and clays) appear to be more vulnerable than arid sandy soils. These pressures also lead to a simplification of the plant community, decreased diversity (inter-specific and genetic), and loss of habitat integrity for globally significant fauna.
- A second mechanism triggered by the loss of vegetation is the propagation of further land-degradation via the land surface-atmosphere feedback. This mechanism however, is little understood at present.
- Natural climatic variability over geological time is a third mechanism whose effects are hard to separate from the fourth factor, recent climatic change. External influences from anomalies in sea surface temperature, deforestation in the humid tropics, and CO_2-induced climate change are thought to be associated with desiccation and drought in arid zones.

4. Desertification and land degradation lead to biodiversity loss, reduction in carbon stocks, and erosion of agriculturally productive landscapes. The contribution of drylands to carbon sequestration is little understood, and most likely under-estimated.

5. Areas of transition (ecotones) between more or less arid regions harbour globally significant biodiversity, and are also increasingly being recognized as important areas of speciation and genetic variability. Desertification is a major worldwide problem, but it is most extensive and severe in the arid and semi-arid areas in Sub-Saharan Africa, where one third of the entire world area of dryland soil degradation is to be found. Over 330 million ha of African drylands are subject to soil degradation. Areas of high degradation are extensive in Sub-Saharan Africa in the regions bordering the Sahara and Kalahari deserts. The gradient of aridity from the core of the Sahara and Kalahari deserts to the neighbouring arid and semi-arid lands acts as a natural screener of genetic adaptation to aridity. Although total number of species is lower in these areas than other biomes, the percentage of endemism is very high. The spatial heterogeneity based on the pattern of soil texture, rainfall distribution and re-distribution of surface water by run-off enhances the biodiversity of these ecotones in spite of extreme ecological condition for plant and animal lives. However, because of large rainfall variations between years, the survival of these animals and plants requires that large areas of land be kept under low human pressure. Land fragmentation that results from the expansion of crop agriculture, associated with deforestation and sedentary overgrazing, threaten the biodiversity of these ecosystems. There is a strong correspondence between the areas of land degradation and the arid (100-400 mm rainfall per year) and semi-arid zones (400-600 mm rainfall per year) (Annex Ka and Kb). The aridity (index 0.05-0.65) emphasizes the close relationship between land degradation and drought.

6. Past attempts to address and arrest land degradation have relied on International Agricultural Research Centres (IARCs), NARS, NGOs and other Advanced Research Organizations (AROs) working more or less independently with *ad hoc* inter-linkages through the NARS. Although this approach served the purpose of each institution, it failed to recognize the considerable benefits of synergy that could be derived from integrating individual institutional interests into a more holistic and coordinated approach.

7. The imperative for more effective utilization of resources to address common problems has brought together nine countries of sub-Saharan Africa: Kenya, Botswana, Burkina Faso, Mali, Namibia, Senegal, Niger, South Africa, and Zimbabwe into the Desert Margins Programme (DMP) (Annex Kc) with a basic premise to develop an integrated national, sub-regional, and international action programme for developing sustainable natural-resource management options to combat land degradation and loss of biodiversity. The DMP would build on the existing National Action Programs (NAPs) of the CCD and involve both development and action-research efforts to unravel the complex causal factors of biodiversity loss through land degradation, and formulate and pilot appropriate solutions.

8. NAPs developed in the DMP countries have clearly indicated the need to carry out targeted actions in the sustainable use and conservation of biodiversity of the drylands. Moreover, the sites selected by the DMP countries are priority sites for dryland conservation and rehabilitation highlighted in the different country NAPs and have been identified in a consultative process encompassing national stakeholders at all levels. Hence, the DMP meets the dual country needs of arresting land degradation at priority sites, and of developing replicable models for promotion of sustainable dryland management and food security in all drylands at risk of desertification. At the sub-regional level, programmes have been initiated to carry out targeted actions to conserve biodiversity, including inter alia, to create a sub-regional information system, to harmonize databases and to strengthen human capacity development at the grass-roots level. Southern African Development Community (SADC) for example has formulated a sub-regional programme that include early warning systems that

relate to food security and environment monitoring placing emphasis on capacity building, institutional strengthening and networking with the framework of their sub-regional action programme. Comité permanent inter-états de lutte contre la sécheresse dans le Sahel (CILSS) countries have similar provisions. DMP is expected to contribute to these efforts.

9. The DMP stakeholders have participated at different levels to the national process that led to the developing of these National Action Programs (NAPs) and the Sub-regional Action Programs (SAPs) and have therefore established strong linkages between DMP and the NAPs and SAPs to ensure a) better coordination of strategic frameworks to combat drought and desertification, b) the development of incentives system to secure long-term sustainability of field-level multisectoral action programs, c) strengthened public policy and enabling environment for addressing land degradation.

10. Therefore, mechanisms for better coordination and collaboration between NAPs, the environment programs and similar programs issued from CBD, UNFCCC exist. For example DMP-South Africa and the CCD national Scientific Task Team have been mandated by the South African government to play a major role in the coordination and development of these action programs and act on a consultative level in the revision of the current government Acts (NAP, CBD, Landcare, CONNEP, Conservation Act, Water Act, Land Tenure, etc.) and are also charged in fund raising, facilitation and prioritising of sustainable development projects, creation of quality control mechanisms and effective networking. Similar arrangements have been worked out in the remaining DMP countries.

11. 120 million people live in the nine countries participating in the DMP, with some of the highest population growth rates in the world. The majority of these people depend on rainfed agriculture and natural rangelands, which are particularly vulnerable to climate change. Cereal production per unit area of land has been decreasing in the last few decades because of the impacts of land degradation and increasing aridity, thus obliging farmers to clear more and more virgin land.

12. The project is eligible for GEF funding through the Operational Programme 1 on Arid and Semi-Arid Ecosystems because it addresses biodiversity issues of global significance. DMP is expected to provide benefits to two focal areas (biodiversity and climate change through carbon sequestration) and is therefore also of relevance to the GEF Operational Programme 12 on Integrated Ecosystem Management as well as 13 on Conservation of Biodiversity important to Agriculture, through its focus on carbon sequestration and conservation of biodiversity within the managed/productive landscape. Furthermore, this project is eligible for GEF funding through GEF's Action Plan to enhance support to land degradation that was adopted in 1999. The main elements of such action plan revolve around a) operationalising the linkages between land degradation and the GEF focal areas by on-the-ground activities; b) strengthening public policy and enabling environment for addressing land degradation; and c) engaging key stakeholders and enhancing GEF catalytic role in mobilizing resources to address land degradation. The project will make significant contribution towards the achievements of these goals. In addition to the GEF eligibility criteria listed above, all DMP member countries have ratified the three conventions on UNFCC, UNCC and CBD.

13. The project has been closely designed to complement activities of existing GEF funded projects in DMP countries such as the Management of Indigenous Vegetation for the

Rehabilitation of Degraded Rangelands in Africa (Botswana, Kenya, Mali). The TSBF's project on below-ground biodiversity both managed by UNEP, the Integrated Ecosystem Management in Four Representative Landscapes of Senegal managed by UNDP just to mention a few. It is therefore expected to enhance GEF overall impact in semi arid areas.

14. From a sustainable development perspective, and pursuant to the three fold objectives of the Convention on Biological Diversity, biodiversity conservation at agricultural forest margins should not occur at the expense of farmers livelihoods. Similarly, the GEF Operational Strategy and GEF operational programme 1 on Arid and Semi-arid Zone Ecosystems recognize that agricultural practices aimed at reducing GHG emissions and increasing carbon sequestration must also be economically and socially beneficial in order to be sustainable. DMP would also present its member countries contribution to the work of Committee on Science and Technology of the Desertification Convention (CST/CCD). More specifically it relates to the articles 17, 18 and 19 of CCD on institution building, training and development of national capacities. It would also make a contribution to the work of the SBSTTA of the CBD, the SBSTA of the UNFCC as well as to STAP.

RATIONAL AND OBJECTIVES

PROBLEM TO BE ADDRESSED

15. The overall objective of the DMP is to arrest land degradation in Africa's desert margins through demonstration and capacity building activities developed through unravelling the complex causative factors of desertification, both climatic (internal) and human-induced (external), and the formulation and piloting of appropriate holistic solutions. The GEF increment to this project will enable the programme to address issues of global environmental importance, in addition to the issues of national economic and environmental importance, and in particular the loss of biological diversity, reduced sequestration of carbon, and increased soil erosion and sedimentation, associated with land degradation in these arid and semi-arid ecotones.

16. The broader objectives of the overall DMP are to:

- develop a better understanding of the causes, extent, severity and physical processes of land degradation in traditional crop, tree, and livestock production systems in the desert margins, and the impact, relative importance, and relationship between natural and human factors;
- document and evaluate, with the participation of farmers, NGO's, and NARS, current indigenous soil, water, nutrient, vegetation, and livestock management practices for arresting land degradation and to identify socio-economic constraints to the adoption of improved management practices;
- develop and foster improved and integrated soil, water, nutrient, vegetation, and livestock management technologies and policies to achieve greater productivity of crops, trees, and animals to enhance food security, income generation, and ecosystem resilience in the desert margins;
- evaluate the impact and assist in designing policies, programs, and institutional options that influence the incentives for farmers and communities to adopt improved resource management practices;
- promote more efficient drought-management policies and strategies;

- enhance the institutional capacity of countries participating in the DMP to undertake land degradation research and the extension of improved technologies, with particular regard to multidisciplinary and participative socio-economic research;
- facilitate the exchange of technologies and information among farmers, communities, scientists, development practitioners, and policymakers.
- use climate change scenarios to predict shifts in resource base and incorporate these into land use planning strategies

17. The overall objective of the GEF alternative is to conserve and restore biodiversity in the Desert Margins through sustainable utilization. The GEF component will enable the DMP to address issues of global environmental importance, in particular the loss of biological diversity and reduced sequestration of carbon associated with soil erosion, sedimentation, and natural resource degradation and to develop replicable models for the sustainable use of dryland biodiversity. The unique focus of the GEF component of DMP is the promotion of enhanced ecosystem resilience in semi-arid areas, where agricultural land has been degraded by practices that negatively impact on biological diversity and global climate change.

18. The GEF increment will build upon the baseline and co-financing, to cover the additional costs related to achieving global benefits. Appendices A and B provide the detailed description of outputs, activities and co-financing arrangements for each participating country. Bottom-up consultations and negotiations were undertaken in each country with leaders of rural communities and donors of existing baseline activities to derive co-financing arrangements. In general, these co-financing will cover the cost of sustainable development activities, investments in production inputs, micro-credits, and promoting sustainable livelihoods strategies as well as replication of successful models.

19. The GEF increment (Annex Aa and Ab) will cover the costs of the full inventory of threatened and endangered species and habitats and monitoring of changes in biodiversity of global significance, development and implementation of sustainable harvesting regimes, validation and adoption of sustainable ecosystem rehabilitation techniques as well as the development and testing of sustainable biodiversity management and conservation technologies and models in selected project sites in each of the nine countries. Furthermore, it will enhance effective national participation in transboundary biodiversity conservation. For example, Mier, Paulshoek, Prieska and Namaqualand sites in South Africa (Annex Kc and Kd) share common boundaries with Botswana and Namibia. Sites in Mali (Gao) have common boundaries with sites in Niger. The GEF increment will also lift barriers to the sustainability of replicability of some of the successful technologies, approaches and models promoting conservation and sustainable use of biodiversity. The barriers are technical, economic, political and institutional in nature (Annex J). The GEF increment will address these barriers at the local (e.g. appropriate technologies, policies and economic incentives), national (e.g. capacity building, inter-sectoral policy reform, land tenure reform, legal clarification) and regional (e.g. tariffs on biodiversity products) levels.

20. The GEF component of DMP will further develop and implement improved management of land use practices that restore and rehabilitate degraded agricultural land through integrated approaches that lead to sustainable use of globally significant natural resources and landscapes. The focus will especially target the endemic organisms that are the keystone species, which determine ecosystem function, above and below ground, at different spatial scales (benchmark sites, national and sub-regional). This focus will seek to determine the causes, extent, severity of biodiversity loss, as well as the physical processes of soil and

ecosystem degradation in selected key sites in Africa that harbour globally significant biodiversity (Annex L).

21. The DMP takes an innovative participatory and integrated natural resource management (INRM) approach. The goal is the conservation of biological resources through restoration activities that reverse degradation processes in managed landscapes, rather than the preservation of specific ecosystems or species (in protected areas). The specific outputs will be actively disseminated to all stakeholders, including policy makers in each country. This knowledge and experience will also be shared with stakeholders at all levels, through 2-way interchange between project partners.

22. DMP will also encourage other types of sustainable land use and promote parallel activities that develop alternative livelihoods (e.g. eco-tourism) within the project areas, as well as at the sub-regional (E&S Africa and W Africa) and at the regional scale. Sustainable livelihood strategies that promote wise use of natural resources, such as those that develop the use of medicinal plants, will also be addressed. In addition, DMP will actively promote public awareness of sustainable biodiversity management and capacity building of national partners through knowledge sharing, training activities and collaborative research.

SITE ACTIONS

23. Land degradation is diverse in form and impact on farming systems, suggesting that generalization is likely to be a problem. One of the implications for a project strategy is a need for detailed case studies and an emphasis on the particularities of the local history of land degradation and regeneration. This emphasis implies that both research and the design of interventions must invest intellectual resources in the contextualization of the problems of resource use.

24. The strategy proposed for choosing sites within the DMP project is to focus most of the effort on a small number of well-monitored sites where the work of the soil, plant, and animal scientists can be integrated with the studies performed by the socio-economists, policy analysts, and institutional analysts. These sites will also act as sub-regional "field laboratories", where the necessary interactions will be established between farmers, researchers, and development workers. It is the partnerships formed by this integration of disciplines and combination of farmers/resource users contemporary knowledge, research and development which is the strength of the DMP project. The strategy of focusing on a few sites of this kind will also avoid duplication of effort and will give a critical mass of work which can achieve the progress necessary for tackling the complex problem of land degradation.

25. Based on above, the following sites have been selected in each country: Burkina Faso (District of Bah, District of Katchari and District of Oursi); Botswana (Bobirwa and Khalagadi Districts); Mali (Gao); Namibia (Northern edge of the Nama-karoo region, and northern region of Namibia); Niger (West and East); Senegal (North and Center zones, Western zone, Center, East and south zones, and Estuary zone); South Africa (Mier (Kalahari), Paulshoek/Leliefontein in Nanagualand, Suid Bokkeveld in the Hantam District of the Northern Cape); Kenya (The Kargi settlment area of Marshabit District, the Tarack River of Turkana District and the Kaambeere area in Mbeere District); Zimbabwe (The Mayingo South, the Matebeland South and North and Lowveld areas of Zimbabwe). Annexes Kc and

Kd provide more details of each site while full description can be found in each country annex (available on file).

26. There are already some areas in the DMP countries where there has been significant relevant study and assessment of sites for their suitability for studying land degradation and natural-resource management. The DMP will capitalize on this by linking its activities to build on what has already been done. The final selection of sites has been made during national workshops. To obtain standardization across sub-regions, the following guiding principles have been used:

- build on areas where substantial relevant studies already exist; Work in areas where there are interactions between facets of natural resource management land use, farmers' fields, pastures, trees, etc.;
- use areas that are physically well-defined (e.g., watershed), where most of the key natural resource and socioeconomic phenomena occur;
- select areas that are accessible and have the basic facilities to allow the efficient conduct of multidisciplinary research and development activities;
- select areas which have been identified as prioritized zone by both biodiversity strategy and action plan, NEAP and/or NAP.

27. The envisaged methodologies at each site will include:

(a) Demonstrations and experiments to be conducted on farmers fields and on rangelands in actual resource use condition at different stages of degradation to demonstrate the effect of grazing management on flora diversity, range productivity, soil physical and chemical properties and animal production. The demonstration experiments will be repeated for a minimum of three years to capture the dynamics of vegetation and account for interaction effects of rainfall conditions. Modelling the effect of rotational grazing on herbaceous growth during the wet season and on standing hay and litter disappearance during the dry season will permit the application of the findings to a wider range of situations.

(b) Assessments of the genetic diversity losses that may result from the expansion of cropped land, the fragmentation of rangelands associated to increasing grazing pressure and wood harvesting will be carried out. The potential offered by marginal lands, fallows and ecotones at field edges, along drainage lines and roadsides to maintain some plant diversity will also be evaluated.

(c) Forage species adapted to grazing and drought stress will be identified. Populations of these species will be sampled along the climatic gradient and in areas of different grazing history in order to characterize the genotype of the best adapted provenances using specialized molecular analysis such as isozyme and DNA profiles. Subsequently, field experiments will be carried out to test and demonstrate the usefulness of the selected genotypes in the reclamation of degraded rangelands and production of good quality forages in the semi-arid zone.

(d) Farm surveys will be conducted to identify economic policies and institutional arrangements that would facilitate the adoption of improved grazing management systems and use of selected genotypes in the reclamation of degraded lands.

(e) The economic profitability of recommended resource management systems involving grazing management and herd mobility will be established under different environmental conditions

(f) Assessments carried out on crop genetic losses that may result from habitat disturbance, market-driven forces leading to crop uniformity and the replacement of traditional varieties, and catastrophic events such as war and climatic episodes,

(g) Subsequently, formulate strategies on how to conserve and distribute the maximum biodiversity of Semi-Arid Tropics (SAT) food crops and how to diversify SAT cropping systems through a broader choice of crop and livestock options,

(h) Accelerate impact by scaling up promising technologies, using new informatics tools,

(i) Assess how to use community-based participatory approaches to enhancing the return on natural resource assets,

28. The benefits of more sustainable agricultural practices are evidently local and national. However, they are also global since the sustainable use of the resource base of agriculture promotes the conservation of the unique above - and below - ground plant and animal biodiversity of the dry tropics. The benefits of biodiversity conservation, carbon sequestration and decreased GHG emissions are largely global. A basic premise of the project is that these global environmental benefits can be achieved only through a combination of appropriate land-use practices and supportive national and global policies.

29. The project will result in the identification of benefits that have been found to accrue global incremental environmental benefits in terms of conserving biodiversity and minimizing the impact of climate change. From a biodiversity perspective, the project is in support of and consistent with Decision III/11 of the Conference of Parties regarding conservation and sustainable use of agricultural biological diversity which highlighted, in that Decision document, important aspects under the land resources thematic area to be considered for priority funding by the GEF.

30. Selected and recommended practices will have measurable costs (e.g. of labour) associated with carbon and biodiversity management but will also generate local agricultural benefits (e.g. more stable production). Such recommendations inevitably require some trade-offs between global and local benefits. This is why technological alternatives will be developed that will ensure that local benefits, become sufficiently attractive for farmers to adopt the recommended practices. These recommendations will be widely disseminated so as to benefit other GEF recipient countries with similar ecological and socio-economic conditions. Lastly, the envisaged GEF financial contribution will cover the incremental costs of the programme while the in-kind and direct contributions from the partners and co-financing from other donors will cover costs related to local and/or national benefits. Linkages to related presently on-going programmes are explained in each country annex.

COMPONENTS AND EXPECTED OUTPUTS

31. The DMP partners have gone through a bottom-up participatory planning process during the PDF-B phase. This has resulted in each country preparing its own logical framework including an indicative list of activities, verifiable indicators, means of verification, and assumptions, which are presented in country annexes (available on file). Each national consultation was facilitated by either an international consultant or by the DMP global

coordinator. Furthermore, each sub-region organized a sub-regional consultation meeting to develop a sub-regional logical framework. The LFA for West Africa and that of East and Southern Africa are available on file.

32. Finally, a global stakeholder meeting was organized in Nairobi to develop a global DMP logical framework. See Annex B. The following is a brief description of the expected outputs and GEF increment for each component. More details are given in Annex Aa for incremental costs and in annex H for major projects activities by year. Annex I gives a breakdown of activities by component and indicates the amount of co-financing as well as GEF funds requested for each activity. Annex I moreover indicates in which phase of the project the respective activities will be implemented.

Component 1: Ecological Monitoring and Evaluation ***(GEF: US$4,466,265; Co-financing: US$6,984,230)***

33. This component is aimed at improving knowledge about the physical processes leading to biodiversity loss in the drylands, in particular the relative importance of human and climatic factors, the development of quantitative indicators of biodiversity loss, and improved monitoring techniques.

Component 2: Biodiversity conservation and sustainable use *(GEF: US$2,177,504; Co-financing: US$5,086,006)*

34. This component will emphasize participatory testing of strategies for conservation, restoration and sustainable use of degraded agro-ecosystems with farmers, rural communities, NGOs and decision markers. It will identify, document and evaluate and mainly test existing best practices, pilot selected technologies that enhance conservation, restoration and sustainable use of biodiversity and disseminate, promote and facilitate the adoption and implementation of the best practices and proven technologies. This component will foster improved and integrated soil, water, nutrient, vegetation, and livestock management technologies to achieve greater productivity of crops, trees, and animals to enhance food security, and ecosystem resilience in the desert margins. It will lead to:

(a) The identification of livestock management practices that preserve biodiversity and resilience of natural vegetation in the arid zone and minimize land degradation and biodiversity loss in the semi-arid zone

(b) Improved methods for restoring and sustaining long-term fertility in dryland areas to effectively reduce biodiversity loss

(c) Improved soil and water management techniques for increasing plant water-use efficiency

(d) Sustainable crop production technologies that conserve the environment and are socially and economically acceptable, and meet the food and fodder needs of local populations in the dryland areas

(e) Strategies for enhancing ecosystem resilience through optimisation of biodiversity

Component 3: Sub-regional, National and local capacity building *(GEF: US$3,749,701; Co-financing: US$8,969,133)*

35. Given the lack of appropriate personnel and facilities in many participating countries to design and effectively implement natural resource management strategies, it is important to enhance institutional capacities. Emphasis will be placed on:

- reinforcement of national capacities to carefully monitor climate, soil, vegetation and livestock trends and dynamics;
- standardization of methodologies to ensure data quality;
- building effective partnership of national (NGOs, rural communities, CBOs), regional and international institutions to create a continuum from identification, testing to extension and adoption of technologies for arresting biodiversity loss and promoting its sustainable use
- building capacity of stakeholders in land use planning. The GEF increment will enhance stakeholders' awareness and skills in natural resource management and strengthen community involvement in natural resource management leading to more effective biodiversity conservation and reduction in natural resource degradation.

Component 4: Alternative Livelihoods *(GEF: US$967,100; Co-financing: US$2,960,150)*

36. This component will identify, develop an inventory and document economically viable livelihood options. It will create an environment conducive to the adoption of improved plant nutrient technologies through programs that promote a more efficient procurement, distribution, and marketing of inputs and programs that enhance effective utilization of farm outputs through the development of micro enterprises. It will increase the local awareness and use of the indigenous dryland products, processing and enhanced marketing strategies, develop markets for non-timber forest products and other dryland products, implementation of pilot schemes with alternative crop technologies that have proved to be successful in several regions for sustainable utilization of existing inputs and enhancing productivity. Examine ways to add value to the outputs from the farm in order to increase the farmer's income.

Component 5: Policy and legal framework *(GEF: US$1,427,000; Co-financing: US$1,720,345)*

37. Incentives for farmers and rural communities for the conservation and sustainable use of natural resources are influenced by a variety of social, economic and political factors. These include micro and macroeconomic policies, legal rules of access to resources, direct public investment, institutional mechanisms put into place to support these policies. The DMP work will not only be synchronized with existing work on policy reform to avoid any duplications but will focus mainly on informing policy debate. It would address micro-economic issues, but also include a broader mandate to look at:

- How macro, trade and agricultural sector policies impact on dryland areas, including the likely impact of trade liberalization and globalisation
- A range of local institutional issues, including property rights arrangements and incentives for collective management of rangeland resources

- Payoffs from investing in dryland areas as policy makers, especially finance ministers, remain sceptical that investing in dryland areas is a good use of scarce public funds
- Analysis of how livelihood strategies change in response to desertification and what policies can be enacted to mitigate the negative effects on farmers and farm communities
- Document "successes" and "failure" for lessons learned, as well as carry out an overall evaluation of what past investments have achieved at an aggregate level
- Share information and knowledge with policy makers to inform on-going policy debates

Component 6: Extension of Sustainable Natural Resource Management *(GEF: US$2,502,151; Co-financing: US$4,570,972)*

38. This component will foster improved and integrated soil, water, nutrient, vegetation, and livestock management technologies to achieve greater productivity of crops, trees, and animals to enhance food security and ecosystem resilience. It will ensure the integrated management of biological diversity by households and farmers associations so as to improve their incomes. It will enhance the capacity of national agricultural research systems (NARS) to identify in collaboration with farmers natural resource management methods and technologies that include strategies for implementing and promoting conservation, restoration and sustainable use of degraded ecosystems.

Component 7: Stakeholder participation (*GEF: US$680,279; Co-financing: US$3,246,471)*

39. This component covers activities intended to guarantee the participation of all stakeholders and especially the participation of the most vulnerable groups in the design, implementation and follow-up/evaluation of the project. It will establish a permanent dialogue framework using participatory tools. It will evaluate the existing interface between experts and rural communities in order to identify effective mechanisms constitute working groups, especially of women and promote effective linkages between researchers and rural communities in all project sites.

EXPECTED END OF PROJECT SITUATION

40. It is expected that the project would make a significant contribution in reducing land degradation in the marginal areas and help conserve biodiversity. The project will at the same time provide alternative livelihoods to the rural communities. Most of the stakeholders especially the local communities in and around the project sites, will have developed a common purpose and acquired the necessary skills, strategies and policies to:

a) conserve and restore biodiversity
b) reduce and ultimately stop land degradation
c) manage the environment and the natural resources in a sustainable manner

41. It is also expected that guidelines and recommendation domains (areas) and supportive national policies that address biodiversity concerns would be in place in implementing countries. The role of women in decision making on management of natural resources will also be greatly improved. The project is expected to effectively address the root causes of the threats to globally significant ecosystems in the region (long-term impact)

and contribute towards biodiversity restoration in the region. The following outputs are envisaged from the implementation of the full-scale project:

- data on existing technologies (indigenous, new technologies, policy and institutional changes) and identification of those proven to increase the sustainable use of biodiversity (plants, animals and trees), arrest soil erosion and sedimentation;
- developed and tested technological options in collaboration with other partners to arrest and reverse land degradation and its negative impacts.

RISKS AND SUSTAINABILITY

42. In each country, the DMP project falls within adopted national tools such as National Environment Action Plans (NEAP), National Biodiversity Strategies and Action Plans, and National Action Programs (NAP). The commitment of governments at policy and operational levels through co-funding, the adoption of the decentralisation process in most of participant countries, the presence of governmental institutions at the project sites, and the active involvement of NGOs and community based organisations, will ensure sustainability of the project and follow-up activities. Sharing of resources, skills and experience will be fostered to engender complementarities. Implementation will also actively involve beneficiary groups such as farmers, rural communities, NGOs, governmental institutions and private sector within a participatory framework to ensure project ownership and future implementation and sustainability.

43. Win-win measures such as developing alternative livelihoods that release much of the pressure from the dryland soils and water resources and sustainable national resource management strategies will be developed leading to both environmental conservation and improved economic returns. Similarly proven techniques tested and demonstrated at DMP sites are expected to spread and be taken by other communities well beyond the project completion.

44. Also, the structure of the project is designed to insure the participation of local experts in all related aspects of the proposed activities and consequently to secure a strong technical level of sustainability of futures activities. The project will enhance the sharing of skills and experiences between the nine countries. This will permit the replication of the process within other African countries.

45. During the five years of GEF funding, financial sustainability will also have been created. This will be done through building national capacity to raise and manage funds from sources other than GEF and through the creation of strong national partnerships and local constituencies which are not dependent on significant external funding to ensure on-going programs and activities. Sustainable funding mechanisms (such as trust funds, endowments and sponsoring etc.) will have been evaluated and set in place, where appropriate. At the end of the project, stakeholder participation should continue with each contributing skills, experience and required materials and financial support for those activities identified by the project as being of economic and ecological importance.

STAKEHOLDER PARTICIPATION AND IMPLEMENTATION ARRANGEMENTS

46. The DMP is conceived as a regional project because its participating countries face similar threats to globally significant biological diversity, namely similar forces that lead to

land degradation. Nine of the countries in the region have expressed a strong interest to join forces to develop a common programme. Thus there is a logic to sharing learning about appropriate responses to these particular threats over possibly rather different types of ecosystems. The regional component of the project will focus on information and technical exchange, and harmonization of pilot demonstration activities addressing biodiversity loss, land degradation, and reduction in carbon sinks.

STAKEHOLDER PARTICIPATION

47. National programmes have clearly identified various groups of individuals/organisations who are going to benefit from the DMP/GEF programme. An analysis of the national programmes reveal that these groups fall into five categories as identified below:

(a) Local communities, pastoralists / agro-pastoralist farmers through better knowledge on the management of Natural Resources and hence;

- -easier access to medicinal plants and water,
- -improved nutrition to families and fodder to livestock and wildlife,
- -reduced levels of poverty due to alternative livelihood options, and
- -reduced loss of biodiversity and general degradation of the ecosystem.

(b) Grassroot organizations - CBOs and NGOs through access to appropriate technologies to plan and guide sound natural resources management programmes among local communities.

(c) Service providers - Government and NGOs involved in Policy making and extension through better understanding of biodiversity issues resulting from;

- participatory interaction with local communities and grass root organizations regarding Natural Resource aspects,
- access to sound information on biodiversity an ecosystem functions for sound policy and decision making as well as preparation and dissemination of relevant packages, and
- training in biodiversity and ecosystems aspects.

(d) Local and international research Institutions in terms of;

- improved interaction and linkages with local communities and NARS (target populations) and hence development of sound intervention approaches, and
- training in biodiversity and ecosystems aspects.

(e) International community involved in development assistance programs in terms of

- better policy environment guaranteeing enhanced
- more committed development partners success

IMPLEMENTATION ARRANGEMENTS

48. DMP governance is organized according to three distinct and complementary levels: national level, sub-regional level (western, and southern / eastern Africa), regional level (Africa) including at the GEF level (e.g., GEF/UNEP, GEF/UNDP). The governing body for

the DMP is a Steering Committee that will provide policy guidance and direction. NARS and NGOs are at the center of the organizational structure. The Steering Committee consists of representatives of the DMP Consortium (see composition below and in Annex F). The consortium of partners (see Table 1; Annex E) pools resources and expertise of nine NARS and NGOs, four sub-regional organizations (CORAF for western Africa, SADC/SACCAR for southern Africa, and ASARECA for eastern Africa), five IARCs (ICRAF, ICRISAT, IFDC, ILRI, and TSBF), and three ARIs (CEH, CIRAD and IRD, with the experience of UNEP and UNDP in the implementation of the CBD, UNFCC and UNCCD).

49. A coordination and communication structure has been put in place. The Coordination Unit is headed by a "DMP Coordinator", with a Programme Assistant. The DMP Coordinator oversees the day-to-day direction of the scientific programme as a whole and is responsible for scientific and administrative aspects of liaison between all collaborators. He reports to the DMP Steering Committee and ICRISAT. The DMP Coordinator will plan and manage the work of the coordination unit, located at the ICRISAT Sahelian Center in Niger and will be responsible to the DMP Steering Committee and act as its ex-officio member-secretary. The DMP Coordinator will organize meetings and interact with the NCCs and regional organizations, to ensure that the results are effectively synthesized and reported, review the research, report to the steering committee, and assist them in their work. ICRISAT will ensure the accountability of DMP funds. Details of the project management structure are given in annex G.

INCREMENTAL COSTS AND PROJECT FINANCING

50. The deteriorating productivity through land degradation and loss of biodiversity is to the communities dependent on dryland ecosystems a serious threat to their survival and well-being, and to the global community a potential threat to climatic stability through global warming. The proposed project is part of regional programme that addresses biodiversity issues of local, regional and global significance. Sharing of information from cross-site comparison is expected to enhance success. The project will contribute to and thus enhance the global biodiversity database.

51. The GEF increment to the project (Annex Aa and Ab) will enable it to specifically address issues of global environmental importance, primarily in the area of biodiversity but with secondary impacts in the areas of climate change (carbon sequestration) and international waters (reduced sedimentation and pollution). Examples of these include:

- Full inclusion of biodiversity and above and below ground biomass (carbon storage) issues in analytical and monitoring activities;
- understanding impact of different management regimes on biological diversity (plants and animals);
- inclusion of studies on sedimentation (siltation) of trans-boundary rivers and lakes;
- study of fugitive dust and impacts;
- large-scale carbon (carbon sequestration) and nutrient (biodiversity) balance models in arid lands;
- understanding and developing strategies for enhancing ecosystem resilience through sustainable use of biodiversity; development of participatory approaches to vegetation management and biodiversity conservation.

52. The total cost of the GEF Alternative, including the baseline, is US$77,865,362. The baseline cost of currently undertaken activities are estimated at US$28,000,000.

53. The GEF incremental cost is US$49,872,307 including the PDF-B and PDF A grants of US$340,000 and US$25,000 respectively.

Co-financing in cash is estimated at US$18,537,000 from several sources, including contribution from the governments of the nine countries, bilateral donors, operating in each country (GTZ, UNDP, USAID, IDRC, IFAD) as well as contribution from IARCs and ARIs. In-kind contribution from the government is estimated to be around US$15,000,000. Furthermore, it is expected that rural communities will also contribute in-kind resources (labour, minor equipment, land and seeds) but this has not yet been quantified.

The requested GEF contribution to the project is US$15,970,000 (Annex I).

a) Incremental Cost Table (US$)

Outputs	Baseline	Alternative	Co-funding	GEF
1. Monitoring and Evaluation	10,935,017	22,385,512	6,984,230	4,466,265
2. Testing and implementation	3,564,448	10,827,950	5,086,006	2,177,504
3. Capacity building	5,213,263	17,932,097	8,969,133	3,749,701
4. Sustainable alternative livelihoods	1,932,062	5,859,312	2,960,150	967,100
5. Policy and legal framework adopted	1,574,285	4,721,630	1,720,345	1,427,000
6. Up scaling of NRM options	2,989,647	10,062,770	4,570,972	2,502,151
7. Stakeholder participation	2,149,333	6,076,083	3,246,471	680,279
Total	**28,358,055**	**77,865,362**	**33,537,307**	**15,970,000**

Annex Ab. on incremental cost table provides details on outputs that give global versus domestic benefits.

b) Component Financing (US$)

Component	GEF	Co-financing	Total
1. Monitoring and Evaluation	4,466,265	6,984,230	11,450,495
2. Testing and implementation	2,177,504	5,086,006	7,263,510
3. Capacity building	3,749,701	8,969,133	12,718,834
4. Sustainable alternative livelihoods	967,100	2,960,150	3,927,250
5. Policy and legal framework	1,427,000	1,720,345	3,147,345
6. Up scaling of NRM options	2,502,151	4,570,972	7,073,123
7. Stakeholder participation	680,279	3,246,471	3,926,750
Total	**15,970,000**	**33,537,307**	**49,507,307**

MONITORING, EVALUATION AND DISSEMINATION

54. Monitoring and evaluation will be conducted at two levels. Ecological monitoring will be conducted throughout the project with special emphasis in year one and two. This constitutes component 1 of the project activities and include inventories, surveys and targeted research at project sites. Results from this monitoring will be used to guide the project development activities.

55. The second type of monitoring will be done to assess progress made by the project. The research outputs will be monitored annually through individual reports presented by the collaborating institutions/partners at the national annual technical meetings, and by the combined annual project reports.

56. At each annual meeting, the participating institutions will present their work plans and budgets for the following year. The national steering committee will evaluate the documents for consistency with the goals and objectives of the project and will approve the annual work programme and budgets.

57. The entire DMP/GEF project will be subject to an external mid-term (2/12 years) review to obtain an independent assessment of progress and recommendations for completion of the project. A final external review will be done at the end of the project to assess its achievements and make recommendations on how to ensure its long-term sustainability.

58. It is envisaged that through its capacity building activities, project staff, NGOs, rural communities and policy makers will be encouraged to disseminate lessons learnt, project results and other relevant information on sustainable use and conservation of biodiversity. Supervision mission by UNEP-GEF, UNDP-GEF and ICRISAT will be done annually to gauge project progress and gather and disseminate lessons learnt.

59. Finally all Monitoring and Evaluation activities will follow standard ICRISAT, GEF, UNDP and UNEP procedures. To that effect, a detailed Monitoring and Evaluation Plan will be developed by the time of CEO endorsement.

LIST OF ANNEXES

Annex Aa. **Incremental Cost**

Annex Ab. **Incremental cost matrix**

Annex B. **Logical Framework**

Annex C. **STAP Roster Technical Review**

Annex C1. **Response to STAP/Council/IA comments**

OPTIONAL ANNEXES:

ANNEX D. **ROOT CAUSES AND THREATS**

ANNEX E. **PUBLIC INVOLVEMENT PLAN**

ANNEX F. **DMP ORGRANIGRAMME**

ANNEX G. **PROJECT MANAGEMENT STRUCTURE**

ANNEX H. **PROJECT WORKPLAN**

ANNEX I. **BUDGET**

ANNEX J. **CONSTRAINTS TO SUSTAINABLE AGRICULTURE AND BIODIVERSITY USE**

ANNEX K a. **RAINFALL ZONES MAP**

ANNEX Kb. **DMP LAND DEGRADATION MAP**

ANNEX KC. **DMP COUNTRIES AND SITES**

ANNEX KD. **PROJECT SITES**

ANNEX L. **Globally Significant Ecosystems in DMP Member Countries**

ANNEX M. **PROCESS OF ECOSYSTEM DEGRADATION**

ANNEX Aa: INCREMENTAL COSTS

1. BROAD DEVELOPMENT GOALS

The broad development goals of each country are summarized under section A of the project brief.

2. GLOBAL ENVIRONMENTAL OBJECTIVES

The project brief identifies a number of threats to the conservation and sustainable use of biodiversity in the 9 project sites (see also Annex D). There are a number of baseline activities already addressing these threats by promoting sustainable development. All of them are important, however they will not address the full scale of the problem of natural resource degradation in sub-sahelian Africa. This project will use its regional network of sites; to understand regional patterns and trends in land degradation, including loss of biodiversity and their causes; identify best practices from the 9 participating countries; test best practices; and develop national strategies to scale-up successful approaches. The project will leverage existing experience and pool knowledge to more effectively address the problems facing biodiversity conservation and sustainable use throughout the 9 participating countries.

3. BASELINE

Below is a brief summary of planned activities at GEF project sites, for the duration of GEF project. The activities are summarized under the GEF project output of the LFA to which they are expected to contribute. They are also described in more detail, by country in each country LFA.

Output 1: Ecological Monitoring and Evaluation

USD 10.9 million in baseline expenditure will support this output. Soil and vegetation inventories, including biodiversity are fairly widespread across the project sites (Kenya, Zimbabwe, Burkina Faso, Mali, Niger). Levels of details, coverage and the age of data varies across countries. Supplementary work by the DMP project will be necessary to generate consistent baseline data. Some countries, and project sites have begun modelling climate change, hydrological cycles (Kenya, Zimbabwe, Burkina Faso, Senegal, Mali, Niger) and are studying the impact of land use on the resource base, including levels of degradation, soil fertility, and changes in biodiversity and cover. These programmes will be strengthened by the DMP, and harmonized to generate regional sub-sahelian perspective on the impacts of land use and climate change on the resource base. Finally some countries are looking into socio-economic change in the project sites and potential measures for adapting to climate change, including deriving lessons learned from indigenous and project practices in agriculture, pastoralism and agro-forestry (Kenya, Burkina Faso). The project will link together all project sites for information sharing to derive best practices across the eco-region.

Output 2: Biodiversity Conservation and Sustainable Use

USD 3.6 million in baseline expenditure is planned which will support this output. Sustainable use and rural development activities cover agricultural, pastoral; agro-forestry and forest, land uses. A couple of initiatives are planned to identify and re-popularize sustainable indigenous land use practices (Zimbabwe, Senegal). A number of activities are planned to help communities improve their management of soil and water resources, retain soil fertility, avoid soil erosion, and make best use of water resources (Zimbabwe, Burkina

Faso, Senegal, Niger). The DMP will take the latest lessons from the field, indigenous knowledge and scientific research from across the region to update and rationalize approaches to water and soil management at project sites. Rural development initiatives are planned to help local communities build the capacity to organize themselves into collectives and cooperatives, increase their levels of productivity and add value to farm gate prices (Kenya, Burkina Faso). Finally there are a number of baseline activities to rehabilitate pastoral areas, encourage natural regeneration of over-used species, and to re-afforest degraded areas, and stabilize sand dunes (Burkina Faso, Senegal, Niger). The DMP will build on the foundations laid by the community development and rehabilitation activities, building on the broad base of experience.

OUTPUT 3: NATIONAL, SUB-REGIONAL AND LOCAL CAPACITY BUILDING

USD 5.2 million in baseline funding is planned which will support this output. Two initiatives are planned to build local government natural resource management capacity, and improve extension services to farmers. (Namibia, Senegal). Zimbabwe is planning to build the capacity of pastoralists to monitor the condition of their own pastoral resources. Natural resource management initiatives are planned to help communities organize, plan and manage the use of their own natural resources, especially community lands. Activities include the formation of rural management units; building conflict resolution skills; helping pastoral communities to reduce their risk exposure to the effects of climatic variation; and to help communities manage village woodlots (Kenya, Namibia, Burkina Faso, Senegal, Niger).

OUTPUT 4: ALTERNATIVE LIVELIHOODS

USD 1.9 million in baseline financing is planned, that will support this output. A couple of initiatives are planned at project sites to encourage the development (as opposed the modification of) new rural enterprise and livelihood ventures. Both Kenya and Burkina Faso are planning to promote alternative rural enterprise, by making rural credit available to seed new ventures, and provide renewable sources of energy for rural initiatives, and provide business development support for new enterprises. In Senegal activities are planned to domesticate new wild fruit, for commercialisation.

OUTPUT 5: POLICY AND LEGAL FRAMEWORKS

USD 1.6 million in baseline funding is planned, that will support this output. A number of initiatives are planned to generate a policy and regulatory environment to encourage sustainable use of natural resources. Zimbabwe is developing policy guidelines to further facilitate community-based management of natural resources, as well as monitoring and evaluation of the natural resource base. Namibia has evaluated policy effecting land degradation, and plans to develop policy guidance to address the problem. Burkina Faso is finalizing its Biodiversity Strategy and Action Plan, and is developing a national eco-strategy. These efforts will be consolidated and expended under the DMP.

OUTPUT 6: EXTENSION OF SUSTAINABLE NATURAL RESOURCE MANAGEMENT

USD 3.0 million in baseline funding is planned that will support this output. Activities to scale-up best practices in land use, are mainly confined to information dissemination and exchange, and awareness raising. Zimbabwe is planning a number of workshops and is training extension workers in sustainable land use practices, and there is some local and national advocacy to scale-up conservation tillage practices. Niger plans to disseminate best sustainable land use practices. The DMP will make a sustained effort to stimulate proactive scaling-up of best practices through the development of national strategies.

OUTPUT 7: STAKEHOLDER PARTICIPATION

USD 2.2 million in baseline funding is planned, that will support this output. Most activities under output 2 above will be implemented through a participatory approach. Zimbabwe in particular is approaching stakeholder participation as a central strategy to foster sustainable land use.

4. GEF ALTERNATIVE

The basic rational used below for separating incremental from non-incremental costs are as follows:

- ***Outputs 2, 3, 4, 7***: All sustainable use and alternative livelihood activities will generate greater domestic benefits than under the baseline. Therefore only technical assistance, through a participatory process to remove barriers is considered incremental. It will not include the subsidization of economic inputs for any sustainable use or alternative livelihood. The domestic benefits of these activities are intangible and uncertain.

- ***Output 6:*** Selected and strictly necessary small-scale demonstration, including capital investments, is considered incremental in so far as it is necessary to catalyse the adoption of alternative livelihoods or sustainable practices. Because of the limited scale of the demonstrations, domestic benefit will be minimal although tangible.

- ***Output 7:*** Once proven it will be of interest of host governments to scale-up win-win alternative livelihoods, sustainable land use practices. However catalysing scaling-up activities is considered incremental, including helping governments to develop a strategy, and ensuring they have the capacity to implement the strategy. Catalytic activities in themselves will have little domestic benefit.

- ***Output 5:*** The impacts of policy and legislative change are expected to have domestic benefit. Incrementality is therefore confined to catalysing the adoption and administration of recommended policy and regulatory changes. This includes all activities to identify and build national consensus around the expected benefits, and securing sufficient capacity to administer new policies and regulation. The domestic benefits of these activities are intangible. Domestic benefits will accrue from implementing recommendations, which are not incremental costs.

- ***Output 1:*** Incrementality in monitoring and evaluation activities will be confined to activities to fulfil implementing agency and GEF project requirements; and baseline data collection and interpretation necessary to support an adaptive management approach for the project. The domestic benefits of these activities are intangible and uncertain.

  Output 1: Ecological Monitoring and Evaluation
  The GEF will fund all activities to complete inventories of biodiversity and ecosystem functions in each of the project sites; identify temporal and spatial changes and trends in baseline data and their causes, including the development and application of indicators; and regional synthesis and interpretation of data sets; and provide necessary data for an adaptive management approach to project implementation. All additional data collection beyond that required for adaptive management will be co-

financed. To show sustainability of M&E beyond the life of the project, all M&E activities should be funded from independent sustainable financial backers by the beginning of the second last year of the project.

Output 2: Biodiversity Conservation and Sustainable Use

The output will introduce pre-identified sustainable land use practices with similar or increased potential for profit over those practiced in the baseline. The GEF will finance all barrier removal costs of introducing these technologies; community training in approaches; community extension advice; community capacity building and institutional strengthening to support adoption of new practices. All factors of land use production including land, labour, equipment, and agricultural inputs will be cofinanced. For habitat and ecosystem rehabilitation activities the GEF will fund the costs additional to least cost practices expected under the baseline, such as pasture improvement with non-native mono-cultures.

OUTPUT 3: NATIONAL, SUB-REGIONAL AND LOCAL CAPACITY BUILDING

The GEF will fund the cost of training local government agencies to support and provide extension advice on best practice land uses identified under output 2. This will include training extension workers in new techniques and building the capacity of local land planning agencies in the principles of eco-system management, to support new practices, as part of a broader landscape approach to land use, biodiversity conservation and sustainable use. National efforts to build capacity to monitor climate change will be co-financed.

OUTPUT 4: ALTERNATIVE LIVELIHOODS

As with Output 2 the GEF will finance all barrier removal costs of fostering alternative livelihoods; including community training in technical and business aspects of proposed alternative livelihoods; on-going community extension advice; community capacity building and institutional strengthening for cooperatives, collectives and existing micro-credit schemes to support adoption of alternative livelihoods. All factors of land use production including land, labour, equipment, and agricultural inputs will be co-financed.

OUTPUT 5: POLICY AND LEGAL FRAMEWORKS

The GEF will fund costs of reviewing project lessons and existing policy and regulation and their impacts, developing recommendations to support sustainable land use; conduct a national consultation process to draft/ modify regulation and policy for consideration by national legislature; and build government capacity to implement new regulations and policy. Governments will co-finance the costs of considering, adopting and administering new policy and legislation.

OUTPUT 6: EXTENSION OF SUSTAINABLE NATURAL RESOURCEMANAGEMENT

The GEF will finance limited small-scale demonstrations in projects sites where necessary to foster adoption of new practices. As successful approaches are identified the GEF will finance the costs of developing a scaling-up strategy with participating governments, including a broad consultation process; assist in setting-up government implementation units and build the capacity of implementation units to implement a scaling up strategy; and help

identify co-financing for implementation of these strategies to match government commitments. The costs of implementing these strategies will be fully co-financed and implementation will begin by the second last year of the project.

OUTPUT 7: STAKEHOLDER PARTICIPATION

The GEF will fund the full costs of ensuring full participation of stakeholder groups in project design and implementation. This will include training project staff, extension workers, and participating government agents in participatory approaches; the costs of ongoing consultations with local stakeholders during project implementation, and the costs of institutionalising the consultation process to ensure sustainability of participatory approaches beyond the life of the project. Institutionalised participatory processes set-up by the project will be fully cofinanced from sustainable sources by the second last year, to demonstrate sustainability of project impact. The GEF will also fund the costs of stakeholder participation in regional project management processes.

PROGRAM MANAGEMENT, OPERATING COSTS, MONITORING AND EVALUATION

All project management costs will be fully financed by the GEF. This will include the costs of the project coordination unit, the costs of project reporting including financial reporting, monitoring reports and meetings, project implementation reviews and independent evaluations.

5. SCOPE OF ANALYSIS

The scope of analysis includes the geographic, institutional, market, policy and legislative factors impacting on the projects target sites, as well as the costs and benefits generated from the project activities.

6. COSTS

This is a sustainable use project that builds on a substantial baseline, and is complemented by a significant co-financing ratio. The total project costs are USD 49,507,307, while project co-financing amounts to 64% of this total, to cover activities generating tangible domestic benefits.

Annex: Ab Incremental Cost Matrix for GEF Funding *(US$ million)*

Component	Cost Category		Domestic Benefit	Global Benefit
Ecological Monitoring and Assessment	Baseline Incremental Co-funding GEF Total	10.935 11.450 6.984 4.466 22.385	Better management information on trends in land degradation/desertification and in broad ecosystem conditions that will enhance national capacity to identify and respond to national threats. These are mainly - Land degradation - Deforestation - Overgrazing - Fuel wood and wood harvesting - Uncontrolled fires	Full inventory of threatened and endangered species and habitats and monitoring of changes in biodiversity of global significance. This will include assessments of the genetic diversity losses that may result from the expansion of cropped land, the fragmentation of rangelands associated to increasing grazing pressure and wood harvesting, harvesting of medicinal plants etc… Scientific base to establish relationships between biodiversity status and loss in productivity and stability of the ecosystem.
Testing and Implementation	Baseline Incremental Co-funding GEF Total	3.564 7.263 5.086 2.177 10.827	Sustainable harvesting regimes for fruits, woods, fuel wood, medicines and other natural products will be made available. Adoption of superior technologies which will directly benefit the farmer, his family and the community. Potential for economic exploitation as an alternative livelihood; promotion of eco-tourism; wildlife tourism	Development and implementation of sustainable harvesting regimes, validation and adoption of sustainable ecosystem rehabilitation techniques. This will include: - Creation of community reserves (jardins du desert) - Conservation of woody plant biodiversity in parklands, - Rescue of endangered crop biodiversity - In-situ conservation of endangered crop, forage and medicinal plant species - Conserving habitats rich in wild relatives of crops.

Component	Cost Category	Domestic Benefit	Global Benefit
Capacity building	Baseline 5.213 Incremental 12.719 Co-funding 8.969 GEF 3.750 Total 17.932	Introduction and/or promotion and enhancement of community based land use planning capability and agricultural development to increase production and productivity in resource conservation. Training of stakeholders (scientists, extension agents, NGOs) to better work with rural communities Build capacity of stakeholders in land use planning, control of bush fires, regulation of transhumance and pastoral resources etc…	Community involvement in natural resource management leading to more effective biodiversity conservation and reduction in natural resource degradation. Use of community-based participatory approaches to enhancing the return of natural resource assets Build up of stakeholders awareness and skills in Natural Resource Management.
Alternative Livelihoods	Baseline 1.932 Incremental 3.927 Co-funding 2.960 GEF .967 Total 5.860	Design and implementation of productive activities such as: - Utilization of improved crop varieties, animal breeds and inputs such as fertilizer micro-doses. -Adoption of intensive production technologies - Access to basic services and micro-credits - Support to women and other vulnerable groups - Promotion of crop diversification such as the Introduction of date - Poverty reduction	Intensification of selected agricultural activities with positive impacts on controlling biodiversity loss Diversification of income sources allowing to set aside threathened ecosystems, Lift barriers to the sustainability and replicability of appropriate harvesting techniques Improve access to services, micro-credits and education.

Component	Cost Category	Domestic Benefit	Global Benefit
Policy and legal framework	Baseline 1.574 Incremental 3.147 Co-funding 1.720 GEF 1.427 Total 4.721	Existing policies and legislations will be altered to strengthen the participation of local communities in the management and equitable sharing of benefits accrued from the outcomes of this project	Current development policies and legislations pertaining to agriculture, forestry, and pastoralism will be reviewed with the participation of all stakeholders in order to identify and remove policy and legal barriers for sustainable management of biological resources. Promotion and adoption of new guidelines and policies that promote conservation and sustainable use of biodiversity.
Up scaling of NRM Options	Baseline 2.989 Incremental 7.073 Co-funding 4.571 GEF 2.502 Total 10.063	Developing, testing and promoting livelihoods strategies, sustainable development activities, micro-credits, inputs and export supplies across selected project sites in each of the nine countries	Developing, testing and demonstrating sustainable biodiversity management and conservation technologies and models in selected project sites in each of the nine countries. Up-scaling of sustainable use of biodiversity
Stakeholder participation	Baseline 2.149 Incremental 3.926 Co-funding 3.246 GEF .680 Total 6.075	Benefits accrued from enhancing stakeholder participation collaborating at the national level - sharing of experiences	Fully effective national participation in transboundary biodiversity conservation - Increased awareness of biodiversity conservation - Improve access and equity in resource use for all.

Component	Cost Category	Domestic Benefit	Global Benefit
Other Non-GEF financed site specific operations	Baseline 15.0 (salaries) Incremental 0 GEF 0 Total 15.0	Baseline activities related to improved health service deliveries, education and improved rural infrastructure.	N/A
Total	Baseline 28.358 Incremental 49.507 Co-funding 33.537 GEF 15.970 Total 77.865		

Annex B: Global Logical Framework (DMP)

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
Wider Objectives (Goal) To conserve and restore biodiversity in the Desert Margins through sustainable utilization	• Rates of biological diversity loss and land degradation minimized to below half the current rates • Biological diversity is preserved and restored	• Government reports to CBD on national status of biodiversity • Database and expert system • Survey, monitoring and site reports
Specific Objectives (Purpose) To develop and implement strategies for conservation, restoration and sustainable use of dry land biodiversity (to enhance ecosystem function and resilience)	• Community base NRM strategies in place by end of project • Capacity to independently manage NR sustainably • Improved ecosystem stability • Improved livelihoods shown by use of viable alternatives • Ecosystems are preserved and restored to functional level • Lands degradation is reduced by half or nearly so • Populations and grassroots communities control and apply sustainable management techniques of biological diversity • Equal access to resources is guaranteed to all	• Annual reports to GEF, UNDP and UNEP on a six monthly basis • Government reports to CBD on national status of biodiversity

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
Expected Outputs 1. Improved understanding of ecosystem status and dynamics with regard to loss of biodiversity 2. Strategies for conservation, restoration and sustainable use of degraded agro ecosystems developed and implemented 3. NRM Capacity of stakeholders and target populations enhanced 4. Alternative livelihood systems tested and promoted 5. Sound policy intervention/guidelines for sustainable resource use formulated, adopted and implemented 6. Participatory natural resources management methods are implemented 7. The target populations are involved at each stage of the project's cycle		
OUTPUT 1 Improved understanding of ecosystem and dynamics with regard to loss of biodiversity	At least 10% of communities in target areas promoting sustainable ecosystems management technologies by year 3	National government reports to CBD/Ext. evaluation reports
Output 2 Strategies for conservation, restoration and sustainable use of degraded agro-ecosystems, developed and implemented	• At least 3 technologies developed by year 3 • At least 1 technology implemented at each site by year 5	• Studies report • Field visit • National programme reports and external reviews/evaluations
ACTIVITIES 2.1 Identify, document and evaluate existing best practices 2.2 Pilot selected technologies that enhance conservation, restoration and sustainable use of biodiversity	2.1 Appropriate practices identified and documented within first year 2.2 Best practices identified through evaluation by year 2	• Studies report • Field visit • Publication • Technical files

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
2.3 Disseminate, promote and facilitate adoption and implementation of best practices and proven technologies 2.4 Elaborate techniques and technologies adapted to conservation and restoration of ecosystems and biological diversity 2.5 Enhance knowledge and local know-how for a sustainable and integrated management of biological diversity 2.6 Participate in the implementation of benchmark site characterizations and an overall synthesis	2.3 Majority of communities in project area are implementing at least one alternative income generating activity by project end 2.4 The elaborated techniques are disseminated and applied by 50% of the target population by end of project 2.5 Knowledge and local know-how are listed and adapted technologies are disseminated and adopted by 50% of the population by project termination time 2.6 Overall synthesis document by IARCs showing a variety of site characteristics by end of 2nd year	• Ibid • Inventory of local know how is available • Review and monitoring reports, field visits • Synthesis reports from each IARC publications
Output 3 Capacity of stakeholders and target populations enhanced	• At least 10% of target populations able to apply sustainable community based NRM principles with limited outside assistance by end of project • 90% of partners have their intervention capacity strengthened • All target communities are set up and operational	• Reports • External evaluation and monitoring reports
Activities 3.1 Undertake training needs assessment of stakeholders in relation to biodiversity and land degradation	3.1 Training needs off all stakeholders and target population assessed in year 1 and 2 using participatory approach	• Training reports

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
3.2 Strengthen knowledge base of stakeholders through relevant training programmes	3.2 At least three training activities (information, implementation, evaluation) carried out in each member country per year from year 3	• Attendance registers
3.3 Promote participatory approaches in planning and implementation of sustainable technologies	3.3 Resource institutions for training identified and training materials prepared by year 2	• Reports
3.4 Inform and sensitize partners of the causes of ecosystems degradation factors within the adoption of a sustainable management of natural resources	3.4 At least 2 to 3 sensitization meetings organized at each project site by year 2 3.4 Effective linkages and information sharing taking place	• Minutes of meetings reports • Minutes of meetings
3.5 Organize training resources and experience sharing among partners	3.5 One training session per annum at each pilot site from year 2 to 4 of project	
3.6 Generating and production of information dissemination packages for all levels of stakeholders across sub-regions and countries (cross referenced to activities in national log frame)	3.6 Information dissemination packages produced by year 2	• Training reports
3.7 Develop training packages and appropriate policy guidelines that meet requirements identified in 3.7 and undertake training as appropriate	3.7 Training packages and policy guidelines developed by year 3	• Reports • Reports
Outputs 4 Alternative livelihood systems tested and promoted	• At least 5 different alternative livelihood activities being practised in target area of each implementing country by end of project	• Review and monitoring reports, income levels

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
Activities 4.1 Identify, inventorize and document economically viable livelihood options 4.2 Empower communities to develop and manage livelihood options sustainably 4.3 Facilitate establishment of best-bet livelihood options	4.1 More than 50% of economically and ecologically viable livelihood options identified by the 6th month of the project life and remaining 50% by end of year one. 4.2 At least 10 community based organizations and communities trained in business management issues related to livelihoods 4.3 Majority of communities in project area are implementing at least one alternative income generating activity	• Inventory reports of all possible alternative livelihoods in project areas available • Training reports • Monitoring and field visit reports
Output 5 Sound policy intervention/guidelines for sustainable resource use formulated, adopted and implemented	• At least one policy guideline formulated in a participatory manner at local community level by year 2 • Formulated guidelines are tested per country site by project end	• Policy documents compiled
Activities 5.1 Review and document existing policies on natural resources management, identify flaws and harmonize conflicting policies 5.2 Jointly with local communities, develop lay versions of relevant policy documents, guidelines 5.3 Implement policy recommendations on a pilot scale at the sites	5.1 Review and harmonized policy document presented for adoption (to policy makers) by end of 5th year 5.2 Revised policy documents/guidelines in place by 5th year 5.3 At least one policy recommendation being tested in each site piloted	• Policy analysis documents are available • Improved policy is published • Recommended policy discussed with all stakeholders and critically assessed

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
Output 6 Participatory natural resources management methods are implemented	• Participatory Natural Resources Management methods are published, known and used by local communities in at least 50% of project sites	• Reports, field visits • External evaluation and monitoring reports
Activities 6.1 Promote integrated soil fertility and water management methods	6.1 50% of target populations have one or two integrated soil fertility technologies	• Field visits
6.2 Promote land development methods and holistic management strategies of pastoral spaces and peripheral zones of wildlife reserve	6.2 Holistic management strategies of pastoral lands exist	• Reports • Field visits
6.3 Promote the integration of vegetal species (herbaceous and ligneous) with multiple use in the systems of lands use	6.3 Multiple use of vegetal species have been introduced in project pilot sites	
6.4 Ensure integrated management of biological diversity by households and farmers associations so as to improve their incomes	6.4 Income improved from integrated management of biodiversity	• Reports • Field visits
6.5 Provide support to NARS for the development of natural resource management methods and technologies that include strategies for implementing and promoting conservation, restoration and sustainable use of degraded ecosystems (cross referenced to activities in national log frames)	6.5 Two training courses per country organized per year and per country– 10 NARS staff trained per year	• Reports
Output 7		• External review and evaluation

OBJECTIVES AND ACTIVITIES	INDICATORS	MEANS OF VERIFICATION
The target populations are involved at each stage of the project's cycle	• All the components (farmers, NGOs, CBOs, NARS etc..) are involved in the design, implementation and follow-up/evaluation of the project	reports • Minutes of meetings
Activities 7.1 Guarantee the participation of the most vulnerable groups in the design, implementation and follow-up/evaluation of the projects 7.2 Establishment of a permanent dialogue framework using participatory tools 7.3 Scientific team exchange visits and information sharing between sub-regions and countries to facilitate technology transfer	7.1 Women and other vulnerable groups formed at each project site and are taking part in the project implementation 7.2 Existence of a permanent dialogue group in each country by year 2 and functional 7.3 One sub-regional and one inter-country exchange visits organized per year	• Reports • List of memberships of different dialogue groups • Field and monitoring reports • Field reports

ASSUPTION AND RISKS	Hypotheses	Risk level
Goals/Objectives (Specific objectives/global objectives)	9. Migratory flows 10. Security of tenure 11. Climatic change of natural disaster 12. Ownership of the project by the populations 13. Social and political stability	L M L L L
Outputs/Goals (Expected results/specific objectives)	5. Pauperisation 6. Extreme drought 7. Brain drain 8. Social stability maintained	L L M
	1. Constant political support 2. Social peace not threatening 3. Extreme climatic variation 4. Adequacy of environment	L L M M
Pre -conditions for starting of the project	A. Project's approval with States support B. Agreement of the focal point C. Stakeholder collaboration (Farmers association in place) D. Involved parties agreement E. Co-funding F. GEF funding	Fulfilled condition Fulfilled condition Fulfilled condition Fulfilled condition Fulfilled condition Pending

L = Low risk; M= Medium; H = High

Annex C. STAP Roster Technical Review

Desert Margins Programme

Review by STAP member
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Global priority in the area of biodiversity

The desert margins of Africa, which are regionally well-covered by this proposal, are a globally-significant location of plant and animal biodiversity. Arid lands are often overlooked in the quest to protect biodiversity, since it seems intuitive to concentrate on areas of abundant life (the humid tropics) first. A carefully considered approach would note, however, that many desert margin systems are very species rich, with high levels of endemism. For example, just one of the systems targeted by this proposal, the succulent karoo of Namaqualand in South Africa and Namibia, contains around 7000 plant species, about half of which occur nowhere else. This includes about 80% of the global flora of succulent plants. It has been identified as a conservation priority area by at least one major conservation NGO (Conservation International). The Sahelian zone, also covered by this proposal, has a rather depauperate flora (1200 species, 40 endemics), but the Sudanian zone immediately to its south has about 3000 plant species, one third endemic, and several hot-spots of its own, such as the inselbergs of the Jos Plateau.

The richness of the desert margins is apparently due to their antiquity and the unique environmental stresses found there. Furthermore, there are a priori reasons to believe that the African desert margins contain gene pools useful to humankind. They have already been the source of several important crops (Sorghum and Citrullus (watermelon) spring to mind) and medicinal plants (eg Harpagophytum). The genetic resources for drought resistance, which could be crucial in a climatically-changed world, are likely to reside in the desert margins.

Finally, experience has shown the desert margins to be highly susceptible to degradation – perhaps more so than many other systems. They are not so arid as to forbid human use, but insufficiently moist to support intensive use. The high inter-annual variation in rainfall mitigates against simple, fixed management rules and sedentary populations.

Cost effectiveness

This is very hard to judge from the material provided in the proposal. The key problem is estimating the probability that this intervention will protect biodiversity which otherwise would be lost, and that it will do so indefinitely into the future. The actual mechanisms by which such protection will be achieved are somewhat faith-based: the discovery and dissemination of best land-use practices seems to be the main one. It is reasonable to assume that the impact of the project on biodiversity conservation will be positive, but its actual magnitude is impossible to judge, and will probably evade accurate measurement at the end of the brief project period as well.

The ratio of alternative costs to baseline costs is reasonable (about a doubling), but the baseline is probably very approximate. My guess is that the sum of investment over a five-year period by national and local governments, NGOs and the international community exceeds the $28 million estimated in the project baseline. The proportion of co-funding to GEF request is also reasonable (54:46).

Given that the proposal covers a very large swathe of Africa (9 countries) with an extrapolation potential in Africa of about 5 million km^2 in which about 100 million people live (both my rough estimates), the project expenditure of $34 million ($16 million from GEF) would be cost effective even if the success rate of the project is modest. Historically, success in mitigating and reversing land degradation in the desert margins has been less than modest.

Adequacy of project design

The proposal contains the elements that would be expected in a well-designed project: a history of extensive consultation with stakeholders, a well-thought out geographical distribution of effort, a balance of ecological, agronomic, social and economic analyses, capacity development, and built-in monitoring and evaluation. The actual content of these elements is somewhat vague, as is the detailed nature of the interventions. The right phrases are present in the outline, but there is a huge gap between saying that sustainable/participatory/biodiversity-conserving/carbon storing technologies will be developed and disseminated, and actually doing so; and another between doing it and proving it. The devil is in the details, and the details are sparse. The approach of not imposing a one-size-fits-all a priori technological fix is laudable, but a case-by-case participatory approach is likely to be slow if not guided by at least some idea of where the potential interventions might lie. The individuals and organisations involved in the proposal presumably have such ideas, but they do not appear in the proposal.

Feasibility

The funding level and institutional apparatus (including human resources and facilities) are adequate to undertake a significant action. Technically, all the things proposed by the project have been tried and shown to be possible (but not necessarily impactful).

It is unlikely that clearly demonstrable impact will be evident by the end of five years.
Desert margins are slow-response systems – a series of dry years can completely mask any progress, and a fortuitous series of wet years may completely supersede any project impact. Add the inherent slowness of participatory processes and cultural adoption, and experience suggests decades rather than years as the time needed to declare success or failure.

Implementation

The key issue will be adoption at the local scale. This is not intended as a research proposal, but as an implementation of techniques of land use in the desert margins which have been shown to be beneficial (or at least less-damaging) to biodiversity. It is unlikely that the short-term benefits of such techniques will be so obvious and overwhelming that spontaneous and sustained adoption will occur. The project has wisely chosen sites where the participating organisations have a history of work and have already built up a relationship with local communities; otherwise this approach would be completely unfeasible in the given timeframe.

Operation

The institutional situation is complex, involving nine countries, nineteen sites, ten institutions and 40 individual tasks. Since biodiversity loss in this context is primarily a local process, there is no fundamental necessity for tight operational coordination between nations and institutions. There is a need for information sharing. A less-complex project management structure, with more exchange within working-groups (ie,

specifically focussed on particular common tasks) and fewer, smaller meetings of purely management structures is suggested. (Bi-annually means every two years; I presume the intention for executive meetings is semi-annual, ie 6 monthly).

Maintenance

The plans for post-project economic and institutional continuance are very unspecific. There will no doubt continue to be national and international support for this kind of project, as there has been in the past, but the prospects of ramping up the baseline support to double its pre-project level in five years are slim.
The financial sustainability generating mechanisms are weak: the items in paragraphs 42-45 are largely a strategy of hope.

Scientific and technical merits

Strengths

- located in an area of high biodiversity, under threat
- participatory approach
- well-distributed geographically over a significant target region
- good institutional mix, some strong partners, NARI's, CG Centres, APIs and NGOs

Weaknesses

- Vague on details of each project element. What will be monitored? How? In whom will capacity be developed? How? How will successful technologies be identified? How disseminated?
- No strong unifying conceptual model (Annex M is fine as far as it goes, but does not provide a clear guide to intervention, and misses as many mechanisms as it includes). The long list of causes of biodiversity loss (Annex D) does not clearly link to the proposed plan of action (or to Annex M): which, if any, of these root causes will be tackled?
- Indicators of success either unlikely to be demonstrable after 5 years, or only indirectly related to the key objectives

Suggested improvements

1. Be specific about project elements, even if briefly in the Annexes, and give a few concrete examples in the main text.
2. Make the linkages between biodiversity, desertification and climate change more explicit.
3. Provide more quantitative statements about the impact and extrapolation domain. What is the land area footprint of the communities who will be directly engaged? What is the area occupied by communities who face similar problems? How many endemic species may be involved? What area is covered by the vegetation types targeted?
4. Better integrate the parts of the proposal. Many of the annexes are not called out from the main text. Why are they there?
5. A few key references would improve credibility: for instance to the NAPs which formed the basis of the plan.

Relationship to GEF objectives

Risks

There is very little risk that this project will do harm, either to biodiversity protection or to any other GEF objective (eg avoidance of climate change). There is a potential risk created by direct or indirect subsidisation of land use practices at the margin, allowing their persistence when all logic would suggest

that they should be abandoned. This can be avoided by careful structuring of external benefit flows to local communities, to ensure that unsustainable practices are not perpetuated.

There is a real risk that no measurable biodiversity benefit will be attributable to this project in the short or possibly even in the medium to long term. The reviewer has no opinion regarding whether this risk is higher or lower in the case of this project relative to other GEF biodiversity interventions. There are many potential sources of failure: wrong or incomplete identification of root causes and unsustainable interventions are historically the most likely.

Benefits

The proposed action, in concert with the baseline actions, has the potential to help protect biodiversity.

The principle benefits are likely to be in the area of combating desertification. It is perverse that this proposal has to be submitted to a biodiversity window. There is a real and demonstrable chance that at least local remediation or avoidance of degradation could be achieved.

Actions that increase net primary productivity, decrease soil loss and increase the amount of biomass returned to the soil, will with high confidence increase carbon storage in arid lands. The absolute amounts are likely to be small: carbon densities and biomass stocks in hot and arid lands are intrinsically limited.

The benefits of improved land cover in terms of avoided siltation and atmospheric dust burdens are potentially large. Although mentioned by the proposal in passing, they are not quantified or expanded on.

Regional context

One of the strong points of the proposal is its good regional coverage.

Replicability

The replicability domain is large in Africa, but probably small beyond the continent. The key to replication will be the successful matching of demonstratively beneficial change packages (technology, policy, cultural practice, economic incentive) to their receiving environment.

Added value

A very difficult question to answer, given the difficulty in separating what outcomes are attributable to the project, and what to baseline interventions. Certain aspects, such as biodiversity documentation and monitoring, are unlikely to have occurred under baseline conditions. A systematic effort has gone into partitioning the tasks between baseline, co-funding and GEF funding.

Sustainability

The environmental aspects of this proposal are targeted at sustainability, and the participatory approach has a better chance of achieving local-scale social sustainability than pure top-down technology interventions (but may mot be sustainable at the national policy level). The likely weak link will be the economic sustainability after the project.

Secondary issues

Linkages to other focal areas
Strong potential linkages to climate change and combating desertification

Linkages to other programmes
Probably good, given the range of organisations involved, several explicitly mentioned.

Action plans at regional level

Good regional approach.

Other environmental benefits or damages
Mostly positive environmental benefits, no obvious damage.

Stakeholder involvement
Good at local and institutional level; not as obvious at policy level.

Capacity building
Provision has been made for capacity building, although the details are unclear.

Innovation
Not deeply technically innovative, but novel in the sense that a targeted desert margins programme at this scale has not previously been attempted.

Annex C1. Response to STAP/IA Comments

GLOBAL PRIORITY IN TH E AREA OF BIODIVERSITY

We fully agree with the assessment of the reviewer that the "arid lands are often overlooked in the quest to protect biodiversity". Indeed the desert margin systems are very species rich, with high levels of endemism. Besides the example of the succulent karoo of Namaqualand
in South Africa and Namibia we know that Niger alone has 1700 plant species of global significance. Senegal has listed important plant and tree species threathened by different stresses in their national annexe. South Africa has the third highest level of biological diversity in the world, with 7.5% of the worlds vascular plants, 5.8% of the world's mammal species, 8% of the world's bird species, 4.6% of the world's reptile species, 16% of marine fish species and 5.5% of the world's recorded insect species.

In terms of the number of endemic species of mammals, birds, reptiles and amphibians, South Africa ranks as the 5th richest country in Africa and the 24th richest in the world (DEAT 1997). This diversity is caused by variation in climate, geology, soils and landscape form. However, South Africa also has the highest concentration of threatened plant groups in the world (Cowling & Hilton-Taylor 1994). Approximately 3 435 of South Africa's plant groups are considered to be globally threatened with extinction (Hilton-Taylor 1996). A further 204 groups are estimated to be threatened at a local level

Many of these ecosystems harbor significant hot-spots for birds, wildlife and medic inal plants.

Furthermore there is ample evidence to support the conclusion of the review that the African desert margins contain gene pools useful to humankind. Pearl millet, bambara nut (*Voandzeia subterranean*), cowpea, okra and sorel are to be added to the list of important crops originating from the area. There are also animal genetic resources in wild and domesticated species. Among the later, there are cattle breed which have developed some resistance to trypanosomiasis (N'dama, Kouri).

As the Third Assessment Report (TAR) on Climate Change indicates, there is no doubt that the Earth's climate is changing. The last sixty years were the warmest in at least the 1000 years. And with the current knowledge that above certain temperatures the fertility levels of today major crops drop drastically there is no doubt that the African desert margins may turn out to play a key role in providing germplasm of food and medicinal crops for drought resistance in changed climates.

COST EFFECTIVENESS

The reviewer is correct to point out that the maintenance of protective interventions over the longer-term is difficult to assess. This is indeed a major challenge for the DMP, but.the issue goes beyond this particular project. The sustainability of any interventions in highly variable and fragile environments depends on the adoption of adaptive management practices that incorporate the capacity to respond to change. Within the DMP one of the key mechanisms to promote this will be the serie suite of demonstration sites which provide a wide range of socio-economic and biophysical conditions and thence a strong comparative base from which to derive information on appropriate responsive mechanisms. This in turn is clearly dependent on maintaining theses sites and the information systems derived from them over the longer term – an issue discussed under the heading of Maintenance below.

A great deal of genetic erosion is taking place in the desert margins. In the sahel for example, many local landraces initially of 120 and more growing-days have all but disappeared due to drought. Many ecosystems are threatened. By rehabilitating these ecosystems, the project seek to reintroduce lost or displaced species.

There is also a wealth of proven interventions and technologies which have been developed by the DMP partners in the past 20-30 years of research efforts. (Among them we can cite the International Agricultural Research Centers of the CGIAR (ICRISAT, ILRI, IFDC, TSBF, ICRAF), the Advanced Research Institutes (CEH, IRD, CIRAD), and the National Agricultural Research Systems (NARS).

These technologies and/or interventions while not mentioned in detail in the project brief are available (and listed in the country Annexes) to serve as a spring board for field demonstration and adoption. They include the followings:

- Sand dunes stabilization
- Contour bunding
- Wind en water erosion
- Drought resistant crop varieties
- Integrated nutrient management
- Watershed management approaches to conserve wetlands, oases that harbor important migratory birds and useful endemic species
- Water harvesting and conservation

Furthermore, it is important to point-out that economic evaluation of best practices will be undertaken and only those that are both economically viable as well as environmentally friendly will be promoted. The promotion of this kind of win-win strategies will lead to spontaneous spread and adoption of best practices in a wider area. For example Dutch supported projects on Indigenous Soil and Water Conservation and Promotion of Farmer Innovations in Africa have shown that rapid spontaneous spread can happen by using farmer-to-farmer/village-to-village exchange visits etc.

So there is no doubt that the proposed program will be cost effective and its success rate more than modest even though certain benefits will be difficult to quantify.

ADEQUACY OF PROJECT DESIGN

The reviewer has identified an issue which is inherent to the problems being addressed by this project. The project addresses the convergence of a range of problems of land and resource degradation and biodiversity loss which are driven by a wide range of external factors of which climatic and demographic change impacts are the most dramatic. These drivers of change are not constant and it is indeed essential as the reviewer comments to provide by building capacity for adaptation rather than seeking monolithic solutions.

Furthermore it is essential that the 'solutions' are ones which fit the priorities and goals of the land-users and are not simply 'fixes' imposed from outside – hence the highly participatory nature of this project. Nonetheless interventions can not be endlessly postponed. The situation is already critical. The institutions collaborating in this project embody expertise across a wide range of social, economic, cultural and agro-ecological disciplines which will enable, early in the project, the opportunity to offer appropriate technologies and interventions (as outlined above) for alternative adaptive management practices to the land-users and other stakeholders. Brief descriptions of examples of such practices are given also under the section on Scientific and Technical Merits. Implementation of the 'protective practices' then becomes a matter of partnership. The comments of the reviewer on implementation below are very pertinent to the approach described here .
The necessary framework is in place to ensure the success of the project:

1) Strong complementary expertise of partners

ICRISAT in crop biodiversity and natural resource management

ILRI is pasture lands restoration
ICRAF in agroforestry systems
TSBF for soil fertility management
IFDC for integrated soil nutrient management
ARIs in models development and upscaling
Specialized NGOs in medicinal plants
NARS in local expertise on above

2) Availability of interventions developed over the past 20-30 years of research and development activities.
3) Sound mechanisms of participation that are put in place with well defined roles and responsibilities of each stakeholder including the full participation of resource users as full partners in DMP.

The project will focus its activities in the dissemination and up scaling of these already characterized interventions using participatory approaches.

FEASIBILITY

We agree with the assessment of the reviewer that desert margins are slow – response systems and that a series of dry years can completely mask any progress, and a fortuitous series of wet years may completely supersede any project impact. These are already stated in the project assumptions and risks section of the Logical Framework Analysis (LFA).

However, some key interventions such as water and soil conservation technologies, sand dunes stabilization and capacity building activities will lead to impact during the lifetime of the project.

Biodiversity conservation strategies developed and agreed upon by rural communities will continue to be implemented and will have permanent positive impacts in the years ahead. Techniques for sustainable use of biodiversity, by-laws and regulations will also remain in place. This may well influence government policies and resource allocations toward biodiversity conservation.

IMPLEMENTATION

Agree

However, the key ingredients for success are:

1) The stakeholders involvement in the implementation that has taken 4 years to build
2) Proven local management techniques / approaches developed by partnering farmers over generations
3) Proven technologies developed by partners over 20-30 years life span
4) Prior work at some DMP selected sites including site characterization (Kenya, Burkina Faso, Niger and Botswana with IDRC and other donors support).

Therefore, implementation has a solid base necessary for achieving project outputs and success/impact as outlined above.

OPERATION

The review finds the operational framework and the institutional situation complex and makes a valid suggestion to emphasise sharing of information. Though the information sharing is there, it needs to be made more explicit. The information is not only shared in the envisaged steering and executing committee

meetings and between the ad hoc thematic advisory teams, but also through email network between members of the committees and thematic teams on continuous basis. Perhaps the role of modern information techniques was considered so obvious that its elaboration was ignored.

Therefore the reviewer is correct in stating that some additional clarity is required.

We now propose to remove the middle layer in the organigramme referring to the sub-regional level (see revised organigramme in project brief). So we now have the national steering committees that will meet annually for national programming purposes and an overall DMP steering committee to ensure regional coordination. The DMP steering committee will meet once a year at one location to review and approve the yearly workplans and conduct a second meeting through electronic media. Other groups will only meet when the need arises.

MAINTENANCE

The problems of the desert margins will not go away over the period of the project. Success in achieving the objectives of the DMP will however create clearer and more focused opportunities for addressing the problems. The project members will work throughout the time to seek further and longer-term funding to maintain the demonstration sites and extrapolate the successful strategies over a wider area of the desert margin zones.
Furthermore:

1) With the coming to force of the biodiversity (CBD) and the CCD Conventions, there is now a general consensus among nations that preservation of national resources and halting environmental degradation are highest national priorities. For example the South African Government has committed itself to investing in the combating of desertification (UNCCD), the CBD and the Climate Change Conventions, by supporting large interventions on the National scale, such as landCare, Working for Water and others. In the Millenium Africa Recovery Programme (MARP), their president has committed himself to ongoing assistance in these fields of expertise and programme as listed in the DMP/GEF project.

2) Interest of development investors is geared toward supporting such national priorities

3) Under the CBD and CCD, development or the setting up of national funding mechanisms are being encouraged

4) Local communities themselves are aware of the importance of conserving their natural resources including biodiversity to support sustainable livelihoods

5) Benefit sharing activities arising from the sustainable use of conserved biodiversity such as the use of medicinal plants, ecotourism.

These are the foundations that will ensure economic and institutional continuance of the project.

Scientific and Technical merits

STRENGTHS

These are commendable and welcome comments by the reviewer

WEAKNESSES

We agree that many of the details were not listed in the project brief even though many of them are outlined in each country documents. More specifically, the project will in terms of:

MONITORING

To assess baseline status and inventory the number of major ecosystems, endangered plant and animal species, level of land degradation (low, medium and severe) and environmental quality from which to gauge trends in environmental changes due to interventions. These will include:

a) reversing genetic erosion by quantifying the number of species recovered or rescued
b) number of degraded ecosystems that would be rehabilitated
c) improvement in land use systems by knowing the percentage of croplands, grazing lands, woodlands and wetlands rehabilitated.
d) soil chemical and physical characteristics
e) changes in natural resource use

How

Following tools will be used: GIS, remote sensing, plant genomic approaches for species differentiation, population dynamics, indigenous knowledge, simulation modeling

Capacity development will be done at different levels:

- local communities capacity in preserving biodiversity
- traditional medecine practitioners trained in sustainable harvesting of medicinal plants
- local communities in in-situ conservation of plants and animals
- NGOs in technology exchange
- government technical department personnel in most aspects of biodiversity management and in land conservation technique, policy formulations, etc..
- NARS – skill upgrade of national scientists including on the job and degree training (project sites will be made available for field research of MSc and PhD students).
- IARCs and ARIs will house and/or support thesis research

Identification of successful technologies

In addition to the numerous interventions that have already been documented in the literature (e.g. book on proven technologies by ICRISAT/INRAN), in publications and from lessons learn from successful baseline project interventions and from the project development phase (PDF-B), there are farmer-proven and adopted techniques to be identified, tested and disseminated.

How disseminated

- Through workshops, printed media, TV, radios, field days, bulletins,
- Public awareness activities, brochures, project reports, newsletters
- Farmer to farmer technology exchange activities
- Farmers exchange visits – West African farmers visiting East and Southern Africa and vice versa

Strong Unifying conceptual model

One which was not earlier described in the project brief. **Conceptual framework for biodiversity loss and conservation at the desert margins** is, however, available and will guide project interventions.) .

The main elements of the model are described in the appendix below.

Indicators of success

These have been reviewed and the LFA has been revised accordingly. Main indicators added include the following.

- Innovative new technologies
- Scientific and technical informations
- Provide predictions of shifts in plant pests, diseases and weeds and livestock diseases
- Crop varieties able to maintain yields under severe droughts
- System of coping with more frequent and more severe droughts
- Systems for monitoring biodiversity conservation, especially of the wild relatives of crop and medicinal plants
- Systems of plant and animal production that emit less GHG, principally CO_2, nitrous oxides, methane
- Cost-effective system for sequestering carbon both in biomass and in the soil
- Macroeconomic policies that encourage sustainable use of biodiversity
- Innovative system for recuperating lands with modern biomass plantations

SUGGESTED IMPROVEMENTS

1. Project brief and Annexes have been revised to reflect the insertion of more project elements. Further project details are outlined in each country documents (Wich will be part of the appraisal documentation and are presently available for review at DMP Coordination Unit or from UNEP/GEF project file)

2. Linkages between biodiversity, desertification and climate change are now been made explicit in Annex M.

3. Better integrated the parts – Brief has been reviewed to comply with this useful comment. Annexes are now well referenced in the main text

4. Key references have been called in and are listed at the end of the project brief.

RELATIONSHIP TO GEF OBJECTIVES

RISKS

Agree with first part of the review that there is very little risk that the project will do harm, either to biodiversity protection or to any other GEF objective.

We believe however that:

1) most subsidies have been remove through structural adjustment programs in most of the participating countries and it is unlikely that they will pose potential risks

2) benefits sharing that will accrue from the sustainable use of biodiversity and ecotourism form strong potential economic benefits to help shift from rural communities practicing environment destroying activities to more environment friendly interventions. Therefore risks are substantially reduced.

Benefits

Agree with reviewer that the project has the potential to help protect biodiversity. However the project is geared to do more that. It will transform this potential into reality. In contributing to mitigate land degradation, the project will remove a major threat to biodiversity loss.

While the evidence for ecological benefits from biological diversification through the practice of agroforestry is not well documented in dryland agroecosystems, there is increasing evidence from the moist tropics illustrating the benefits of mature agroecosystems. Soil microbial biomass and macrofauna are often increased in systems containing trees and will play an important role in nutrient cycling. These mature systems also lead to an increase in associated biodiversity in terms of wild fauna and flora.

The use of microsymbiants will enhance the ability of tree to become established on degraded soils and, in turn, these trees will improve the soil inoculum potential in previously impoverished dryland sites, which can be of benefit to intercrops. In such environments, trees and other perennials establishment will increase net primary productivity, decrease soils loss (thru erosion) and will increase the amount of biomass returned to the soil, thus leading to increased carbon stocks in the desert margins.

It is estimated that the amount of atmospheric dust living the sahel is huge as more than 100 million tons of dust per annum is blown westward over the Atlantic from Africa (*Middleton et al., 1986*). It has recently been speculated that the super-saturated, high-energy Sahelian winds may have contributed to the increased frequency and intensity of Atlantic hurricanes observed in recent times. It has been suggested that the dust laden Sahelian air transported during the summer monsoon into the eastern Atlantic by the easterly winds in association with the Inter Tropical Convergence Zone contain sufficient energy to accelerate the formation of severe storms and energize the formation and maintenance of hurricanes (*Macleod, 1998*). The project will contribute to a significant reduction of this atmospheric dust burdens.

REGIONAL CONTEXT

We agree with this assessment

REPLICABILITY

Agree that it is wider in Africa. However, many of the successful elements and lessons learnt can be incorporated into adopted mechanisms elsewhere to form successful models of replicability.

ADDED VALUE

The integrated approach to biodiversity conservation taken by the project may make it difficult to clearly separate between the benefits of the baseline and project activities. However, the project has been designed to fill the gaps in the baseline that so far have been hampering environmentally sustainable dryland development in Africa;s desert margins. The project is specifically targeting gaps that will integrate biodiversity conservation into land management strategies and practices.The project itself is designated to produce a synergy between the basline activities and activities funded by GEF and other donors leading to increased benefits than the sum of the two.

Moreover, specific project interventions will bring about:

- More biodiversity conservation awareness
- More sustainable use and conservation of biodiversity within the broader context of land management
- Enhanced stakeholders participation through capacity building
- Development of policy and le gal frameworks from enhanced biodiversity conservation etc..
- Benefit sharing…

SUSTAINABILITY

On maintenance and financial sustainability mechanisms , the reviewer has raised a very pertinent question. Fund raising is always a major problem. However, Desert Margins Program is dealing with very fundamental issues in the nine desert margins countries and all of them are developing and adopting the National Action Programs (NAPs) to combat desertification and the UNCCD. Therefore, while envisaging DMP as an integral part of the NAPs, (and in turn as part of national socio-economic development plans) it will give a certain degree of confidence of continuation of DMP with secure funding base. Consequently paragraphs 42-45 can be taken as more than just a "strategy of hope".

Economic sustainability will be assured through successful demonstrations and adoption of sustainable livelihoods, benefit sharing activities and win-win landuse strategies. As an example, the Agroforestry Parcklands of the sahel is an example of a win-win landuse strategy. These Parklands represent well developed traditional agroforestry system based on large mature trees that provide a range of non-timber forest products.

We give here an example on how to capture economic and environmental benefits with multistrata agroforests.

These are the Agroforesty Parklands (*Boffa, 1999*) which predominate in semi-arid west Africa, and for example, cover 90% of the agricultural land area of Mali. While the area of these parklands may have expanded in recent decades, it is generally considered that parkland tree densities have declined due to a lack of regeneration *(Boffa, 1999*). This decline is thought to arise from increasing human and livestock population pressure, and the consequent shortening of the regenerative fallow period. Prospects for the conservation and regeneration of these parklands may depend on the influences of market demand for the traditional tree products, the sustainability of indigenous management systems, more clearly articulated agreements regarding land and tree rights and the domestication of the parkland species.

In the Sahel, livestock contribute about 70% of farm cash income but its production is constrained by the availability of dry-season fodder. Vendors bring 40-70 kg bundles of Pterocarpus erinaceus fodder 30-50 km into markets in Bamako, Mali and make US$6-12 day-1 from this activity (*ICRAF, 1997*). This laborious activity is the result of overexploitation of natural stands close to the city, making the establishment of fodder banks close to market an obvious agroforestry alternative. Trials suggest that such fodder banks produce 4.5t ha-1, which converts to gross income of US$630 y-1 on the basis of an average price of US$0.14 kg-1. This level of income should be attractive to maintain its sustainability as average annual per capita income in Mali is US$270 (*ICRAF, 1997*).

Secondary issues

Linkages to other focal areas

These linkages are well established at country level through coalition developed at NAPs, SRAPs, NEAPs levels. Countries are party to the 3 conventions and will be reporting the project outcomes to the appropriate COPs.

LINKAGES TO OTHER PROGRAMMES

This project is an integral part of NARS activities, collaborating IARCs and ARIs, programmes. It will collaborate with emerging CGIAR global challenge programmes on climate change and desertification as well as link with UNEP and UNDP work, both members of the DMP.

ACTION PLANS AT REGIONAL LEVEL

No comment

OTHER ENVIRONMENTAL BENEFITS

No comment

STAKEHOLDER INVOLVEMENT

Agree to improve the involvement of policy makers at the national level by involving them proactively at the policy and legal frameworks review stage and subsequently in new policy formulation.

CAPACITY BUILDING

DMP will develop capacities, both institutional and human, within and throughout the "DMP partership community". At project coordination and other institutions level the capacity building is obvious. On site level, farmers/resources users will not only gain from the project activities, but they also serve as a major contributors in identifying in testing appropriate land/biodiversity management techniques. Furthermore, farmers are also a built-in extension mechanisms of DMP. They are a primary vehicle in disseminating successful approaches to their fellow farmers in the vicinity of the demonstration areas and even beyond. Farmers are not objects of DMP efforts only, but very strong (and fully fledged) partners.

INNOVATION

The reason that the project is not perceived as deeply innovative is probably the fact that it will draw from the existing body of information and research on dryland management, which is extensive, and adapt and upscale practices in a wider geographical area. This is indeed the main challenge of the project, to obtain upscaling and sustained impact, of practices that have so far mainly been tested at research stations and on a very limited pilot basis in farmers' fields.

Appendix Ca: Drawn from 'Degradation and recovery in socio-ecological systems: a view from the household/farm level by ***R.J. Fernandez et al. (2001 in press)***

- Biodiversity loss is one component process of desertification, i.e. dry land ecosystem degradation.
- Desertification is a multi-dimensional problem, with many conceivable causes and a network of consequences that encompass a wide range of spatial and temporal scales.
- Degradation and restoration of a landscape are two sides of the same problem, involving both natural and social forces
- The supply of desired ecosystem goods and services is governed by a subset of a few variables, which include both biophysical and socioeconomic one and are often variables of relatively slow dynamics.
- The framework can be visualised into a set of three inter-related graphs.
- In Figure 1, a continuous axis represents the biophysical state of a particular ecosystem from sustainable state near the origin to a desertified stage defined as a decrease of biological productivity that is not reversible in the temporal scale relevant to the decision-makers at a specified level with the resources available. The degradation process along the axis is stepwise. there are a number of thresholds defined as to include the resources and reach of action that can be harnessed for restoration at a low level of intervention. Thus "reversibility" is a concept not totally independent from the scale of analysis and contingent on the physical, technological and institutional/political resources available.

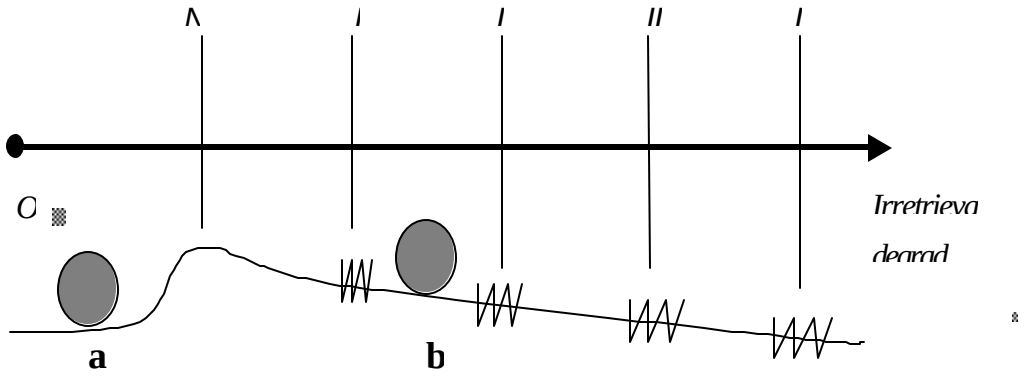
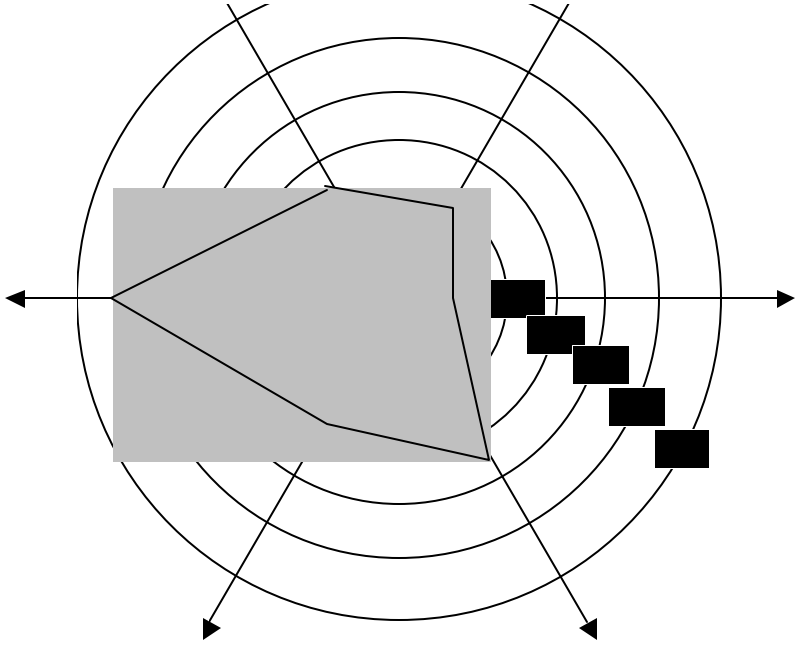


Figure 1: The horizontal line above represents a hypothetical, composite state variable for a particular system. The line below is a representation of the ball-in-the-cup metaphor for system dynamics. The "resistance", zigzag symbols represent buffering actions without which the system will continue a trend to its degradation (towards the right).



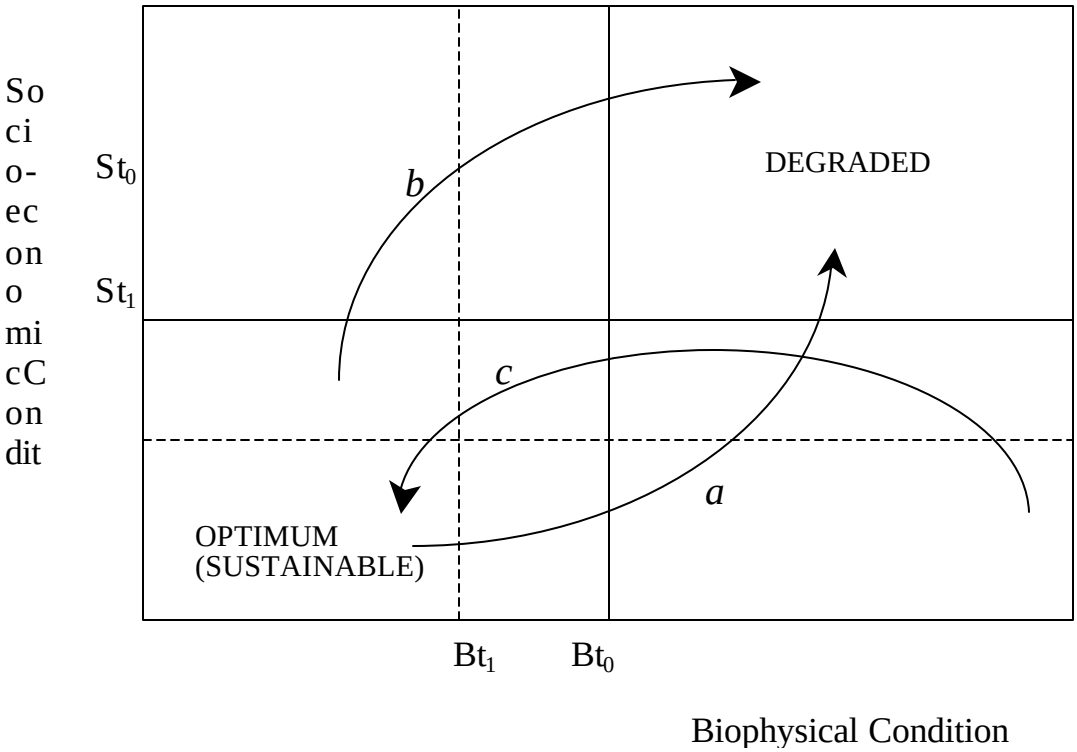
- In Figure 2, the complexity of the factors implied in the status of an ecosystem is visualised by a snowflake-type diagram of the various components of degradation biophysical as well as relevant socioeconomic. The axes can be scaled so that degradation thresholds are figured as concentric circles.

Figure 2: "Snowflake" diagram suggested as a useful multivariate way of portraying and tracking degradation. Each of the radii represents one relevant state variable, with the center point representing its extreme non-degraded value. Circles indicate deterioration thresholds and are labelled as in Fig. 1. This example represents the state of a system using 6 variables: two of them are within the threshold of natural variability, and the rest requiring external resources at different levels of intervention to be restored. The shaded area quantifies the degree of overall system deterioration.

Analyses of several different ecosystem types show that the number of crucial variables that govern the trajectories of the desired ecosystem services is likely to be somewhere between three and five (*Gunderson and Holling, 2001*) with at least one biophysical and one socio-economic variable. In figure 3 a system component (farm, community, district) can be plotted against the two axis representing one of the biophysical and one of the socio-economic variable. the thresholds on the two axes define a domain of socio-economic and environmental sustainability (down-right quadrant including the origin of the axes) and a domain of desertification (top-left quadrant beyond the thresholds).

- The positions of the thresholds determining the actual boundaries of resilience are not fixed. They could be seen as fluctuating naturally from year to year around a certain average position.
- The position of the thresholds can be shifted through changes in the system and through external factors. Climate change, for example, could have this type of effect, either in a positive or a negative way.
- Management and policies could contribute to expand the domain of resilience (by pushing the threshold on each axis away from the origin) and thus build and maintain the adaptive capacity of the ecosystem.

Fig. 3. Two-dimensional representation of a system's possible state.



Annex D: Causes, threats and impacts on biodiversity loss

Causes	Threats	**Impacts**
Poverty	Land degradation:	Poverty
Population pressure	Over-cultivation	Loss of dryland biodiversity
Government policies	Overgrazing	Loss of livelihood opportunities
Inappropriate land tenure (substitution of rangeland by cropland)	Urbanization	Impair vegetation regrowth
Failure to enforce laws or inadequate legal and institutional framework	Deforestation	Mass migration – environmental refugees, rural-urban
Lack of awareness	Unsustainable land management practices	Food insecurity
Commodity pricing and terms of trade	Hunting and poaching	Loss of traditional knowledge
Climate change	Exotic invasive species	Ecosystem fragmentation and habitat loss
Drought	Excessive use of agro-chemicals	Species extinction
Inadequate international cooperation and partnerships	Indiscriminate introduction of GMOs	Loss of local landraces
Inadequate education and capacity building	Unsustainable resource extraction	Soil degradation – soil erosion, salinization etc.
Inadequate data and information	Wildlife/human conflicts	Pollution of soils, water and air
War and civil unrest	Land use conflicts	Reduction in soil carbon pool and above-ground sink function
Inadequate energy supply	Household vulnerability	Lowering of ground water table
	Uncontrolled fires	Changes in ecosystem boundaries
	Dependence on fuel wood	Loss of productivity

Annex E: Public Involvement Plan

PARTNERS AND THEIR ROLES IN THE DMP IMPLEMENTATION

Local stakeholders

The PDF-B exercise has allowed the participation of local stakeholders as full partners of the DMP. These involve men and women of target communities, farmer associations, traditional leaders, pastoralists and agro-pastoralists. They will contribute directly to the implementation of the project and be consulted by the other partners in project decision forums

NARS and NGOs

NARS and NGOs of the selected countries affected by desertification and the loss of biological diversity are at the heart of the DMP. NARS include all of a country's public and private agricultural research institutions, such as government departments, universities, and non-profit establishments that conduct research or contribute to the development or adaptation of technology and policies that support agricultural and rural development. The NARS form the essential links with extension services, the private sector, educational institutions, and government ministries. They work with farmers and farmers' organizations on the identification of research problems and on technology transfer. For the purpose of this Program, NARS will be the focal point of agricultural research in each country.

NGOs have a catalytic role in this Program. They function best at the grassroots level and work with farmers and other resource users, and farmers' organizations, developing new approaches to agricultural and environmental problems. Their role as full partners in the development and implementation of DMP has been clarified during the PDF-B implementation. There have been examples of NGOs assisting governments in experimenting with establishing community extension systems and transferring responsibilities to them.

INTERNATIONAL AGRICULTURAL RESEARCH CENTERS (IARCS) / UNITED NATIONS AGENCIES

The IARCs under the CGIAR participating in the DMP include ICRAF, ICRISAT, IFPRI, ILRI, and IPGRI. ICRISAT, on behalf of the consortium, is taking a leadership role in the development and implementation of this Programme.

ICRISAT's regional mandate is to improve agriculture in the semi-arid tropics (SAT), and its global mandate is to conduct research on six food crops: sorghum, pearl millet, finger millet, chickpea, pigeonpea, and groundnut. ICRISAT's scientists in sub-Saharan Africa are located in Niger (ISC), Mali, Nigeria, Zimbabwe, Malawi, and Kenya.

ICRAF's mission, as stated in its charter, is "to increase the social, economic and nutritional well-being of peoples of developing countries through the use of research and related activities to integrate woody perennial species in farming and related land-use systems in order to increase productivity, profitability, sustainability, diversity of output, and the conservation of natural resources". This mandate is pursued in thirteen African countries and six countries in Southeast Asia and Latin America. The relevant countries of the DMP are Burkina Faso, Kenya, Mali, Niger, and Senegal.

ILRI's mandate is to measurably and sustainably improve the livelihood of resource-poor livestock keepers, make animal products more affordable and accessible for the poor and conserve natural resources in developing countries through partnerships and alliances for innovative livestock research, training and

information exchange". Key agroecological research and associated activities that have had impact on sustainable agricultural production in sub-Saharan Africa and are relevant to this initiative include: the development of feed resources suited to the specific needs of various agroecological zones, studies on the role of crop residues and manure for nutrient cycling in crop-livestock systems, grazing management practices that improve the carrying capacity of rangeland, prevent degradation and maintain plant species diversity, and policy studies on farmers' land use decisions and impact on productivity and land degradation.

IFPRI was established to undertake research on food policy issues and to help developing countries devise appropriate policies to ensure the optimum use of new agricultural and resource management technologies. With its national and international collaborators, IFPRI has been conducting agricultural policy research in the Sahel for over a decade. IFPRI's research conducted under this Initiative would be under part of its broader research program on "Policies for Sustainable Development of Fragile Rainfed Lands". Thus, insights and methods from work being carried out in other parts of the world on similar issues could contribute to the DMP.

IFDC undertakes research and provides assistance, advisory services, and training for the transfer and use of improved fertilizer and related technology, and for the implementation of appropriate economic policies. IBSRAM conducts adaptive research in 23 countries in Africa and Southeast Asia.

TSBF. The overall goal of the Tropical Soil Biology and Fertility (TSBF) Programme aims to contribute to human welfare and the conservation of environments in the tropics by developing adoptable and sustainable soil management practices that integrated biological, physical and socioeconomic processes that regulate soil fertility and optimize the use of organic and inorganic resources available to the land uses.

UNEP's desertification control programme has its origin in the 1977 Desertification Conference in Nairobi. Since 1999 UNEP has expanded its programme beyond desertification in drylands. It presently includes all types of land degradation in different ecological regions and rainfall areas from arid lands to humid tropics

Since 1978, UNEP and UNDP, in a joint venture, have assisted countries in the Sudano- Sahelian region to develop and initiate national action plans to combat desertification. This partnership has now been extended to assist all developing countries in designing their national action plans under the CCD.

UNEP and UNDP are two of the implementing agencies for the GEF, which was created to assist developing countries to respond to global environmental concerns. Following the Earth Summit in Rio, the global Conventions on Climate Change and Biodiversity chose GEF as their funding mechanism.

ADVANCED RESEARCH INSTITUTES (ARIS)

ARIs associated with the DMP include the Center for Ecology and Hydrology (CEH), Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) (France), and Institut de Recherche pour le Developpement (IRD) (France).

The Centre for Ecology and Hydrology (UK). The Centre for Ecology and Hydrology (CEH) has a scientific staff of about 500, and is a component Centre of the UK Natural Environment Research Council. CEH is also a member of the Edinburgh Centre for Tropical Forests, an implementing agency for Development Projects. CEH was formed in 2000 by the merger of four former institutes (Institute of Terrestrial Ecology, Institute of Hydrology, Institute of Freshwater Ecology and the Institute of Virology and Environmental Microbiology). CEH has been involved in the development of the Desert Margins Programme from the start (1995).

The staff of CEH have many areas of expertise relevant to the GEF component of the DMP and can contribute to DMP as collaborators in the field work and/or as providers of training packages, in the following areas:

- Rapid biodiversity assessment of the impacts of environment degradation and rehabilitation
- Use of DNA molecular techniques for assessment of soil biodiversity and the genetic diversity of flora and fauna
- Assessment of carbon sequestration in natural ecosystems and agroecosystems
- Assessment and modelling of tree-crop-grassland interactions, especially for water and nutrient competition
- Assessment of diversity and ecology of mycorrhizal fungi and their importance in ecosystem function and the nutrient cycling of production systems
- Use of mycorrhizal fungi as indicators of environmental degradation /rehabilitation
- Evaluation of hydrological processes at all levels: especially for the prediction of seasonal rainfall and the improvement of predictions of future climate; sustainable watershed management; etc.
- Agroforestry for environmental rehabilitation and household benefits, including income generation from indigenous fruits, fodder, medicinal products, other NTFPs; etc.
- Domestication of new tree crops, using vegetative propagation and cultivars selection
- Assessments of the hazards to potable water of deep nitrogen percolating to the water table as a result of deforestation and environmental degradation
- Modelling environmental and ecological impacts at sub-regional, regional and global scales.

Institut de Recherche pour le Development (IRD)

IRD brings its long-standing expertise in the monitoring of dryland climate, soils, and vegetation, using ground-based measurements and remote sensing.

Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement (CIRAD) specializes in agriculture in the tropics and subtropics and contributes to the economic development of these regions through research, experiments, training, and dissemination of scientific and technical information.

Table 1. National, sub-regional, and international partners in the DMP Consortium

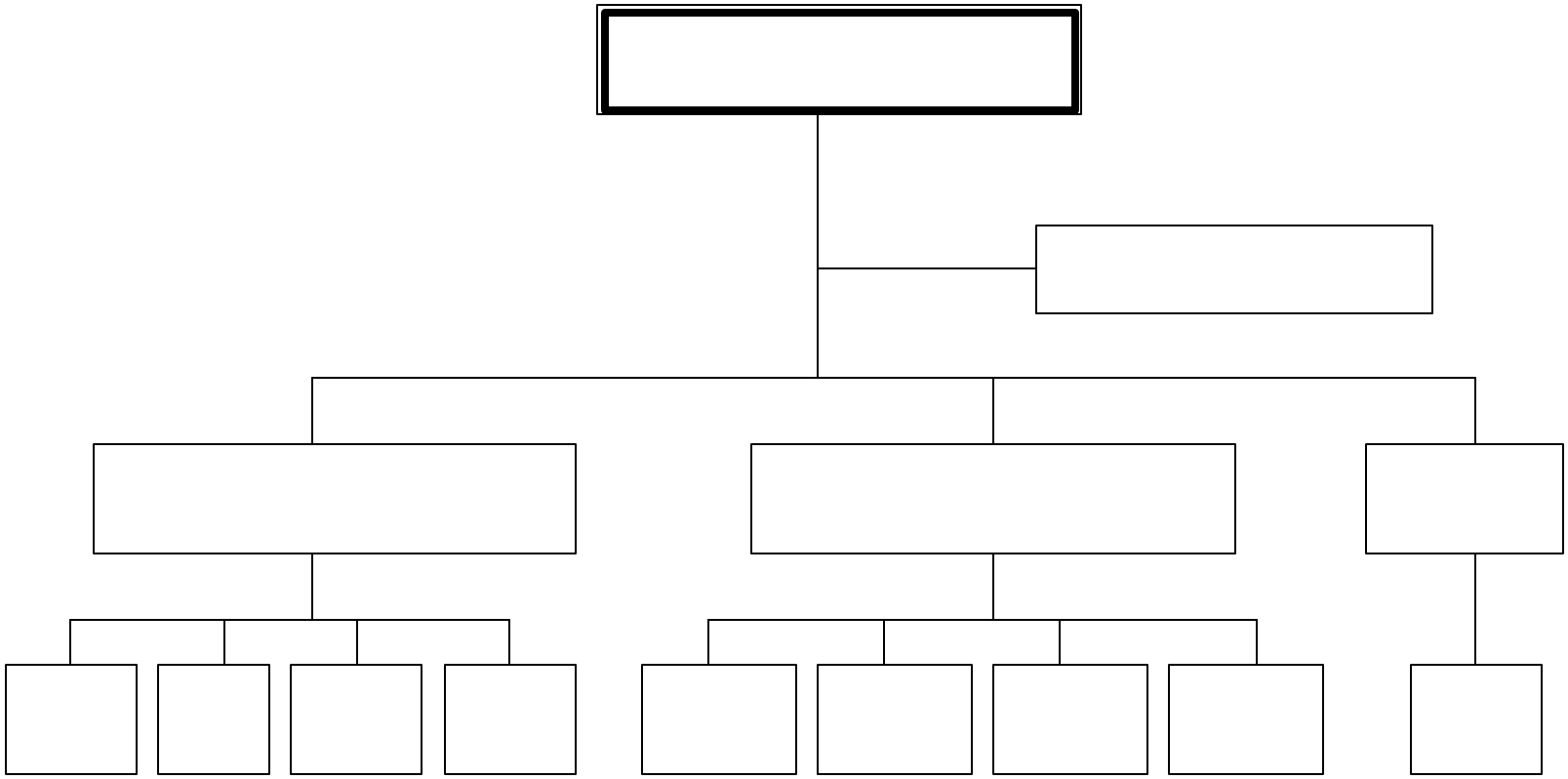
Focal Institution	**Country/region**
1. NARS/NGOs	
Institut d'études et de recherches agricoles (INERA), Association Six-S (NGO)	Burkina Faso
Agricultural Research Department, Thusano Lefatsheng (NGO)	Botswana
Kenya Agricultural Research Institute (KARI)	Kenya
Environment Liaison Center International (NGO)	
Institut d'économie rurale (IER)	Mali
Institut national de recherches agronomiques du Niger (INRAN)	Niger
Ministry of Agriculture, Water and Rural Developement, Research and raining	Namibia
Institut senegalais de recherches agricoles (ISRA), Bureau Pedologie	Senegal
Plateform Rurale des Paysans des Etats Membres du CILSS (NGO)	
National Department of Agricultur (NDA)	South Africa
Department of Research and Special Services, ENDA-Zimbabwe (NGO)	Zimbabwe
2. International Institutes/United Nations Agencies	
International Center for Research in Agroforestry (ICRAF)	Nairobi, Kenya
International Crops Research Institute for the Semi-Arid Tropics	

(ICRISAT)	Patancheru, India
International Fertilizer Development Center (IFDC)	Muscle Shoals, AL, USA
International Food Policy Research Institute (IFPRI)	Washington, DC, USA
International Livestock Research Institute (ILRI)	Nairobi, Kenya
International Plant Genetic Resources Institutes (IPGRI)	Rome, Italy
United Nations Development Programme (UNDP)	New York, USA
Untied Nations Environment Programme (UNEP)	Nairobi, Kenya
Tropical Soil Biology and Fertility Programme (TSBF)	Nairobi, Kenya

3. Advanced Research Institutes

Centre de coopération internationale en recherche agronomique pour ledevelopment (CIRAD)	Montpellier, France
Center for Ecology and Hydrology (CEH)	Edinburgh, UK
Institut De Recherche pour le developpement (IRD)	Paris, France

Annex F: ORGANIZATION AND MANAGEMENT STRUCTURE FOR DMP



ANNEX G: PROJECT MANAGEMENT STRUCTURE

DMP will have two levels of activity; (i) National activities jointly implemented at the country level by the National Agricultural Research Systems (NARS), International Agricultural Research Centres (IARCs) and Advanced Research Institutes (ARIs), led by National Coordination Committees, chaired by a National Coordinator, and (ii) Sub-regional / regional activities implemented by IARCs and ARIs.

At the national level, IARCs and ARIs, will assist NARS through the Scientific and Technical Advisory Team (STAT) to develop a common framework for site stratification and to characterise specific bench mark sites. The STAT will also provide support to NARS for the development of standardised data collection methodologies, storage and management systems for an understanding of ecosystem status and dynamics with regards to the loss of biodiversity. IARCs and ARIs will also participate in the implementation of studies at the benchmark sites and assist with an overall syntheses at the sub-regional and regional level. In addition, IARCs and ARIs will promote capacity building in the NARS through training courses and collaborative studies at the field level. Through these collaborative studies, IARCs and ARIs will provide support to NARS for the development of natural resource management methods and technologies that include strategies for implementing and promoting conservation, restoration and sustainable use of degraded ecosystems.

At the sub-regional and regional level, IARCs and ARIs will assess the need for new scientific, technical and social science in order to implement and fulfill all the proposed DMP outputs, and then develop appropriate training packages that meet these needs. Such training may be provided by an array of different types of courses, or through scientific team exchange visits and information sharing between sub-regions and countries to facilitate technology transfer. Sub-regional and regional synthesis of results will be developed by IARCs and ARIs through upscaling methodologies for south-south trends and through the use of systems modeling, remote sensing and GIS tools for extrapolation strategies. Biophysical and socio-economic approaches to modeling will be integrated to allow the screening and identification of scenarios that will lead to best bet management practices and policies for rebuilding biodiversity and restoring degraded and collapsed ecosystems. Once appropriate technologies and land use practices have been identified, IARCs and ARIs will assist NARS scientists to assess the training needs of all levels of stakeholders and target populations across sub-regions and countries. They will then develop training packages and appropriate policy guidelines that meet these requirements. They will also generate and produce information / dissemination packages.

DMP Steering Committee

The Steering Committee will meet once a year at one location to review and approve the yearly workplans and conduct a second meeting through electronic media. Other groups will meet only when the need arises. Meetings will rotate between countries and sub-regions. Meetings will be open, and NGOs observers will be invited.

Terms of Reference for the DMP GEF Project Steering Committee

Review and approve final project documents
Promote sound relations between the DMP and other initiatives
Constitute working groups to facilitate implementation of activities and work plans
Determine the programme's priority research areas
Promote effective linking between country and sub-regional aspects of the project
Develop guidelines for the appointment of members of the Scientific and Technical Advisory Team (STAT)

Develop and approve Terms of Reference for specific tasks to be undertaken by the STAT
Appoint members of the STAT

Membership of the Steering Committee

The steering committee is composed of 14 members:
One National Co-ordinator per country (9), one representative of the International Agricultural Research Centers (1), one representative from the convening center (ICRISAT), one representative each from UNEP and UNDP (2) and the DMP Coordinator as its ex-officio member.

Executive Committee and its Terms of Reference

The day to day management of the DMP will be supported by an Executive of the Steering Committee. The Executive will meet (largely) virtually.

Membership of the Executive Committee

It is formed by a committee of 6 members as follows:
One Anglophone/Eastern African Representative, one Francophone/West African Representative, one representative each from UNEP, UNDP, ICRISAT and the DMP Coordinator.

Scientific and Technical Advisory Team (STAT)

The STAT will be an ad hoc grouping of experts, and its membership will be fluid as the need arises. It will comprise the most suitable advisors to address the topic at hand (members will not be appointed on a proportional or country basis)

It will provide ad hoc advice on implementation, both proactive policy advice and problem oriented, as these arise.

The STAT will be appointed by the Steering Committee and its Executive Committee via the Co-ordinator.

National Coordinating Committees

As explained earlier, National Coordinating Committees (NCCs) established during the national workshops, will identify and prioritize the national research problems in collaboration with all partners in the Program, including research and extension institutions, local office of UNEP, UNDP, CBOs (farmer's, resources users representatives) local NGOs, and universities. A National Coordinator has been appointed by each NCC in the consortium to coordinate the planned national program in the DMP, allocate research tasks, and share information and resources across the national institutions.

Terms of reference of the National Steering Committees

Select and appoint the National Coordinator
Identify and prioritise research activities within projects for submission by the DMP to donors
Liase with the national GEF Focal Point and ensure sound coordination within government
Liase with the DMP country office
Liase actively with all national partners so as to ensure effective project management, and promote synergy between all aspects and partners of the DMP.
Receive, approve and forward all progress reports to the DMP

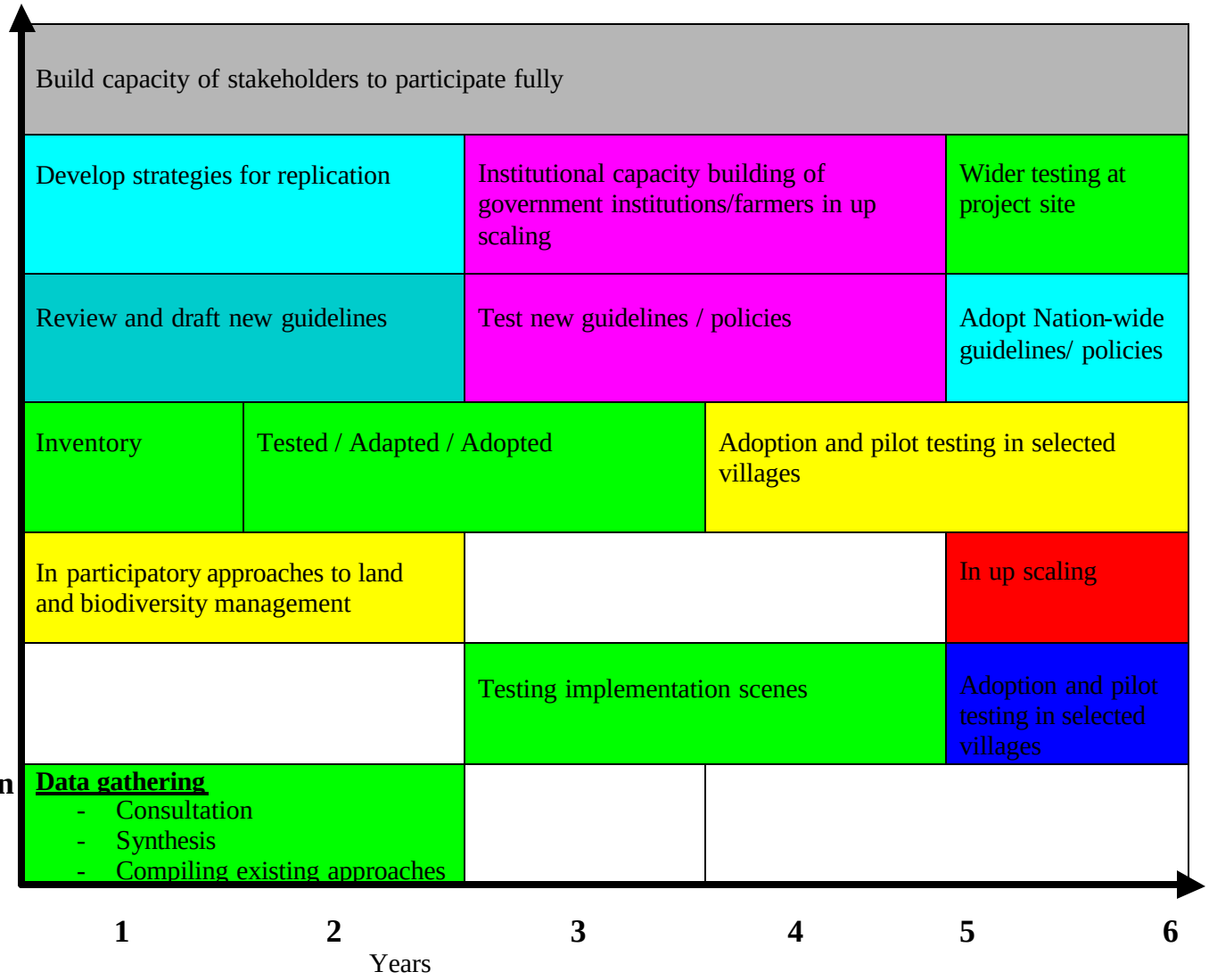
Global management structure

ICRISAT will manage logistics, finances, etc on a de-centralized basis in each sub-region. The ICRISAT regional office in Niamey will manage funds earmarked for the West Africa partners, the regional office in Nairobi for partners in East Africa and the regional office in Bulawayo for partners in Southern Africa. Each office will be supported by a sub-regional coordinator supported jointly by ICRISAT and GEF project funds. Sharing of experiences and learning should primarily take place at field level via exchange visits, seminars, etc that involve both francophone and Anglophone countries.

Annex H: Project Workplan

Major Project activities by Year

Outputs



Annex I: Budget by Outputs and Activities

Activities	Project Phase	Baseline	Alternative	Co-funding	GEF
Output 1. Monitoring and Evaluation					
1.1. Inventory of endemic species	1	2,093,863	3,634,370	906,161	634,346
1.2. Ecosystems stability	2	2,415,909	3,740,909	657,143	667,857
1.3. Document IK	1	404,500	581,720	151,850	25,370
1.4. Inventory of endangered species	1	12,400	124,460	106,225	5,835
1.5. Biodiversity degradation	2	497,000	1,132,000	335,000	300,000
1.6. Regeneration	2	12,180	173,960	121,780	40,000
1.7. Restoration of biodiversity	2	717,175	930,175	111,000	102,000
1.8. Characterization of benchmarks	1	276,000	1,313,000	801,000	236,000
1.9. Standardized data collection	1	1,256,133	2,736,133	895,000	585,000
1.10. Identify social skills	2	625,000	1,115,000	310,000	180,000
1.11. Develop packages	3	500,000	1,315,000	580,000	235,000
1.12. Scaling up methodologies	3	1,534,857	4,336,785	1,669,071	1,132,857
1.13. Modeling	3	590,000	1,252,000	340,000	322,000
Total 1		***10,935,017***	***22,385,513***	***6,984,230***	***4,466,265***
Output 2. Testing and Implementation					
2.1. Document best-bet practices	1	813,043	1,850,727	803,290	235,738
2.2. Pilot technologies	1	401,658	1,738,393	932,400	404,335
2.3. Adoption and implementation	2	1,014,176	2,461,938	1,009,665	438,097
2.4. Conservation and restoration	3	647,371	1,991,716	939,131	405,214
2.5. Enhance IK	3	203,200	1,235,200	792,880	239,120
2.6. Overall synthesis	3	485,000	1,548,640	608,640	455,000
Total 2		***3,564,448***	***10,827,950***	***5,086,006***	***2,177,504***

Activities	Project Phase	Baseline	Alternative	Co-funding	GEF
Output 3. Capacity building					
3.1. Assess Training needs	1	946,904	2,600,970	912,554	741,512
3.2. Develop training programmes	1	929,029	2,976,617	1,378,469	669,119
3.3. Planning and implementation	2	813,333	2,788,333	1,202,000	773,000
3.4. Sensitize partners	2	1,214,272	2,871,272	1,398,600	258,400
3.5. Organize training courses	2	654,500	3,255,150	2,132,960	467,690
3.6. Information packages	3	338,100	1,104,330	416,250	349,980
3.7. Training packages	3	317,125	2,335,425	1,528,300	490,000
Total 3		***5,213,263***	***17,932,097***	***8,969,133***	***3,749,701***
Output 4. Sustainable alternative livelihoods					
4.1. Livelihoods options	1	1,047,500	2,500,650	1,008,150	445,000
4.2. Empower communities	1	58,100	670,800	543,100	69,600
4.3. Implement best-bet options	3	826,462	2,687,862	1,408,900	452,500
Total 4		***1,932,062***	***5,859,312***	***2,960,150***	***967,100***
Output 5. Policy and legal framework					
5.1. Document existing policies	1	757,219	1,838,834	461,615	620,000
5.2. Develop policy documents	2	27,266	805,631	594,365	184,000
5.3. Implement policies	3	789,800	797,165	1,124,365	623,000
Total 5		***1,574,285***	***4,721,630***	***2,180,345***	***1,427,000***
Output 6. Up scaling of NRM options					
6.1. Promote soil fertility	2	1,027,933	2,740,033	1,017,100	695,000
6.2. Promote integrated land and pastoral spaces	2	415,000	1,545,000	920,000	210,000
6.3. Promote multiple land use systems	3	150,000	1,400,000	650,000	600,000
6.4. Integrated management of biodiversity	3	201,714	1,446,737	1,183,872	61,151
6.5. Support to NARS	2	1,195,000	2,931,000	800,000	936,000
Total 6		***2,989,647***	***10,062,770***	***4,570,972***	***2,502,151***

Activities	Project Phase	Baseline	Alternative	Co-funding	GEF
Output 7. Stakeholder participation					
7.1. Participation of vulnerable groups	1	254,333	1,246,797	732,185	260,279
7.2. Permanent dialogue framework	1	100,000	755,000	600,000	55,000
7.3. Scientific teams exchanges	2	1,575,000	3,394,286	1,454,286	365,000
Total 7		***1,929,333***	***5,396,083***	***2,786,471***	***680,279***
Grand Total		**28,358,055**	**77,865,362**	**33,537,307**	**15,970,000**

Annex J: Major constraints to sustainable agricultural production and biodiversity conservation in the countries covered by the Desert Margins Program (DMP)

Environmental constraints

- Infertile erosion prone soils ;
- Limited and unpredictable rainfall, with frequent and severe droughts;
- Inadequate irrigation which is often poor in quality as well as quantity.
- Reduction of suitable land for agricultural purposes;
- Pests and diseases that limit both crop and livestock production.

Technological constraints

- Inappropriate technology transfer; Some technologies are beyond the capacity of farmers in terms of labour, time and capital; Some technologies are also not adapted to farmers' means, living conditions, as well as specific needs;
- Weak research-extension-farmer linkages. Inadequate coordination of technological information from NGOs, researchers and extension workers;
- Inappropriate and inadequate technological packaging, as well as limited technological awareness;
- Limited involvement of universities in research and extension education and lack of adequately trained personnel;

Socio-cultural constraints

- Indigenous technical knowledge is not taken into account, particularly when introducing new practices; Technology conflicts with local knowledge and time-tested traditional practices;
- Some farmers are not convinced of the added value of technology;
- Gender barriers to technology adoption;

Economic constraints

- Inadequate access to markets for agricultural produce.
- Low market competitiveness for agricultural produce.
- Insufficient funding for agricultural research; Not well oriented agricultural research programmes;
- Limited access to farm inputs and credit;
- High costs of fertilizer inputs and other soil-condition ameliorating methods;
- Competition/conflict between agriculture and livestock enterprise on limited land resources;

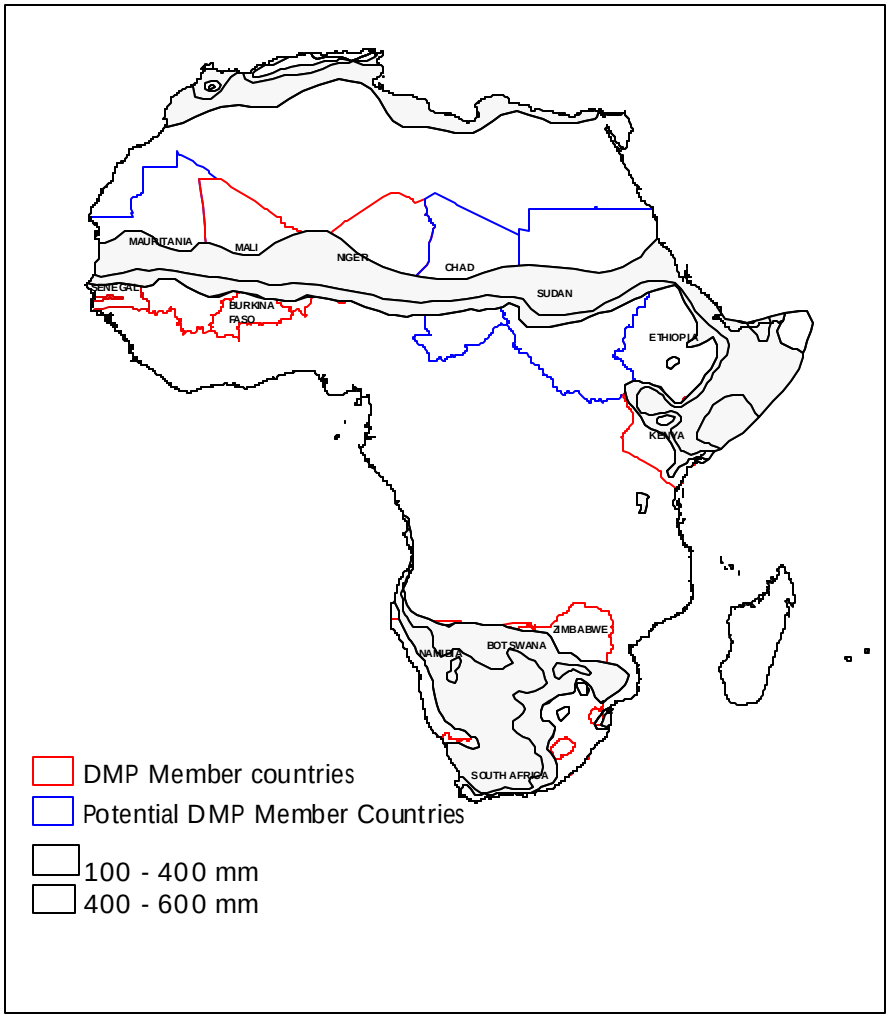
Institutional constraints

- Inadequate integration of research and development activities;
- Lack of coordination among and between agricultural research institutions (IARCs and NARS);
- Inadequate promotion of sustainable agricultural farming systems;

Policy constraints

- Incentives to increase agricultural production are not harmonized within and across countries of the region and sustained;
- Inappropriate land tenure systems that limit access to land and security of tenure;
- Inadequate policy to support sustainable agricultural farming systems;
- Exclusion of the corporate sector from agricultural research;
- Inefficient financial support to implement technology;
- Weak logistics to extend technologies e.g. roads. Telephones and tools;

Annex Ka : Rainfall zones 100 to 600 mm



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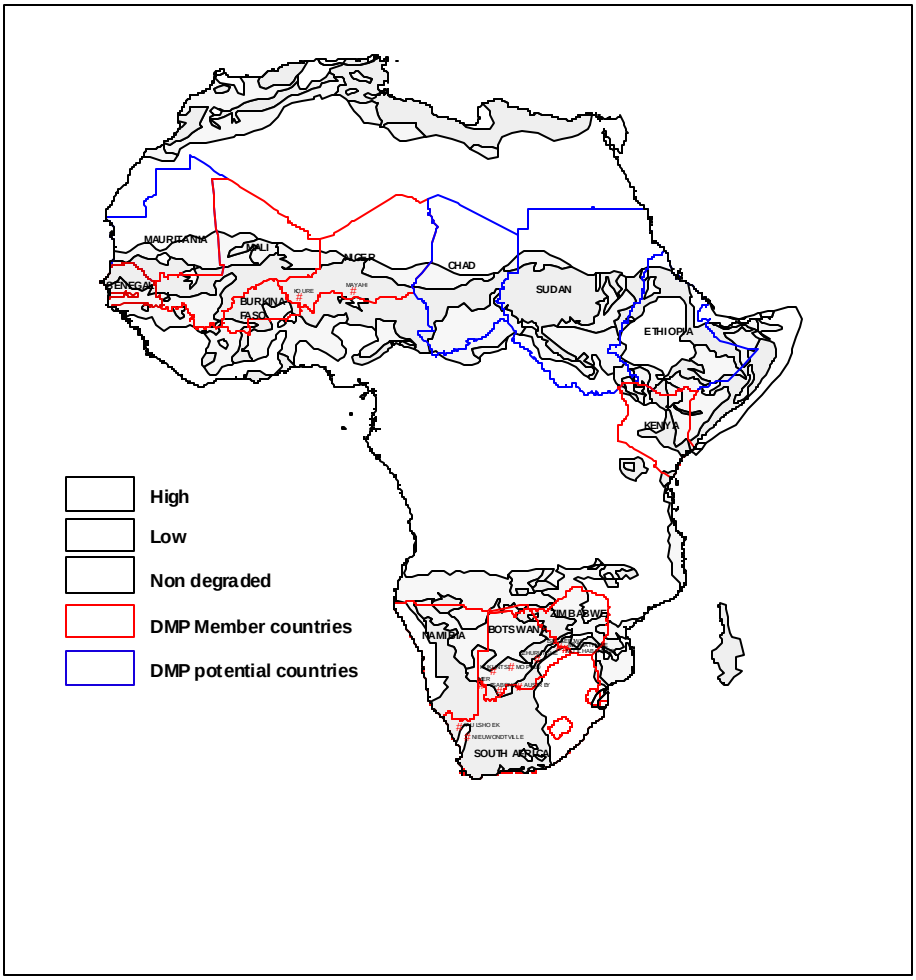
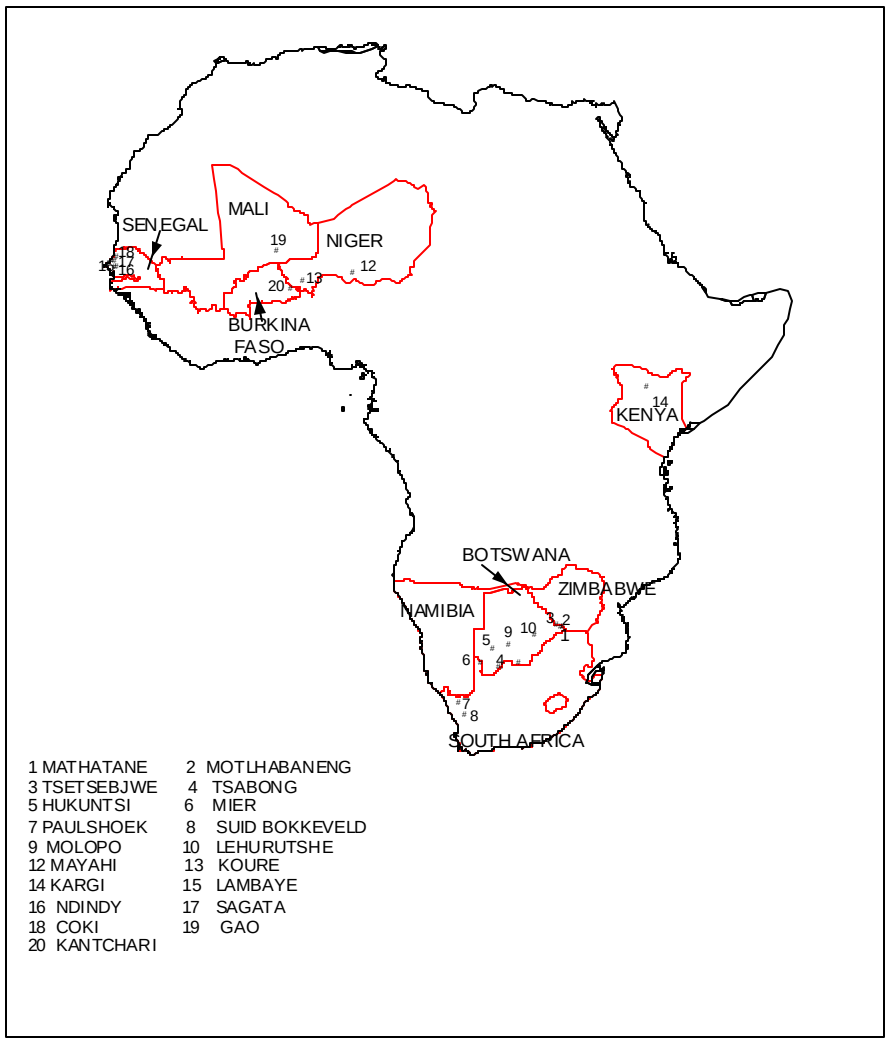
Annex Kb : Land degradation severity and project sites in DMP countries



ANNEX kc: DMP Countries and project Sites



ANNEX Kd: PROJECT SITES

BURKINA FASO

Three main sites have been selected in Burkina Faso.

1. District of Banh
2. District of Kantchari
3. District of Oursi

BOTSWANA

Two main sites are selected comprising 5 villages as follows:

District/ Sub district	Village	Coordinates	Altitude (m)
Bobirwa	Mathathane	22? 15N 35.60 S; 28? 45N 29.10 E	722
	Motlhabaneng	22? 10N 10.20 S; 28? 53N 25.60 E	590
	Tsetsebjwe	22? 18N 18.20 S; 28? 20N 43.50 E	886
Kgalagadi	Tsabong	26? 04N 01.30 S; 22? 21N 28.90 E	1002
	Hukuntsi	24? 00N 43.20 S; 21? 47N 43.90 E	1225

MALI

Project activities will be centered around Gao

NAMIBIA

This project will mainly focus in four of these 14 sub-zones namely the **Dwarf Shrub Savanna** in the south, the **Mixed Tree and Shrub Savanna** in the southeast, the **Camelthorn Savanna** in the east and the southern parts of the **Forest Savanna and Woodland** in the northeast.

DMP Description of project area

Ecological diversity in Namibia is best described in terms of biomes or ecosystems. Namibia's four main terrestrial biomes are **Desert**, **Nama-Karoo**, **Succulent Karoo** and **Savanna**. Although animal distribution data on their own cannot realistically be used to delineate biomes, insect distribution data have helped to confirm the general validity of this categorisation. A similar biome classification has been used by Africa's largest biodiversity project, the Southern African Bird Atlas Project (SABAP) and by a recent diversity analysis of Namibian birds. At a finer scale, Namibia is divided into three broad vegetation categories and fourteen veld types.

The specific sites would be focused on and around Gibeon in the south-central communal farming areas (25º 74'S, 17º 48' E), Epikuro (21º 21'S, 19º 12'E) and Aminuis (23º 38'S, 19º 21'E) in the eastern communal farming areas. Lessons learned would be shared and expanded to other communal farming areas, in the desert margins, both south and east. Sites selected for this work are located in the Northern edge of the Nama-karoo region of Namibia. They are complementary to NAPCOD current work in the West (Namib margin) and North of Namibia.

NIGER

Selected sites are given below

East province	West province
Mayahi Coordonnées : 7.67 lat.- 13.96 long. Plaines de l'Est	Kouré: Coordonnées : 2.57 lat. - 13.31 long. Dallols, Plateaux, Fleuves et affluents

SENEGAL

Selected sites are given below

Zone Nord et Centre – Zone Ouest	Zones Centre – Est – Sud - Estuarienne
Zone Nord et Centre : 351 762.15 longitude, 1639 662.18 latitude Zone Ouest : 308 081.17 longitude, 1567 998.08 latitude	Zone Centre – Est et Sud : 476 662.45 longitude, 1583 695.93 latitude Zone estuarienne : 306 033.63 longitude, 1569363.11 latitude

SOUTH AFRICA

Selected sites are given below

Northern Cape Province	North West Province
(1) Mier (Kalahari)	Molopo Nature Reserve and adjacent Molopo Agricultural district as buffer area. Molopo is situated in the Kalahari Plains Thornveld and bordering Botswana.
(2) Paulshoek\Leliefontein in Namaqualand	Lehurutshe (Agricultural district) – borders Botswana
(3) Suid Bokkeveld in the Hantam district, Northern Cape	Kudumane ((Agricultural district)

KENYA

Three benckmark sites are selected

1. The Kargi settlement area (Marsabit District)
2. Tarach River (Lopuski Sub-location in Kakuma Division, Turkana District)
3. and Kiambeere area (Gachota division in Mbeere District).

ZIMBABWE

Three sites have been selected

1. Masyingo South
2. Matebeland South and North
3. and the Lowveld areas of Zimbabwe.

These sites represent the semi-arid marginal ecological zones of Zimbabwe

ANNEX L. Globally Significant Ecosystems in DMP Member Countries

ZIMBABWE

Globally Significant Resources	Immediate Threats	Intermediate Threats	Root Cause
1. Miombo Woodland Ecosystem (Masvingo Site) Brachystegia/Julbernardia co-dominant woodlands	Deforestation Overgrazing over browsing Over-utilisation (extraction) of forest products Drought and other episodic events (fires)	Fuel wood for urban and rural populations Increased land clearing for cropping purposes Reduced biomass production per unit of land Increased demand for alternative livelihoods Depleted biodiversity	Population pressure on resources, growth rate > supply. Inherently infertile soils (fragile ecosystem). Poverty drives resource exploitation Lack of NRM skills
2. Acacia Savanna Colophospermum mopane ecosystem (Matebeleland North and South Sites)	Herbivory pressures leading to land degradation Drought Over-utilisation (grazing/browsing) product extraction	Loss of soil and increased infertility Increased sodicity Reduced biodiversity Impaired ecosystem function and reduced resilience	Increased livestock and wildlife numbers Lack of NRM skills and awareness Inadequate NRM policies and knowledge of ecosystem function Poverty
3. Kalahari sands and forest ecosystem (Matebeleland North Site)	Over-exploitation (Timber for construction and firewood) Productivity declining due to reduced biodiversity (Extinction of *spp*) Drought	Drastic species composition changes Irreversible loss of biodiversity Ecosystem imbalances not understood Wood carvings	Increased human and livestock populations More land frequently opened up for cropping Export demand for timber and increased use in domestic construction Lack of NRM knowledge

BURKINA FASO

Globally Significant Resources --- Ressources d'importance mondiale	Immediate Threats --- Menaces Directes	Inter-mediate Threats --- Menaces Intermédiaires	Root Causes --- Causes Fondamentales
1. Steppe arbustive • sols fragiles de fertilité très médiocre • sols à capacité de rétention en eau très faible. • 300 – 500 mm	• Dégradation irréversible des terres et de la diversité biologique • Surpâturage • Dégradation des écosystèmes • Pression des terres agricoles sur les ressources naturelles.	• Méconnaissance des facteurs qui menacent la diversité biologique et les écosystèmes • Absence de techniques / technologies de conservation de la diversité biologique • Absence de technique / technologies de conservation / restauration des ressources naturelles • Absence / insuffisance d'information sur les causes de la dégradation • Manque / insuffisance de cadre de concertation pour les différents acteurs.	• L'accroissement de la population humaine et animale • La pauvreté • La baisse de la pluviométrie
2. Steppe arbustive et fourrée ▪ Bassins versants ▪ Isohyète 600 mm ▪ Végétation de brousse tigrée	• Dégradation • Ecosystème fragile et sensible • Evaporation … • Vents violents • Erosion • Diminution de la longueur • Pauvreté des sols • Faiblesse des rendements • Baisse de la pluviométrie • Manque de fourrage • Manque d'eau • Assèchement des cours d'eau • Baisse de la nappe phréatique	• Pauvreté • Exode rural • Migration des hommes et des animaux • Diminution de la diversité biologique • Mortalité des animaux • Surpâturage • Diminution de surfaces cultivables • Disparition de certaines espèces	• Climat • Pression démographique • Mauvaise pratique de gestion de l'environnement • Pression foncière • Baisse de la pluviométrie • Déforestation.

BOTSWANA

District/ Village and Sub district	Threats
a. Miombo Woodland Ecosystem (Masvingo Site) – Brachystegia/Julbermadia co-dominant woodlands. Acacia Savanna Colophospermum Bobirwa :Tsetsebjwe, Mathathane and Motlhabaneng villages are within the Mixed type of vegetation zone in the central district in Botswana. The vegetation is mainly comprised of mixed tree species, mostly tall and characterised by a few shrubs as an understorey. Common to all these areas are the mophane (*Colophospermum mopane*), mohudiri (*Combretum apiculatum*), Modumela (*Kirkia acuminata*), Mooka (*Acacia karroo*), Motsiara (*Terminalia prunioides*), Mowana (*Adansonia digitata)* and shrubs such as the following - Moretlwa (*Grewia flava*), Mogwana (*Grewia bicolor*), Motlhakola (*Euclea undulata*), Moselesele (*Dichrostachys cineria*) and many more other shrubs. In general, the area is described as a Mophane Woodland characterised by Semi - Sweet Mixed Bushveld (Botswana Society, 1992). Different grass species form the bottom layer of the vegetation strata in these three areas. Common to those areas are the *Aristida congesta* (Seloka), *Eragrostis rigidior* (Rathathe), *Enneapogon cenchroides* (Mosekangwetsi), *Schmdtia pappophoroides* (Tshwang), *Setaria sphacelata* (Mabele), *Setaria verticillata* (Bogoma), T*ragus berteronianus* (Segowe), *Chloris virgata, Dactylocteneum aegyptium* (Phoka), *Urochloa trichopus* (Phoka), *Eragrostis lehmaniana, Eragrostis racemosa* and others. There are quite a number of forbs growing side by side to grasses as evidenced during the rainy season.	b. Mopane ecosystem (Matebeleland North and South Sites). Motlhabaneng According to the TRRA exercise conducted at Mathathane village on November 4, 1998, the following vegetation species had disappeared: **Grasses -** Rathathe (*Eragrostis rigidior)*, Tshwang (*Schmdtia pappophoroides*), Tshikitshane (*Stipagrostis uniplumis*). Present at that time included Seloka (*Aristida congesta*). **Trees and Shrubs** - no record of any disappearance of the below mentioned species: Mohudiri, Mogwana, Motsiara and Mophane although the same species are in high demand for fuel wood.
c. Kalahari sands and forest ecosytem (Matebeland North Site) Tsetsebjwe : The following grass species were said to have disappeared as a result of lack of moisture: Phoka (*Chloris gayana*), Motsikiri (*Eragrosis pallens*), Makorwane ? while Seloka grass stands can still be seen all over.	d. **Trees and Shrubs -** The following trees and shrubs were reported to be on the decline, Mohudiri, Motsiara, Mokosho (*Acacia nigrescens)*, Mogwana, Moretlwa and Mokabi (*Combretum hereroense*). Mophane, Motsiara and Mohudiri specifically are disappearing because of being over-utilized as fuel-wood. Also mentioned along the same line are some medicinal plants such as Monepenepe, Sengaparile (Devil? s Claw), Morula (*Sclerocarya birrea)* and Modumela.

Utilisation of Veld Products.

Various veld products are utilized by the residents of the area for many socio-economic benefits. The table below attempts to summarize some of these products and their respective uses.

Utilisation of veld products.

Tree Species	Uses					Depletion Status		
	fire wood	browse	poles	medicinal	fruits	0k	declining	lost
Mophane	❄	❄	❄			❄		
Mohudiri	❄	❄	❄				❄	
Mogonono	❄		❄					❄
Moretologa					❄		❄	
Mhatha		❄		❄			❄	
Mokomotu			❄			❄		
Motsiara	❄					❄		
Mokala	❄	❄				❄		
Moselesele	❄						❄	
Mogwana	❄	❄			❄	❄		
Monepenepe				❄			❄	
Mokabi		❄					❄	
Mokosho		❄					❄	
Moretlwa		❄			❄			❄
Morula				❄	❄		❄	
Motshijane				❄			❄	
Mhaha				❄			❄	
Mowana					❄	❄		
Sengaparile				❄			❄	

Grass Species	grazing	thatching	ok	declining	lost
Rathatha		❄			❄
Rantafole		❄			❄
Tshwang	❄				❄
Makurwane					❄
Sedupapula					❄
Seloka	❄		❄		
Sesadile					❄
Sesekangwetsi					❄
Tshikitshane	❄				❄
Phoka	❄				❄
Motshikiri	❄				❄
Mogorwane	❄				❄
Pitseesule					

Other Products	Uses	Availability
Mophane Worms	food (protein rich relish)	Seasonal
Honey	food	
Wild vegetables	food	Seasonal

NIGER

Biodiversité existante	Causes	Menaces	Impact
• Cultures vivrières : mil, niébé, sorgho, arachide • Autres espèces cultivées • Arbres et arbustes • Animale (girafe, oiseaux) • Plantes (Hyphaene T., brousse tigrée, plantes médicinales) • Plants d'eau (mares, fleuve)	• Faiblesse des revenus • Pression démographique • Aridification du climat • Faiblesse du niveau de technicité • Inadéquation des pratiques culturales • Faiblesse des revenus • Pression démographique • Aridification du climat • Manque de sources d'énergie • Pauvreté • Inadéquation des pratiques de gestion des ressources naturelles	• **Surexploitation des ressources naturelles** • Déforestation • Erosion éolienne • Mauvaises pratiques de gestion des resources • Déplacement de l'agriculture dans les zones pastorales et forets • Déforestation • Erosion hydrique • Mauvaises pratiques de gestion des ressources • Utilisation du bois comme principale source d'énergie	• Perte de la diversité biologique • Accroissement de la pauvreté et insécurité alimentaire • Destruction des écosystèmes • Entrave à la reprise de la végétation • Baisse de la productivité des terres • Exode rurale • Perte du savoir faire local • Perte de la diversité biologique • Accroissement de la pauvreté et insécurité alimentaire • Destruction des écosystèmes et des habitats des espèces animales • Dégradation des sols avec baisse de la productivité des terres • Exode rurale • Perte du savoir faire local

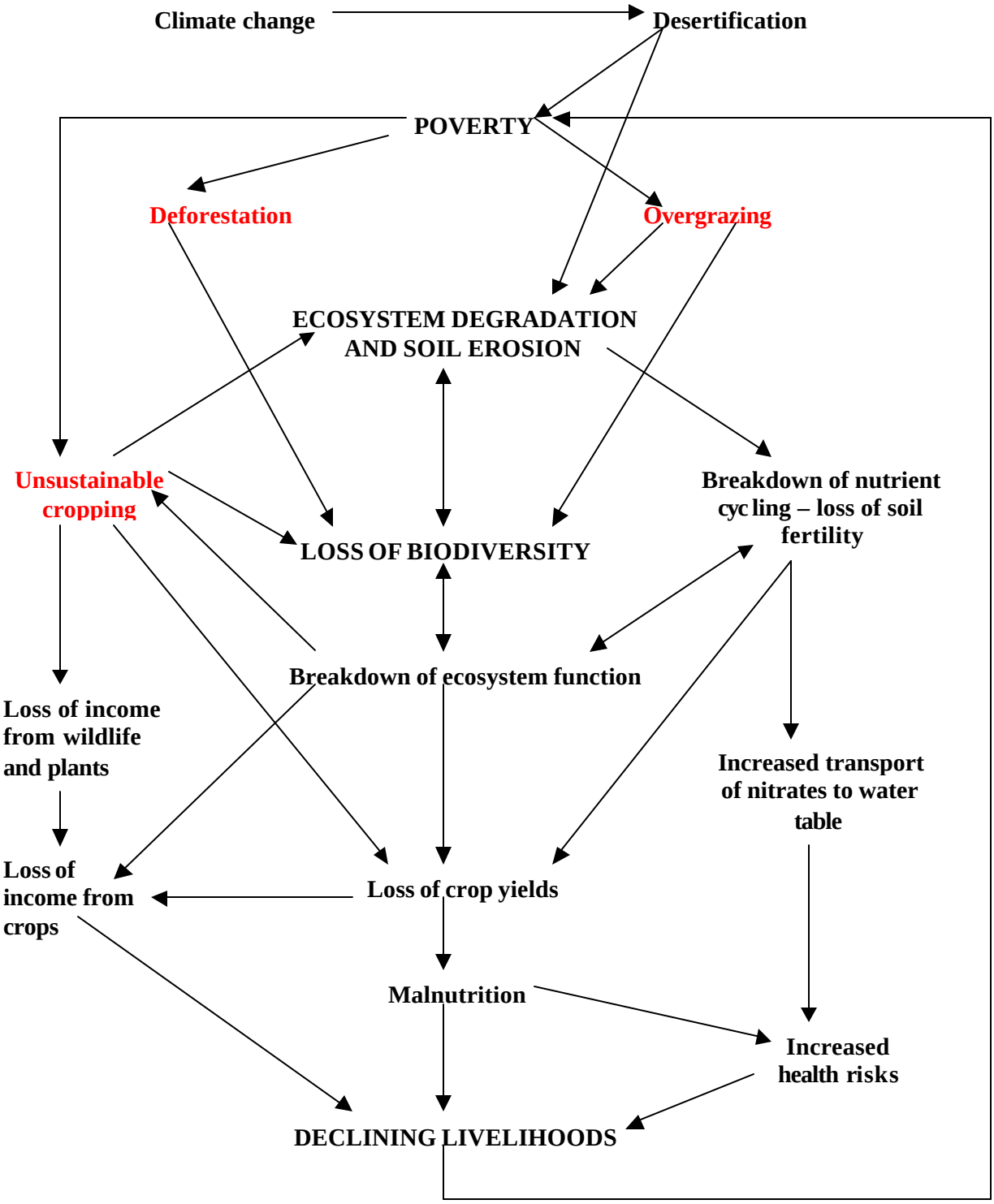
SENEGAL

Major ecosystems	Threats
1. North and Centre ecosystem Two major sub-ecosystems - One formed by species striving on non-leached Alfisols: *Acacia raddiana, Balanites aegyptiaca, Boscia senegalensis, Ziziphus mauritiana* et *Guiera senegalensis* et colonisant les sols isohumiques, *Faidherbia albida, Balanites aegyptiaca, Combretum sp, Acacia seyal, Borassus aethiopum* et *Adansonia digitata.* - A second ecosystem formed by species striving on hydromorph to pseudogly soils: *Parinari macrophylla, Acacia seyal* et *Combretum glutinosum*	1. degradation or destruction of these ecosystems 2. extension overgrazing 3. bush fires and 4. illegal wood harvesting
2. Ecosystem of the West zone Habitat of a great number of endemic species and two types of vegetal cover. A forested zone with tree species and a savanna woodland.	1. degradation or destruction of these ecosystems 2. extension overgrazing 3. bush fires and 4. illegal wood harvesting
3. Ecosystem of the Centre, East and South zone Sudano-sahelian zone with major species composed of *Cordyla pinnata, Faidherbia albida* et *Combretum sp*. Other species are also found *Pterocarpus erinaœus* et *Anogeissus leiocrapus*.	1. degradation or destruction of these ecosystems 2. extension overgrazing 3. bush fires and 4. illegal wood harvesting
4. Ecosystem of the estuarian zone (or mangrove) A mangrove dominated by *Rhizophora racemosa, Rhizophora mangle* et *Avicennia africana*.	1. degradation or destruction of these ecosystems 2. extension overgrazing 3. bush fires and 4. illegal wood harvesting

KENYA

Major ecosystems	Threats
Lopuski settlement in Turkana District 1. Riverine forest ecosystem *sp Acacia eliator, A, tortilis, Salvadora persica and Ziziphus Mauritania*	Over-exploitation by refugee camps
2. Kargi settlement in Marsabit District Ecological zones (ecosystems) VII – VIII of Kenya with little vegetation cover	High livestock population Accelerated runoff poor water infiltration
1. Kimbeere area of Mbeere District	

Annex M: Process of ecosystem degradation and breakdown in agricultural land



Note. The cycle of biophysical and socio-economic processes causing ecosystem degradation, biodiversity loss, and the breakdown of ecosystem function, in agricultural land. Through the development of better understanding of these processes and appropriate interventions, the DMP aims to reverse this cycle.