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## GEF LAND DEGRADATION LINKAGE STUDY

# **GEF Land Degradation Linkage Study**

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# Executive Summary

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The purpose of this report is to identify the results and initial impact of the land degradation component of those linkage projects which link biodiversity, international waters and climate change with land degradation. The lessons learned from this review lead to a set of recommendations on how land degradation issues should be addressed in focal area reviews and in subsequent GEF activities.

In response to this assignment, a total of 103 land degradation linkage projects were reviewed in a desk analysis. Thirty-five were selected for a more detailed assessment and eight of these chosen for specific review. An attempt was made to identify the degree to which land degradation was being addressed in the projects and 39 of the 103 projects were identified as having a strong land degradation component. Of these, 27 (69 percent) were in the biodiversity focal area, six were in climate change, and six were in international waters. Fourteen of these projects derived from the pilot phase and 25 had been initiated since 1995. However, a statistical trends analysis suggests that allocation to all land degradation linkage projects has decreased since 1997, although a significant number of projects are currently in the agency pipelines.

In general, the detailed study of project documents shows that the land degradation component of projects is not as strong as suggested in previous GEF reports, though this desk analysis may not reveal actual field-level actions and priorities. It is clear, however, that the number of land degradation projects and financial allocation to land degradation has not increased in recent years, with the exception of medium-size projects.

An initial analysis of this trend suggests some basic causes which have limited land degradation linkage activities. First, project concepts are usually based on focal area activities rather than linkage activities such as land degradation. Second, 69 percent of projects with land degradation linkages are in the biodiversity focal area, and of these 77 percent are located in or near protected conservation areas. Protected areas are not usually regions of highest land degradation concern and project activities in these areas, though obviously important to biodiversity, do not directly impact land management problems or land degradation issues. International waters projects have included land degradation mitigation in some cases, but the specifics have tended to focus on institutional and water pollution aspects rather than land degradation mitigation and catchment management activities. Climate change projects have not in recent years focused much on land degradation because current climate change operational programs are not addressing land management issues, though there seem to be opportunities to expand this linkage with a new operational program. A third reason for the lack of strong land degradation components has been the difficulty in estimating incremental costs of mitigation activities when the activities are usually providing local as well as global benefits. An attempt to reduce this problem has led to a new operational program with “cost sharing” opportunities. In general, the large majority of current projects identified as land degradation linkage projects have been designed to address the focal areas as a first priority and only in some cases has land degradation mitigation been a priority.

The analysis of project portfolios was an imperfect mode of project evaluation and did not allow for an assessment of project impacts on mitigating land degradation, though this may be addressed in part through the focal areas assessments following this study. The more detailed review of project documents did provide some clear findings:

- GEF projects with a strong land degradation component are fewer than previously thought.
- While projects containing a strong land degradation component have been allocated about US \$278 million by the GEF, the portion that comprises the *land degradation component* is estimated at US \$50 million of the GEF portfolio.
- The most effective linkage projects appear to be those where land degradation is built in as an initial component of the problem and the solution.
- In biodiversity linkage projects, rangeland environments have created the best land degradation/biodiversity synergy.
- In international waters projects, land issues, while included, have been generally given less prominence in project implementation.
- Projects with a people/land management focus tend to address land degradation issues more directly.

In general, the current structure has created significant barriers to building land degradation as a critical component of the GEF agenda. The situation can be improved within the current structure, but the agencies will need to make a coordinated approach to achieve a stronger portfolio.

Recommendations call for possible action within two time frames. First, taking into account Council recommendations and guidelines over the past four years and the results of the two STAP workshops, together with the constraints outlined above, it is suggested that GEF explore ways in which land degradation issues of global significance can be dealt with more directly and successfully. This could be addressed in the context of the Second Study of GEF's Overall Performance, which is scheduled to be conducted in 2001.

Second, in the meantime, ways can be found to generate an improved focus on land degradation within the current guidelines and constraints. These include continued close coordination between the agencies in the development of a set of guidelines for an ongoing action and an implementation plan and process. Project design issues can be addressed and the facilitation of land degradation approaches can be improved through the use of OP 12—the operational program for integrated ecosystem management—the Land and Water Initiative, and the forthcoming operational program on agrobiodiversity.



# Background

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The GEF serves as the financial mechanism for the Convention on Biological Diversity (CBD) and the UN Framework Convention on Climate Change (UNFCCC). In this function, the GEF receives guidance from each convention's conference to the parties and is accountable to them. The GEF also supports the implementation of the UN Convention to Combat Desertification (CCD).

The GEF provides support to activities concerning land degradation, as they relate to the four GEF focal areas. Given the importance of land degradation to the global environment, and the cross-cutting nature of its treatment in the GEF portfolio, the Monitoring and Evaluation team initiated this linkage study on land degradation to feed into ongoing focal area program studies.

The overall objective of the study is to identify whether and how land degradation linkages are being effectively pursued in the land degradation projects identified by the implementing agencies in their 1999 report to Council<sup>1</sup> and to assess how these interventions have contributed to achieving the objectives of the operational programs in the three focal areas. Specific objectives are to:

- Identify land degradation activities supported by the GEF in its portfolio;
- Identify results and initial impacts of land degradation interventions;

- Document lessons learned; and
- Provide recommendations on how land degradation issues should be addressed in the focal area studies mentioned above.

The context for the study is set in the *Instrument for the Establishment of the Restructured Global Environment Facility*, the *GEF Operational Strategy*, and *GEF Operational Programs*, which provide the basic strategic approach for GEF support to activities concerning land degradation. Specific activities conducted under the study are:

- The identification of projects which contain components that directly or indirectly address land degradation issues
- A coverage analysis of projects that address land degradation issues—a classification of the projects by type and scope of intervention, focal area, implementing agency and geographical region (As a guide, the study used the table in GEF/C.3/8, *Scope and Operational Strategy for Land Degradation*.)<sup>2</sup>
- Definition of a sample comprising various categories of projects that have directly or indirectly addressed land degradation and an analysis of:
  - Quality of design
  - Implementation results
  - Effectiveness of GEF in addressing land degradation issues

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<sup>1</sup>Relevant projects were identified in GEF/C.14/4, *An Action Plan for enhancing GEF Support in Land Degradation*, November 1999.

<sup>2</sup> This document was later published by the GEF Secretariat under the title *A Framework of GEF Activities Concerning Land Degradation*, 1996.

- General findings and conclusions
- Recommendations on how land degradation issues should be addressed in the focal area studies of climate change, biodiversity, and international waters.

The projects examined were all projects which link land degradation with one of the GEF focal areas. Though the whole project context was taken into

account, the purpose and focus of this report was primarily to examine the land degradation components and linkages. The *Report of the STAP Expert Group Workshop on Land Degradation, Bologna, Italy, 14-16 June 1999* (GEF/C.14/Inf.15, November 16, 1999) and the report on the follow-up to the 1996 STAP Dakar workshop provided a framework for identifying the relevant biophysical/socioeconomic linkages inherent in a land degradation program (see Annex C).

# Project Analysis Methodology

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To identify and analyze land degradation activities in the GEF portfolio, groups of projects were examined at varying degrees of detail. A broad statistical overview of the linkage activities and strength of their land degradation components was conducted on a group of 103 projects, a qualitative analysis was conducted on a sample of 35 of those projects, and finally eight projects were examined in some detail. From this approach, it was hoped that both a broad overview of GEF projects, as well as an interpretation of the specific linkage activities, would be provided.

The basic dataset from which projects were chosen to analyze GEF's land degradation linkage activities derives from the list of 60 projects in the Annex B of *Clarifying Linkages Between Land Degradation and the GEF Focal Areas: An Action Plan for Enhancing*

*GEF Support*, GEF/C.14/4, November 17, 1999 (referred hereafter as "the Linkage report"). This list was approved by the implementing agencies and by Council as projects containing components that address land degradation. In addition, the GEF secretariat provided to the consultants three lists of 43 additional projects that it considered land degradation projects. The 43 additional projects from the GEF secretariat's Excel files were generally more recent (1999 and 2000, including projects in the pipeline) than those in the Linkage report annex. They also contained 22 medium-size projects, which were under represented in the Linkage report. Thus the dataset includes 103 projects in total from those two sources.<sup>3,4</sup> Two sets of analyses on the database were completed (further details of methodology are in Annex A).

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<sup>3</sup> UNDP and UNEP also provided extensive lists of land degradation projects in their portfolio to the consultants. These lists included many projects in the pipeline, providing a view of the direction the agencies are taking in regard to land degradation. The projects were not added to the basic database because of their preliminary status. The findings of a UNDP analysis of the land degradation projects are discussed in Annex B.

<sup>4</sup> Land degradation is defined by the Convention to Combat Desertification (CCD) as "reduction or loss, in arid, semi-arid and dry sub-humid areas, of biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns such as: soil erosion caused by wind and/or water; deterioration of the physical, chemical and biological or economic properties of soil; and long-term loss of natural vegetation."



# Land Degradation Components of Operational Programs

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GEF has developed operational programs for a number of topical areas in which land degradation is an important component. The following concepts from these operational programs relate most directly to land degradation (excerpts from *GEF Operational Programs*, July 1997, and OP 12).

## *Operational Program 1 (Arid and Semi-Arid Ecosystems)*

Among examples of possible GEF activities are:

- Soil and water conservation and restoration of degraded areas to conserve biodiversity
- Natural resources management activities which emphasize integrated resource use with conservation and development, such as use of water resources and its distribution in order to spread out grazing pressure and prevent vegetation deterioration
- Energy conservation projects that emphasize conservation of trees and alternative energy sources to conserve the natural vegetation. (p 1-8, GEF Operational Programs)

## *Operational Program 2 (Coastal, Marine, and Freshwater Ecosystems)*

Coastal, marine, and freshwater ecosystems suffer the impact, directly or indirectly, of land degradation. The GEF will support activities that demonstrate how to control land degradation effects on these ecosystems. (p 2-9, *ibid*)

## *Operational Program 3 (Forest Ecosystems)*

Global and nationally significant forested lands have and are suffering substantial land degradation in the

form of deforestation and desertification. The GEF will fund pilot activities that prevent deforestation and promote sustainable use and sustainable management of forests and forested areas at risk in order to conserve their biodiversity. Pilot rehabilitation and restoration activities will be supported on tropical and temperate forest ecosystems in areas at risk (e.g., with threatened and/or endangered species and ecosystems). (p 3-9, *ibid*)

## *Operational Program 4 (Mountain Ecosystems)*

Among examples of possible GEF activities are:

- Removal of the specific causes of, or threats to, biodiversity loss in the mountain, e.g., tourism impacts and deforestation (p 4-9 *ibid*)
- Because of their fragility, mountain ecosystems have suffered severe land degradation. Projects focusing on the conservation of ecosystems and integrated land use will also naturally alleviate the problems of land degradation, but there will be areas which have been degraded to the extent that they will need rehabilitation and management for sustainability. Components addressing these specific issues will be developed within both types of GEF activity: conservation and sustainable use. (p 4-10, *ibid*)

## *Operational Program 5 (Removing Barriers to Energy Conservation and Energy Efficiency)*

This operational program contains no specific land degradation wording.

## *Operational Program 6 (Promoting the Adoption of Renewable Energy)*

This operational program contains no specific land degradation wording.

*Operational Program 7 (Reducing Costs of Energy Technologies)*

This operational program contains no specific land degradation wording.

*Operational Program 8 (Water-body Based)*

Among examples of possible GEF activities are:

- Cost-sharing of best management practice installation for nonpoint source control of land-based pollution in degraded priority watersheds
- Building a human resources capability to strengthen institutions. Hot spots of transboundary degradation may be targeted for funding if information is sufficient to characterize the transboundary nature of the problem and the country (or countries) commits to undertaking the needed measures. Single-country versions of Strategic Action Programs (SAPs) may be appropriate to leverage other funding for baseline and additional actions. (p 8-8, *ibid*)

*Operational Program 9 (Integrated Land and Water Multiple Focal Area)*

A special linkage exists between land degradation in dryland areas and management of both surface and groundwater resources in transboundary drainage basins. Rehabilitation of damaged catchments, adoption of sustainable land use systems, and integration of water resources management and land management practices are priorities for both transboundary basins and ecologically important multiple country dryland settings. Opportunities will be sought for deriving global environmental benefits in other focal areas such as climate change and biodiversity, with sound water resources management measures and revegetation initiatives being important elements of international waters projects that address this cross-cutting issue.

Improved watershed and catchment management, sustainable land-use and conservation systems, as well as sound sectoral development and economic policies are essential to addressing transboundary water-related environmental concerns in the context

of land degradation. Especially in dryland regions, land degradation can be linked with changes in climate and river flow regimes and with the overuse of water resources by sectoral activities such as agriculture. This can also result in degraded subsurface water supplies, some of which have transboundary implications. Support for preparation of water resources management strategies by riparian countries for a transboundary dryland basin is a common characteristic of these projects to provide a basis for harmonization of sectoral water use among basin countries in an environmentally sustainable manner. This often requires commitments to reduce water withdrawals in dryland basins so that the sufficient quality and quantity of water are provided to sustain the waters environment and its ecological diversity. (p 9-5, *ibid*)

*Operational Program 10 (Contaminant-Based)*

This operational program contains no specific land degradation wording.

*Operational Program 12 (Integrated Ecosystem Management, new)*

Cross-sectoral projects that address ecosystem management in a way that optimizes ecosystem services—ecological, social, and economic—make up this operational program. These services encompass biodiversity, carbon sequestration, land and water conservation, food production, sustainable livelihoods, and the production of marketable goods and services. The operational program is not aimed at addressing natural resource management issues related to a single GEF focal area, but at bringing synergy between three of the GEF focal areas (i.e., biological diversity, climate change, and international waters) and land degradation to optimize multiple benefits. It complements GEF's existing operational programs by providing opportunities to address issues related to the conservation and sustainable use of biodiversity, land degradation, management of water bodies, and/or stabilization of atmospheric greenhouse gases through a programmatic approach and within the context of sustainable development. It also provides opportunities for sharing the costs of land degradation mitigation activities (p 1 Operational Program #12, and GEF website)

The Council recently reviewed *Draft Elements of an Operational Program for Reducing and Eliminating*

*Releases of Persistent Organic Pollutants into the Environment* (GEF/C.16.6) and recommended that the GEF Secretariat continue to develop the draft. The potential of activities under this operational program to address land degradation would be in the remediation of contaminated sites.

Another draft operational program with strong potential for land degradation linkages is being developed for agro-biodiversity. This program could strengthen management practices in cropping and herding areas to promote diverse crop, forage, and domestic animal species through development of sustainable and economic land use systems.

### **Summary**

Tables 1 and 2 indicate the distribution of all projects in the sample and of the subset of strong land degra-

dation projects according to operational program. In considering all the projects in the land degradation database, 19 percent are in Arid and Semi-Arid Ecosystems (OP 1). Both Forests (OP 3) and Renewable Energy (OP 6) have about 15 percent each, and OP 2 (Coastal, Marine, and Freshwater) and OP 4 (Mountains) have 12 percent each. When only strong land degradation component projects are considered, a higher proportion are in the biodiversity operational programs. OP 1 and OP 3 have 23 percent each, and OPs 2 and 4 have 10 percent each.

The focus on land degradation/desertification in Africa led to 11 of the 15 projects of OP 1 being located in Africa, whereas projects in the other biodiversity operational programs are more evenly distributed throughout the globe.





# Analysis of Land Degradation Projects

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## Statistical Analysis of All Land Degradation Projects (Tables 3–7 and Figures 1–6)

As described in Annex A, a statistical analysis of the 80 full-size projects was conducted. Tables 3–7 and Figures 1–6 summarize this analysis.

### Distribution

Of the 58 full-size projects in Annex B of the Linkage report projects and files and the 22 additional full-size projects in Land Degradation project files of the Secretariat, 60 percent are in the biodiversity focal area, 28 percent are in the climate change area, and 12 percent are in international waters (see Tables 5, 6, and 7). Due to land management activities being more frequent in the biodiversity and international waters projects, a high percentage—56 percent—of the biodiversity projects and 60 percent of the international waters projects were labeled as having “strong” land degradation components. Twenty-seven percent of the climate change projects were considered to have strong land degradation components.

Around 46 percent of the land degradation projects are in Africa, with 21 percent in Asia, 19 percent in Latin America, and a few in the Middle East, East and Central Europe, and global (Tables 3 and 4). A high proportion of the projects in Africa were considered to have a strong land degradation component, so when only strong land degradation projects are considered, Africa has just over half of the projects. Many of those are in the biodiversity focal area. Of all the strong land degradation projects, around one-third are biodiversity projects in Africa.

## General Comments

The land degradation linkage activities of the climate change projects are primarily related to providing alternative energy and improved efficiency (most of the projects are energy technology-oriented). Those with a strong land degradation component have linkage activities of tree plantations, sustainable forest harvesting, improved grazing practices, and reduction of bush or forest fires.

The international waters projects with a strong land degradation component are directed to improve watershed management through prevention of deforestation, land use zoning, and/or soil conservation techniques as well as improving relevant organizational and administrative structures.

The large majority of biodiversity projects in the land degradation portfolio—79 percent—are located in and around protected areas, often in locations of high global biodiversity significance and with intact ecosystems (Table 10). Most are, therefore, by design not located in areas with severe land degradation. Common objectives of these projects are the improvement of management in the protected areas, and reduction of threats to the biodiversity in and surrounding those areas. The buffer zones are thus a frequent focus of project activity, especially activities to prevent the local population’s agricultural or hunting encroachment into the protected areas and activities to enhance natural area regeneration near the protected areas.

The most common land degradation linkage activities

of these projects are (in order of frequency) rehabilitating habitat in the protected areas, improving protected area management, and reducing pressure in the buffer zones. Examples of efforts to reduce pressure are land use planning or zonation (e.g., to permit harvesting of certain wild resources in selected zones), alternative income generation projects, and employment generation in the protected area.

The land degradation linkage activities of biodiversity projects thus commonly respond to the “biological complexity” aspect of the land degradation definition in the CCD. Using this definition, 56 percent of the biodiversity projects are considered to have a strong land degradation component because of their activities to rehabilitate habitat or to reduce land pressure in the surrounding agricultural or pastoral systems. The remaining projects are oriented toward prevention more than mitigation, and protected area management is their usual linkage activity. These projects were placed into the “potential land degradation effects through prevention” category.

Biodiversity projects not located in protected areas include agrobiodiversity projects and those addressing in situ natural biodiversity outside protected areas. Of the agrobiodiversity projects, those with strong land degradation components promote soil and water conservation, and improvement of soil and land management to enhance both domesticated and wild crop species diversity. Activities of projects addressing natural biodiversity outside protected areas include improving agro-pastoral system land use (such as transhumance patterns), and controlling bush or forest fires.

## Trends

A trends analysis was conducted using a database constructed of all of the full-size projects in Annex B of the Linkage report (N=58) and the full-size projects in GEF secretariat files of land degradation projects given to the consultants (an additional 22, in total N=80).

The results of the analysis are presented in a table (Table 3) and bar charts (Figures 1 to 8). In addition to analyses of the entire database, some analyses were restricted to those 35 projects that were deemed to have a strong land degradation component. Please see Annex A for explanation of how the projects were categorized according to strength of their land degradation components.

## *Projects by Strength of Land Degradation Effect*

The bar charts (Figures 1, 2, and 5-8) include all the projects in the database except those projects that had little apparent land degradation effect. The pattern of proportion of “strong” land degradation projects to all projects has remained relatively steady, at around half of the projects.

The trend in the total number of projects, however, has been very irregular. There were around ten projects per year during the pilot stage, which dropped to very few during the transition. During the current phase, the number rose to a peak of eleven in 1997, but since has declined precipitously. The decline is especially apparent in projects with a strong land degradation component.

The financial allocation to land degradation projects reflects the trend in the number of projects, except that the pilot phase projects were apparently smaller than those in the current phase. A few very large projects with indirect land degradation effects in 1999 raised that year’s total.

The reason for the decline in land degradation projects following the pilot phase is unclear, especially because of land degradation being included in the *Instrument for the Establishment of the Restructured GEF* in 1995, and the Council’s approval of the operational strategy for land degradation in 1997. The decline could be linked to the weakening of support for carbon sequestration projects, and/or the uncertainty of GEF eligibility for land management activities with a strong degradation component and a less obvious global biodiversity or other focal area component.

This downward trend in land degradation linkage projects can be compared to trends in the wider GEF portfolio (Figures 3 and 4). The number of and allocation to all GEF projects has fairly steadily increased since 1991 with a dip before the current phase started. The rise in allocation has been especially marked since 1998 (it is expected that the number and allocation for 2000 will increase when totals are available for that year). The number of medium-size projects has increased dramatically since their initiation in 1998 and, in 2000, they outnumbered the full-size projects.

The decline in the number of and allocation to land degradation linkage projects thus cannot be explained by trends in the wider GEF portfolio.

### *Strong Land Degradation Projects by Focal Area (Tables 5, 6, 7 - Figures 5, 6)*

The trend in strong land degradation projects mirrors those of all land degradation projects: relatively numerous during the pilot phase, a drop during the transition followed by a renewal and peak in 1997, and then a drop in numbers and allocation to land degradation. Biodiversity projects dominate the strong land degradation project portfolio. Trends in all land degradation projects thus reflect changes in the number of land degradation biodiversity projects. The dominance of biodiversity has increased since 1996, when the number of climate change projects with a strong land degradation component (for example, for carbon sequestration or sustainable fuelwood harvesting) declined. The number and allocation to international waters projects with strong degradation components has been small, but has not changed. The financial allocation trends to international waters projects appears erratic because the few IW projects in the portfolio are very large.

### *Full and Medium-Size Strong Land Degradation Projects*

When medium-size projects (MSPs) are added to the trend analysis (2 projects from Annex B of the Linkage report and 22 from the secretariat files), the sharp decline in the number of strong land degradation projects is modified. It appears that it has been easier for MSPs with a strong land degradation component to be accepted into the GEF system than for full-size projects. Indeed, the number of medium-size land degradation projects surpassed the number of full-size land degradation projects in 1999. The decline in the annual financial allocation to strong degradation projects, however, is not offset when MSPs are included in the analysis. MSPs did not substitute for the level of activity of full-size projects.

The reason for the high number of MSPs may be due to less stringent GEF eligibility requirements or due to the relative ease of participation by NGOs, universities, and other organizations with an interest in land management and sustainable use issues. Some of the MSPs have promise to provide significant informational and programmatic contributions to GEF's land degradation program. These include the *Arid and Semi-Arid Ecosystem Conservation in the Caucasus* project, the *Indicator Model for Dryland Ecosystems* project in Latin America, the *Land Use Change*

*Analysis as an Approach for Investigating Biodiversity Loss and Land Degradation* project in East Africa, and the *Conservation of Globally Significant Biodiversity in Agricultural Landscapes Through Conservation Farming in South Africa* project.

### *Allocation to Strong Land Degradation Projects by Implementing Agency*

Because some projects are now implemented by more than one agency, this complicates meaningful analysis of annual allocation to strong land degradation projects by implementing agency. Comparing the pilot phase to the current phase, however, an important change has been an increase in the participation by UNEP, though still small compared to the World Bank and UNDP, and the development of projects with multiple implementing agencies (four of the 25 projects during the current phase). (See Tables 8 and 9.)

UNDP has implemented more strong land degradation projects than the World Bank, with the UNDP proportion growing larger following the pilot phase. During the current phase, UNDP has implemented twice as many strong land degradation projects as the Bank (particularly biodiversity projects). The financial allocation per project has been larger in World Bank projects, however, so the difference between the two agencies in financial allocation is less pronounced.

### *Pipeline of Land Degradation Projects*

UNEP, UNDP, and the World Bank sent the consultants Excel files of projects in the pipeline that they considered land degradation projects. The UNEP pipeline (in PDF or concept stage) included 19 full-size projects, two MSPs, and 3 new enabling activity projects. It includes frequent usage of OP 12, as well as four projects addressing POPs (persistent organic pollutants) as OP 10 projects. Many of the remaining projects are in OP 1 and address issues such as soil erosion, below-ground biodiversity, grazing, and integrated sustainable use.

The World Bank's list of "pending" projects consisted of 19 full and 14 medium-size projects. Approximately half are conservation-focused, and the other half mention integrated natural resources management or another reference to community activity

in their titles. One full-size project appears to be located in a farming area and several are in rangelands, and one medium-size project is addressing carbon sequestration and one agro-biodiversity.

UNDP's pipeline (PDF or concept stage) was large. It included approximately 20 projects at the concept note stage, 79 full-size projects with PDFs, and 18 medium-size projects with PDFs. Most are in the biodiversity focal area, but some are climate change projects with tree plantations and several are in international waters.

The number of projects in the pipeline is encouraging, though all the projects might not have equally strong land degradation components. The use of the new operational programs, the frequency of mention in the titles of "integrated" activities or "sustainable use," and the direct addressing of land degradation is especially encouraging. The uncertainty of success of the project proposals, and the extended length of time required before project implementation, however, tempers our ability to predict a resurgence of land degradation mitigation activity in GEF projects.

### **Findings from the Sample of Projects: Meeting Guidelines (Tables 11, 12, 13)**

Thirty-five projects were chosen as a sample from the Linkage report's Annex B for more detailed analysis. Project briefs and any other materials available in the secretariat were examined for the projects' strength in addressing linkage activity variables defined in land degradation guidelines. The land degradation criteria examined emanate from linkage activities mentioned in the table "Activities in the Interface Between Land Degradation and GEF Focal Areas" of the Linkage report, the priority linkage activities listed in the *Follow Up to the Recommendations of the Dakar Workshop* (1997), and from Articles of the CCD. The criteria mirror interventions proposed in the *STAP Expert Workshop on Land Degradation in Bologna in 1999* (GEF/C.14/Inf.15) (see excerpts in Annex C).

The sample was not completely random (approximately half were chosen randomly and half chosen to complement the types of projects and their linkage activities). In addition, three recent projects not of the Linkage report were included. The sample does not thus allow for valid statistical analysis, but was intended to provide examples of a variety of project activities. A summary of the findings is presented

below, organized by land use practices, forest/tree-related activities, project approaches, and environmental quality issues (see Tables 11 to 13, p ).

### **Land Use Practices**

#### *Improvement of Cropping Practices to Prevent or Mitigate Land Degradation*

Few projects have a strong element of improving the cropping system to reduce land degradation. Close to half of the biodiversity projects have no or weak approaches to improving the cropping system. This weakness is surprising since agriculture is frequently described as the major threat to biodiversity conservation, especially agricultural expansion. This illustrates a major difference between projects whose fundamental objective is biodiversity conservation, and those with an important land degradation objective. Only selected projects (*Alternatives to Slash and Burn; People, Land Management, and Environmental Change [PLEC]; Integrated Watershed Management Program for the Pantanal and Upper Paraguay River Basin [the Pantanal]*) are using the mitigation of land degradation within the cropping system to reduce the pressure of agricultural expansion, and thus the threat to biodiversity. A higher percentage of the few international waters projects in the sample are planning to address this topic, especially erosion in the cropping areas.

#### *Improvement of Herding Practices to Prevent or Mitigate Land Degradation*

Surprisingly, more projects are strongly addressing land degradation aspects of herding systems than of cropping systems. Most of these projects are in the OP 1 biodiversity focal area, with one climate change pilot phase project for carbon sequestration in the rangelands of Sudan. One reason for this relative strength could be that GEF is more willing to support land degradation mitigation in rangelands than in cropping areas because the wild plant and animal species in rangelands are more visibly affected by land degradation. Protected areas are also less of a solution to biodiversity conservation in rangelands. Examples of projects with a strong land degradation mitigation herding component include *Management of Indigenous Vegetation, Reducing Biodiversity Loss at Cross-Border Sites in East Africa, Ecosystem Conservation in the Caucasus of Georgia*, and *Tranhumance for Biodiversity in Morocco*.

Addressing herding practices, including transhumance, includes the identification and promotion of alternative patterns of grazing, and thus necessitates addressing land tenure and social issues and policy barriers. Development of such an approach for improved land management outside of protected areas is complex and requires a commitment of time and resources for effective targeted biophysical and socioeconomic research, and for the successful implementation of the proposed practices. This is an area that may grow in importance with the possibility of carbon sequestration projects in OP 12.

### *Soil and Water Conservation*

This activity, a vital land degradation mitigation practice, is rare in GEF's land degradation project portfolio. Several OP 1 biodiversity projects mention the positive impact vegetative restoration will have on reducing soil erosion, but *PLEC* is the only biodiversity project with an active soil and water conservation component. The *PLEC* brief described it as part of a wider sustainable land management activity to ensure agrobiodiversity conservation. Despite its obvious importance, other agrobiodiversity projects do not have a strong soil and water conservation component, perhaps because of concerns with GEF eligibility requirements. Soil and water conservation practices are a key element of successful agricultural intensification, a goal that buffer zone projects might choose to reduce the pressure for agricultural extensification.

Despite the obvious importance of controlling erosion to international waters projects, a strong soil conservation component is described in only one project's brief (*the Pantanal* project; this may be a field activity in other projects, but it was not mentioned in their briefs). Similarly, only the pilot phase climate change project in Sudan had a strong soil conservation program, designed to reduce dust in the atmosphere affecting climate change.

The weakness of soil and water conservation activities in GEF projects may be tied to GEF eligibility requirements; GEF does not support activities with primarily local or national benefits. This is an example of how this requirement restricts land degradation mitigation activities, even when they have an important role in addressing the focal areas.

### *Fire Control*

Similar to carbon sequestration, and reducing dust and albedo, fire control is a potentially strong linkage activity between land degradation and climate change due to its enormous impact on carbon sequestration and greenhouse gas emissions in tropical areas—a true global environmental impact. Fire control also has important benefits for biodiversity, in both rangelands and humid areas. Indeed, several OP 1 biodiversity projects mention the importance of preventing the use of fire to improve biodiversity conservation and reduce land degradation, and two projects have a strong fire control components.

*Alternatives to Slash and Burn II (ASB)* is the only climate change project addressing the use of fire, and it is devoted to finding alternative land management options for farmers and herders in the humid tropics now dependent on fire. It also has a strong research component examining the impact of fire on the resultant landscape from a biodiversity, carbon sequestration and productivity standpoint. Other than ASB, climate change projects are extremely weak in this area, particularly in light of importance placed on the impact of fire on greenhouse gas emissions by the climate change community.

### *Watershed Catchment Management*

This is an important and strong land degradation linkage activity with international waters, and with potential to affect biodiversity. All the International Waters projects in the sample had catchment management components described in their brief. The actual activities to be implemented, however, were not well described so their land degradation linkage can only be surmised as being strong. Several biodiversity projects, however, were also planning watershed management as part of a wider improved land management program, including wetlands' plant and animal species habitat conservation.

### *Habitat Restoration*

Biodiversity projects with strong land degradation linkages to habitat restoration were planning to restore wide areas of degraded land. Most of these projects are located in rangelands. An exception is the *Mauritius Restoration of Highly Degraded Native Forests* located in a protected area that has no nearby human population. Two climate change

projects, *ASB* and the *Community-Based Rangeland Rehabilitation for Carbon Sequestration* project in Sudan, also have strong habitat restoration/land degradation components.

#### *Reduce Land Use Intensity/Remove Land from Production*

These are common objectives in both protected area biodiversity projects and those outside protected areas. The assumption is that by reducing human use of the land, it will allow regeneration or reversion to a more natural state, promoting biodiversity. The linkage with land degradation can be strong, as for example in rangelands when high concentrations of domestic animals result in over-grazing and a reduction in animal density would mitigate degradation.

The same principal is being applied to cropped land near protected areas (where land degradation is not necessarily a threat). Common plans in these projects are to restrict or remove from cropping selected areas or prevent future agricultural expansion.

Reduction of land use intensity and removing land from production will usually reduce the economic productivity of the land for the local community, thus moving in the opposite direction of mitigating degradation according to the CCD definition of degradation. It also works against poverty alleviation. Without sufficiently increasing productivity in other areas for the same community members, the success of this approach for biodiversity may be short-lived. Profitable agricultural intensification approaches and improved land use systems would appear to be a necessary complement.

#### *Land Use Planning*

Land use planning is a very common activity of biodiversity projects, with the goal often being to develop a zonation system—to identify the location of multiple-use areas and restricted areas. Some projects use geographic information systems (GIS) to aid in this effort. Similarly, international waters projects conduct land use planning as part of watershed management. This activity has important land degradation links, in that land use planning is key to improved land management and mitigation of degradation.

### **Forestry/Tree-Related Components**

#### *Fuelwood Collection, Sustainable Forest Harvesting*

Despite the role ascribed to unsustainable fuelwood collection for desertification and for degradation of habitat, few “land degradation” projects have a strong fuelwood collection or sustainable forest harvesting components. Those that do include projects in biodiversity (two) and in climate change (three). The lack of strong projects in this area may be due to the current emphasis on protected areas in biodiversity, and on alternative energy techniques in climate change. This would seem to be an activity providing useful, multi-focal area benefits in climate change, biodiversity, and land degradation.

#### *Fuelwood Use Conservation*

Reducing the demand for fuelwood, and thus reducing fuelwood harvesting from natural areas, would seem to be an important activity to reduce land degradation (especially in semi-arid areas), promote biodiversity, and contribute to energy efficiency. Three energy-related projects do have a fuelwood conservation component, two from the pilot phase and one more recent (the Senegal *Sustainable and Participatory Energy Management* project). All three projects are located in the Sahel and are promoting fuel efficient stoves. The potential of some of the other energy projects to reduce fuelwood cutting by, for example, introducing solar energy, is less clear because of the question of whether the solar energy would replace fuelwood for cooking and heating.

#### *Agroforestry*

Few projects are strongly promoting tree planting by communities for biodiversity conservation, watershed management, or carbon sequestration. The reason for this could be the lack of projects working in human-dominated landscapes. However, as for sustainable forest harvesting, agroforestry would seem to be an important potential activity in GEF multi-focal area projects.

#### *Deforestation/De-vegetation*

Many GEF projects are addressing deforestation, especially for biodiversity conservation. Biodiversity

projects addressing deforestation tend to be located in and around protected areas, and important activities to reduce deforestation include land use zonation, protected area management, and reduction of pressure in buffer zones. Those projects with plans for proactive components to change current land use patterns and reduce deforestation rates were rated as having a “strong” deforestation component, while those with plans for preventive action were rated as having a “medium” or “weak” deforestation component (but strong preventive component). Many biodiversity projects have a strong preventive element for around protected areas, but are not attempting to address the causes and current rates of deforestation or de-vegetation.

Four climate change projects in the sample were planning to address deforestation or de-vegetation, three in semi-arid areas and one in humid areas. Considering the importance placed on widespread deforestation and de-vegetation by the climate change community due to carbon sequestration and greenhouse gas emissions, there is a scarcity of projects in GEF’s climate change portfolio addressing widespread deforestation in humid areas and de-vegetation in drylands.

### *Tree Plantations*

Plantations were being planned in all focal areas for different purposes—to provide fuelwood and thus reduce threats to biodiversity in forests (Ghana), for watershed management (Lake Victoria), to produce biomass for a power generator (Brazil), and for carbon sequestration and fuelwood production (Sudan). The number of projects planning plantations, however, is small, perhaps due to the requirement to find a sufficiently sized parcel of land that could be devoted to a global environmental good. The importance of their impact on either preventing or mitigating land degradation depends on the degradation status of the land on which they would be placed.

## **Project Approaches**

### *Participatory*

The biodiversity focal area projects were especially strong in using participatory methods; 40 percent were judged to be strong in this category, usually where projects featured active buffer zone activities. These activities typically included involving commu-

nities in the planning and enforcement of land zoning rules. Many such participatory activities in protected area biodiversity projects are designed to restrict communities’ access to land and other resources, while generating alternative livelihood opportunities. The climate change and international waters projects tend to have fewer activities related to community involvement or participation.

### *Capacity Building*

In general, capacity building specifically for land degradation tends to be at a low level and to focus on technical training. Only a small percent of the projects were judged to be “strong” in this category. In biodiversity projects, for example, capacity building commonly includes training forest guards or project personnel in administration or how to conduct species inventories. In only a few pilot phase projects is higher level training being provided (such as graduate degrees). No project had land degradation specifically defined as a topic of capacity building. Discussion with the agencies suggests that, in practice, capacity building may be a stronger component than it appears in the project briefs.

### *Information Collection and Exchange*

The projects were stronger in information collection and exchange than in capacity building: 34 percent were rated as being “strong.” The biodiversity projects frequently planned activities to conduct species inventories, and some are using GIS for land use planning and other activities. Surprisingly few are using remotely sensed imagery to examine ecosystem distribution or fragmentation, or changes in habitat or land cover. The data collection in some international waters projects is often focused on water variables themselves, with only a few interested in collecting data on changing land cover or other land degradation related problems. Only two project briefs mentioned collecting soil or other specific land degradation data (*PLEC* and *ASB*). Similarly, collection of socioeconomic data is weak (see below).

### *Targeted Research on Biophysical Aspects of Land Degradation*

Biophysical research in biodiversity projects is often limited to conducting species inventories as baseline data. There are few projects conducting research into ecosystem dynamics or interaction between species

and environmental or socioeconomic variables, and few examining change (using monitoring systems, comparing sites, older data, etc.). Missing is research to establish the interaction between land degradation and the focal areas, resulting in weak understanding of the impact of degradation on the focal areas, and of how to develop effective land degradation linkage projects.

### *Targeted Research on Socioeconomic Aspects of Land Degradation*

Socioeconomic research is, with only a few exceptions, based on the participatory rapid appraisals of selected communities. In approximately five projects, household level information is being collected (for example, to examine the impact of wealth differences on resource management); and in fewer projects are socioeconomic variables at levels higher than a community being analyzed. One project brief mentioned that markets and other relevant economic information would be collected, and one mentioned examining the impact of past policies. This situation limits understanding and ability to address the underlying causes of biodiversity loss or land degradation processes occurring, restricting the formation of effective remedial actions or policy recommendations.

### *Addressing Underlying Causes of Land Degradation*

The CCD listed examples of root, or underlying, causes of desertification that need to be addressed including human migration and rapid human population growth. To these can be added those described in many project briefs: land tenure changes, changes in land policy, and economic transformation. Despite these causes and their impact on the focal area and land degradation being described in the briefs, projects are not fully addressing the root causes. Approximately 17 percent of the projects were rated as “medium,” meaning that they may not have been addressing the root causes directly, but were addressing some aspect of the socioeconomic processes occurring (such as the land tenure situation affecting transhumance patterns, or policy influencing land use change). This variable is the least well addressed by the projects.

### *Enabling Land Degradation Mitigation Policy*

In general, the project briefs do not clearly describe the potential for policy implications of their activities,

or the policy objectives of their activities. In biodiversity projects, policy tends to be limited to expanding or strengthening protected areas without addressing proximate or root causes of biodiversity loss. Similarly, the international waters project briefs do not mention the policy implications of sediment or pollution-causing land uses. Since the roots of land degradation problems are often associated with economic or policy issues, this lacuna is especially important for degradation mitigation.

### *Integrating Indigenous Knowledge into Technical Approaches*

The CCD, the Dakar workshop, and the Bologna workshop summaries emphasized the importance of integrating indigenous knowledge into the development of techniques and project approaches. Approximately one-quarter of the biodiversity and international waters projects had strong elements of this written into their briefs, all operating in Africa and with strong community and land management components. Other project briefs, especially those outside of Africa, rarely mentioned this approach.

### *Generation of Alternative Livelihood Income*

This activity is often developed for the population in buffer zones who will be affected by loss of access to land and resources with the implementation of a protected area management project, and/or who will be asked to participate in management of the area. In some projects, such as the *Bwindi Impenetrable National Park and Mgahinga Gorilla National Park* project in Uganda, the project planned to provide funds in the form of grants to communities, but in most cases projects plan to create small, environmentally friendly, income generating projects such as handicrafts or beekeeping, or provide employment to community members as, for example, park guides. The sustainability of these activities beyond the length of the GEF project is often questionable. Their role in land degradation mitigation can be indirect, by supplying a reason to desist from land degradation, and can be direct, such as the Uganda project that was planning to fund soil conservation activities.

### **Environmental Quality Issues**

#### *Reducing Dust in the Atmosphere; Albedo*

The CCD and the Dakar workshop described the



linkage between land degradation and climate change due to degraded land producing dust and increasing albedo. Nevertheless, GEF has not recently supported projects that address this well-established land degradation/climate change linkage. Of the projects in the sample, only the pilot phase Sudan project had a strong planned component to reduce dust. The *Alternatives to Slash and Burn (ASB)* project was the only current GEF phase project to mention controlling dust, and it was the only land management project in the sample that had a greenhouse gas emissions component (targeted research and land management activities).

### *Promoting Carbon Sequestration in Soils*

The relative importance of soils for carbon sequestration is an important topic of research, and scientific

consensus has not yet been formed, but both the CCD and the Dakar workshop called for strong activities to bolster carbon storage in soils by reducing land degradation. Of the projects in the sample, only three mentioned the potential positive impact their activities will have in this regard (all three proposing to contribute to sequestration by mitigating land degradation), and only the *ASB* project had a research activity to examine carbon in the soil. This weakness in GEF projects may be tied to the lack of an operational program devoted to carbon sequestration and the uncertain nature of carbon sequestration activities meeting GEF eligibility requirements.



## Analysis of Detailed Project Sample

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A more detailed assessment of eight strong land degradation projects was made to examine some of the design and linkage issues in a range of different projects. The projects examined were:

<b>Title</b>	<b>Agency</b>	<b>Status</b>	<b>FA Linkage</b>	<b>Goals</b>
Alternatives to Slash and Burn (ASB)	UNDP	Complete	Climatic Change Biodiversity	Develop land management & technologies to prevent deforestation
People, Land Management and Environmental Change (PLEC)	UNEP	Phase II	Biodiversity	Environmentally sustainable models of agrodiversity
Biodiversity Conservation and Sustainable Livelihood Options in the Grasslands	UNDP	Phase II	Biodiversity	Protection of biodiversity sustainable use of grasslands
Indicator Model for Dryland Ecosystems in Latin America	UNEP	MSP	Biodiversity	Develop indicators of land degradation and biodiversity status
Pollution Control and Other Missions to Protect Biodiversity in Lake Tanganyika	UNDP	Near Complete	Biodiversity/International Waters	To assess biodiversity and develop measures to improve lake systems
Arid and Semi-Arid Ecosystem Conservation in the Caucasus	UNDP	MSP	Biodiversity	Improve land use and control loss of biodiversity in grazing lands
Natural Resources Management in Ghana	WB	In Implementation	Biodiversity	Improve forest management in a tropical forest
Integrated Watershed Management Program for the Pantanal and Upper Paraguay Rivers	UNEP	In Implementation	International Waters/Biodiversity	Develop structures to improve management of critical international waters in high biodiversity area

These eight projects<sup>5</sup> provide a sample of well-directed activities that link land degradation with one or more of the focal areas. The following design characteristics link these projects:

- Land degradation is a component of the initial problem statement.
- The linkage between land degradation and the respective focal areas is well defined.
- Project objectives include dealing with land degradation either directly by land use changes or indirectly through development of appropriate administrative or institutional structures.

### Global or Regional

Three of the projects—*ASB*, *PLEC*, and *Indicator Model*—attempt a regional or global approach to identifying land degradation problems and mitigation approaches. They also are the projects which most directly address root causes. The two global projects, *ASB* and *PLEC*, appear to be well directed in terms of land degradation issues, but almost inevitably the difficulties of dealing with a number of sites in different continents has created challenges in promoting a common approach. *PLEC* has a relatively small administrative set-up and devolved project management, allowing each site to develop an individualized approach. This helps enable an integrated field approach when management is good, but in other cases can create difficulties in global comparisons. The focus on land degradation in the project is therefore uneven, and a mid-term evaluation suggests that a soil conservation component in Ghana was a misdirection of resources.

*ASB* is directly focused on a land degradation topic: developing sustainable land management options to forest burning. Despite criticism of a slow start, it has looked productively at land management/carbon sequestration linkages, and developed land use options that reduce land degradation. As our notes suggest, this work requires high-quality targeted research to be effective. Also, policy and economic structures dealing with land use are as, or more, important than technological issues.

The indicator model for dryland ecosystems is still in an early stage, but the project also addresses the land degradation/biodiversity loss linkage up front and has good potential for addressing problem identification, root causes, and response through multiple scale models.

### Grassland Issues

Two of the selected projects deal with grassland issues in very different locations (Mongolia and Caucasus). In both projects, the links between biodiversity and land degradation are well established and a major effort is made to include the participation of the local community. In each project, there is a direct causal link between land degradation and the drop in biodiversity, and the project objectives include land use management plans that will improve both biodiversity and land quality. The Mongolia project is more typical of biodiversity linkage projects in that it deals with land use management around a conservation area. The Caucasus project is innovative in that it deals with soil degradation and biodiversity loss as a package. In the attempted solutions, the mix of approaches includes incentives to return to traditional grazing patterns and a economic incentive to conserve faunal biodiversity by establishing zones of conservation and use that range from a licensed hunting zone to a total preserve zone.

### Humid Forest Ecosystems

The *Natural Resources Management* project in Ghana is an example of a project attached to a major World Bank loan package so that the incremental cost issues are a relatively well-defined component compared with some other land degradation projects.

The core loan project is designed to provide a change in the use of the humid tropical forest resources of southwest Ghana from low return management to a less exploitive but higher value-added system. The biodiversity/land degradation GEF component adds a series of institution/capacity building and land conservation components to the set of activities. Somewhat in the same model as the Caucasus project, the goal is to provide income incentives to local people and governments while reducing land degradation and biodiversity loss. This linkage is a good model for other projects and seems particularly appropriate to World Bank projects.

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<sup>5</sup>Project descriptions are found in Annex D.

## International Waters

The remaining projects in the sample are linkage projects with international waters, though biodiversity is also a strong component. Although one is UNDP and the other UNEP, the goals and objectives are similar.

The UNDP project on Lake Tanganyika (*Pollution Control and Other Missions to Protect Biodiversity in Lake Tanganyika*) was started in GEF's pilot phase and grew into a full size project in 1995. The initial goal was to assess the unique and remarkable biodiversity of this important lake and to assess and ameliorate threats to this biodiversity. Among the threats are localized pollution on the lake shores and major increased sediment on the western shore due to inappropriate land use in catchment areas. Although this project resulted in a detailed analysis of the sediment issues at the lake level, security and other problems have not allowed this threat to be dealt with at its

source. A follow-up project is being prepared, and the management structures are now in place to begin to move forward on the land degradation component.

The *Integrated Watershed Management Program for the Pantanal and Upper Paraguay* project has a similar set of goals—to preserve the biodiversity of a unique ecosystem. In this case too, inappropriate land use in the catchment areas is causing a major increase in sediment flow and downstream sedimentation and hydrologic change. So land degradation is a direct component of the project. At this stage of the activity, attention is being directed to institutional structures and management components, but some 20 percent of the budget is directed to land degradation activities.

It seems axiomatic that most international waters projects dealing with lakes and rivers need to be treated as land/water projects and that in the process these two components should be linked all the way from project concept to project completion.



# Findings

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## Role of Land Degradation in the GEF Portfolio

Over the past few years, GEF has addressed the issue of land degradation linkage with a number of Council recommendations and guidelines and two important STAP workshops in Dakar (1996) and Bologna (1999). In response, the current GEF portfolio contains a substantial number of land degradation linkage projects, as identified by the agencies and the GEF secretariat. These projects form the core of this study; however, the formal commitment by GEF to this linkage activity was somewhat later than to the focal areas so the impact of this linkage might have been slow to develop.

In our analysis, there seems to be a significant gap between the apparent strength and the reality of land degradation activities in the projects analyzed. Of the projects analyzed, whether in the Linkage report or the wider database, only about 50 percent are judged to have a strong land degradation component.

According to our analysis, there has been a decrease in full-size land degradation projects in recent years with no increase in funds allocated to land degradation projects in those years. However, there has been a significant increase in medium-size projects with a land degradation component.

The land degradation component of all the projects analyzed in the database is estimated at around \$50 million over the life of GEF. The total budget of projects with a strong land degradation component is \$278 million.<sup>6</sup>

There is a significant number of projects in the pipeline; history though shows that translation from pipeline to project is far from sure.

## Constraints

Given that land degradation is addressed through linkages to the four focal areas, there appear to be constraints in the degree to which land degradation problems can be directly addressed. An initial analysis suggests some basic constraints which have limited land degradation linkage activities. First, project concepts are usually based on focal area activities rather than linkage activities such as land degradation. Second, 69 percent of projects with land degradation linkages are in the biodiversity focal area, and, of these, 77 percent are located in or near protected conservation areas. Protected areas are not usually regions of highest land degradation concern; project activities in these areas, though obviously important to biodiversity, do not directly impact land management problems or land degradation issues. International waters projects have included land degradation mitigation in some cases, but the specifics have tended to focus on the institutional and water pollution aspects of the problem rather than land degradation mitigation and catchment management activities. Climate change projects have not in recent years focused much on land degradation because the climate change operational programs do not address land management issues, though there seem to be opportunities to expand this linkage with a new operational program (OP 12).

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<sup>6</sup> This is an estimate from the proportion of direct and indirect land degradation activities in the project design.

Another reason for the lack of strong land degradation components has been the difficulty in estimating incremental costs of mitigation activities when the activities are usually providing local as well as global benefits. This difficulty of land degradation mitigation activities meetings the proof of incrementality was illustrated in Pagiola (1999). Again, an attempt to reduce this problem has led to a new operational program (OP 12) with “cost sharing” opportunities. The issue of how to calculate the incremental costs of land degradation mitigation activities should be examined. In general, the large majority of current projects identified as land degradation linkage projects have been designed to address the focal areas as a first priority and only in some cases has land degradation mitigation been a priority, so rarely are the root causes of land degradation addressed.

### **Linkages**

Linkages tend to be strongest in projects where land degradation is identified as a central part of the problem early in the design phase. When this occurs, there is a synergy between activities that address land degradation and activities addressing the focal areas of biodiversity, international waters and climate change. When land degradation is not perceived initially as a threat to the focal areas, the land degradation component tends to be poorly addressed.

Most land degradation projects in the pilot phase are linked through biodiversity projects with a few large international waters projects and a few climate change projects with linkages to land degradation.

Almost all biodiversity projects have some indirect link with land degradation issues, but many do not have strong land degradation components. The projects tend to have a strong conservation focus with the land degradation activities addressing those conservation issues. Geographic locations of greatest land degradation concern may not be areas of the greatest biodiversity concern and vice versa.

International water projects focusing on lakes, rivers, and coastal problems all tend to have a land degradation component, sometimes a strong component, but in implementation have tended to focus on the water issues rather than the broader land degradation components of the catchment. However, this doesn't mean there are no project with strong land degradation activities.

The impact of climate change projects in land degradation is mostly indirect. Other climate change/land degradation linkages such as dust, albedo, and carbon sequestration have not been well addressed. However, there are good possibilities of direct impact in the future through carbon sequestration activities, particularly through OP 12.

As the analysis of relatively strong projects shows, the key element in linking land degradation with the operational programs is in the early stage of the design process where land degradation is seen as a fully integral part of the project. OP 12, the Land and Water Initiative, and the forthcoming operational programs for agrobiodiversity and persistent organic pollutants provide vehicles for this approach. OP 12 offers the opportunity to integrate land degradation issues more centrally with the activities of the focal areas. The role of OP 12 in promoting land degradation mitigation activities appears promising, particularly because of the possibility of projects taking a strong focus on sustainable use and other land management strategies in human modified areas. The Land and Water Initiative allows the clear integration of several components and should directly incorporate land degradation issues. The success of developing strong land degradation linkage activities within the new operational programs will only be achieved if specific land degradation linkage guidelines are developed which allow and encourage such integration.

### **Project Design**

Projects that address specific biodiversity or international water problems tend to prioritize biophysical issues, whereas projects that start with land degradation as the central problem tend to prioritize improving land management and developing sustainable use options in modified resource systems. Because of this, most current projects tend to be focused on conservation rather than on people or land management. From a land degradation perspective, key issues such as land tenure, policy, and gender are thus often poorly integrated into project activities.

Projects which are people-focused tend to be strong projects from several perspectives. For example, the few projects on grazing systems were well integrated between people and environmental concerns with direct attention to restoration of previously sustainable systems.



Integrated approaches such as land and water management, a total ecosystem focus, and agrobiodiversity may be a better framework for introducing land degradation priorities.

### **Agencies**

Of the implementing agencies, UNDP has the largest land degradation linkage project portfolio. It is completing an in-house review of the land degradation components of its projects, including pipeline projects. UNEP also has a well-developed list of projects including many in the pipeline. World Bank land degradation projects tend to be fewer, but larger. Most are addressing climate change and biodiversity in humid areas, though there is a trend towards a more dryland focus.

The GEF secretariat itself has some divergence of opinion on the land degradation component of its activity. On one hand, there is a commitment to respond to the stated need for a land degradation initiative in GEF; on the other hand, there is concern given the past structure and operational programs about how this linkage can be legitimized.

### **Design and Approval Process**

Defining and justifying the incremental cost component of land degradation activities has been a chal-

lenge given the current guidelines. While there are clear links between land degradation issues and the global environment in many cases, these are sometimes hard to quantify. OP 12, with its emphasis on cost sharing, and the Land and Water Initiative may help in addressing this issue.

Although GEF projects are expected to be based the state-of-the-art knowledge, it is not clear how the findings of the Consultative Group on International Agricultural Research (CGIAR) system, STAP, and the rest of the scientific community are fitted into project design. This is particularly so in that the land degradation component of the STAP roster of consultants is not as strong and comprehensive as other components.

There often appear to be significant time lapses between various stages of project approval and action on the ground. This is not an issue confined to land degradation projects and needs to be addressed in a broader context.

Implementing agencies are continuing to learn how to best design and implement land degradation components. Assessment and feedback from one project to another would strengthen project design and execution.



# Recommendations

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We have specific recommendations in two time frames. To improve the focus on land degradation issues in the GEF portfolio, we recommend first focusing on longer term goals, which may take time to develop, and then taking immediate or short-term actions.

## Longer Term Recommendations

Given the ongoing concern of GEF's Council, GEF and the agencies need to move forward with an agenda to combat land degradation. In light of the real constraints noted in this report, it is recommended that GEF explore ways in which land degradation issues of global significance can be dealt with more directly and successfully. This could be addressed in the context of the Second Study of GEF's Overall Performance, which is being conducted this year.

## Immediate or Short-Term Recommendations

### *Interagency Approaches*

The Land Degradation Working Group of the Inter-Agency Task Force on Land and Water should be the focus for a conceptual strategic plan for land degradation within the GEF context. While recognizing that most specific activities are or should be country-driven, a strategy would be helpful that:

- Formulates goals
- Agrees on agency roles
- Develops a cooperative framework
- Develops GEF priorities for addressing land degradation

- Agrees on eligible land degradation mitigation activities
- Evaluates results and progress.

To enable land degradation linkages to be more effective, an agreed-upon definition of land degradation in the GEF context (e.g., inclusive of humid and sub-humid areas and referring to declining land productivity in human-managed landscapes) should be adopted by the working group.

In order to track the progress of land degradation linkage activities, it would be useful for the implementing agencies to create a coordinated report matrix which records the movement of land degradation linkage projects from inception through PDFs to approval and, most important, to implementation. This could provide the basis for implementing agency self-assessment and also for reporting to GEF council.

Agencies should be encouraged to develop a project base where land degradation linkages to focal areas are identified as a strong component from the beginning of project design. This review shows that maximum benefits to both land degradation and focal area priorities are achieved under these circumstances.

A follow-up analysis should be undertaken in 2001 to identify whether the recent downward trend in land degradation projects, both numerically and as a proportion of the GEF portfolio, continues.

While most activities are and should be project-based, there is a need for some broader based programmatic approaches that might be considered in relation to land degradation. An information system on best management practices for land degradation

activities would be one example of a program approach. The purpose of such an approach would be to serve and strengthen project activities and to develop capacity at all levels.

### *Project Design*

Land management for sustainable use is the core approach to the land degradation problem. Land and people issues need to be the core of a good land degradation project proposal. This differs from many approaches to biodiversity and CC projects. Special attention needs to be given to the design of land degradation components.

The links between scientific (including local knowledge) communities and land degradation projects need to be improved. For this and other reasons, the PDF-A funding should be increased to at least \$50,000 and more support given to integrative targeted research. Consideration should be given to a selectively higher PDF-A for medium-size projects to ensure good project design.

Regional approaches to land degradation issues could be considered within the OP 12 framework. It is conceivable that a package of projects, GEF and others, could deal with regional issues from an environmental and sustainable resource use context.

Climate change projects with linkages to land degradation, such as a carbon sequestration, should be encouraged.

International waters projects should focus on land as well as water components of the system in the spirit of the new Land and Water Initiative.

If the new OP 12 on ecosystems and the forthcoming operational programs on agrobiodiversity and POPs are to provide new opportunities for land degradation activities, clear guidelines concerning land degradation activities are important.

There is a need to review how global aspects of land degradation are to be supported in relation to incremental costs. A less theoretical and more pragmatic, but defined, approach is needed. The principle of “cost sharing” instead of incremental costs is being introduced in OP 12. The principle needs to be clearly explained in guidelines. How it is implemented to support land degradation mitigation activities should be monitored.

### *Monitoring and Evaluation*

Monitoring and evaluation for land degradation projects should more systematically include environmental field indicators, e.g., change in vegetative cover, soil erosion, and other land degradation indicators, as well as the currently used direct indicators of project activity to get a sense of the impact of projects on the environment. A set of common indicators should be agreed upon.

Monitoring and evaluation should include environmental and social indicators, and be linked to local, regional, and broader feedback into project design. A GEF land degradation “lessons learned” database (website) should be developed.

### *Relationship of Study to Focal Area Reviews*

This report has reviewed the land degradation component of the GEF portfolio of biodiversity, climate change, and international waters projects. In many of these projects, land degradation was a significant component. In others, it was addressed only indirectly. We suggest that the detailed review of the focal areas:

- Take this analysis into account and confirm our assessment of the strength of these linkages, where appropriate
- Examine the importance of the land degradation component to the focal area projects, especially where we have identified these as strong linkages
- Identify ways in which land degradation linkages can more effectively strengthen biodiversity, climate change, and international waters projects.

In the selection of projects for field analysis, at least one should be chosen with a strong land degradation component.

**Biodiversity.** In our opinion, the most effective linkages have been in areas not focused around protected areas, for example, in pastoral areas where land degradation was seen as compromising biodiversity. The focal area study might seek to confirm this finding.

**Climate change.** There have been relatively few linkage projects between climate change and land degradation. There is opportunity for well-designed linkage

projects in this area, especially related to carbon sequestration and through the new operational programs.

**International waters.** Land degradation has been an effective component of a small number of international waters projects but tends to be second priority in project activities. A more integrated design process involving land and water issues would help both land degradation and international waters project design.

Often the land component of international waters projects involved research into the effects of land degradation but few activities were designed to address the problem. We suggest the focal area study review the impact of this apparent lack of integration on the effectiveness of the project as a whole.



## Annex A. Methodology

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The first analysis was based on the 103 projects and was used for the statistical analysis (the bar charts of trends in Figures 1-8, and statistics in Tables 1-4). To determine the strength of each project's land degradation component, information in the project description in *Operational Report on GEF Programs, December 31, 1999*, supplemented by descriptions in the Linkage report and the Secretariat's Excel files, was examined. When insufficient information was available, such as for those projects in the pipeline, no determination was attempted of the strength of the projects' land degradation components. (Please note that some of the tables and bar charts present data only of those projects determined as having strong degradation components.)

The determination of the strength of the land degradation components in the projects was based on the definition of land degradation adopted by the CCD and used by GEF. This definition is broad—encompassing economic and biological productivity and landscape complexity. Following this definition, all biodiversity projects and many of the other projects could be, ex post, considered to be addressing land degradation. As some projects were located in humid areas, the definition was extended for the purpose of this report.

In an effort to be more focused and identify the strength of the land degradation components in projects, a set of categories was developed and projects placed within these categories:

*Strong land degradation component.* These are projects, often in agro-pastoral landscapes, with a proactive land rehabilitation components (e.g., re-vegetation, afforestation) or proactive components

to ameliorate current land management (e.g., improved cropping or grazing practices, fire use).

*Potential land degradation effects.* These projects' interventions will potentially prevent land degradation. These are projects with few proactive interventions but whose activities will restrict future deforestation or other types of degradation through activities such as reducing land use intensity or improving land management in protected areas. Many of these projects are biodiversity projects in and around protected areas, with plans to implement land zonation to reduce land use intensity.

*Indirect effects on land degradation.* These projects are without a land management component but will have indirect effects on the land, for example through reducing fuelwood collection from natural areas. Many of these projects are climate change projects promoting alternative energy sources to replace collected wood or technologies to improve fuel efficiency.

*Little apparent land degradation effect.* Such projects have no apparent effect on land degradation.

The second set of analyses was based on a sample of projects. This analysis was to gain a more detailed understanding of the nature and importance of the land degradation linkage interventions of the projects, and the degree to which GEF is meeting the objectives of the GEF land degradation framework. Tables 11, 12, and 13 present the results of this analysis, and the findings are discussed in Section IV. The sample was chosen as follows: 19 projects were chosen at random from the Linkage report annex; an additional 11 from

the Linkage report were added to provide implementing agency, topic and regional coverage; and three from outside the Linkage report were chosen to give a sample of more recent activity. The sample thus consists of 35 projects in total.

The variables used to represent key land degradation linkage activity interventions (see Tables 11 and 12) were identified from the following sources:

- *Convention to Combat Desertification*
- *Scope and Operational Strategy for Land Degradation* (GEF/C.3/8, February 1995)
- *Follow up to the Recommendations of the Dakar Workshop* (GEF/C.9/6, March 1997)
- *Report of the STAP Expert Group Workshop on Land Degradation, Bologna, Italy, 14-16 June 1999* (GEF/C.14/Inf.15, November 16, 1999).

The intervention variables are not unique to land degradation projects, but the analysis focused on their relation to addressing land degradation, for example, targeted research on biophysical aspects of land degradation.

The land degradation interventions of the projects were rated as being strong (XXX), medium (XX), weak (X), not existent (0), or not applicable (n/a). For each project, the project brief or document (proposal) and available supplemental information at the GEF secretariat office were examined. The supplemental information included Program Implementation Reviews, and project reviews and evaluations. In general, therefore, the rating is based on what projects planned to accomplish, not what they actually did.

Finally, a detailed review was completed of eight projects to determine how well project design is meeting land degradation guidelines and to determine the nature of the land degradation/focal area linkage. These projects were chosen from the sample of 35 to provide examples of various land degradation/focal area linkages, and to provide focal area, implementing agency, and geographical area distribution. The same variables representing key land degradation linkage activity interventions were used to frame the analysis. All available material was examined for these projects, including project documents, reviews, evaluations and projects reports, supplied by the GEF secretariat and the relevant implementing agency.



## Annex B. UNDP Land Degradation Review

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UNDP did an extensive review of their current and pipeline projects in the summer of 2000 to determine which could be considered ex post as land degradation projects. UNEP supplied a draft of their report of this review to the consultants.<sup>7</sup>

The criterion for a project to be considered as having a land degradation linkage, and to be thus included in the land degradation database, is that the project brief must mention any one of 12 threats or 18 linkage activities. These are as follows:

### *Threats*

- Soil erosion by wind or water; sand dune movement; sedimentation and coastal areas
- Soil denudation; surface crusting; compaction; declining fertility; loss of soil organic matter
- Salinization; chemical or organic pollution of soils related to agriculture, urban or industry; pollution related to GHG emissions
- Aquifer loss/lowering or pollution
- Herbaceous or woody vegetation loss; deforestation fuelwood over-harvesting
- Invasive species when they lead to ecosystem instability
- Uncontrolled bush/forest fires

- Overharvesting of fauna or flora when it leads to ecosystem instability
- Overgrazing around settlements or in extensive rangelands
- Habitat conversion (crops, planted pastures, urban)
- Drought and desiccation
- Medicinal species loss when it leads to ecosystem instability

### *Activities*

- Soil stabilization; soil and water conservation.
- Spontaneous or assisted vegetation rehabilitation
- Pollution clean-up and control; waste treatment
- Sustainable use and management of natural resources
- Fire control
- Aquifer regeneration; sustainable use
- Alternative agriculture (appropriate technology; organic agriculture; agroforestry; revival of transhumance...); soil organic matter management.

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<sup>7</sup>UNDP-GEF'S Land Degradation Database: an Initial Analysis, August 2000

- Forest plantation for fuel; energy saving/substituting devices
- Common property management
- Alternative income generation/livelihood systems
- Land use planning
- Human impact assessment
- Land degradation indicators; inventory and monitoring
- Vegetation plantation for carbon sequestration
- Policy reform/formulation
- Capacity building for land degradation
- Protection of agrobiod when threatened by invasive species

Using this criterion, 209 projects were included in the UNDP database (not reported was the number of UNDP's projects that were excluded from the database). The most common reason for inclusion was the mention in the project brief of deforestation as a threat (64 percent). Threats mentioned in only a few briefs

were drought and desiccation (15 percent), and soil degradation (13 percent). Land degradation linkage activities mentioned most frequently in the briefs were socioeconomic such as alternative income generation and land use planning (activities not confined to mitigating land degradation). Soil stabilization and conservation were rarely mentioned (7 percent of the projects), and vegetative rehabilitation and alternative agriculture were also infrequent.

Most of the projects in the database are biodiversity projects, particularly in the forest ecosystem operational program. The climate change projects in the database were primarily those with woodfuel conservation programs or tree plantation activities.

Lessons from UNDP's exhaustive exercise include 1) the criteria to identify land degradation projects are currently broad and include activities to reduce loss of biological complexity, and 2) few projects are addressing declining land productivity. The broadness of the criteria used makes it difficult to determine the level of GEF support for activities that address soil degradation or other, non-biodiversity related problems. Perhaps reflecting this uncertainty, in the *GEF Project Performance Report 1999*, UNDP called for clearer, more consistent guidelines on what constitutes land degradation, and what specific degradation activities are eligible for GEF funding.

# Annex C. Interventions Proposed by the STAP Expert Group on Land Degradation

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Excerpts from *Report of the STAP Expert Group Workshop on Land Degradation Interlinkages (Bologna, Italy, June 14-16, 1999)*, GEF/C. 14/Inf. 15, November 1999

## Section 3: Interventions: Opportunities for Achieving Global Benefits

### 3.1. Identifying opportunities

#### 3.1.1. People Centered Approach

Interventions should not only focus on redressing the effects, such as soil erosion, vegetation destruction, and water pollution, but also the root causes - the drivers of land degradation. These reside in local land-use systems and in the interactions with the wider socio-economic system. Interventions require a “people-centered” rather than a “land-centered” approach. This implies a participatory approach that engages communities in the definition of issues and in the design, implementation and evaluation of remediation policies, while taking into consideration that communities are not homogenous.

#### 3.1.2. Multi-Benefit Approach

Interventions should be evaluated in the broader context of the multi-benefit potential. A strong case was made for an approach which seeks to integrate benefits accruing from climate change, biodiversity and international waters, thus offering greater opportunities for GEF interventions, particularly in drylands.

##### 3.1.2.1. Criteria for assessing global significance of biological diversity in drylands

In assessing the opportunities for achieving global benefits, the issue of what constitutes “globally significant biodiversity” in drylands was raised. It was concluded that the criteria that is often used for assessing biodiversity significance in forest ecosystem are not necessarily applicable to dryland ecosystems. To

assist the GEF, the workshop identified a number of questions which could be used as criteria.

#### 3.1.2.2. Carbon sequestration

Carbon sequestration featured prominently in the discussion on land degradation/climate interlinkages. Though the issues raised have universal relevance, particular emphasis was placed on dryland ecosystems, summarised as follows:

- (i) Proper baseline setting
- (ii) Grow and harvest approach
- (iii) Verification methodologies

### 3.1.3. Intervention Strategies

#### 3.1.3.1. Vegetation/forest management/re-vegetation

Vegetation/forest management strategies provide a range of agro-forestry intervention options that have the potential for securing multiple benefits. In the Peruvian Amazon, primary forest ecosystems have sequestered 250 tonnes of carbon per hectare. In contrast, crops and pastures sequester 60 tonnes, whereas 10-year-old agroforests have sequestered 160 tonnes of carbon per hectare, or two-thirds the amount of primary forest. Replenishing soil fertility in sub-humid and semi-arid degraded lands also plays a vital role in reducing carbon emissions. Measures to rehabilitate degraded lands are compatible with those aimed at promoting the sequestration of carbon in plants and soils.

#### 3.1.4. Sustainable Rangeland/Grassland/Dryland Management

Sustainable Rangeland/Grassland/Dryland Manage-

ment can have multiple benefits for the environment and local inhabitants. Rangelands occupy 51% of the terrestrial land surface, contain 36% of the world's total carbon in above and below-ground biomass and include a large number of important species and ecotypes. The drylands harbour 240 billion tonnes of organic carbon in their soil and vegetation, thereby constituting a large potential source of emissions into the atmosphere. Alternatively, they have considerable potential for sequestering carbon. They are also important for biodiversity in terms of their genetic significance, ecological services, unique biota, and high levels of endemism and rarity. Significant international waters benefits can also be derived since they usually occupy headwater areas.

### *3.1.5. Integrated Catchment/Watershed Management*

The fact that many of the international waters are by definition shared by several countries and that management needs to be carried out at both the micro and macro levels indicate that interventions need to consider issues of spatial and temporal scales. The use of catchment approach as the analytical framework within which to address shared water basin could result in significant multi-benefits.

### *3.1.6. Sustainable Agricultural Practices/Management*

Agriculture contributes significantly to anthropogenic emissions of carbon dioxide, methane and nitrous oxide. Agriculture accounts for about 20% of the annual increase in radiate forcing. Land-use changes related to agriculture including biomass burning and soil degradation are major contributors. Biomass burning and loss of soil associated with the conversion of natural ecosystems to agricultural use in the tropics is believed to be the largest non-fossil fuel of CO<sub>2</sub> input to the atmosphere. Sustainable agricultural practices/management has the potential of mitigating CO<sub>2</sub> emissions through the reduction of emissions from present sources (i.e., storages in managed forests) and the creation and strengthening of carbon sinks. It also provides non-food goods and services relating to the global environment including, but not limited to, pollution control, water resources, erosion control, biodiversity enhancement, ecosystem integrity and improved population stabilisation (preventing migration).

### *3.1.7. Energy Related Strategies*

A number of energy supply options were considered

including improvement of efficiency of wood burning stoves, biomass production as a substitute for fossil fuels; the use of renewable energy technologies such as solar and wind power. Particular emphasis was however placed on biomass, because of its importance as an energy source in many developing countries.

### *3.1.8. Establishment of Transboundary Mechanisms for the Management of Shared Resources*

In situations where the resources and/or ecosystems - be it a river basin, underground aquifer or a forest ecosystem - are shared by more than one country, a strong case was made for the establishment of transboundary mechanisms to facilitate joint management.

## **Section 4: The Need for Targeted Research**

4.1. There is obviously a great need for a better understanding of many scientific, technical and socio-economic issues to do with land degradation interlinkages, particularly in dryland ecosystems.

### *4.1.1. Cross-Sectoral*

- Targeted/Applied Policy Research: Policy to remediate land degradation should provide understanding of the drivers of degradation. Identification of entry points of intervention strategies requires critical analysis that differentiates symptoms from root causes. Research is required to provide methods and information that establishes a basis for long term assessment of implications of intervening. This will entail a long-term commitment to policy research to identify interventions and allow evaluation of their impact on socio-economic and environmental conditions.
- People-Centered Approach: The need for targeted research that focuses on “best bet” solutions was highlighted. That is research that relies on the indigenous knowledge of local stakeholders and enables the researcher to draw on the development values of the existing results. The participation of local stakeholders in the planning, execution and evaluation of such activities is essential.
- Nutrient Depletion: The need for a better understanding of the role of vegetation as the provider of organic material for soil improvement and the canopy interception of rainfall was highlighted.

### *4.1.2 International Waters*

- Understanding of Land/Water degradation processes: A lack of understanding of the complexi-

ties of degradation processes exist, especially where the degradation of land or water are linked. The interaction between degradation events such as water logging, salinisation and acidification is still not clear. One gap recognised was the lack of robust models on land degradation.

- Quantify the Extent/Intensity of Land/Water Degradation: “Guesstimates” are often used to arrive at the quantum of negative change that could be attributed to land degradation processes. There is a need to obtain “real” estimates of land degradation, not only on the spatial scale but also some indication on the temporal scale. Modern techniques such as remote sensing and Geographical Information Systems (GIS) should be employed in such an exercise.
- Relationship Between Intensive/Extensive Water and Land-use: Issues relating to the intensification - extensification continuum are complex and not fully understood. Conceptually, there must be a point in the I - E continuum where there is balance leading to optimal land use for any particular habitat/eco-region/biome.
- Thresholds/Critical Loads: There are also data gaps in the area of thresholds or critical loads of land degradation. There is a time scale response and also a spatial scale response.

#### 4.1.3 *Climate Change*

- Flux measurements: Research is required on flux measurements including carbon fluxes in arid, semi-arid and tropical environments in both forested and non-forested sectors; the effects of species, landscapes and weather on fluxes and the effects of various interventions on GHG emissions.
- Development and validation of carbon management models: The need for the development and validation of carbon management models for biomass production and use, with particular emphasis on applications to degraded lands on a region-by-region basis was emphasized.
- Inventories of degraded lands: Inventories of degraded lands suitable for restoration to more pro-

ductive uses—including the production for biomass for CO<sub>2</sub> sequestration, for energy and other uses—in conjunction with perpetual-rotation management strategies for biomass.

- Environmentally sound and sustainable biomass production strategies: Multi-disciplinary targeted research to develop environmentally sound and sustainable biomass production strategies as well as the most effective strategies for restoring degraded lands to productive use.

#### 4.1.4 *Biodiversity*

- Feedback Linkages from biodiversity to land degradation: The conclusion from the analysis of linkages between biodiversity and land degradation is that the feed-forwards linkages are more established than the feedback (biodiversity to land degradation) linkage.
- Intensification and Extensification: How can intensification (in high potential areas) and extensification (in drylands) be realised.
- Ecosystem resilience: Ecosystem resilience and the resilience of diverse management systems was identified as an important area in need of targeted research since a significant amount of biodiversity occurs in managed land.
- Genetic Improvement in drylands: With respect to indigenous fruit trees and other useful plants, activities are required to promote genetic improvement of these crops, to ensure proper propagation of planting materials and to develop improved capping systems that utilise these indigenous food crops.
- Mitigation of social driving forces: How are social driving forces linked to land degradation, biodiversity, climate change and water resources and how can these forces be deflected/mitigated.
- Economic Incentives for Biodiversity Conservation: What is the value of different aspects of biodiversity and how can value be added to biodiversity to create economic incentives for conservation.



# Annex D. UNDP Assessment of Land Degradation Projects

Project Name: *Alternatives to Slash and Burn II (ASB)*

Focal Area/OP: CC

Implementing Agency: UNDP

Project Location: Global

Status: recently completed

Issue	Land Degradation Component	Comments
Participatory with communities	Weak	
Capacity building re land degradation	Strong	
Information collection and exchange, land monitoring system	Strong	Important attempt to collect relevant cross-country and regional data (GIS, etc.) for local land use planning and for global community (e.g., carbon storage data)
Targeted research on biophysical aspects of land degradation	Strong	Variety of topics such as impact of burning on soil properties and biodiversity, testing grass species for rehabilitating degraded land, biodiversity of various land uses
Targeted research on the socioeconomic system, causes & solutions of land degradation	Strong	Attempt to provide cross-site understanding of slash & burn at community level (for identifying alternatives), weaker at higher levels
Integrate indigenous knowledge in technical approaches	Medium	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Weak	Tends to confine analyses at local levels (surveys etc), but important successful policy research and interventions in Asia
Addressing farming practices leading to degradation	Strong	
Addressing herding practices leading to degradation	N/A	
Addressing fuelwood collection leading to degradation	Medium	
Addressing deforestation leading to degradation	Strong	
Developing alternative livelihood systems (what?)	N/A	
What type of ecosystem	Forest	
Is land degradation mentioned (what type of deg)	Deforestation	Objective of project is reducing loss of carbon sequestration and biodiversity loss, but degradation important element
Land use of the area (PA, buffer, herd, crop...)	Cropping/mixed	

Enhancement of soils as carbon sink	None	
Proactive re-vegetation/reforestation	Strong	Varies by site; successful rehabilitation of land in Indonesia, few alternatives promoted successfully elsewhere
Prevention of future de-vegetation/ deforestation	Strong	
Tree plantations	N/A	
Sustainable forest harvesting/ management	Medium	
Habitat restoration (how)	Strong	
Control of bush or forest fires	Strong	Prevent through alternative land management
Watershed catchment management	N/A	
Non-point source control of land-based pollution	N/A	
Soil conservation techniques	Weak	
Agroforestry	Strong	
Fuelwood conservation (how)	Weak	
Reducing land use intensity (explain)	N/A	Actually attempting to increase intensity in occupied sites to reduce expansion of agriculture into forest
Taking land out of production	N/A	
Land use planning (to do what)	Strong	
Enabling policy (to do what)	Medium	Varies by site, large component of phase 2
Mention reducing dust in atmosphere	None	

This project is unusual in the GEF land degradation portfolio because its focus is on changing current land management practices in humid forest areas using means other than land zonation. It ambitiously attempts to develop alternative, technical solutions to the age-old problem of rapid deterioration of soil productivity in cleared forested areas.

The assumption is that promotion of such alternatives will lead to an increase in productivity and land use intensity in currently occupied areas, and reduce extensification into forested areas.

It directly addresses two GEF focal areas-climate change and biodiversity-by preventing degradation and rehabilitating degraded areas. The linkage is thus strong.

To accomplish this feat, an important amount of targeted research identifying land use alternatives that are economically viable and environmentally beneficial is required. This project also included a large research component of the determinants and environmental impact of slash and burn agriculture.

The first lesson concerning land degradation is that the development of viable alternative land use systems requires a not-insubstantial investment of time and finances in high quality targeted research. Despite a slow start, and interruption in funding, the project was nevertheless able to pull together and conduct significant work. This type of complex, land related project requires both focus and time.



A second lesson is that large, and rapid, impacts on land degradation may be obtained by addressing policy and economic structures affecting land use. Although the Phase 1 proposal emphasized technical solutions to slash and burn agriculture, the most impressive results of that phase came from policy analysis and policy recommendations in Indonesia.

Phase 2 focused on consolidating and publishing the climate change, biodiversity and soil parameters re-

search associated with burning, and on testing and evaluating the environmental and social trade-offs of alternative land use systems. The research on carbon stocks and changes related to different land use systems is especially informative for the global climate change community and for future carbon sequestration project design. The results of the project's work are now, after the end of GEF support, becoming available and starting to have an impact.

Project Name: *People, Land Management and Environmental Change (PLEC)*

Focal Area/OP: BD/STRM

Implementing Agency: UNDP

Project Location: Global

Status: implementing phase 2

<b>Issue</b>	<b>Strong/ Med/ Weak/ None/ N/A</b>	<b>Comments</b>
Participatory with communities	Strong	
Capacity building re land degradation	Medium	Not related to land degradation?
Information collection and exchange, land monitoring system	Strong	much plot and landscape level data collection (of crop species, land use)
Targeted research on biophysical aspects of land degradation	Strong	Developing method of determining degree of land degradation
Targeted research on the socioeconomic system, causes & solutions of land degradation	Medium	Thus far tends to be focused on community level (using participating rapid assessment– PRA)
Integrate indigenous knowledge in technical approaches	Strong	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Weak	Examining impacts of commercialization and population growth on agrobiodiversity, less so policy, tenure and economic structures affecting crop choice. More effort on info collection than on addressing the threats to agrobiodiversity.
Addressing farming practices leading to degradation	Strong	
Addressing herding practices leading to degradation	Medium	
Addressing fuelwood collection leading to degradation	None	
Addressing deforestation leading to degradation	Weak	
Developing alternative livelihood systems (what?)	N/A	
What type of ecosystem	Mixed	
Is land degradation mentioned (what type of deg)	Loss of species	
Land use of the area (PA, buffer, herd, crop...)	Primarily cropping, some herding	
Enhancement of soils as carbon sink	None	
Proactive re-vegetation/reforestation	None	

Prevention of future de-vegetation/ deforestation	Medium	
Tree plantations	N/A	
Sustainable forest harvesting/ management	N/A	
Habitat restoration (how)	N/A	
Control of bush or forest fires	N/A	
Watershed catchment management	N/A	
Non-point source control of land-based pollution	N/A	
Soil conservation techniques	Strong	
Agroforestry	None	
Fuelwood conservation (how)	None	
Reducing land use intensity (explain)	N/A	
Taking land out of production	N/A	
Land use planning (to do what)	None	
Enabling policy (to do what)	Weak	
Mention reducing dust in atmosphere	None	

The PLEC project, like ASB, is a complex project crossing three continents and addressing land management issues. It also has a significant targeted research component with contributions by international level scientists.

This project conceptually links agrodiversity (diversity of agricultural species and management practices) and soil conservation, arguing that practices that undermine crop species diversity also undermine management diversity and soil and water conservation. Its goal is to develop environmentally sustainable models of agrodiversity management.

It is, thus, the only project in the GEF portfolio of those examined that has soil conservation and improved soil management in cropped areas as a stated objective.

Nevertheless, reaction to the joining of agro-biodiversity conservation and soil management has

been varied. The mid-term reviewer felt that, in one site in Ghana, emphasis was being placed on soil conservation to the detriment of agrodiversity efforts. In Brazil, on the other hand, he highlighted an example of a successful linkage in the development of a method to rehabilitate degraded pasture land with indigenous plant species.

An important contribution of the project to future GEF and other projects will be the development of field methods for agrodiversity and for land degradation assessment in small-scale rainfed farming systems. A just completed a working paper, "Land Degradation—Guidelines for Field Assessment" will be published by EarthScan with funds from UNEP, DFID, GEF, and others. A second important contribution will be the testing and development of approaches for productive, sustainable agriculture that promote agro-biodiversity.

Project Name: *Biodiversity Conservation and Sustainable Livelihood Options in the Grasslands*  
 Focal Area/OP: BD/1  
 Implementing Agency: UNDP  
 Project Location: Mongolia  
 Status: phase 2 ongoing

Issue	Strong/ Med/ Weak/ None/ N/A	Comments
Participatory with communities	Medium	For buffer zone management
Capacity building re LD	Medium	
Information collection and exchange, land monitoring system	Medium	GIS, monitoring system
Targeted research on biophysical aspects of land degradation	Strong	Species inventories
Targeted research on the socioeconomic system, causes & solutions of LD	Medium	PRA, Markets
Integrate indigenous knowledge in technical approaches	Weak	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Weak	
Addressing farming practices leading to degradation	N/A	
Addressing herding practices leading to degradation	Weak	
Addressing fuelwood collection leading to degradation	Medium	Tree planting
Addressing deforestation leading to degradation	Medium	
Developing alternative livelihood systems (what?)	Strong?	Communities apply for grants from trust fund to do biodiversity activities
What type of ecosystem	Steppe	
Is land degradation mentioned (what type of deg)	Uncertain of severity	Overgrazing, deforestation, fires around settlements
Land use of the area (PA, buffer, herd, crop...)	PA	
Enhancement of soils as carbon sink	None	
Pro active re-vegetation/ reforestation	Strong	Afforestation around settlements
Prevention of future de-vegetation/ deforestation	Medium	
Tree plantations	Strong	
Sustainable forest harvesting/ management	Medium	
Habitat restoration (how)	None	
Control of bush or forest fires	Strong	

Watershed catchment management	N/A	
Non-point source control of land-based pollution	N/A	
Soil conservation techniques	Medium	May be one of activities at community level (grants given from trust fund)
Agroforestry	N/A	
Fuelwood conservation (how)	None	
Reducing land use intensity (explain)	None	
Taking land out of production	Strong	PA development, buffer zone management
Land use planning (to do what)	Strong	
Enabling policy (to do what)	Medium	biodiversity intro provincial & local gov' t plans
Mention reducing dust in atmosphere	None	

The environmental and causal link between biodiversity loss and land degradation is clear in this project—overgrazing, cutting of trees for woodfuel and high fire incidence are leading to a decline in natural vegetative cover and change in plant species, and this is expected to lead to a long-term decline in land productivity and wildlife diversity. The project is planning to address the problem directly, by planting trees, reducing fire incidences, and greatly expanding the area under protected status.

This project is typical of biodiversity projects located in and around protected areas. It is committed to working with local communities in the buffer zone in order to gain community support for restricting their use of the protected area and reduce the incidence of fire. Due to a new trust fund, the project hopes to have funds to disperse as grants to communities to conduct biodiversity enhancing activities such as afforestation and soil conservation. Environmental education is also an important element of the project. Re-vegetation in the buffer zones is expected to be an output of the project (the project is too recent to have measurable effects on land degradation).

The project proposal discusses the impact of current major upheavals in the local tenure and economic systems due to major changes in the governmental structure—changes that are feared to have large consequences on the grasslands as the herding system is further disrupted. The proposed activities of the project, however, fall well short of attempting to address these changes or their land degradation and biodiversity impacts. It appears that the herding system—to develop and promote a sustainable transhumance system or a settled land management system—will not be a focus of the project. The difficult development of a new, sustainable land use system would require targeted research, both biophysical/agronomic and socioeconomic, and a sustained implementation effort.

Without addressing the underlying causes of degradation in changes to the herding system, the long-term and geographical area of the impact of project efforts is unclear.

Project Name: *Indicator Model for Dryland Ecosystems in Latin America*

Focal Area/OP: 1

Implementing Agency: UNEP

Project Location: Mexico, Brazil, Chile

Status: new MSP in implementation

Issue	Strong/ Med/ Weak/ None/ N/A	Comments
Participatory with communities	Strong	
Capacity building re LD	Strong	
Information collection and exchange, land monitoring system	Strong	
Targetted research on biophysical aspects of land degradation	Strong	
Targetted research on the socioeconomic system, causes & solutions of LD	Strong	
Integrate indigenous knowledge in technical approaches	Medium	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Weak	
Addressing farming practices leading to degradation	N/A	
Addressing herding practices leading to degradation	N/A	
Addressing fuelwood collection leading to degradation	N/A	How
Addressing deforestation leading to degradation	N/A	How
Developing alternative livelihood systems (what?)	N/A	What
What type of ecosystem	Drylands	
Is land degradation mentioned (what type of deg)	Strong	What type Erosion – vegetation loss
Land use of the area (PA, buffer, herd, crop...)	Farming Herding	
Enhancement of soils as carbon sink	N/A	
Pro active revegetation/ reforestation	N/A	
Prevention of future devegetation/ deforestation	Medium	How Need better information
Tree plantations	N/A	
Sustainable forest harvesting/ management	N/A	
Habitat restoration (how)	N/A	How
Control of bush or forest fires	N/A	
Watershed catchment management		How
Non-point source control of land-based pollution		

Non-point source control of land-based pollution		
Soil conservation techniques	Medium	
Agroforestry	None	
Fuelwood conservation (how)	N/A	
Reducing land use intensity (explain)	Medium	
Taking land out of production	Weak	
Land use planning (to do what)	N/A	
Enabling policy (to do what)	N/A	
Mention reducing dust in atmosphere	N/A	

The project is a joint effort by NGO groups in three countries to develop a set of indicators of dryland degradation and loss of biodiversity in drylands. It aims to develop a tool that would be an effective assessment instrument in the three countries and to test the tool in three pilot areas. In this way, it is anticipated that the potential use will apply much more widely, both as an assessment and monitoring device. The model will attempt to integrate biophysical, economic, and social indicators into an assessment of dryland states through the use of GIS databases. This would lead to problem identification and policy recommendations.

Given a functioning model, each country would be able to develop an ongoing monitoring system using the same basic data sets, leading to:

- Development of sustainable land use and resource management plans

- Identification of threats to those plans and design necessary interventions
- Development of a basic protocol for long-term monitoring of indicators.

This project is judged to be a good example of a land degradation linkage project for a number of reasons. First, it is conceived as a land degradation project with a strong link to biodiversity, not the other way around. Second, it provides a strong local knowledge base to the problem, though the integration of indigenous knowledge could have been given greater prominence. Third, it leads from information to action and policy in a well-defined way.

However, if successful, it is clear that this will only be the beginning of the process. More work will be needed to disseminate the model and even more to apply its principles. This seems like a great starting point for the hemisphere.

Project Name: *Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika*

Focal Area/OP: 1 W

Implementing Agency:

Project Location: East Africa

Status:

Issue	Strong/ Med/ Weak/ None/ N/A	Comments
Participatory with communities	Weak	
Capacity building re LD	None	
Information collection and exchange, land monitoring system	Strong	
Targetted research on biophysical aspects of land degradation	Strong	
Targetted research on the socioeconomic system, causes & solutions of LD	Weak	
Integrate indigenous knowledge in technical approaches	None	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	None	
Addressing farming practices leading to degradation	None	
Addressing herding practices leading to degradation	N/A	
Addressing fuelwood collection leading to degradation	None	How
Addressing deforestation leading to degradation	Weak	How
Developing alternative livelihood systems (what?)	None	What
What type of ecosystem	Lake	
Is land degradation mentioned (what type of deg)	Medium	What type Soil loss degradation
Land use of the area (PA, buffer, herd, crop...)		
Enhancement of soils as carbon sink	N/A	
Proactive revegetation/ reforestation	N/A	
Prevention of future devegetation/ deforestation	None	How
Tree plantations	None	
Sustainable forest harvesting/ management	N/A	
Habitat restoration (how)	None	How
Control of bush or forest fires	None	



Control of bush or forest fires	None	
Watershed catchment management	Medium	How
Non-point source control of land-based pollution	Weak	
Soil conservation techniques	None	
Agroforestry	None	
Fuelwood conservation (how)	N/A	
Reducing land use intensity (explain)	None	
Taking land out of production	None	
Land use planning (to do what)	Weak	
Enabling policy (to do what)	Strong	
Mention reducing dust in atmosphere	N/A	

This activity started as a pilot project and was developed into a five-year full project of \$10 million. Lake Tanganyika has one of the world's most distinctive and biodiverse ecosystems with many endemic fish species. The lake is under threat from coastal pollution and heavy sedimentation issuing from deforestation and inappropriate land use, particularly in the northern catchments.

The project aims to improve understanding of the ecosystem and the degree of stress and to take actions to improve and maintain the current biodiversity. This first phase concentrates on the establishment of regional institutional frameworks for cooperative management. Measures include the establishment of parallel legislation in the four countries, the identification of pollution sources, and conservation measures within the park. The main goal is to set up an ongoing regional co-generating mechanism that can continue work after the end of the project. The land degradation component concerns the contribution of soil erosion and deforestation to the heavy sedimentation of the north end of the lake.

This project is now in its final stages and there are already plans for a follow-up project. The final report is complimentary in that the project achieved some of its goals in the face of extremely difficult conditions in the region including, but not limited to, continuing ethnic violence in the northern watershed catchments of the lake basin.

Some outputs of the project were highly commended, for example, the updated knowledge of the lake's biodiversity, detailed information of the lake component of the sedimentation, a clearly articulated program of action, and a well-defined regional management structure. Because of the security situation, the land degradation component outside the immediate lake confines was not able to be a major component, though this is an obvious priority for any follow-up work, especially if local conditions improve. Though not all of the detailed studies were available, it is evident that this project was well-designed and achieved a good deal more than might have been thought possible.

Project Name: *Arid and Semi-Arid Ecosystem Conservation in the Caucasus*

Focal Area/OP: 1

Implementing Agency: UNDP

Project Location: Georgia

Status: MSP

<b>Issue</b>	<b>Strong/ Med/ Weak/ None/ N/A</b>	<b>Comments</b>
Participatory with communities	Strong	
Capacity building re LD	Medium	
Information collection and exchange, land monitoring system	Strong	
Targetted research on biophysical aspects of land degradation	Medium	
Targetted research on the socioeconomic system, causes & solutions of LD	Medium	
Integrate indigenous knowledge in technical approaches	Weak	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Weak	
Addressing farming practices leading to degradation	N/A	
Addressing herding practices leading to degradation	Strong	
Addressing fuelwood collection leading to degradation	N/A	How
Addressing deforestation leading to degradation	N/A	How
Developing alternative livelihood systems (what?)	Strong	What Grazing & Hunting
What type of ecosystem	Arid, Semi-Arid	
Is land degradation mentioned (what type of deg)		What type
Land use of the area (PA, buffer, herd, crop...)	Herding	
Enhancement of soils as carbon sink	None	
Proactive revegetation/ reforestation	Medium	
Prevention of future devegetation/ deforestation	Strong	How
Tree plantations	N/A	
Sustainable forest harvesting/ management	N/A	
Habitat restoration (how)	Strong	How - Change land use patterns
Control of bush or forest fires	N/A	

Control of bush or forest fires	N/A	
Watershed catchment management	N/A	How
Non-point source control of land-based pollution	N/A	
Soil conservation techniques	Weak	
Agroforestry	N/A	
Fuelwood conservation (how)	N/A	
Reducing land use intensity (explain)	Strong	
Taking land out of production	None	
Land use planning (to do what)	Medium	
Enabling policy (to do what)	Medium	
Mention reducing dust in atmosphere	N/A	

This medium-size UNDP project is a counterpoint to the World Bank Biodiversity Conservation project on forestlands in the Georgian Caucasus.

The visible problem is defined as widespread soil erosion due to overgrazing in the region. There is also a sharp drop in the numbers of threatened and endangered species due to intensive hunting and habitat loss. There is important biodiversity loss of indigenous flora and fauna in a degrading ecosystem.

There is little permanent habitation in the region, but livestock are driven here for the winter season (from mid-September to early April) from the south, center, and northwest of Georgia and also from Azerbaijan and Armenia. Rapid surveys show 72 encampments, each with about 2,000 sheep, a density of 12 sheep/ha compared with the permitted 4 per ha. Land use and grazing strategies, which preceded the revolution in Russia, were generally efficient in resource use. The Soviet system destroyed them, however, and new sustainable patterns have not developed.

The goal of the project is to protect and restore ecosystem functioning through:

- Baseline data development
- A management plan with alternative economic activities
- Improved international and local community cooperation
- Transboundary agreements.

Through a series of practical steps, the goal was to develop agreed land use strategies to allow the recovery and protection of key ecosystem species and to increase awareness of their importance. A coordination unit will be established and pilot demonstration projects carried out. Among these is the experimental establishment of hunting farms, within differentiated zones, for hunting, protection, and specially protected natural breeding zones.

Although the world has changed greatly, the goal is to reestablish the principles of the former sustainable land use patterns in a modern format.

Project Name: *Natural Resources Management*  
 Focal Area/OP: 3 Forest Ecosystems  
 Implementing Agency: World Bank  
 Project Location: Ghana  
 Status: Under Implementation

<b>Issue</b>	<b>Strong/ Med/ Weak/ None/ N/A</b>	<b>Comments</b>
Participatory with communities	Medium	
Capacity building re LD	Weak	
Information collection and exchange, land monitoring system	Medium	
Targetted research on biophysical aspects of land degradation	Medium	
Targetted research on the socioeconomic system, causes & solutions of LD	Medium	
Integrate indigenous knowledge in technical approaches	Weak	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Weak	
Addressing farming practices leading to degradation	Medium	
Addressing herding practices leading to degradation	N/A	
Addressing fuelwood collection leading to degradation	Medium	How
Addressing deforestation leading to degradation	Strong	How
Developing alternative livelihood systems (what?)	Strong	What Economic forest use
What type of ecosystem	Humid Forest	
Is land degradation mentioned (what type of deg)	Medium	What type Forest depletion/erosion
Land use of the area (PA, buffer, herd, crop...)	Forest	
Enhancement of soils as carbon sink	N/A	
Proactive revegetation/ reforestation	Strong	
Prevention of future devegetation/ deforestation	Strong	How New administrative structure
Tree plantations	Strong	
Sustainable forest harvesting/ management	Strong	
Habitat restoration (how)	Strong	How
Control of bush or forest fires	Weak	

Control of bush or forest fires	Weak	
Watershed catchment management	N/A	How
Non-point source control of land-based pollution	N/A	
Soil conservation techniques	Strong	
Agroforestry	None	
Fuelwood conservation (how)	None	
Reducing land use intensity (explain)	Strong	
Taking land out of production	Strong	
Land use planning (to do what)	Strong	
Enabling policy (to do what)	Medium	
Mention reducing dust in atmosphere	N/A	

The project addresses the conservation of tropical forest ecosystems by strengthening the Ghanaian network of conservation areas and reinforcing the development of sustainable use and management systems for biodiversity resources. By financing the incremental cost of addressing global and regional biodiversity conservation priorities within the framework of the National Biodiversity Strategy and the National Forest Protection Strategy, GEF funding will complement IDA and bilateral donor-financed programs for development of forest production systems that are environmentally and socially sustainable, and for management of protected areas.

The project targets the approximately 8 percent of moist tropical forests in Ghana that, based on a comprehensive national forest inventory, rank highest, globally, in term of their importance for biodiversity. This systematic evaluation of threat and rarity, covering more than 1,000 tree species, carried out under the ODA-financed *Forest Inventory and Management* project is unparalleled in the West Africa region in terms of its scope and comprehensiveness. Protection of these forests would secure representation of a significant fraction of the biodiversity of the upper Guinea-Congolese forest formation within a well-connected network of forest reserves. Additional priorities to be addressed by the project include the biologically unique southern dry forests of the Dahomey Gap that separates the two major high forest formations of western and central Africa, and the montane outlier forest of the Kyabobo highlands, the

last disjunct forest within the savannah corridor that is the only place where elements of the eastern and western forest blocks intermingle, forming a globally unique composite biota.

Environmentally sustainable woodland management in the savannah zone will enhance rural incomes as well as generating ancillary environmental benefits to rural communities in the form of improved soil, water, and wildlife habitat management. Community participation in wildlife resource management and development of compatible uses such as ecotourism will increase locally retained revenues from wildlife resources. Improved conservation of biodiversity will ensure a sustainable supply of non-timber forest products such as medicinal plants, which contribute differentially to the health and well-being of the poorest population segments.

In Ghana, pilot participatory management programs within the high forest zone have also been initiated by the Collaborative Forest Management Unit within the Forestry Department, and, in the savannah regions, local NGOs have been working successfully to promote community-managed operations particularly in potable water supply. These provide a basis for expanding the formal involvement of local organizations in wildlife and forest reserve management. The presence of an active and growing community of conservation NGOs and the project's intention to engage this community in monitoring and evaluation of program performance as well as in key aspects of pro-

gram implementation will improve transparency, accountability and, ultimately, performance of the public agencies responsible for executing the program.

Under the GEF alternative, Ghana will enhance the conservation of its globally significant forest biodiversity by supplementing the baseline activities with the following additional measures: (a) further strengthening conservation planning and management of the national park system; and (b) in the forest reserves, (i) classifying areas that are particularly rich

in biodiversity as Special Biological Protection Areas, taking them out of production, upgrading the conservation of their biological resources and compensating the affected communities for the forest product income they will lose through alternative livelihood schemes, such as ecotourism, sustainable use of non-timber forest products, and restoration of degraded woodlands; and (ii) designing and adopting more environmentally friendly logging practices and additional conservation measures within the production forests.

Project Name: *Implementation of Integrated Watershed, Pantanal and Upper Paraguay River Basin*

Focal Area/OP: OP 1 W

Implementing Agency: UNEP

Project Location: Brazil, Bolivia, Paraguay

Status: FP IMPLEMENTING

Issue	Strong/ Med/ Weak/ None/ N/A	Comments
Participatory with communities	Strong	
Capacity building re LD	Medium	
Information collection and exchange, land monitoring system	Medium	
Targetted research on biophysical aspects of land degradation	Weak	
Targetted research on the socioeconomic system, causes & solutions of LD	Medium	
Integrate indigenous knowledge in technical approaches	Weak	
Address underlying causes of degradation (e.g. poverty, migration, nat' l econ)	Medium	
Addressing farming practices leading to degradation	Medium	
Addressing herding practices leading to degradation	N/A	
Addressing fuelwood collection leading to degradation	Weak	How
Addressing deforestation leading to degradation	Medium	How
Developing alternative livelihood systems (what?)	N/A	What
What type of ecosystem	Humid	
Is land degradation mentioned (what type of deg)	Strong	What type Soil loss – chemical pollution
Land use of the area (PA, buffer, herd, crop...)		
Enhancement of soils as carbon sink		
Proactive revegetation/ reforestation	Strong	
Prevention of future devegetation/ deforestation		How
Tree plantations	N/A	
Sustainable forest harvesting/ management	Medium	
Habitat restoration (how)	Strong	How
Control of bush or forest fires		

Watershed catchment management	Strong	How
Non-point source control of land-based pollution	Strong	
Soil conservation techniques	Strong	
Agroforestry	N/A	
Fuelwood conservation (how)	N/A	
Reducing land use intensity (explain)	Medium	
Taking land out of production	Medium	
Land use planning (to do what)	Medium	
Enabling policy (to do what)	Medium	
Mention reducing dust in atmosphere	N/A	

This international waters project is a good example of the integration of land degradation issues into the international waters context. The project lays the groundwork for a detailed watershed management program for the Pantanal and the Upper Paraguay River Basin. It also attempts to provide protection for the rich biodiversity of that region and to address the root causes of land and water degradation. The project aims to create the framework for an action plan by institutional strengthening, capacity building, and the integration of degradation and environmental concerns into sustainable economic development.

The land degradation component of the project concerns soil loss from agricultural areas, contamination of land and water by organic pollutants and heavy metals from agricultural and mining operations, and also wetland issues. The specific land degradation component seeks to implement community-based land management, for both mining and agriculture, and to develop land rehabilitation efforts in both ac-

tivities. This will include a public awareness, information, and education component, which will encompass both urban and rural communities. Specifically, soil conservation practices to reduce soil erosion loss, reclaiming degraded mining lands and reestablishing riparian vegetation along streams and river margins to reduce bank erosion, and the adoption of good urban waste disposal practices are all included. Some \$1.8 million of the project total of \$16.2 million will be spent on this component. A good part of the rest of the project, especially that dealing with Pantanal conservation and organizational strengthening, will also benefit the land degradation activities.

This project should lay the foundation for an important program in the area and allow a beginning to environmental restoration in this area. While a strong project with a sound and extensive knowledge database, it will only provide the beginning of the process needed to provide a sustainable and environmentally sound economy for this priority area.



## Annex E. Materials Consulted

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- An Action Plan for Enhancing GEF Support in Land Degradation (GEF/C.14/4) November 1999
- Clarifying Linkages Between Land Degradation and the GEF Focal Areas: An Action Plan for Enhancing GEF Support (GEF/C.14/4) November 1999
- Designing Projects within the GEF Focal Areas to Address Land Degradation: with Special Reference to Incremental Cost Estimation. Draft. (K. Kumari, GEF) August 1997
- Draft Elements of an Operational Program for Reducing and Eliminating Releases of Persistent Organic Pollutants into the Environment (GEF/C.16.6) November 2000
- Dryland Management in Sub-Saharan Africa: The Search for Sustainable Development Options (The World Bank)
- Drylands, Poverty and Development: Proceedings of the June 15 and 16, 1999 World Bank Roundtable (World Bank) November 1999
- Follow Up to the Recommendations of the Dakar Workshop (GEF/C.9/6) March 1997
- A Framework of GEF Activities Concerning Land Degradation (GEF) October 1996
- GEF Land Degradation Linkage Study (Initiating Memorandum)
- The Global Environmental Benefits of Land Degradation Control on Agricultural Land (S. Pagiola, The World Bank) 1999
- Good Practices in Drylands Management (R. Oygard, T. Vedeld, J. Aune, World Bank) October 1999
- Implementing the Action Plan on Land Degradation (GEF/C.15/Inf.9) April 2000
- Instrument for the Establishment of the Restructured Global Environment Facility (GEF)
- Integrated Land and Water Management Action Program for Africa. Draft (GEF) May 2000
- Land Degradation in Tanzania: Perception from the Village (World Bank) 1998
- New Opportunities for Development: The Desertification Convention (The World Bank) 1999
- Operational Report on GEF Programs (GEF) December 1999
- Operational Program #12, Integrated Ecosystems Management (GEF) April 2000
- Operational Programs (GEF) June 1997
- Project Implementation Review (PIR) 1999
- Project Implementation Review (PIR) 2000
- Project Performance Report 1998 (GEF)
- Project Performance Report 1999 (GEF)
- Protecting the Environment from Land Degradation: UNEP's Action in the Framework of the Global Environment Facility (UNEP)

- Report of the Scientific and Technical Advisory Panel (STAP) to the Global Environmental Facility (GEF) Expert Group Workshop on Land Degradation. Dakar, Senegal, 18-20 September 1996 (UNEP)
- Report of the STAP Expert Group Workshops on Land Degradation. Bologna, Italy, 14-16 June 1999 (GEF/C.14/Inf.15) November 1999
- Request for PDF Block B Funds. Development of an IFAD Pipeline of GEF-Eligible Projects on Land Degradation Control
- Safeguarding the Earth, Global Environment Facility 1999 Annual Report (GEF)
- Scope and Preliminary Operational Strategy for Land Degradation (GEF/C.3/8) October 1997
- A Socio-economic Perspective on Land Degradation and Linkages to GEF Focal Areas: Climate Change, Biodiversity, and International Waters (D. Campbell, Michigan State University)
- Study of GEF's Overall Performance (G. Porter, R. Clemoncon, W. Ofosu-Amaah, M. Philips; GEF) 1998
- The UNDP/GEF 1996 Project Implementation Review Reporting Format
- UNDP-GEF's Land Degradation Database: an Initial Analysis (UNDP) August 2000
- United Nations Convention on Biological Diversity
- United Nations Convention to Combat Desertification
- United Nations Framework Convention on Climate Change

Numerous PDFs, project briefs, project documents, PIR reports, mid-term and terminal reviews, and project reports were also consulted.

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7 UNDP-GEF's Land Degradation Database: an Initial Analysis, August 2000

**Table 1      Operational Program Distribution of All Land Degradation Projects**

GEF Allocation (\$ m)

<b>Focal Area</b>	<b>Operational Program</b>	<b>Projects</b>	<b>% of Projects</b>	<b>GEF Allocation (\$ m)</b>	<b>% of Allocation</b>
<b>Biodiversity</b>	1: Arid & Semi-Arid	15	18.8%	88.40	14.2%
	2: Costal, Marine	10	12.5%	48.36	7.7%
	3: Forest	13	16.3%	103.57	16.6%
	4: Mountain	9	11.3%	61.60	9.9%
	STRM	1	1.3%	6.28	1.0%
	<b>Total</b>	<b>48</b>	<b>60.0%</b>	<b>308.21</b>	<b>49.4%</b>
<b>Climate Change</b>	5: Energy Efficiency	1	1.3%	1.70	.3%
	6: Renewable Energy	12	15.0%	82.61	13.2%
	7: Technologies	4	5.0%	94.75	15.2%
	STRM	5	6.3%	21.70	3.5%
	<b>Total</b>	<b>22</b>	<b>27.5%</b>	<b>200.76</b>	<b>32.2%</b>
<b>Int'l Waters</b>	8: Waterbody-Based	6	7.5%	77.99	12.5%
	9: Land & Water	4	5.0%	37.16	6.0%
	<b>Total</b>	<b>10</b>	<b>12.5%</b>	<b>115.15</b>	<b>18.5%</b>
<b>Total</b>	1: Arid & Semi-Arid	15	18.8%	88.40	14.2%
	2: Costal, Marine	10	12.5%	48.36	7.7%
	3: Forest	13	16.3%	103.57	16.6%
	4: Mountain	9	11.3%	61.60	9.9%
	5: Energy Efficiency	1	1.3%	1.70	.3%
	6: Renewable Energy	12	15.0%	82.61	13.2%
	7: Technologies	4	5.0%	94.75	15.2%
	8: Waterbody-Based	6	7.5%	77.99	12.5%
	9: Land & Water	4	5.0%	37.16	6.0%
	STRM	6	7.5%	27.98	4.5%
	<b>Total</b>	<b>80</b>	<b>100.00%</b>	<b>624.12</b>	<b>100.0%</b>

**Table 2 Operational Program Distribution of Projects with a Strong Land Degradation Component**

GEF Allocation (\$ m)

<b>Focal Area</b>	<b>Operational Program</b>	<b>Projects</b>	<b>% of Projects</b>	<b>GEF Allocation (\$ m)</b>	<b>% of Allocation</b>
<b>Biodiversity</b>	1: Arid & Semi-Arid	9	23.1%	55.26	19.1%
	2: Coastal, Marine	4	10.3%	19.10	6.6%
	3: Forest	9	23.1%	61.03	21.1%
	4: Mountain	4	10.3%	35.90	12.4%
	STRM	1	2.6%	6.28	2.2%
	Total	27	69.2%	177.57	61.5%
<b>Climate Change</b>	6: Renewable Energy	2	5.1%	6.90	2.4%
	STRM	4	10.3%	11.70	4.0%
	Total	6	15.4%	18.60	6.4%
<b>Int'l Waters</b>	8: Waterbody-Based	3	7.7%	63.59	22.0%
	9: Land & Water	3	7.7%	29.16	10.1%
	Total	6	15.4%	92.75	32.1%
<b>Total</b>	1: Arid & Semi-Arid	9	23.1%	55.26	19.1%
	2: Coastal, Marine	4	10.3%	19.10	6.6%
	3: Forest	9	23.1%	61.03	21.1%
	4: Mountain	4	10.3%	35.90	12.4%
	6: Renewable Energy	2	5.1%	6.90	2.4%
	8: Waterbody-Based	3	7.7%	63.59	22.0%
	9: Land & Water	3	7.7%	29.16	10.1%
	STRM	5	12.8%	17.98	6.2%
	Total	39	100.0%	288.92	100.0%

**Table 3 Geographical Distribution of All Full-Size Land Degradation Projects**

GEF Allocation (\$ m)

Region	Focal Area	Projects	% of Projects	GEF Allocation (\$ m)	% of Allocation
<b>Africa</b>	Biodiversity	24	30.0%	145.76	23.4%
	Climate Change	8	10.0%	62.47	10.0%
	Int'l Waters	5	6.3%	74.84	12.0%
	Total	37	46.3%	283.07	45.4%
<b>Asia</b>	Biodiversity	8	10.0%	63.56	10.2%
	Climate Change	7	8.8%	74.54	11.9%
	Int'l Waters	2	2.5%	26.59	4.3%
	Total	17	21.3%	164.69	26.4%
<b>Middle East</b>	Biodiversity	6	7.5%	33.03	5.3%
	Climate Change	1	1.3%	2.90	.5%
	Total	7	8.8%	35.93	5.8%
<b>Latin America</b>	Biodiversity	9	11.3%	59.58	9.5%
	Climate Change	4	5.0%	53.45	8.6%
	Int'l Waters	2	2.5%	9.82	1.6%
	Total	15	18.8%	122.85	19.7%
<b>Central, Eastern Europe &amp; Former Soviet Union</b>	Climate Change	1	1.3%	4.40	.7%
	Int'l Waters	1	1.3%	3.90	.6%
	Total	2	2.5%	8.30	1.3%
<b>Global</b>	Biodiversity	1	1.3%	6.28	1.0%
	Climate Change	1	1.3%	3.00	.5%
	Total	2	2.5%	9.28	1.5%
<b>Total</b>	Biodiversity	48	60.0%	308.21	49.4%
	Climate Change	22	27.5%	200.76	32.2%
	Int'l Waters	10	12.5%	115.15	18.5%
	Total	80	100.00%	624.12	100.0%

**Table 4 Geographical Distribution of Full-Size Projects with a Strong Land Degradation Component**

GEF Allocation (\$ m)

Region	Focal Area	Projects	% of Projects	GEF Allocation (\$ m)	% of Allocation
<b>Africa</b>	Biodiversity	14	35.9%	86.62	30.0%
	Climate Change	4	10.3%	11.20	3.9%
	Int'l Waters	3	7.7%	64.34	22.3%
	Total	21	53.8%	162.16	56.1%
<b>Asia</b>	Biodiversity	4	10.3%	40.16	13.9%
	Int'l Waters	1	2.6%	18.59	6.4%
	Total	5	12.8%	58.75	20.3%
<b>Middle East</b>	Biodiversity	4	10.3%	26.03	9.0%
	Total	4	10.3%	26.03	9.0%
<b>Latin America</b>	Biodiversity	4	10.3%	18.48	6.4%
	Int'l Waters	2	5.1%	9.82	3.4%
	Total	6	15.4%	28.30	9.8%
<b>Central, Eastern Europe &amp; Former Soviet Union</b>	Climate Change	1	2.6%	4.40	1.5%
	Total	1	2.6%	4.40	1.5%
<b>Global</b>	Biodiversity	1	2.6%	6.28	2.2%
	Climate Change	1	2.6%	3.00	1.0%
	Total	2	5.1%	9.28	3.2%
<b>Total</b>	Biodiversity	27	69.2%	177.57	61.5%
	Climate Change	6	15.4%	18.60	6.4%
	Int'l Waters	6	15.4%	92.75	32.1%
	Total	39	100.0%	288.92	100.0%

**Table 5 Trend in Allocation to Full-Size Projects by Strength of Land Degradation Component**

GEF Allocation (\$ m)

Year WP Entry	Degree Project is LD	Projects	GEF Allocation (\$ m)
<b>1991</b>	Strong LD component	6	45.20
	Potential LD effects through prevention	3	13.80
	Indirect effects on LD	1	7.50
	Little apparent LD effect	2	13.30
	Total	12	79.80
<b>1992</b>	Strong LD component	7	27.10
	Potential LD effects through prevention	1	2.46
	Indirect effects on LD	3	17.60
	Little apparent LD effect	2	4.70
	Total	13	51.86
<b>1993</b>	Strong LD component	1	.20
	Potential LD effects through prevention	1	8.00
	Indirect effects on LD	1	2.50
	Total	3	10.70
<b>1995</b>	Strong LD component	3	7.90
	Potential LD effects through prevention	1	4.00
	Indirect effects on LD	1	4.00
	Total	5	15.90
<b>1996</b>	Strong LD component	5	65.32
	Potential LD effects through prevention	4	28.60
	Indirect effects on LD	1	6.00
	Little apparent LD effect	3	45.37
	Total	13	145.29
<b>1997</b>	Strong LD component	6	58.00
	Potential LD effects through prevention	3	27.44
	Total	9	85.44
<b>1998</b>	Strong LD component	5	32.36
	Potential LD effects through prevention	1	6.20
	Indirect effects on LD	1	36.00
	Little apparent LD effect	2	6.83
	Total	9	81.39
<b>1999</b>	Strong LD component	4	37.96
	Potential LD effects through prevention	3	16.86
	Indirect effects on LD	3	59.21
	Little apparent LD effect	1	6.83
	Total	11	120.86
<b>2000</b>	Strong LD component	2	14.88
	Potential LD effects through prevention	2	16.40
	Indirect effects on LD	1	1.60
	Total	5	32.88
<b>Total</b>	Strong LD component	39	288.92
	Potential LD effects through prevention	19	123.76
	Indirect effects on LD	12	134.41
	Little apparent LD effect	10	77.03
	Total	80	624.12

**Table 6 GEF Allocation to Full-Size Projects by Phase and Focal Area**

GEF Allocation (\$ m)

GEF Phase Project Was Initiated	Focal Area	Projects	GEF Allocation (\$ m)
<b>Pilot</b>	Biodiversity	15	74.36
	Climate Change	9	39.50
	Int'l Waters	4	28.50
	Total	28	142.36
<b>1995-2000</b>	Biodiversity	33	233.85
	Climate Change	13	161.26
	Int'l Waters	6	86.65
	Total	52	481.76
<b>Total</b>	Biodiversity	48	308.21
	Climate Change	22	200.76
	Int'l Waters	10	115.15
	Total	80	624.12

**Table 7 GEF Allocation to Strong Land Degradation Projects by Focal Area**

GEF Allocation (\$ m)

GEF Phase Project Was Initiated	Focal Area	Projects	GEF Allocation (\$ m)
<b>Pilot</b>	Biodiversity	10	56.00
	Climate Change	3	6.50
	Int'l Waters	1	10.00
	Total	14	72.50
<b>1995-2000</b>	Biodiversity	17	121.57
	Climate Change	3	12.10
	Int'l Waters	5	82.75
	Total	25	216.42
<b>Total</b>	Biodiversity	27	177.57
	Climate Change	6	18.60
	Int'l Waters	6	92.75
	Total	39	288.92



**Table 8 GEF Allocation to Full-Size Projects by Implementing Agency and Phase**

GEF Allocation (\$ m)

GEF Phase Project Was Initiated	Implementing Agency	Projects	% of Total Projects	GEF Allocation (\$ m)	% of Total Allocation
<b>Pilot</b>	World Bank	8	10.0%	46.70	7.5%
	UNDP	20	25.0%	95.66	15.3%
	Total	28	35.0%	142.36	22.8%
<b>1995-2000</b>	World Bank	15	18.8%	209.21	33.5%
	UNDP	26	32.5%	131.15	21.0%
	UNEP	4	5.0%	34.69	5.6%
	UNEP/UNDP	4	5.0%	31.07	5.0%
	WB/UNDP	1	1.3%	21.30	3.4%
	WB/UNEP	1	1.3%	35.00	5.6%
	WB/UNDP/UNEP	1	1.3%	19.34	3.1%
	Total	52	65.0%	481.76	77.2%
<b>Total</b>	World Bank	23	28.8%	255.91	41.0%
	UNDP	46	57.5%	226.81	36.3%
	UNEP	4	5.0%	34.69	5.6%
	UNEP/UNDP	4	5.0%	31.07	5.0%
	WB/UNDP	1	1.3%	21.30	3.4%
	WB/UNEP	1	1.3%	35.00	5.6%
	WB/UNDP/UNEP	1	1.3%	19.34	3.1%
	Total	80	100.0%	624.12	100.0%

**Table 9 GEF Allocation to Full-Size Projects with Strong Land Degradation by Implementing Agency and Phase**

GEF Allocation (\$ m)

GEF Phase Project Was Initiated	Implementing Agency	Projects	% of Total Projects	GEF Allocation (\$ m)	% of Total Allocation
<b>Pilot</b>	World Bank	5	12.8%	34.30	11.9%
	UNDP	9	23.1%	38.20	13.2%
	Total	14	35.9%	72.50	25.1%
<b>1995-2000</b>	World Bank	6	15.4%	47.45	16.4%
	UNDP	11	28.2%	62.89	21.8%
	UNEP	4	10.3%	34.69	12.0%
	UNEP/UNDP	2	5.1%	17.05	5.9%
	WB/UNEP	1	2.6%	35.00	12.1%
	WB/UNDP/UNEP	1	2.6%	19.34	6.7%
	Total	25	64.1%	216.42	74.9%
<b>Total</b>	World Bank	11	28.2%	81.75	28.3%
	UNDP	20	51.3%	101.09	35.0%
	UNEP	4	10.3%	34.69	12.0%
	UNEP/UNDP	2	5.1%	17.05	5.9%
	WB/UNEP	1	2.6%	35.00	12.1%
	WB/UNDP/UNEP	1	2.6%	19.34	6.7%
	Total	39	100%	288.92	100.0%

**Table 10 Location of Full-Size Projects in Biodiversity Focal Area**

GEF Allocation (\$ m)

Located in Protected Area	Region	Projects	% of Total Projects	Sum	% of Total Allocation
<b>PA</b>	Africa	14	32.6%	92.50	33.6%
	Asia	7	16.3%	52.96	19.2%
	Middle East	5	11.6%	24.85	9.0%
	Latin America	7	16.3%	37.20	13.5%
	Total	33	76.7%	207.51	75.4%
<b>Not in PA</b>	Africa	7	16.3%	42.76	15.5%
	Asia	1	2.3%	10.60	3.8%
	Middle East	1	2.3%	8.18	3.0%
	Global	1	2.3%	6.28	2.3%
	Total	10	23.3%	67.82	24.6%
<b>Total</b>	Africa	21	48.8%	135.26	49.1%
	Asia	8	18.6%	63.56	23.1%
	Middle East	6	14.0%	33.03	12.0%
	Latin America	7	16.3%	37.20	13.5%
	Global	1	2.3%	6.28	2.3%
	Total	43	100.0%	275.33	100.0%

**Table 11A Analysis of Sample Biodiversity Projects**

Country	Project Name	Implementing Agency	Year WP entry	GEF Alloc (\$ m)	Current land use	LD threat mentioned	LD Farming Practices	LD Herding Practices	Soil conserv	Fire control	Catchmnt mngt	Habitat restoratr	Reduce land use intensity	Take land from production	Land use planning for LD
<b>BIODIVERSITY PROJECTS</b>															
Af: Bois/Ken/Mali	Management of Indigenous Vegetation for the Rehabilitation	UNEP/ UNDP	1998	9.05	herding	loss veg cover	n/a	X X X	n/a	X	n/a	X X X	X	n/a	X X X
Af: Burkina/ Côte d'Iv	West Africa Pilot Community Based Natural Resource	World Bank	1992	7.00	protected area	loss of habitat	X X	X X	X X	X X	n/a	0	X X	X X	X X X
Af: Kenya/ Tanz/Ug	Reducing Biodiversity Loss at Cross-Border Sites in East Africa	UNDP	1997	12.90	farming & herding	loss of species	X	X X X	0	X	n/a	X	X X	X X	X X X
Af: Maurit/ Senegal	Biological Diversity Conservation through Participatory Rehabilitation of the Degraded	UNEP/ UNDP	1996	8.00	herding	loss vegetative cover	X X	X X	X	X X X	X X	X X X	X	X	X X X
As: Jord/ Leb/Syria	Conservation and Sustainable Use of Dryland Agrobiodiv	UNDP	1997	8.18	farming & herding	loss veg cover	X X	X X	X X	n/a	n/a	X X X	X X	X	X
Benin	National Parks Conservation and Management	World Bank	1998	6.20	protected area	Loss veg cover	0	X	n/a	0	n/a	X	X X X	X X X	X X X
Central Afr. Rep	A Highly Decentralized Approach to Biodiversity Protection and Use: The Bangassou Dense	UNDP	1995	2.50	protected area	Loss of habitat	X	X X	n/a	X X X	n/a	0	X X	X X	X X X
Colombia	Conservation of Biodiversity in the Choco Region	UNDP	1991	6.00	protected area	deforestation	X	n/a	0	X	n/a	X	X X	X X	X X
Ethiopia	Dynamic Farmer-Based Approach to Conservation of Plant Genetic	UNDP	1992	2.46	farming	loss of species	X	n/a	0	n/a	n/a	n/a	n/a	n/a	0
Georgia	Arid and Semi-Arid Ecosystem Conservation in the Caucasus	UNDP	1999	.75	herding	loss veg cover	n/a	X X X	X	n/a	n/a	X	X X	X X	X X X
Ghana	Natural Resources Management	World Bank	1997	8.90	protected area	loss of species	X	X	0	X	n/a	X X X	X X X	X X X	X X X
Global	People, Land Management, and Environmental Change	UNEP	1997	6.28	farming	loss of species	X X X	X X	X X X	n/a	n/a	n/a	n/a	n/a	0
Jordan	Final Consolidation & Conserv of Azraq & Dana Wildlands	UNDP	1996	1.90	protected area	none mentioned	n/a	X	X	n/a	X X X	n/a	X X X	X X X	X X X
LA: Brazil/ Chile/Mex	An Indicator Model for Dryland Ecosystems	UNEP	1999	.75	farming & herding	loss veg cover	X X	X X	X X	n/a	n/a	n/a	X	X	X X X
Mauritius	Restoration of Highly Degraded and Threatened Native Forests	World Bank	1993	.20	protected area	alien spp invasion	n/a	n/a	0	n/a	n/a	X X X	n/a	n/a	X X X
Mongolia	Biodiversity Conservation and Sustainable Livelihood Options	UNDP	1998	5.16	protected area	Loss veg cover	n/a	X	X X	X X	n/a	X X	0	X X X	X X X
Morocco	Transhumance for Biodiversity	UNDP	1999	4.37	herding	Loss veg cover	n/a	X X X	X	0	n/a	X X	X X	X X X	X X X
Panama	Biodiversity Conservation in the Darien Region	UNDP	1991	3.00	protected area	none mentioned	X	n/a	n/a	n/a	X	X X	X X	X X	X
Uganda	Bwindi Impenetrable National Park and Mgahinga Gorilla Park	World Bank	1991	4.00	protected area	Deforestation	X	n/a	0	n/a	X X	X	X X	X X X	X X X
Uruguay	Consolidation of the Banados del Este Biosphere Reserve	UNDP	1997	2.50	protected area	Loss of species	X X	X X	0	n/a	X X X	X	X X X	X X X	X X X

**Table 11B Analysis of Sample, Climate Change and International Waters Projects**

Country	Project Name	Implementing Agency	Year WP entry	GEF Alloc (\$ m)	Current land use	LD threat mentioned	LD Farming Practices	LD Herding Practices	Soil conserv	Fire control	Catchmnt mngt	Habitat restoratn	Reduce land use intensity	Take land from production	Land use planning for LD
<b>CLIMATE CHANGE PROJECTS</b>															
Brazil	Biomass Power Commercial Demonstration	World Bank	1996	40.00	urban/ industrial	none mentioned	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brazil	Biomass Power Generation: Sugar Cane Bagasse and Trash	UNDP	1998	3.75	urban/ industrial	none mentioned	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ghana	Renewable Energy Based Electricity	UNDP	1996	2.47	urban/ industrial	none mentioned	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Global	Alternatives to Slash and Burn Agriculture II	UNDP	1995	3.00	farming	deforestation	X X X	X X X	X	X X X	n/a	X X X	X	X	X X X
India	Optimizing Development of Small Hydel Resources	UNDP	1991	7.50	urban/ industrial	deforestation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Indonesia	Solar Home Systems	World Bank	1995	4.00	urban/ industrial	none mentioned	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jordan	Reduction of Methane Emissions and Use of Municipal Waste	UNDP	1996	2.90	urban/ industrial	none mentioned	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mali	Household Energy	World Bank	1992	2.50	farming	none mentioned	0	0	0	0	n/a	0	X	X	X X X
Senegal	Sustainable and Participatory Energy Management	World Bank	1996	4.90	protected area	deforestation	n/a	n/a	n/a	X	n/a	X	X X	X X	X X
Slovenia	Removing Barriers to Increased Use of Biomass	UNDP	1999	4.40	urban/ industrial	none mentioned	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sudan	Community Based Rangeland Rehabilitation for Carbon Sequest	UNDP	1992	1.50	farming & herding	soil erosion	n/a	X X X	X X X	X	n/a	X X X	X	X X	X X X
<b>INTERNATIONAL WATERS PROJECTS</b>															
Af:Bur/ Congo/TZ /Zam	Pollution Control & Other Measures / Lake Tanganyika	UNDP	1991	10.00	farming	soil erosion	X	X	X	n/a	X X	0	X	X	X X
Af: Ken/ Tz/ Ug	Lake Victoria Environmental Management	WB/ UNEP	1996	35.00	farming	soil erosion	X X	n/a	X X	n/a	X X X	X	X	X	X
Brazil	Integrated Watershed Mngt Prog for Pantanal and Upper Paraguay	UNEP	1998	6.60	farming	soil erosion	X X X	n/a	X X X	X	X X X	X X X	X X	X X	X X
CE: Bulg/ Croa/Cz/ Hung/Mold	Developing the Danube River Basin Pollution Reductn Prog	UNDP	1996	3.90	urban/ industrial	pollution	X X	n/a	X	n/a	X X X	0	X	X	X X X

**Table 12A Analysis of Sample Biodiversity Projects: Forestry/Tree and Environmental**

Country	Project Name	Fuelwood collection	Sust forest harvest	Fuel wood conserv	Agro forestry	Deforestation	Prevent deveg, defor	Tree plantation	Control dust from soils	Soils as C sink
<b>BIODIVERSITY PROJECTS</b>										
Af: Bois/Ken/Mali	Management of Indigenous Vegetation for Rehabilitation	0	X	0	0	n/a	X X X	n/a	X X	X X X
Af: Burkina/Côte d'Ivoire	West Africa Pilot Community Based Natural Resource	X	X X	0	X X	X	X X X	n/a	X	0
Af: Kenya/Tanzania/Uganda	Reducing Biodiversity Loss at Cross-Border Sites in East Africa	X	X X	0	0	X X	X X	0	0	0
Af: Mauritania/Senegal	Biological Diversity Conservation through Participatory Rehab	X X	X X	X X	X X	X	X X	n/a	X	X X X
As: Jordan/Lebanon/Syria	Conservation and Sustainable Use of Dryland Agro-biodiversity	0	n/a	0	0	n/a	n/a	n/a	0	0
Benin	National Parks Conservation and Management	0	0	0	0	X X	X X X	n/a	0	0
Central African Republic	Highly Decentralized Approach to Biodiversity Protection and Use	X X X	0	X	n/a	X X X	X X	n/a	0	0
Colombia	Conservation of Biodiversity in the Choco Region	X	X X	0	X X	X X X	X X X	n/a	0	0
Ethiopia	Dynamic Farmer-Based Approach to Conservation of African Plant	0	n/a	0	0	n/a	n/a	n/a	0	0
Georgia	Arid and Semi-Arid Ecosystem Conservation in the Caucasus	n/a	n/a	n/a	0	n/a	X X X	n/a	0	0
Ghana	Natural Resources Management	X X X	X X X	0	0	X X X	X X X	X X X	0	0
Global	People, Land Management, and Environmental Change	0	n/a	0	0	X	X X	n/a	0	0
Jordan	Final Consolidation & Conservation of Azraq Wetlands & Dana Wetlands	n/a	n/a	X	X	n/a	X	X	0	0
LA: Brazil/Chile/Mexico	An Indicator Model for Dryland Ecosystems	X X	n/a	0	0	n/a	n/a	n/a	0	0
Mauritius	Restoration of Highly Degraded and Threatened Native Forests	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Mongolia	Biodiversity Conservation & Sustainable Livelihood Options	X	X X	0	0	X	X	n/a	0	0
Morocco	Transhumance for Biodiversity	0	0	0	0	n/a	X X X	n/a	0	0
Panama	Biodiversity Conservation in Darien Region	n/a	X	0	0	X X X	X X	X X	0	0
Uganda	Bwindi Impenetrable National Park & Mgahinga Gorilla National Park	0	X	0	X X	X X	X X X	n/a	0	0
Uruguay	Consolidation of the Banados del Este Biosphere Reserve	n/a	n/a	0	0	n/a	X X	n/a	0	0

**Table 12B Analysis of Sample Climate Change and International Waters Projects**

Country	Project Name	Fuelwood collection	Sust forest harvest	Fuelwood conserv	Agro forestry	Deforestation	Prevent od deveg, defor	Tree plantation	Control dust from soils	Soils as C sink
<b>CLIMATE CHANGE PROJECTS</b>										
Brazil	Biomass Power Commercial Demonstration	n/a	0	0	n/a	n/a	0	X X X	n/a	n/a
Brazil	Biomass Power Generation: Sugar Cane Bagasse and Trash	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Ghana	Renewable Energy Based Electricity	X	0	X	0	n/a	n/a	n/a	0	0
Global	Alternatives to Slash and Burn Agriculture II	X X	X X X	X	X X	X X X	X X X	n/a	X X	0
India	Optimizing Development of Small Hydel Resources	X	n/a	X X	n/a	X	n/a	n/a	n/a	0
Indonesia	Solar Home Systems	0	0	0	n/a	n/a	0	0	n/a	n/a
Jordan	Reduction of Methane Emissions & Use Municipal Waste for Energy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mali	Household Energy	X X	X X X	X X X	0	X X	X X	0	0	0
Senegal	Sustainable and Participatory Energy Management	X X X	X X X	X X X	X	X X X	X X X	n/a	0	0
Slovenia	Removing Barriers to Increased Use of Biomass	n/a	n/a	X	n/a	n/a	n/a	n/a	0	0
Sudan	Community Based Rangeland Rehab for Carbon Sequestration	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
<b>INTERNATIONAL WATERS PROJECTS</b>										
Af: Bur/Con/Tz/Zm	Pollution Control Other Measures to Protect Lake Tanganyika	0	0	0	0	0	0	n/a	0	0
Af: Kenya/Tz/Uganda	Lake Victoria Environmental Management	0	0	0	X X X	X X	X X	X X X	0	0
Brazil	Integrated Watershed Management Program for Pantanal & Upper Paraguay	X	X X	0	0	X X	X X	n/a	0	0
CE: Bulg/Croa/Czl/Hung/Mold	Developing the Danube River Basin Pollution Reduction Programme	n/a	n/a	n/a	0	X	0	n/a	0	0

**Table 13A Analysis of Sample Biodiversity Projects/Project Approach**

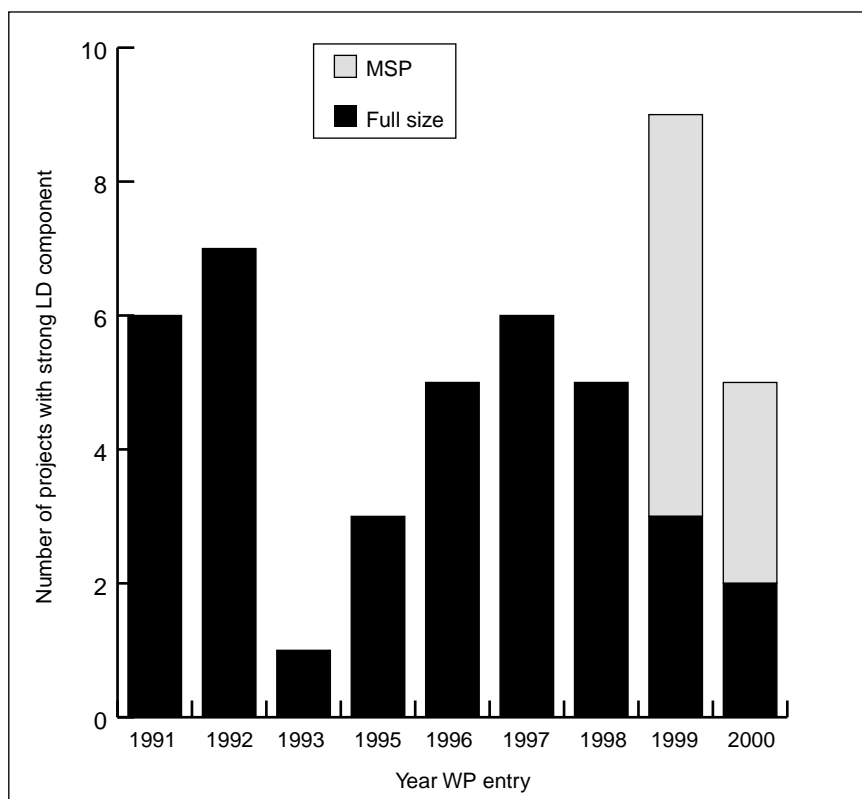
Country	Project Name	Participatory	Capacity Build re LD	Info collec & exchng	Targeted Research LD Biophys	Targeted Res LD Socioecon	LD Root Causes	Enabling LD policy	IK Integrated	Alt livelihoods
<b>BIODIVERSITY PROJECTS</b>										
Af: Bots/ Ken/Mali	Management of Indigenous Vegetation for the Rehabilitation	X X X	X	X X X	X X X	X	X	X	X X X	X X
Af: Burkina/ Côte d'Iv	West Africa Pilot Community Based Natural Resource	X X X	X X	X	X	X	X	X	0	X X X
Af: Kenya/ Tanz/Ug	Reducing Biodiversity Loss at Cross-Border Sites in East Africa	X X X	X X X	X X	X X	X X	X X	X X	X X X	X X X
Af: Maurit/ Senegal	Biological Diversity Conservation through Participatory Rehab	X X X	X X	X	X	X	X X	X X	X X	X
As: Jordan/ Leb/Syria	Conservation and Sustainable Use of Dryland Agrobiodiv	X X	X X X	X X X	X X X	X	0	X X	0	X X
Benin	National Parks Conservation and Management	X	0	X X	X X	0	X	X X	0	X
Central African Rep	Highly Decentralized Approach to Biodiversity Protection and Use	X X	X	X X	X X	X	X	X X X	X X	X X
Colombia	Conservation of Biodiversity in the Choco Region	X X	X	X X X	X X X	X X	X	X X X	X	X X
Ethiopia	A Dynamic Farmer-Based Approach to Conserv African Plant	X X X	X	X	X	X	X	0	X X X	n/a
Georgia	Arid and Semi-Arid Ecosystem Conservation in the Caucasus	X X	X X	X X X	X X X	X	X	X X	X	0
Ghana	Natural Resources Management	X X	X	X X	X X	X X	X	X X	X	X X X
Global	People, Land Management, and Environmental Change	X X X	X X	X X X	X X	X X	X	X	X X X	0
Jordan	Final Consolidation and Conserv of Azraq & Dana Wildlands	X	X X	X X	X X X	X X	X	X X X	n/a	X X X
LA: Brazil/ Chile/Mex	An Indicator Model for Dryland Ecosystems	X X	X X X	X X X	X X X	X X X	X X	X X	X X	n/a
Mauritius	Restoration of Highly Degraded and Threatened Native Forests	n/a	X X	X X	X X X	0	0	0	0	n/a
Mongolia	Biodiversity Conservation and Sustainable Livelihood Options	X X	X X	X X	X X	X X	X	X	X	X X X
Morocco	Transhumance for Biodiversity	X X X	X	X	X X	X X	X X	X	X X X	X
Panama	Biodiversity Conservation in the Darien Region	X X X	X	X	X	X	X	X	X X	X X
Uganda	Bwindi Impenetrable National Park Mghinga Gorilla National Park	X	X	X X	X X	X	X	X	0	X X X
Uruguay	Consolidation of the Banados del Este Biosphere Reserve	X	X	X X X	X X X	X	X	X X X	n/a	X X X



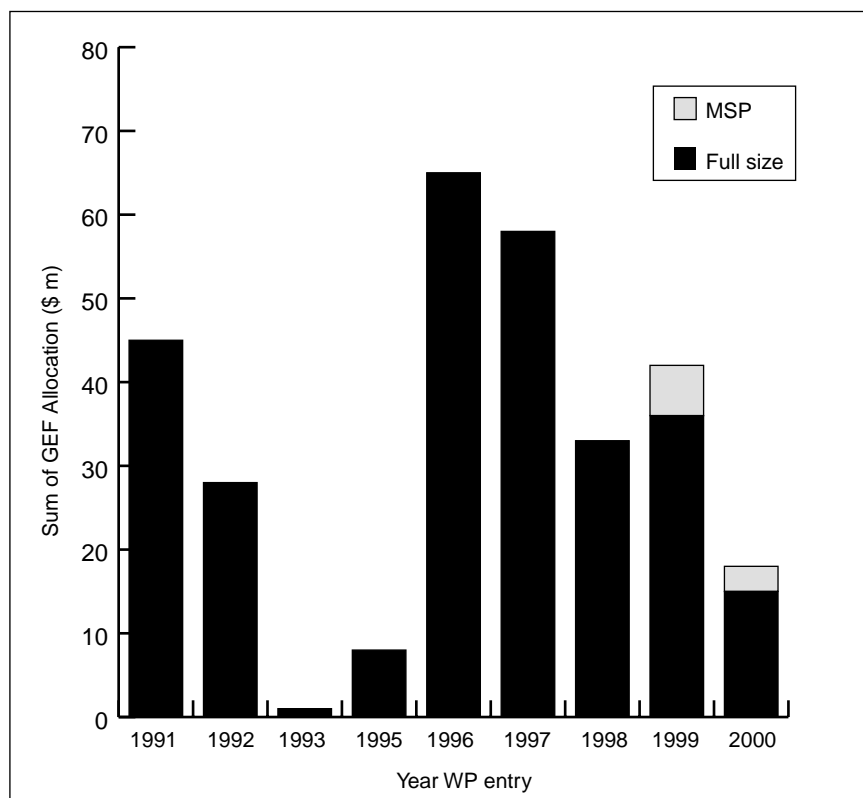
**Table 13B Analysis of Sample Climate Change and International Waters Projects**

Country	Project Name	Participatory	Capacity Build re LD	Info collec & exchn	Targeted Research LD Biophys	Targeted Res LD Socioecon	LD Root Causes	Enabling LD policy	IK Integrated	Alt livelihoods
<b>CLIMATE CHANGE PROJECTS</b>										
Brazil	Biomass Power Commercial Demonstration	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brazil	Biomass Power Generation: Sugar Cane Bagasse and Trash	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ghana	Renewable Energy Based Electricity for Development	X	n/a	n/a	n/a	n/a	X	n/a	n/a	n/a
Global	Alternatives to Slash and Burn Agriculture II	X	X X X	X X X	X X X	X X X	X	X	X	X
India	Optimizing Development of Small Hydel Resources	X	n/a	n/a	n/a	n/a	n/a	n/a	n/a	X
Indonesia	Solar Home Systems	X	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jordan	Reduction of Methane Emissions and use of Municipal Waste	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mali	Household Energy	X X	X	X	X	X	0	X X	0	X
Senegal	Sustainable and Participatory Energy Management	X X X	X	X X	X	X X	X X	X	X	X X
Slovenia	Removing Barriers to Increased Use of Biomass	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sudan	Community Based Rangeland Rehab for Carbon Sequestration	X X X	X	X X	X X X	X X	X	X	X X X	X X X
<b>INTERNATIONAL WATERS PROJECTS</b>										
Af: Bur/ Con/Tz/Zm	Pollution Control & Other Measures to Protect Lake Tanganyika	X	0	X X X	X X X	X	0	X X X	0	0
Af: Kenya/ Tanz/Ug	Lake Victoria Environmental Management	X X	X	X X X	X X	X	X	X X	X	X X
Brazil	Integrated Watershed Management Program for the Pantanal and Upper Paraguay	X X X	X	X X X	X X X	X X	X X X	X X X	X X X	X
CE: Bulg/ Croa/Cz/ Hung/Mold	Developing the Danube River Basin Pollution Reduction Programme	X X	X X	X X X	X X X	X	X	X X X	n/a	n/a

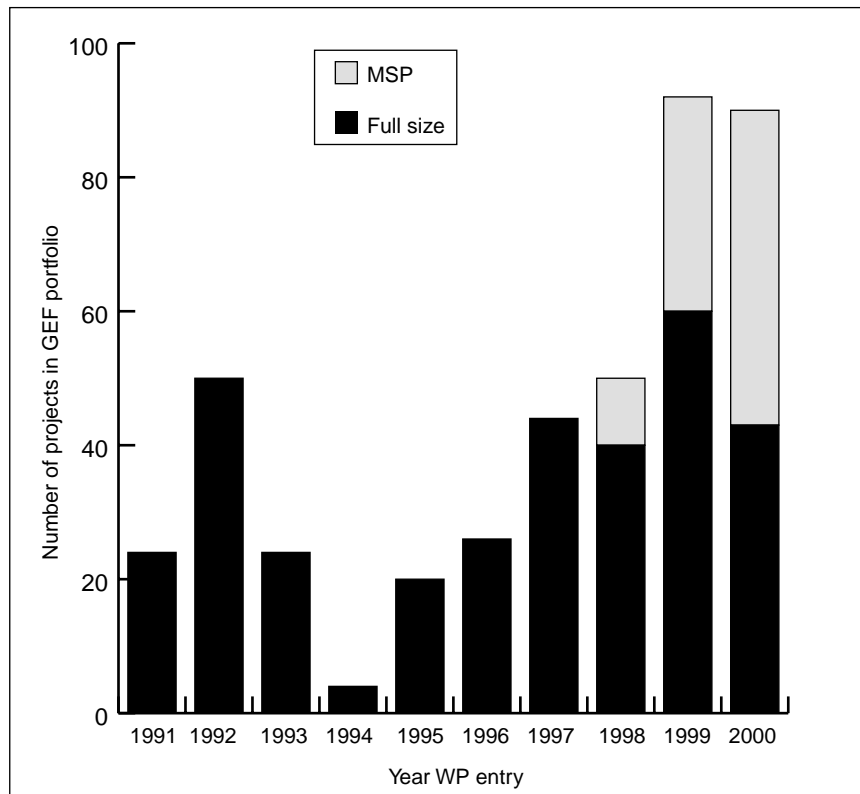
**Figure 1**      **Trend in Number of Full and Medium Size Land Degradation Projects**



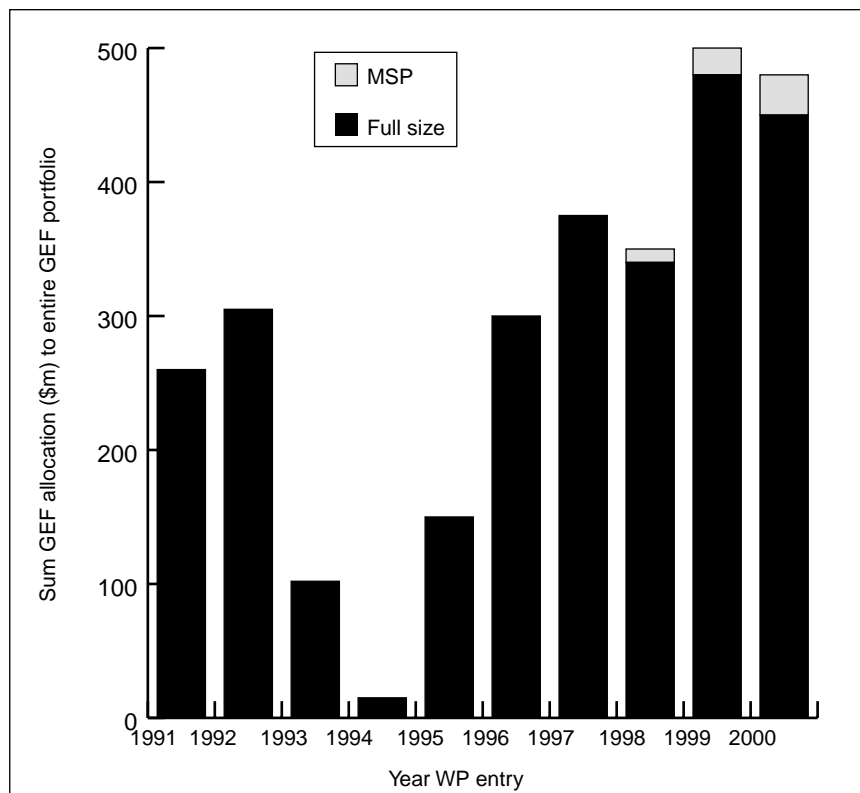
**Figure 2**      **Trend in GEF Allocation to Strong Land Degradation Projects**



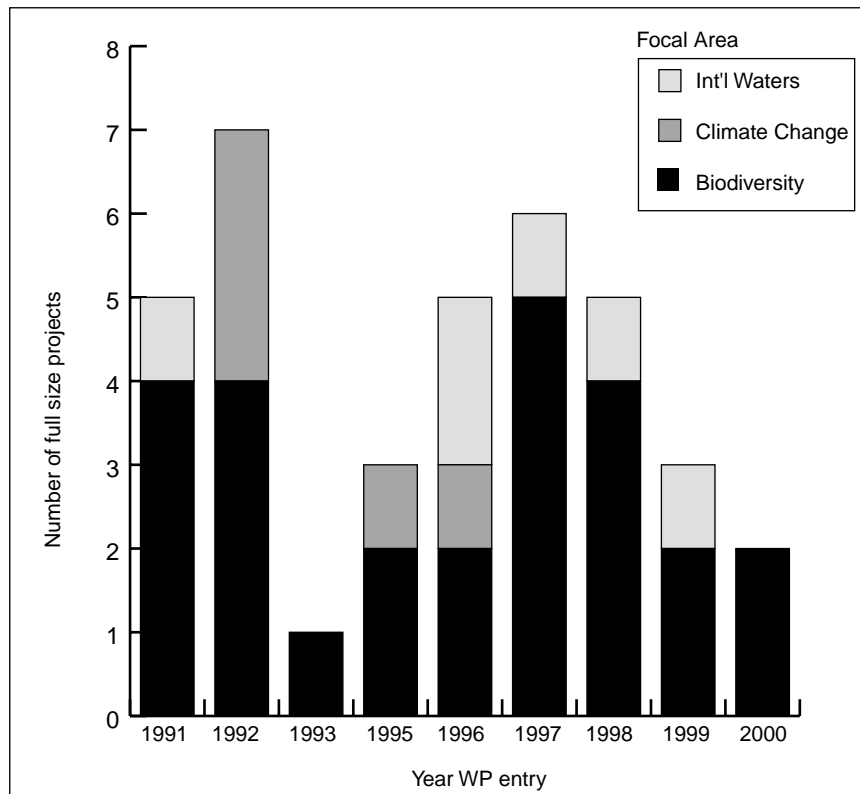
**Figure 3      Trend in Number of Projects: GEF Entire Portfolio**



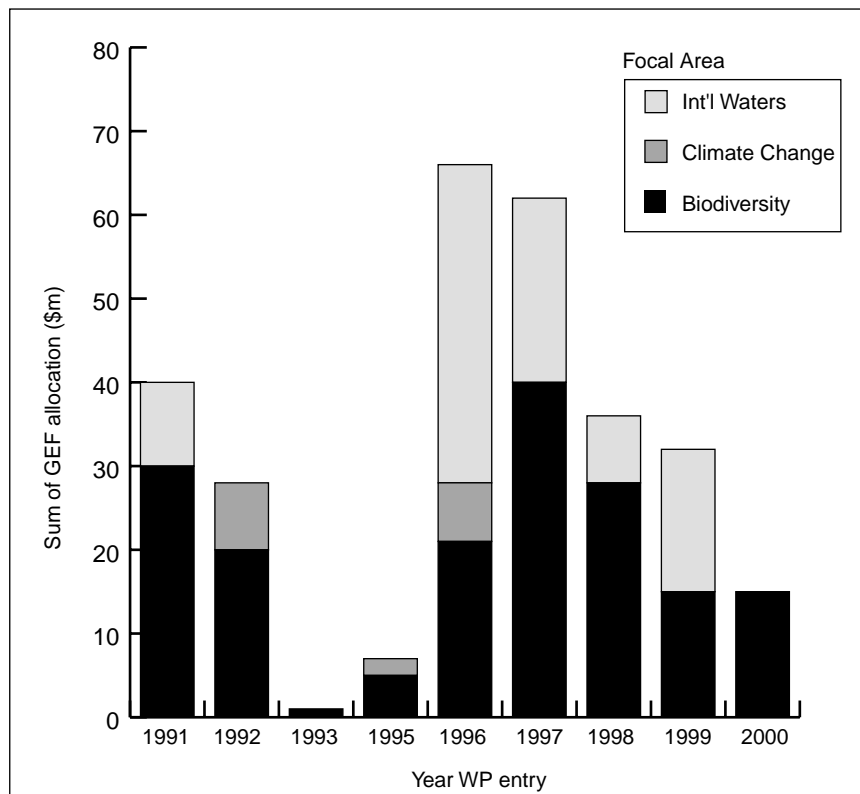
**Figure 4      Trend in GEF Allocation: GEF Entire Portfolio**



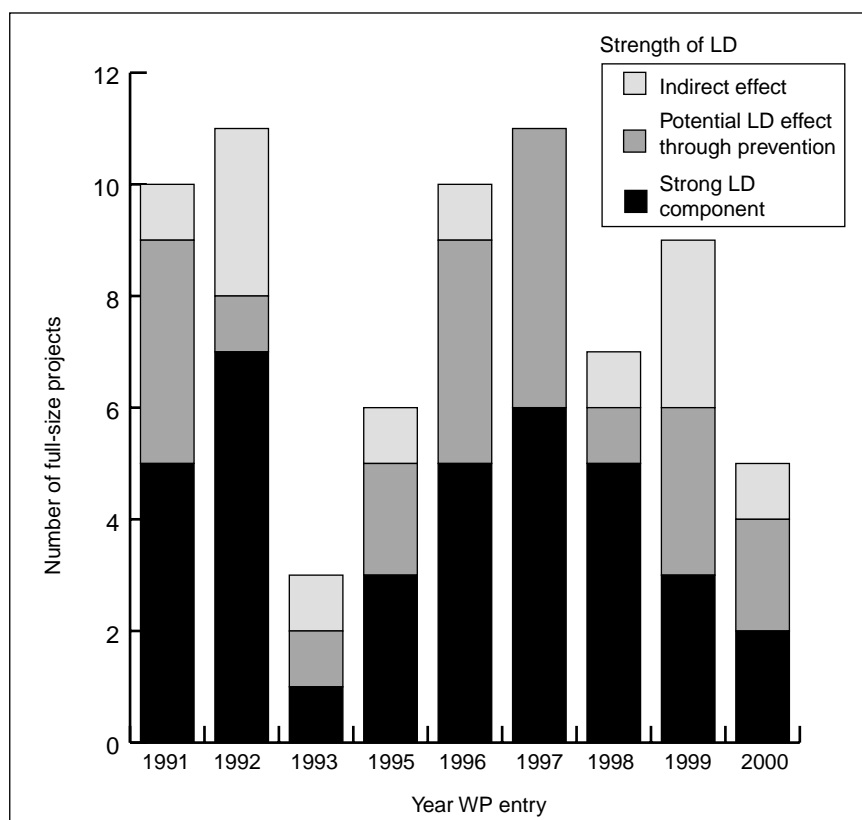
**Figure 5 Trend in Number of Strong Land Degradation Projects by Focal Area**



**Figure 6 Trend in GEF Allocation to Strong Land Degradation Projects by Focal Area**



**Figure 7 Trend in Number of Projects by Strength of Land Degradation Effect**



**Figure 8 Trend in GEF Allocation to Projects by Strength of Land Degradation Effect**

