UNEP

**United Nations Environment Programme**

برنامج الأمم المتحدة للبيئة · 联合国环境规划署 · PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT · PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE
ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

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Ref: GEF/PDF A

Subject: **PDF A Project**

**Page 1 of 8**

In accordance with the agreed procedures, please find attached, for your comments, a PDF A project on **"Land Use Change Analysis as an Approach for Investigating Biodiversity Loss and Land Degradation"** while awaiting the letters of endorsement. I will appreciate receiving your comments.

Regards.

# *PDF BLOCK A FOR MEDIUM SIZE PROJECTS*
## *DECEMBER 6, 1999*

**PART I - IDENTIFICATION**

| | |
|---|---|
| 1. Project name:<br>Land Use Change Analysis as an Approach for Investigating Biodiversity Loss and Land Degradation<br>(medium sized targeted research project) | 2. GEF Implementing Agency:<br>United Nations Environment Programme |
| 3. Country or countries in which the project is being implemented:<br>Kenya, Uganda, Tanzania | 4. Country eligibility:<br>The Convention on Biological Diversity was ratified by Kenya on July 26, 1994, Uganda on September 8, 1992, Tanzania on March 8, 1996 |
| 5. GEF focal area(s), and/or cross-cutting issues:<br>Biodiversity, and links between biodiversity and land degradation | 6. Operational program/Short-term measure:<br>Arid and semi-arid ecosystems. |

7. Project linkage to national priorities, action plans, and programs:
The project responds to the countries' NEAP priorities on the management of natural resources, and conservation of biodiversity, including the importance of protecting national parks. It also addresses the priority of promoting rural livelihoods and ecological integrity.

The project sites are important both ecologically and economically for the nations. The gradients on Mt. Kenya, and on both the Kenyan and Tanzanian sides of Mt. Kilimanjaro, represent ecological variation and the richest gradient of biodiversity in East Africa. On Kilimanjaro, important water sources are shared by Kenya and Tanzania. These support farmers, pastoralists and wildlife in surrounding croplands and rangelands, and also distant urban populations in Nairobi. Highland agriculture, and tourism on the slopes and in the rich wildlife areas at the base of the mountains, generate crucial sources of income to national economies. Population growth, intensification of land use, and evolving land tenure arrangements are among the local processes contributing to land use change, loss of biodiversity and land degradation. The ecological and economic importance of the sites places them at the core of national economic policy, yet much of the productive potential depends on lands undergoing rapid land use change, making them susceptible to land degradation (forests, hill slopes and drylands) and biodiversity loss (wetlands and riverine areas, savannas). In Kabale, Uganda, the patterns of soil degradation associated with land use change are representative of the dilemma of promoting economic opportunities while maintaining resource integrity.

8. GEF national operational focal point and date of country endorsement:

9. Project rationale and objectives:
The project encompasses highland to lowland ecological gradients in four areas in East Africa. Human and wildlife land use systems of the semi-arid savanna evolved to take advantage of the diversity of natural resources across the gradient. Herders and wildlife of the savanna depend on the water and vegetative resources of higher elevations and on the permanent water sources in the lowlands to survive prolonged dry seasons and recurrent drought. However, these same water and vegetative resources in the higher areas and wetter margins of the savannas have been the focus of expanding agricultural settlement. This change in land use has altered the resource base available to herders and to some the richest remaining wildlife biodiversity in the world.

The biodiversity of the East African savanna and adjacent wetlands and woodlands is famous and unparalleled in the world. Herds of large herbivores, such as the zebra, wildebeest, gazelles and giraffe are joined by the more threatened lesser kudu and eland. Other large mammals relying on large expanses of habitat include the elephant and black rhinoceros. Carnivores preying on these and other animals include the endangered wild dog and cheetah. Equally important in the functioning of the ecosystem, and extremely diverse in numbers of species and individuals, are the smaller animals and the region's plants.

Co-existing for centuries with the wildlife in this rich and complex ecosystem are the cattle, sheep and goats of herders. On-going research by project members and others is illuminating how the management system of Maasai herders promoted the grassland and woodland mix sustaining the wild animal biodiversity. These and other new understandings of the relationship between wild and domesticated animals have implications for wildlife management, and in land use management and policy.

Research into habitat requirements of savanna animals has shown the necessity for the maintenance of large expanses of grasslands, a mosaic of ecosystem types (often provided by altitudinal gradients), grazing and water sources during the dry seasons and droughts, and unobstructed migration corridors. Similarly, woodland species including primates, rodents, elephants and birds all depend upon maintenance of sufficiently sized tracts. Loss of these required habitats over the past 30 years has been the most important threat to the region's biodiversity. The loss in habitat has been through direct mechanisms, for example, deforestation or conversion of grasslands to cropping, and through incremental degradation of soils and vegetation.

The expansion of cultivation results in clearance and fragmentation of wildlife habitats, disruption of access to water by fencing, and water pollution by agricultural chemicals. Clearance of riparian and grassland vegetation in the lowlands, and encroachment on remaining upland forests entails the loss of significant biodiversity. The degree of agricultural biodiversity that replaces these remains to be fully documented. Further, on the upper slopes and in irrigated areas, team members are examining changes in established cropping systems that contribute to deforestation, affect agricultural biodiversity, and influence land degradation. These areas continue to be visited by wildlife, though fencing restricts access by larger animals and smaller species now dominate. Recurrent damage by elephants and small species (e.g. porcupine) causes considerable losses to farmers. The economic threat to agriculture is increasing as farmers plant higher value crops (e.g. horticulture and coffee), and the political costs are high as damage results in reduced local support for wildlife management programs. Meanwhile, the expansion of cropping and the intensification of herding in semi-arid areas is leading to increased pressure on fragile soils and creating economic systems highly vulnerable to rainfall fluctuations.

Team members are examining the relationship between these processes—land use change, loss of biodiversity and land degradation. This innovative conceptual and methodological approach will be strengthened to permit cross-site comparison and regional generalization in order to provide GEF with information on the physical and temporal linkages between the processes. The information will be presented in a format, a replicable methodological and analytical framework, useful for future projects aimed at reducing biodiversity loss and land degradation. Establishment of an ecological monitoring system in the sites will further the documentation of the linkages, provide baseline data, and permit scientists and governments to evaluate the impacts of land use change caused by policy or other interventions.

Land in the savannas of East Africa is thus the key to survival of wildlife, and to the economy of the human population. During the past 30 years, competition between land users—between groups of people, and between people and wildlife—has intensified and led to widespread conversions of land use. The conversions have been driven by new land use and tenure policies, by an evolution of the rural economy favoring farming over herding or wildlife, and by human population growth including in-migration from highland areas. The root causes of the land use conversions are thus associated with events in other areas, the national and international economic and policy context, and local socioeconomic and environmental processes. Defining and modeling these causes at different sites, and cross-site comparisons, will permit the development of a model of the driving forces of land use change that lead to biodiversity loss and to land degradation. Potential points of intervention will be identified and alternatives tested through scenario analysis. The understanding of the root causes of land use change, and the consequent replicable conceptual framework, will inform future GEF and other projects aimed at reducing or mitigating land use change that lead to biodiversity loss and land degradation. It will also contribute directly to national level land use and other policy formation.

Land use change analysis is a prime tool in identifying changes in biodiversity and land degradation. Trends in land use change are identified by interpretation of satellite imagery and aerial photographs with field truthing. A wealth of information is documented, including alterations of wildlife habitat boundaries, fragmentation and

corridors, changes in vegetative structure and density, availability of surface water, drainage and irrigation, and changes in human uses including infrastructure, types of crops or pasture, and settlement patterns. Land use change analysis combined with field truthing is thus a useful tool for documenting the relationship between biodiversity and land degradation, and provides a wealth of socioeconomic information critical in the analysis of the driving forces of the landscape changes.

The project will build upon a foundation of long term detailed landscape scale studies of environmental change and resource management in Kenya, Tanzania and Uganda. The four site studies are being conducted within a similar framework that examines the impact of land use change on biodiversity and land degradation. The project would support additional data collection and analysis to provide data complementarity between sites, for example by supplementing the biodiversity information in some sites, soils data in others, and socioeconomic information where necessary. This will allow cross-site comparison of findings and the development of analytical and methodological frameworks. The results will provide global environmental change scientists and policy makers with critical insights into the linkages between land degradation and biodiversity, and tested methodological and analytical frameworks for such analyses. It will provide the communities and countries vital information necessary for effective land use and other policy addressing these serious environmental challenges.

In sum, the project objectives are:
1. To conduct land use change, and ecological and socioeconomic analyses to a) identify the root causes of land use change leading to loss of biodiversity and land degradation, and b) identify the linkages between biodiversity loss and land degradation.

2. Prepare a replicable methodological and analytical frameworks for identifying root causes and analyzing the linkages for use in similar ecoregions in Africa and elsewhere.

3. Establish an ecological information and monitoring system to document the linkages, provide baseline data, and permit scientists and governments to evaluate the environmental impacts of land use change caused by policy or other interventions.

4. Capacity building. The project team will include senior and junior researchers at national institutions and at NGO's, and graduate students conducting their thesis research under the aegis of the project. The project will also train policy makers and other end users on the use of the data and information system, and it will include of a variety of stakeholders in all stages of the project. These activities will promote capacity building and facilitate sustainability over the long term.

10. Expected outcomes:
1. Scientific reports on the root causes of land use change, a variety of society/ environment issues specific to the sites, the links between land use change, biodiversity and land degradation, and analysis of land use change at the site and at the regional level.

2. Replicable conceptual framework of the root causes of land use change leading to biodiversity loss and land degradation.

3. Replicable methodological and analytical framework for assessment of the linkages between loss of biodiversity and land degradation.

4. Establishment of an ecological information and monitoring system to document the linkages, provide baseline data, and permit scientists and governments to evaluate the impacts of land use change caused by policy or other interventions.

5. Improved local land management and national land related policies reducing threats to biodiversity and land degradation.

11. Planned activities to achieve outcomes:

1. Collect additional primary data as necessary to permit cross site comparability: socioeconomic and ecological data collection (e.g. soils testing, vegetative structure, plant and animal diversity & abundance, focus group interviews, household and field surveys), satellite image interpretation completed and change and other maps compiled. Data entered into computers. Analyses (statistical, modeling, GIS, qualitative) of existing and new data.

2. Meetings and writing retreats of project scientists to determine generalizable patterns and processes across sites, to discuss regional patterns, and to develop conceptual and methodological frameworks. Write reports.

3. Ecological monitoring system: Determine key indicators of ecological change. Collect baseline data on these and establish system to monitor changes in all sites. Add to other collected information and disseminate (on CD-ROM, etc.). Present with training to policy makers and other end users.

4. Conduct feedback seminars, policy workshops, and meetings in the field, at the national level and internationally with stakeholders. Disseminate and discuss results at various venues (at sites, governmental agencies, scientific conferences, GEF and other meetings, etc.)

12. Stakeholders involved in project:

The project has a variety of stakeholders. These include:

a) Community members will benefit from participation in the data collection and feedback workshops. Groups of people include the Maasai, the Kamba, the Chagga, the Kikuyu, and Kiembu, the Kimbeere and the Kiga. In addition to community leadership and other organizational representation (NGO's, churches, etc.), the project will design its activities to include participation by women and other underrepresented groups. The project integrates community involvement at several stages: participating in the data collection and monitoring system activities, providing feedback on the project's interpretation of ecological and socioeconomic data, discussing policy implications and options, and direct access to scientific findings that inform their land management. Past experience has shown that participation in workshops increases community members' involvement in development activities. They identify actions that they can implement, and their contribution to policy discussion leads land managers to have a direct interest in adopting measures to fight land degradation. As community members ultimately will implement (or not) the recommended policy, their participation is essential.

b) Policy-makers in local, national and international institutions who are responsible for devising policies and programs that influence biodiversity conservation, land use and land tenure, and land degradation.

c) Scientists locally and throughout the world who study biodiversity, links between biodiversity and habitat change, and the driving forces of land use change and land degradation. They will benefit from a critical evaluation of the scientific outputs of this targeted research, and from information on the links between science and policy.

The project team will include senior and junior researchers and graduate students; this will promote capacity building and facilitate continuity in monitoring and evaluation at the study sites over the long term. The breadth of interest in the topic is reflected in the variety of institutions represented by the project team: national and international universities, regional environmental NGO's, and national governmental agencies.

PART II: Description of Block A PDF Activities

13. Activities to be financed by the PDF A:

The support provided by the PDF A will fund the following activities to prepare for the submission of a Medium Sized Targeted Research Project proposal:

1. A workshop of the project scientists and selected others to discuss project design, activities and expected outcomes. Of particular interest will be determining what additional data collection and analysis is required, and the probable elements of the ecological monitoring system. A framework for stakeholder involvement in the field work and afterwards (meetings, workshops, etc.) will also be determined. In the second half of the workshop, participation will be broadened to include selected national and international level stakeholders (government agency and NGO representatives, GEF collaborative project representatives such as from the PLEC project, country focal point representatives) to ensure collaboration and complementarity with on-going activities.
2. Preparation of the project brief and project description according to GEF guidelines. The project brief will include: a) a detailing of the global significance of the biodiversity and threats affecting biodiversity; b) contributions of the targeted research to GEF and to the countries; c) an analysis of the baseline and incremental costs of the project activities; and d) a monitoring and evaluation plan.

14. Expected outputs and completion dates:

Outputs of the PDF A will include:

1. A medium sized, targeted research project brief that includes:
   a. A description of the project objectives, strategy, outcomes
   b. Explanation of the project's contribution to the GEF's program, to the scientific community, and to the global and national environment
   c. An incremental cost analysis
   d. Stakeholder involvement plan
   e. Capacity building strategy
   f. Monitoring and evaluation plan
2. The PDF A will be used to secure donors to finance the non-GEF component of the medium-size project including existing research and writing activities.
3. The workshop will promote involvement of national and international level stakeholders in the team's activities.

These activities are expected to be completed in less than 2 months.

15. Other possible contributors/donors and amounts for the Block A:

- The institutions of the team members will provide salary support and office space. These include: The National Museums of Kenya, The African Conservation Centre, the International Livestock Research Institute, the University of Makerere, the International Centre for Research in Agroforestry, Michigan State University, the University of Dar es Salaam, and the University of Bordeaux III.
- Communications, local transportation, consultant's support and other expenses will be provided in-kind and in cash by the International Livestock Research Institute, Michigan State University and the National Museums of Kenya.

16. Total budget and information on how costs will be met for the Block A (including the Block A grant):

| Budget Item | GEF | Other ($) | Other (in-kind) | Total |
|---|---|---|---|---|
| Consultants | 6,000 | | 7,500 | 13,500 |
| Workshop | 18,480 | 1,400 | | 19,880 |
| Communications | | 500 | | 500 |
| Office Space | | | 1,700 | 1,700 |
| Miscellaneous | 440 | 1,500 | | 1,940 |
| TOTAL | 24,920 | 3,400 | 9,200 | 37,520 |

| PART III - INFORMATION ON THE APPLICANT INSTITUTION | |
|---|---|
| 17. Name:<br>The project will be executed by LUCID-EA, Land Use Change, Impacts, and Dynamics in East Africa. The executing agencies are the International Livestock Research Institute and the African Conservation Centre, both in Nairobi, Kenya. | 18. Date of establishment, membership, and leadership:<br>While scientific exchanges have been ongoing for years, the collaboration was formalized at a meeting held at Naro Moru, Kenya in 1997. Membership includes: Dr. Helen Gichohi (The African Conservation Centre, Nairobi), Dr. Joy Tukahirwa (Makerere University, Kampala), Dr. M.J. Mbomile (the University of Dar Es Salaam), Dr. Joseph Maitima (The National Museums of Kenya), Dr. Jennifer Olson, Dr. David Campbell (Michigan State University), Dr. Francois Bart (the University of Bordeaux III) and Dr. Robin Reid (International Livestock Research Institute, Nairobi).<br><br>Contact Gichohi or Reid in Nairobi, and Campbell or Olson in the U.S. |
| 19. Mandate/terms of reference:<br>LUCID-EA is a partnership of scientists at leading national and international institutions who have been studying land use change in East Africa and its implications for land degradation, biodiversity, and climate change for over twenty years | 20. Sources of revenue:<br>Member institutions and USAID. Past research has been supported by a variety of international and national sources. |
| 21. Recent activities/programs, in particular those relevant to the GEF:<br>LUCID-EA has held a series of meetings since 1997 to establish and formalize a research programme that brings the experiences from different long term research sites to bear on common regional research themes associated with the environmental impact of land use change. Two books are under preparation, one on Tanzania and the other on Kenya/Uganda, consisting of chapters on the theme of the environmental impact of land use change, and syntheses chapters. | |
| PART IV - INFORMATION TO BE COMPLETED BY IMPLEMENTING AGENCY | |
| 22. Project identification number: | |
| 23. Implementing Agency contact person:<br>Mr. Ahmed Djoghlaf<br>Executive Coordinator<br>GEF Coordination Office<br>UNEP<br>P. O. Box 30552<br>Nairobi, Kenya<br>Tel: (+254) 2 624166<br>Fax: (+254) 2 624041 | |
| 24. Project linkage to Implementing Agency program(s):<br>The Project falls within UNEP's regular programme on *Sustainable Management and Use of Natural Resources*. UNEP is currently supporting a number of initiatives related to conservation and sustainable use of biological diversity in various ecosystems where land degradation constitutes a major threat to the natural resource base. The global UNEP/GEF project PLEC (People, Land Management and Environmental Change) is developing new and innovative approaches to biodiversity conservation within agricultural systems – hence relating biodiversity to land use. In East Africa, ongoing GEF funded activities on the slopes of Mount Kenya and Mount Kilimanjaro, as well as in southwestern Uganda are going to be strengthened as the present proposal | |

will develop a framework for the analysis of the causes and impacts of land degradation. Moreover, the UNEP/GEF project on Management of Indigenous Vegetation for the Rehabilitation of Degraded Rangelands in the Arid Zone of Africa that is developing replicable sustainable conservation strategies for African drylands will also benefit from insights gained from the proposed targeted research project.