MALI DRAFT ACTION PLAN

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USAID/MALI ACTION PLAN

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GLOSSARY

AAPL	Approved Assistance Planning Level
ACDI	Agence Canadienne de Developpement International (CIDA)
ADB	African Development Bank
AFSI	US Peace Corps African Food Systems Initiatives
AJAC	Association des Jeunes Agriculteurs de la Casamance (Senegal)
CARE	Care and Relief Everywhere (USA)
CCCE	Caisse Centrale de Cooperation Economique (France)
CILSS	Comite Inter-Etats pour la Lutte Contre la Secheresse dans le Sahel
CDSS	Country Development Strategy Statement
CLUSA/ NCBA	Cooperative League of the USA/National Cooperative Business Association
CMDT	Compagnie Malien de Developpement des Textiles
DHV	Projet de Developpement de la Haute Vallee (USAID)
DNEF	Direction Nationale des Eaux et Forets
DRSPR	Direction de Recherche sur les Systemes de Production Rurale (Farming System's research directorate supported by a variety of donors including USAID and the Dutch)
EPRP	Economic and Policy Reform Project
FAC	Fonds d'Assistance et Cooperation (France)
FAO	United Nations Food and Agriculture Organization
FLUP	Forestry and Land Use Project (Niger)
FSDP	Farming Systems Development Project (USAID)
GON	Government of Niger
GRM	Government of the Republic of Mali

GTZ	German Technical Assistance (FRG)
IBRD	International Bank for Reconstruction and Development (World Bank Group)
ICRISAT	International Center for Research in the Semi-Arid Tropics
IER	Institute d'Economie Rurale
ILCA	International Livestock Center for Africa
INRZFH	Institut National de Recherche Zootechnique, Forestiere, et Hydrobiologique
ISH	Institut du Sahel-Hydrobiolgie
ISNAR	International Service for National Agricultural Research
IUCN	International Union for the Conservation of Nature
LMS	Local Natural Resources Management Strategy
LSP	Livestock Support Project (USAID)
NGO	Non-Governmental Organization
NRM	natural resources management
NRMS	Africa Bureau's Natural Resources Management Support Project
ODIK	Operation de Developpement Rural Integre de Kaarta
ODR	Operation de Developpement Rural
OHV	Operation de Development Rural de la Haute Vallee
OPRS	Swiss Farming Systems Research Project
ORSTOM	Office de Recherche Scientifique et Technique Outre-Mer (France)
OXFAM	Oxford Famine Relief
PIRT	Projet d'Inventaire des Ressources Terrestres (USAID)
PNLCD	National Plan of Anti-Desertification and Desert Encroachment Control
PNRM	Africa Bureau's Plan for Natural Supporting Resources Management in Sub-Saharan Africa
PRODESO	Malian State Livestock Development Organization for the Sahelian Zone

PRC	People's Republic of China
PRMC	Mali Cereals Marketing Reform Project (USAID)
PVO	Private Voluntary Organization
RFA	Republique Federale Allemand (FRG)
SAFGRAD	Sahelian Africa Food Grains Research and Development Program
SSRA	Sahel Sub-Regional Natural Resources Management Assessment
SWMU	Gambia Soil and Water Conservation Management Unit
TFAP	Tropical Forestry Action Plan
UNDP	United Nations Development Program
UNSO	United Nations Sahelian Office
USAID	U.S. Agency for International Development
VRP	Village Reforestation Project

1. INTRODUCTION

1.1 This report contains the proposed USAID Action Plan for Natural Resources Management in Mali (Action Plan). The proposed Action Plan is an important step in the execution of AID's overall Plan for Natural Resources Management in Sub-Saharan Africa (PNRM). It is intended to help focus AID efforts in natural resources management based on the comparative advantage of the United States, from both prior African and domestic experience. The PNRM defines Action Plans as the definition by USAID Missions of their CDSS planning period actions to support AID's 15- to 20-year goals of balanced protection, restoration and enhanced use of the soil, water, vegetation and genetic components of the resource base of the major ecological zones of Africa i.e., sustainable natural resources management. The proposed longer-term strategy for Mali, the Mali Action Program, was written at the same time as this document. The Mali Action Program was developed using the technical criteria of the PNRM and following the PNRM directive to develop natural resources strategies without regard to budgets available to AID. It should be read as background to this proposed Action Plan.

1.2 The Action Plan is intended to be used as a sub-component of the Mission's CDSS, or its annual update. The Action Plan defines the linkage between the Action Program and the Mission's current portfolio and future programming, as well as identifying new initiatives, if needed.

1.3 Mali is a Group I PNRM country because of the large proportion of its surface area which is occupied by the arid/semi-arid zone, one of the two, first-priority agroecological

zones in Africa from the standpoint of degree of environmental degradation. Group I country Missions are required to perform natural resources management assessments before elaborating Action Programs and Action Plans.

1.3.1 The Sahel Sub-Regional Natural Resources Assessment (SSRA) was carried out in late 1987 with Natural Resources Management Support (NRMS) Project (698-0467) funding. The SSRA concentrated its efforts in Senegal, Gambia, Mali and Niger on the arid/semi-arid zone and the sub-humid upland zone. In addition, it examined the special environments surrounding the major regional rivers. The SSRA inventoried NRM success stories and developed from them detailed criteria and priorities for sustainable natural resources management actions in the Sahel. Success included public and private technical, socioeconomic and legislative initiatives which have led to incremental NRM improvements in specific localities.

1.3.2 Since the SSRA, NRMS funds have been used to assist the Mali Mission to evaluate the Village Reforestation Project (VRP), to assess the natural resources management components of the Mission project portfolio for the CDSS, to elaborate and test the results of the SSRA to refine its analytic approach and to draft an Action Program strategy based upon SSRA successes.

1.3.3 The key features in the formulation of the USAID/Mali Action Program strategy were that:

- o SSRA guidelines define valuable screens to evaluate components of a strategy from GRM plans, current programs and future program and policy design;

- o An action orientation should be maintained. The program should build on specific natural resources actions and changes needed in the implementation environment to enable them to succeed;

- o The Action Program should identify pathways to implementation by examining the environmental, institutional, policy, organization, human resources and financial conditions needed to sustain changes;

- o The program in Mali should identify strategies for semi-arid and sub-humid zones and two special environments, the high-water table areas and the savanna woodlands, building on the findings from the SSRA survey; and

- o The Action Program should be iterative in nature. The SSRA shows that adjustments will be needed as the SSRA did not inventory all major resource use categories specifically--no pastoral and only a few fisheries interventions were included;

- o The Action Program should permit the identification of an Action Plan by defining which Mission activities, both current and planned, intersect with program strategies.

1.4 The following sections present the proposed Action Plan for USAID/Mali over the current CDSS period.

2.0 SUMMARY CDSS ANALYSIS

2.1 The Congressional mandate for increased AID attention to sustained natural resources management in the Sahel is currently interpreted by the Africa Bureau as representing a target for Missions of 10 percent of portfolio allocations to NRM activities.

2.2 The NRMS team's analysis of the Mission's CDSS proposal for 1990-1994 indicates the Mission is basically on-target in terms of its level of commitment. If the VRP budget is combined with one-third of the grants to be made through the upcoming PVO grants project (approximately two million dollars), and the 30-35 percent of the IFHS budget devoted to family planning (approximately two and one-half million dollars), then approximately 6 percent of the Mission's project portfolio will be going directly to NRM activities (See Figure 2.1). The level of mortgaging of Mission DFA funds makes it difficult to conceive of major new initiatives that might be undertaken prior to 1994.

2.3 The team suggests a number of strategies consistent with the spirit of the SSRA that will enable the Mission to reach the Congressional target through a programmatic emphasis upon, and financial proration of, selected project activities, notably :

1) LSP II activities in the area of livestock production, especially forage production and pasture management extension;

2) DRSPR and DHV themes devoted to research and extension of soils and water conservation and soils fertility management, respectively;

3) EPRP II policy dialogue on forestry products price and taxation policies;

4) increased emphasis on NRM training through the HRDA project with annual allocations on the order of $100,000 (short- and long-term training combined); and

5) African Regional Grasshopper and Locust Control activities devoted to the monitoring and evaluation of pesticide use.

2.4 If these suggestions are followed, USAID/Mali's portfolio will be very close to the ten percent target suggested by Congress. More detailed recommendations follow.

2.5 A strict interpretation of natural resources management as activities directly related to soils, water, vegetative cover and non-agricultural germ plasm might reach a different conclusion than that of the NRMS team. The natural resource least affected by current Mission project activities is non-agricultural germ plasm.

Figure 2.1

Projects in Mission Portfolio with NRMS Potential

Number	Title	Planned Expenditures ($US millions)
688-0245	Economic Policy Reform II	17,000
688-0233	Development of Haut Vallee	17,500
688-0232	Farming Systems Research	6,375
688-0218	Livestock Sector Project II	5,306
688-0247	NGO Support	8,000
688-0250	Agriculture Research Support	10,000
688-0234	Small Project Assistance	45
688-0937	Village Reforestation	2,161
688-0227	Integrated Family Health	8,000
	Mission Total	63,387

Proposed New Projects

698-0455	Semi-Arid Tropics Res III	4,475

Regional Project By-Ins

Number	Title	FY 1988 Budget Obligations (US$ thousands)
698-0463	Human Resources Development Assistance	820
698-0517	Africa Regional Grasshopper and Locust Control	750

3.0 USAID/MALI PROPOSED ACTION PLAN

3.1 Guidelines

USAID/Mali's Action Plan for Improved Natural Resources Management should be shaped by following the guidelines identified in the SSRA and Mali's Anti-Desertification Action Plan described in the proposed Action Program. The Action Plan has three primary purposes which are to:

1) Conceive of stable, cooperative activities to end the decline in the natural resources base over a generational time frame as a contract between Sahelian populations, local governments, NGOs and USAID. In short, share the costs as well as the risks.

2) Prioritize activities which extend existing technologies whose positive impacts and financial attractiveness to local populations have been demonstrated and which contribute to long-term resource sustainability.

3) Prioritize activities which seek to reduce the risks and augment the productivity of available innovations and germ plasm resources.

3.2 Management Principles

Improved natural resources practices on the scale required to halt environmental degradation in Mali require a commitment to two management principles:

1) Maintaining a stable level of program and project commitment of human and financial resources to improved resources management strategies (honoring the contract with the Malian population).

2) Proper phasing of tasks is crucial. The environmental problems of Mali cannot be addressed as though they were just a project to be implemented. Management should focus on identification of projects and programs whose current work can be used as a base to which may be added the strategy components of the proposed action program. Iterative action to establish the conditions for sustainable development as well as delivery of technical packages are equally important. The public commitment to balanced protection and use of natural resources will have to engage the GRM and donors in a series of administrative reforms if individual test zone or project gains are to be more generally diffused and sustained.

3.3. Objectives

USAID/Mali's Action Plan should favor several broad medium- and long-term objectives:

1) Support for resource management techniques which shelter natural capital resources and support the needs of the rural economy.

2) Support for income-generating opportunities through sound natural resources management practices and capitalizing on changes in the socioeconomic context which can create new opportunities for natural resources management.

3) Support for those institutional changes which are necessary to encourage and support widespread adoption of available and developing resource-regenerating and improvement techniques in the short-, medium- and long-term.

4.0 PROJECT OPPORTUNITIES: EXISTING PORTFOLIO

4.1 Areas of Geographic Concentration

Results of the SSRA indicate that the greatest impacts come when long-term, concentrated effort is deployed in a given location. USAID/Mali's strategy of concentrating project support in the IInd and Vth regions of Mali should be continued. Some technologies, delivery mechanisms and policy reform perfected in these zones are likely to be applicable to conditions in the Ist, IIIrd and IVth zones, if not the VIth and VIIth zones as well.

4.2 Human Resources Development Assistance Project

4.2.1 HRDA can be used to address the problem of institutional capacity for natural resources management in both the short- and long-term. There is a precedent for this since SMDP II was used to train participants in improved NRM techniques. Two participants are scheduled to return shortly from United States long-term training with M.Sc. degrees in forest resources and water resources management, respectively. Discussions with the DHV and the GRM Forest Service indicated a high level of interest for in-country and short-term training programs. The PACD for HRDA is in September 1995.

4.2.2 The HRDA Officer in GDO should work with the ADO/L & F, the VRP team, the NGO Support Project Paper team and the Ministry of Environment and Livestock to identify candidates for long-term training. VRP, LSP II and DHV project officers and implementing personnel should work together in FY 1989 and subsequent years to develop short-term participant training plans.

4.2.3 Discussions with the GDO indicate that the following returning trainees might be targeted for participation in NRMS- related activities in FY 1989.

1) One short-term trainee returning from the Institut National d'Economie Appliquee (INEA) in Dakar, Senegal;

2) One long-term trainee returning from degree training in sociology in the United States.

4.2.4 In subsequent years, long-term, short-term and in-country seminars could be programmed for NRMS-related activities. Discussion with the GDO suggested the following schedule:

1) FY 1990 One long-term trainee and two short-term trainees in a third country ($23,000);

2) FY 1991 Two short-term trainees in a third country ($23,000 cumulative);

3) FY 1992 Two long-term trainees, of which one might be sent for U.S. training, and two in-country seminars in agroforestry, soils and water

conservation or wildlife conservation ($48,000);

4) FY 1993 Two short-term trainees ($14,000), two in-country seminars in iterative extension work, agroforestry, soils and water conservation or wildlife conservation ($38,000 cumulative);

5) FY 1994 Two short-term trainees ($14,000), one in-country seminar in iterative extension work, agroforestry, soils and water conservation or wildlife conservation ($15,000);

6) FY 1995 Two in-country seminars in agroforestry, iterative extension work, soils and water conservation or wildlife conservation ($30,000).

4.2.5 The University of Idaho's program in forest management, a program in tropical tree crop production and the University of Arizona's program in arid lands studies are possible destinations for long-term trainees. These and other institutions in arid/semi-arid continental climates in the United States offer both renewable natural resources economics and rural sociology programs with concentrations in the socioeconomics of resource management.

4.2.6 Suggested destinations for short-term trainees include CESAO in Burkina Faso, ICRAF in Kenya and INEA in Senegal, among other possibilities.

4.2.7 In-country seminars might be offered by: the DRSPR project in Sikasso, based on its soils and water conservation experience; the U.S. Soils and Conservation Service, based on its extensive experience in The Gambia; CARE, based upon experience in Niger; and the WWF/IUCN, based upon experience in Youvarou, Mali, and Niger.

4.2.8 In addition, USAID/Mali should explore the possible use of HRDA monies to fund visits by Malian extension agents and, possibly, farmers to successful model sites in neighboring countries e.g., The Gambia (SCS soil and water conservation initiatives); Niger (CARE and Guesselbodi agroforestry initiatives); and Burkina Faso (OXFAM soil and water conservation initiatives).

4.2.9 Key participants targeted for in-country training include technicians associated with the Water and Forest, Agriculture, Rural Engineering and Livestock Services, as well as national and expatriate NGOs. A special need is in-country training for pastoral extension agents and producers in appropriate techniques to improve forage production, soil and water conservation and animal parks and to create living fence enclosures, etc.

4.3 Village Reforestation Project

4.3.1 Design of the VRP is basically consistent with SSRA recommendations. The VRP will spend $2 million on three activities: CARE-implemented natural resources management training in Djenne Cercle; ICRAF-implemented agroforestry; and University of Wisconsin Land Tenure Center (LTC) studies of land and tree tenure issues.

4.3.2 USAID/Mali should consider making implementation of the proposed semi-arid NRMS strategy on a trial basis a condition of implementation. The combination of CARE's local organizational experience, ICRAF's technical expertise in the domain and LTC guidance on tenure and resource use conflict resolution should enable testing of the strategy. USAID should provide the impetus for coordination of the VRP efforts in this area with the test zone program of the PNLCD. Special attention needs to be paid to the diagnosis and modification of the interaction among the Forest Service, the local administration, the producers and the external implementing agencies. IUCN assistance may be useful in addressing this problem area.

4.3.3 Planning should begin for a follow-on activity in which implementation and on-farm testing of alternative NRMS strategies chosen from SSRA-based menus occur.

4.3.4 Involvement of the Wisconsin Land Tenure Center in this project offers a significant new opportunity for the Mission to generate data which may be fed directly into both policy dialogue and project implementation activities (training and extension themes). In general, Land Tenure Center activities could aim to develop appropriate vehicles for the delivery of decentralized programs of overlapping (in space and time) natural resources use among resource users as well as to provide credible field input into national policy discussions.

4.3.5 Socio-ecological research themes which the LTC should consider include:

1) Processes of resource tenure allocation and conflict resolution within and between local ethnic groups (IUCN, CECI-ODIK, FAO-Banamba);

2) Risk management and decision-making as relates to the diffusion of agricultural and natural resources management innovations;

3) Comparison of local organizational structures for NRMS activities;

4) Comparison of successful extension and delivery techniques;

5) Analysis of impacts of successful NRMS activities on household structure and organization.

4.4 Livestock Support Project II

4.4.1 Improvements in delivery of veterinary services without substantial improvements in the management of forage resources and grazing rights may encourage over-exploitation of the existing resource base. The recommendation for increased emphasis on forage research and extension activities within the overall animal production strategy found in the Project Paper Supplement is consistent with the overall NRMS/SSRA approach.

4.4.2 Consistent with the strategy of the PNLCD, LSP II should seek to emphasize activities which contribute to the resolution of: a) the problem of joint (agro-pastoral) use

rights using conflict resolution techniques; and b) protection and improvement of pasture resources (tree, shrub, grass species). These activities fall under the heading of animal production, one of the three main project elements.

4.4.3 In the short-term, several project activities to be taken up under the semi-arid animal production component can more precisely target resource management issues. They include forage production and extension, economic assessment of household resource allocation and a diagnostic survey of Toronke, Kayes and cowpea demonstration trials. Several sub-humid production-related activities are germane, including monitoring and evaluation of animal practices and forage production trials. Together, these activities are budgeted at approximately $250,000.

4.4.4 Specific applied research activities which project officers and/or evaluation and design teams might consider for recommendation include the:

1) Identification and dissemination of adapted forage legume varieties which can improve animal nutrition and stabilize existing grazing and cropping systems;

2) Identification and dissemination of adapted varieties of tree forage crops and improved management techniques;

3) Identification of joint pasture and water point monitoring and management systems of transhumance corridors or pasture reserves to improve the

capability of local populations to evaluate and control agro-pastoral resource use.

4.4.5 In the medium term, follow-on activities for the next phase of Mission support to the livestock sector should focus on forage production and natural resources management. Evaluation and design teams should seek to integrate regional project activities (ILCA, ARS Sahel Ribbon Project, Small Ruminant CRSP) into the next phase of support to the livestock sector as well.

4.4.6 Forage production activities should maintain their focus on the identification and extension of forage legumes and tree species which can improve animal nutrition and potentially stabilize existing cropping systems. This effort should not be limited to exotic species. This effort might profit from an SSRA-type exercise focused on the pastoral zones of Mali, Niger, Mauritania and Senegal. Work with women producers to identify production strategies and bottlenecks may also be emphasized.

4.4.7 Natural resources management activities should be focused in one of the semi-humid test zones of the PNLCD in partnership with herder or village associations and on local resource monitoring and management, including improvements through forage production (including bourgou), soil and water conservation and fallow pastureland regeneration. The project may benefit from the experiences of CECI-ODIK in their attempts to develop co-management arrangements along a transhumance corridor.

4.4.8 The Management Information System (MIS) under development by the LSP II has been changed from one reflecting the hierarchical organization of the Ministry of Environment and Livestock (MEE) to one organized by program areas which cut across the MEE organizational units. The MIS will focus first on informing the MEE on the costs and returns from its operations in animal health, including privatization efforts. It, then, will incorporate marketing activities. The current project management system tracks investment and outcomes of its natural resources-related activities. The next phase of the project (LP III) should include the design of the MIS component dealing with animal production and forage actions of the MEE. Before the end of LP II, the MDST and the Joint Management Committee need to review project experience with the abandoned range monitoring program and define terms of reference for an LP III solution of this perennial problem.

4.5 Haute Vallee Development Project

4.5.1 Extension activities in the DHV zone have provided a model for other regional development projects with a natural resources emphasis. The Mission should encourage DHV to continue to emphasize, strengthen and refine its agro-forestry, soils and water conservation and soils fertility initiatives in the zone.

4.5.2 USAID/Mali should provide guidance to DHV so that the NRMS semi-arid natural resources management strategy is pursued in the Koulikoro and Banamba sectors.

4.5.3 The Mission should provide guidance to CLUSA so that some of the cooperative-funded projects emphasize economically viable reinvestments in natural resources capital. The active grain bank and village store (boutique villageois) program in the project area may serve as a useful point of attachment for investments with potential for returns in the near term (microcatchments, gully-plugs) and medium term (polewood planting, natural forest management).

4.5.4 A $200,000 line item in the DHV budget has been tagged for natural resources management activities. Two activities would advance this project's effect on natural resources management. An update of PIRT work would have project-wide application providing both a planning tool and a monitoring tool for project management. Funding of selected components of the semi-arid zone strategy described in the action program would reinforce and extend ongoing project activities which seek to reduce pressure to clear new cropland.

4.5.5 A PIRT follow-up is a good investment given the widespread use of the PIRT maps in other donor and GRM planning activities. The potential PIRT activity should focus on:

1) Human and animal pressure on land, water and forestry resources;

2) Changing extent and duration of fallow cycles;

3) Identification of zones of highest risk of environmental degradation;

4) Appropriate mitigation measures; and

5) Monitoring of project extension.

4.5.6 Money in this line item could also be used to raise the level of DHV support to activities in Banamba sector so that the semi-arid strategy discussed above could be implemented on a trial basis. The project officer should discuss this possibility with DHV, NGOs operating in the zone, FAO project personnel in Banamba and Peace Corps for implementation in FY 1991.

4.6 Farming Systems Research/Extension (FSR/E) Project and the Planned Agricultural Research Support (ARS) Project

4.6.1 USAID/MAli should provide guidance to both projects to place more emphasis on NRMS issues in ongoing research as outlined in the Research Plan. This approach is consistent with AID's agricultural research strategy for Africa which emphasizes technology adaptation rather than basic research and technology creation. The focus should continue to be on:

1) Off-station farming systems research;

2) Continual improvements in current farmer practices;

3) Pasture and forage crop research; and

4) Applied agro-economic and socioeconomic studies.

The FSR/E project can continue to draw fruitfully on the experience of the Dutch-funded PLAE within DRSPR activities in Sikasso. USAID should support the extension of the FSR/E project to the Vth region with the following actions: 1) a more comprehensive historical review of research performed in Mali and similar rain-fed zones in neighboring countries; and 2) a program orientation which is focused on field survey and on-farm research. This orientation should be supported by a station program conceived for supporting off-station work rather than duplicating the station research infrastructure at the sub-humid zone level.

4.6.2 Complementary diagnostic agro-forestry research activities which the DRSPR evaluation team and ARS project design team should consider recommending for inclusion in project activities include:

1) Improving reliability of seedling production, transplanting and management of indigenous field trees such as Butyrospermum paradoxum (karite), Acacia albida (Balanzan), Adansonia digitata (Baobab), Parkia biglobossa (nere), etc.;

2) Improving productivity of field trees;

3) Improving growth rates of indigenous economic tree species e.g., Isoberlinia doka.

4.6.3 Complementary applied research priorities which project evaluation and design teams should consider recommending for on- farm research include:

1) Interaction effects of alternate soils and water management techniques with more traditional production systems interventions (crops, fertilizer, rotation, etc.);

2) Optimum species composition (grass and ligneous species mix, including fruit trees) and spacing for in-field, anti-erosion vegetation bands and riparian zone vegetation filter strips;

3) Alternative, multi-benefit field trees such as Acacia albida, Adansonia digitata, Parkinsonia aculata, etc.

4) Alternative, multi-purpose windbreak species and composition including henna, Cajanus cajun, Prosopis chilensis, Acacia macrophylla, A. raddiana, Azadirachta indicus, Eucaplyptus spp., etc.

4.7 Integrated Family Health Services Project (IFHS)

Human beings are a natural resource. Family planning activities are mentioned explicitly in 4 of the 69 paragraphs of Sections 118 and 119 of the Amendment to the Foreign Assistance Act. The PNRM for Africa identifies population pressure as a major element in natural resources strategies. Vigorous pursuit of family planning objectives in this project is consistent with the findings of the SSRA. Roughly 2.4 - 2.8 million (30-35 percent) of the project's $8 million budget is devoted to family planning activities.

4.8 Small Project Assistance

The project officer should meet with Peace Corps officials to discuss implementation of small-scale natural resources initiatives in areas where AFSI volunteers are already active. The SSRA and the USAID/Mali Action Program can serve as guidance to PCVs in setting up additional project activities.

5.0 NEW INITIATIVES

5.1 NGO Support Project

5.1.1 The following NGOs have developed expertise in the delivery of natural resources management activities: Care, Africare, IUCN, CECI, AFVP, EAA, Nord/Sud, SECAMA, Stop Sahel and DED.

5.1.2 Consistent with the priorities and objectives enunciated above, USAID/MAli should direct the Project Paper design team to earmark half of PVO grants to support NRM activities, especially in the IInd and Vth regions. Continuation of the Care/Djenne activity after its scheduled PACD in 1991 is an example of an opportunity of this kind. NGO participation in ODEM-OREM model site management schemes around Mopti is another opportunity.

5.1.3 The USAID/Mali Action Plan design team suggests that the NGO support project work in collaboration with CCA-ONG to explore modalities for including local NGOs in project activities through a consortia or sub-contracting mechanism. This need not be limited to NRM initiatives and projects. Local NGOs offer expertise in local institutional and organizational development. They lack the technical, planning and administrative skills which can be provided by international NGOs in partnership with USAID.

5.2 Economic Policy Reform Project (EPRP) Phase II

5.2.1 EPRP II may be an appropriate vehicle through which to pursue economic liberalization and privatization goals enunciated in the policy reform discussion above. EPRP provides short-term financial support to cushion the effects of tax and regulatory reform measures. Revision of the fiscal aspects of the forestry code to: 1) increase licenses, permits and prices through local resource co-management relationships between

the Forest Service and the local or regional development committees; and 2) reduce its punitive aspects would be an appropriate activity to undertake consistent with the EPRP PAD and mid-term evaluation.

5.2.2 THE EPRP II PAD team should explore the possibilities for inclusion of a program of financial support to a local or test zone natural resources management project. Financial commitment would be relatively small and monitoring could be combined with existing project activities in the VRP, DHV and LSP II/MSTG cases, for example.

5.3 NRMS Special Studies and Events

The following list provides a range of possible activities. NRMS could undertake one or more of these activities depending on Mission and AFR/TR/ANR negotiations of terms of reference and approvals:

5.3.1 A study of traditional land use policies in a given region and their potential relevance to a modern resources management code;

5.3.2 Pesticide load and monitoring study;

5.3.3 Systematic synthesis of models and analyses of the hydrological regime in the inland delta and possibilities for management of the flood pulse to increase agrosylvopastoral productivity and secure endemic species diversity. Modeling efforts of the U.S. Army Corps of Engineers (for the Niger Basin Authority) and ORSTOM provide a point of departure;

5.3.4 A basic survey based on SSRA techniques could be undertaken to identify successful pastoral (e.g., OXFAM/Chad) and fisheries (e.g., FAO/Niger) NRMS initiatives of interest to Mali;

5.3.5 A more detailed study of the potential for inclusion of a Forest Service Support component within the EPRP II Project. Composed of a Financial Analyst, Social Forester and Policy Specialist, the team would make a detailed study of the organizational environment, re-training needs, level of budget support required and alternative personnel incentives and evaluation criteria for inclusion within the overall PP;

5.3.6 A consultant could be provided to participate in studies and working groups related to the PAFT;

5.3.7 A consultant could participate in a more detailed biodiversity assessment of the Boucle de Baoule and Bafing Parks activity which will be funded, in part, through the African Development Bank. The FAO Investment Center recently assisted the

the African Development Bank. The FAO Investment Center recently assisted the ADB to identify this project. A subsequent preparation mission will be done in the first quarter of calendar year 1989. This TDY could be folded into the overall design work for the PRODESO Livestock and Boucle de Baoule projects with AID providing biodiversity and monitoring guidance to the ADB team;

5.3.8 Should DHV decide to earmark funds for testing of the semi-arid strategy in Banamba or Koulikoro Sectors, a consultant could do the detailed design work for this activity;

5.3.9 Environmental indicators could be developed for the Mission's use based upon the PIRT data base.

5.4 Training of Trainers

Support should be provided in FY 1989 and FY 1990 to training of trainers in specific natural resources management techniques and local conflict resolution approaches for projects for the Water and Forest Service and/or NGO staff charged with training and extension. A follow-up mission to adjust the training of trainers activity for institutions at a recyclage center is recommended.

5.5 Regional Locust Control Project

USAID/MAli should recommend increased project monitoring activities, notably in the areas of compliance with recommended safety guidelines for product storage and application as well as the public health impacts of widespread pesticide use. The project might be a useful vehicle for further exploration of alternative integrated pest management strategies as well as management strategies for animals which have increasingly become pests with the deterioration of the resource base (e.g., large mammals).

5.6 Agriculture Research Support Project

Two types of applied research needs have been identified through NRMS activities in Mali. One concerns diagnostic research devoted to less well understood activities such as agro-pastoral production systems in the Sahelian zones and regeneration of agro-pastoral production systems in the Sahelo-Saharan zones.

The other type concerns on-farm, applied research devoted to gaining a more precise understanding of the ongoing agro-ecological and socio-ecological dynamics of NRM strategies, both traditional and contemporary. Proposals for specific research programs are presented in Section 4.6 and in the Action Program.

6.0 POLICY DIALOGUE

6.1 The USAID/Mali Mission has identified general orientations for policy dialogue concerning natural resources and biodiversity in its CDSS for 1990-1994. The relative rights and responsibilities of government, local communities and individuals with regard to land, tree and resource tenure were highlighted. The stated aim of the approach was, "to bring about institutional and policy change to provide greater incentives for private, as opposed to government, management of natural resources, as appropriate" (CDSS, p 34). The government has already indicated its willingness to engage in such dialogue if:

1) balance can be struck between the need for environmental protection and the need to improve incentives for increased private and local management of natural resources;

2) national receipts from natural resources policy changes and their administration do not decline;

3) donors are willing to assist the GRM to make the detailed studies and tests needed before broad-scale institutional reform is undertaken.

6.2 Backed by financial and technical assistance, the Mission has historically undertaken two major types of policy dialogue. The first has been through area or sectoral projects which have either informed the policy dialogue (e.g., privatization of veterinary services in

the Livestock Sector Project II), or negotiated changes in administration of policy for limited geographical areas (forest police fining practices in the Village Reforestation Project). The second type of policy dialogue has been through projects which support structural changes by providing compensatory funding to the GRM for specific reforms (EPRP). The proposed NRM Action Plan includes both approaches.

6.3 Near-term NRM policy dialogue issues for the Mission to consider include:

1) In the VRP area, implementation of the recommendations presented in the VRP, FSDP and Swiss-financed study of forestry police concerning institutional structure, permits, fines, species protection and fire protection;

2) In the DHV area, a review of the fallow land tax and agreement to modify its application in the area.

3) In the LSP II areas, the potential for designating transit corridors and pasture belts with joint local management agreements and access rights;

4) Dialogue with the GRM on inclusion of NRM resource evaluation, taxation and fining policies in EPRP II;

5) Inclusion of NRM policy impact research in the agenda for the long-term national agricultural research strategy being developed with AID funding.

6.4 Medium-term NRM policy dialogue issues for the Mission to consider include:

1) Development of a national conservation strategy (perhaps using the IUCN model already used in eight countries in Africa);

2) Donor coordination in the review of individual forest, pastoral and fisheries codes and their integration in what is currently a parallel effort to develop a rural code;

3) Negotiation of current code easements for areas where donors are supporting the test zone development of land use management approaches in support of the PNLCD Program.

7.0 IMPLICATIONS FOR MISSION MANAGEMENT

7.1 The primary implication for Mission management is the need to examine current levels against the proposed Action Plan to determine if the policy dialogue and other actions proposed increase the commitment of effort. Current staffing levels may be insufficient to carry out the policy dialogue activities on a regular basis. Mission staff have pointed out that adding new items to the policy agenda of the EPRP would require added effort to correctly define negotiating points, design implementation arrangements and monitoring compliance and impact. If the ADO were to reduce its FSN staff, it would be difficult to see how the reduced staff would be available to assist in this program. Concern

has been expressed that, if the overall monitoring program is to work, attention will have to be paid to what extent current project monitoring and evaluation programs will be able to provide NRM data points. External assistance from NRMS could be provided for this specific issue.

7.2 Where new project designs or extensions are concerned, consultant terms of reference should be able to include the natural resources components or concerns of the project. NRMS may be able to assist in project design if the issues to be addressed are ones not generally encountered or covered in PID or Project Paper preparation. Other centrally-funded projects may also be appropriate, such as the Forestry Support Program or research CRSP's.

8. PROJECTED IMPACTS AND MILESTONES

8.1 Implementation of the Action Plan will have two general types of impact. The first will be effects on existing projects and the content of new project design. The second will be effects on the natural resources base itself over time. The impact on activities will be relatively easy to monitor as the information can be obtained from the reports required for most project and portfolio management i.e., financial flows to natural resources management activities, number of participant trainees, extension agents trained in natural resources management techniques, data on technical interventions, policies targeted for dialogue, etc. Impacts on the natural resources base itself will be more difficult and costly to establish baselines for, require longer time periods to permit impact to be detectable and

be more difficult to accurately measure and attribute. The PIRT inventory provides an invaluable source of baseline data already used by USAID and other major donors for project planning. Prospective updates could provide a major monitoring tool.

8.2 Portfolio Management Milestones are defined by the PNRM for Africa. The key milestones for USAID/Mali as a Category I country are:

1) NRM Assessment - Satisfied in FY 88 in the SSRA;

2) FAA 118/119 Tropical Forestry and Biological Diversity- Underway, to be completed second quarter FY 89;

3) NRM Action Program and Plan - Underway, to be completed second quarter FY 89;

4) Annual Action Plan Update in the CDSS - each year over the current CDSS period;

5) The fifth management milestone is currently interpreted as an approximate 10 percent allocation of USAID FX and PL-480 LC generations for natural resources activities. Currently, allocations total about 6 percent, but the 10 percent target is easily within Mission reach.

8.3 Short-Term Activity Indicators. USAID Mission allocations have already been used in projects and programs supporting natural resources management. Existing monitoring and evaluation plans permit tracking of the effect of the Mission program on some important elements of PNRM implementation. The following matrix is suggested as a first cut of indicators. It is based on the proposed indicators of AFR/TR/ANR which are appended to this report.

Category	Currently Tracked	Where Tracked
8.3.1 Financial Indicators		
1.1 Level USAID FX and PL-480 NRM allocations	Yes	CDSS/AAP
1.2 Number NRM Activities funded by AID or jointly with PVOs, PC, Other Donors	Yes	CDSS/AAP
1.3 Level of GRM budgetary Allocation to NRM Initiatives	?	National Budget?

8.3.2 Technology Indicators

2.1	Number of Farmers/HH who have adopted improved NRM technologies	Partly	OHV, VRP
2.2	Number of Promising NRM technologies identified	Partly	MTSG, FSSP
2.3	Number of NRM technologies adapted and extended	Partly	MTSG, FSSP, OHV
2.4	Parks/reserves identified with improved management plans	No	
2.5	Park/reserve buffer zones established	No	

It should be noted that some projects (OHV, VRP, Manantali Resettlement) have more detailed technology activity and output indicators than these. These indicators may be more appropriate for USAID/Mali reporting than the general categories listed here. The team is still examining the potential for their adoption as the primary indicators for

reporting purposes. More specifically, the team is considering interview techniques which would be targeted at determining rates of technology diffusion (growth in respondents reporting use of NRM technologies) as a low cost add-on to existing surveys.

8.3.3 Policy Indicators

3.1	NRM Policies Identified as needing change	Partly	Project Reports
3.2	NRM Policies Changed and implemented	Partly	Project Reports

Through Village Reforestation, Manantali Resettlement, Livestock Sector II and various health sector projects, policies affecting natural resources which need changing should be identified and acted upon. It has also undertaken actions which affect policy implementation in project areas. Reporting on the implementation of the policy changes is probably best done according to the existing schedule of project reviews and evaluations because of the time required for any government to make the administrative adjustments required. The final draft of this report will contain the priority policies for AID attention over the near and medium term.

8.3.4 Institutional Indicators

1. Number of Malians trained or retrained as:

- natural resources technical specialists	Partly	Project Reports
- park/reserve managers		
- extension agents		

2. Number of integrated village territory or pasture management zones

3. Number of private/public management zones

8.4 Economic indicators of crop, livestock, forestry and fisheries productivity are done by national services and individual projects. The problem of attributing these changes to NRM activities is at least as large as the attribution problems of more traditional sectoral programs and projects. Stabilized and increased crop yields over a three- to five-year period would probably be the best indicator, in any given area, of economic impact on the land resource base. Similar measures for livestock, forestry and fishery off take are much more difficult to identify because of the swings in animal populations, the lack of growth and regeneration information on forest trees in Mali and major shifts that have occurred in fish habitat.

8.5 Longer-Term Indicators of Impact on the Natural Resources Base

The appended proposed indicator list from AFR/TR/ANR suggests that a number of biophysical indicators be monitored. The Action Program team finds it would be very difficult and expensive to establish appropriate sampling, reliable analysis and measurement for many of the more detailed indicators proposed. Soil nutrient status, soil organic composition/structure, soil reaction and available soil moisture require sophisticated sampling and analyses. They are both extremely costly and difficult to complete in Mali given the personnel and laboratory facilities available. Measures which integrate the effects of improved natural resources management on a large scale are needed. Options which are under discussion by the team include:

Soil Erosion - Sediment load from catchments providing water to the dams in Region II, especially the Selingue. Alternatively, the use of erosion rods in sites for simpler physical evaluation.

Forest Cover and Clearing - FY 89 or 90 remote updating of the PIRT evaluation of forest cover to give a baseline for periodic (e.g., once every five years) updating to show trends in pressure on vegetative cover.

Species Diversity - Counts of endangered plant and animal species.

Ground water - Monitoring of groundwater tables in wells and peizometers with water quality analysis.

While the Africa Bureau has commissioned the World Resources Institute to do a study of potential macro-environmental indicators for monitoring purposes, there is unlikely to be final consensus on indicators during FY 89. The team is predisposed to a recommendation which would identify incremental additions to existing project monitoring and evaluation, with the possible exception of biological diversity in the national parks.

9. ENVIRONMENTAL REVIEW REGULATIONS

9.1 Environmental Review

The purpose of the United States environmental review policy is to "ensure that the environmental consequences of AID-financed activities are identified and considered by AID and the Host Country prior to a final decision to proceed and that appropriate environmental safeguards are adopted" [22 CFR 216.1 (b)(1)]. This purpose has not been fully realized as yet since the Categorical Exclusion given the NRMS project by the Initial Environmental Examination (IEE) included the provision that individual activities assisted would be subject to their own Environmental Examinations (EE's). EE's, when conducted outside the United States, by regulation need to address only adverse impacts which a project presents. This section will define the level and complexity of care necessary during the environmental review for the various activities proposed under the project, illuminate the areas where critical examination is necessary and suggest appropriate environmental

safeguards when needed.

9.2 Overview of the Natural Resources Management System

The Natural Resources Management System is a collection of strategies designed for cooperative action at the village level which are based upon successful experience and which are designed to arrest and, eventually, reverse the degradative effects of human agroeconomic activities on the Sudano-Sahelian environment. These strategies are composed of collections of on-farm interventions which involve coordinated village- or group-wide activities but which promise swift and increasing returns for individual effort. Each of the singular interventions has been shown to have a desirable developmental or environmental impact which, when combined with other interventions, will result in a strategy which will exhibit a synergetic effect. Over the proposed twenty-year time frame, the summation of these positive environmental impacts, together with the replication of the procedures in other areas, will begin the long process of replenishing the overtaxed Malian natural resources base.

9.3 Anticipated Impacts

The anticipated project impacts, otherwise referred to as the "significant effects", of these strategies on the environment will be the cumulative effect of the individual interventions. Some of these interventions were gleaned from AID-sponsored projects and, as such, would have already received environmental review assuming the projects were not

initiated before 1975. Other interventions were taken from successful projects or successful components of projects of other donors, PVOs, NGOs, governments and other development workers from four Sahelian countries. These may not have undergone an environmental review, but they were chosen for their beneficial contribution to environmental improvement and were judged successful because they worked and did not have significant adverse environmental effects. This pre-screening of the small-scale, on-farm interventions has reduced the need for extensive review.

9.4 Regulation Review Degree Categories

The environmental regulations recognize that there are actions which have varying degrees of effect on the environment. The degree of environmental review is correspondingly scaled to reflect this varying potential for adverse effect. Five categories of review exist, only three of which are normally encountered on projects such as NRMS. The highest degree of investigation, the environmental impact statement, is not normally needed on AID- supported projects because the activities often do not have wide-ranging, adverse effect. Likewise, exemptions are not generally used for project-type work such as the NRMS project. Investigations of actions which have an environmental effect can be included under the following general types of review categories: exemptions, categorical exclusions, environmental examinations, environmental assessments and environmental impact statements.

1) Exemptions

Projects or activities which are eligible for exemption under the regulations include: a) international disaster assistance; b) other emergency circumstances; and c) circumstances involving exceptional foreign policy sensitivities.

2) Categorical Exclusions

Projects are eligible for categorical exclusion under the regulations if they are based on the following specific criteria: a) they are actions not having an effect on the natural or physical environment; b) they are actions which AID does not have knowledge of or control over and the objective in providing assistance does not require knowledge of or control over specific activities which may effect the environment; and c) research activities which may affect the environment but are of limited scope, carefully controlled and effectively monitored.

3) Environmental Examination

IEE's (or, in this case EE's) have to be prepared for all projects, project components or activities which: a) are not exempt; b) are not categorically excluded; and c) will have no significant adverse environmental impact.

4) Environmental Assessment

An Environmental Assessment (EA) is required unless it is believed that the action will not have a "significant adverse impact". The regulations list a class of actions which normally have a significant effect on the environment and for which an EA will be required. The list of eleven classes of actions is included below, even though some items may not have relevance to the NRMS project:

a) Programs of river basin development;

b) Irrigation or water management projects, including dams and impoundments;

c) Agricultural land leveling;

d) Drainage projects;

e) Large-scale agricultural mechanization;

f) New lands development;

g) Resettlement projects;

h) Penetration road building or road improvement projects;

i) Power plants;

j) Industrial plants; and

k) Potable water and sewerage projects other than those that are small-scale.

Additionally, any adverse impact not previously studied requires the preparation of an EA.

5) Environmental Impact Statement

An EIS shall be prepared when AID actions significantly affect: a) the global environment or areas outside the jurisdiction of any nation; b) the environment of the United States; or c) other aspects of the environment at the discretion of the AID Administrator.

9.5 Classification of Interventions According to Review Requirements

Interventions have been classified according to the type of review required and are presented in Annex 6.13, 6.14, and 6.15. Category I interventions are activities for which a categorical exclusion is appropriate. Category II activities require only an environmental examination cover sheet requesting a negative determination, if such is the finding, together with the written technical rationale supporting the recommended decision. The expertise

and level of effort required to perform reviews of Categories I and II are not excessive and are well within the capability of the Mission Environmental Officer. Category III activities require more critical examination, including the more extensive and thorough procedures of an environmental assessment, since the potential for adverse impact exists. A Category III review should be performed by someone e.g., the Regional Environmental Officer, who is thoroughly versed in the regulations and experienced in preparing this type of document.

This categorization is intended to serve only as a guide and is not intended to relieve the reviewer of the necessity of performing a thorough examination of the facts of each individual case.

This discussion is intended to be informational only and should not be construed to be a legal interpretation of environmental regulations and law.

9.6 Current and Future Projects

The folding of NRMS strategies into current and future portfolio projects will necessitate the preparation of a CE, an EE, an EA or an EIS for each individual activity proposed. The level and complexity of review necessary for the majority of the activities will not be great, however, since the track record shows that most do not have adverse impacts on the environment. Nevertheless, the paperwork requesting a categorical exclusion must be prepared as must an environmental examination proposing a negative determination and containing a proposal description when each is appropriate and

warranted. An environmental assessment or even an environmental impact statement likewise must be prepared for the Category III interventions which warrant these higher levels of environmental protection review.

9.7 Negative Impacts and Mitigating Measures

A list of some of the potential negative environmental impacts which may result from interventions such as those being proposed by the Natural Resources Management System is included in this document as Annex 2. This checklist presents general categories of potential impacts which must be addressed during preparation of CE's and EE's.

Mitigating measures or alternative courses of action should always be conceived when the potential for adverse impact becomes apparent. Since most of the NRMS interventions will be utilized as strategy systems, concurrent interventions may provide some of the mitigating measures or additional interventions could serve this purpose. The overall, long-term goal of the NRMS project, which is to provide a positive environmental impact, can best be realized when the negative impacts of individual interventions are minimized.

ANNEX 1

INDICATORS FOR TRACKING AFR BUREAU'S PROGRESS IN IMPLEMENTING THE PLAN FOR SUPPORTING NATURAL RESOURCES MANAGEMENT IN SUB-SAHARAN AFRICA

Background: The Africa Bureau is currently in the process of identifying appropriate indicators for tracking its progress in implementing the Plan for Supporting Natural Resources Management in Sub-Saharan Africa (PNRM). The identification of natural resource indicators by the end of calendar year 1988 responds to one of the requirements of the Development Fund for Africa, as well as of the PNRM's evaluation plan.

Progress To Date: On February 26, 1988, AFR/TR/ARD convened a meeting of A.I.D.'s evaluation and natural resource specialists to discuss the preliminary list of indicators identified by ARD (attached). ARD's framework for identifying indicators incorporates the concept that indicators should be viewed from a multi-dimensional perspective if they are to reflect implementation progress realistically and appropriately. These dimensions are discussed briefly below:

o Geographic considerations - Different sets of indicators should be used to track progress in different groups of countries (i.e., Group I, Group II, and Group III countries, as identified in the Plan) in order to reflect the difference in levels and types of activities that A.I.D. will support in these countries.

o Temporal considerations - The current set of indicators identified by ARD are grouped into two major categories: short-term indicators and long-term indicators. Incorporating temporal considerations into the indicators framework conveys a very important message: the biophysical and socio-economic impact of natural resource interventions can only be realized over the long-term; however, other intermediate accomplishments can and should be tracked in the short- or medium-term to determine whether progress is being made in attaining the ultimate goals (i.e., biophysical and socio-economic impacts).

o Cost-effectiveness considerations - Information costs money, and the availability of funds is a major limiting factor in determining the amount, level of precision, and methodology used in collecting information. The incorporation of geographic and temporal considerations into the Africa Bureau's indicators framework is a cost-effectiveness consideration. Another cost-effectiveness consideration is the reduction of the current list of indicators to include only those that can be collected within the limits of available resources, while still providing sufficient information on implementation progress.

Next Steps:

From now until the end of calendar year 1988, the Africa Bureau will undertake the following steps in finalizing the natural resource indicators:

o Incorporate suggestions made during the February 26th meeting of A.I.D. evaluation and natural resource specialists.- During the February 26th meeting, suggestions to refine the current indicators framework were made: (a) the indicators should be reclassified under different groupings, such as "input indicators", "output indicators", and "goal level indicators"; (b) the indicators should be further classified according to whether they are institutional, policy-related, or technology-related; (c) additional indicators should be considered for inclusion, especially those that measure the level of local participation in the implementation of natural resource interventions; and (d) a cover note should precede the listing of indicators to present background information, discuss objectives and targets, and relay information on data collection/research techniques. All these suggestions will be considered as the Africa Bureau finalizes its list of natural resource indicators.

o Solicit views of NGOs/PVOs and universities. - The Africa Bureau will collaborate with outside groups such as the NGOs/PVOs and universities to further develop and refine the natural resource indicators framework.

o Continue collaboration within A.I.D. - During the process of developing the natural resource indicators framework, the views and inputs of the AFR Bureau field missions will be solicited, and the collaboration which was initiated early on with relevant offices within A.I.D./W will be continued.

o Investigate availability of information and data collection requirements and methodology. - A critical factor in determining which indicators will be included in the final list is the steady availability of information related to specific indicators and the ease and cost of collecting additional information (where data gaps for critical indicators exist). Thus, an assessment of the availability in Sub-Saharan Africa of specific information related to listed indicators will be made, as well as a determination of how additional information for the most critical indicators can be collected in the most cost-effective manner.

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Attachment

PROPOSED INDICATORS FOR TRACKING PROGRESS IN IMPLEMENTING
the PLAN FOR SUPPORTING NATURAL RESOURCES MANAGEMENT IN SUB-SAHARAN AFRICA

	Countries		
	Grp.I	Grp.II	Grp.III
I. SHORT-TERM INDICATORS: (1st year-onwards)			
- Number of promising technologies identified (including IPM techniques)			
- Number of technologies adapted and extended (including IPM techniques)			
- Number of farmers/households who have adopted improved technologies (including IPM techniques)			
- Number of policies identified that require change			
- Number of policy changes adopted and implemented by host governments			
- Number of SSA countries with completed natural resource assessments			
- Level of USAID FX and PL-480 LC generations allocated for natural resource management activities			
- Number of natural resource activities funded by A.I.D alone, or jointly with other donors, PVOs, or the Peace Corps			
- Level of African host government budgetary allocation for natural resource initiatives			
- Number of Africans trained as natural resource technical specialists, park/reserve managers, tour guides, and extension agents			
- Number of PVOs and NGOs strengthened			
- Parks/reserves identified for intensive mgmt. & tourism			
- Number of buffer zones established			
II. LONG-TERM INDICATORS: (6th Year - onwards)			
A. Biophysical Indicators			
Nature of Environ. Degr. — Indicators			
Soil Erosion & Soil Fertility Decline — Soil nutrient status			
Soil organic composition/structure			
Sediment loading			
Soil reaction (pH)			
Level of soil loss			
Changes in water available for plants			

Nature of Environ. Degr.	Indicators	Countries Grp.I	Grp.II	Grp.III
Veg. Loss or Degradation	Area under vegetation			
	Vegetation density			
	Vegetation vigor			
	Vegetation composition/diversity			
Biological Diversity	Area protected as park or reserve			
	Number of species on endangered status			
	Number of viable buffer zones			
	Level of pesticide contamination			

B. Economic and Related Indicators*

- Increases in agricultural (crops/livestock) productivity
- Reduction in crop losses
- Increases in production of forest products
- Increases in incomes from crop production
- Increases in incomes from livestock production
- Reduction in energy costs
- Increases in incomes generated from tourism
- Increases in non-farm incomes/employment opportunities due to rational utilization of natural resources
- Improvements in nutrition levels
- Increases in GDP

* The achievement of sustainable improvements applies to each of the indicators.

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ANNEX 2
ENVIRONMENTAL EXAMINATION CATEGORIES FOR NRMS ACTIVITIES

CATEGORY I: CATEGORICALLY EXCLUDED INTERVENTIONS - NO ADVERSE IMPACT

training of village farmers
forestry education
environmental education

literacy training
nursery management training
vocation training program

forest classification
crop association research
millet research

sorghum research
vegetation inventory
soil inventory

extension to village farmers
risk avoidance through cooperative association
provision of credit to villagers

diffusion of improved wood stoves
diffusion of improved charcoal stoves
garden market development

providing private forest guards
seed storage and preservation
conflict resolution techniques

resolving land tenure issues
common resource use agreements
common property law

sacred woodlots
forest policy change: allow a farmer to cut trees he planted

ENVIRONMENTAL EXAMINATION CATEGORIES FOR NRMS ACTIVITIES

CATEGORY II: INTERVENTIONS NEEDING EE - NO SIGNIFICANT ADVERSE IMPACT

vegetative bands
green belts
reforestation

enrichment planting
windbreak planting
direct seeding

alley cropping & inter-cropping
village tree plantations
tree nursery establishment

well lining
windmill use
fish culture

firebreak establishment
early controlled burning
improved bush fire control

compost pits
fallowing
natural phosphate use

providing wildlife shelter & cover
in-field planting of Acacia albida
live fence & living hedge planting

collective animal stabling
soil fertility improvement
manure and organic fertilizer use & field application

production and introduction of improved seed
support for regional forest service
seed multiplication

improved planting density for agricultural crops
introduction of improved crop varieties
crop storage and preservation

rainfall harvesting microcatchments
contour & diversion bunds (earth or rock)
trench water catchment bund

collective village nurseries
tree planting & protection from weed competition
medicinal plant cultivation

vegetable and fruit tree gardening
horticultural and sylvicultural biodiversity improvement

introducing animal traction
controlled forest grazing
simultaneous crop planting to reduce bird losses

dune stabilization
small biogass digester use
installation of hand pumps

small collective grain storage facility construction
forest and woodlot management

ENVIRONMENTAL EXAMINATION CATEGORIES FOR NRMS ACTIVITIES

CATEGORY III: INTERVENTIONS NEEDING EA - POTENTIAL ADVERSE IMPACT

salt barrier dams
water retention dams
small check dams

large channel protection dams
channel protection structures
concrete reservoir construction

concrete holding tank construction
rural roads construction
livestock vaccination pen construction

chemical fertilizer use (except natural phosphates)
chemical pesticide, herbicide and fungicide use
integrated pest management

industrial forestry plantation
school construction
clinic construction

warehouse construction
installation of motor pumps

INITIAL ENVIRONMENTAL EXAMINATION

or

CATEGORICAL EXCLUSION

PROJECT COUNTRY:

PROJECT TITLE:

FUNDING: FY(s)_____ US$_____

IEE PREPARED BY:

ENVIRONMENTAL ACTION RECOMMENDED:

Positive Determination _____
Negative Determination _____
Categorical Exclusion _____
Deferral _____

SUMMARY OF FINDINGS:

CLEARANCE:

Mission Director:_____ Date:_____

CONCURRENCE:

Bureau Environmental Officer:
APPROVED:_____
DISAPPROVED:_____ DATE:_____

CLEARANCE:

GC/AFRICA: _____ DATE:_____

IDENTIFICATION AND EVALUATION OF ENVIRONMENTAL IMPACTS IN IMPACT AREAS

A. LAND USE AND NATURAL RESOURCES

1. Changing the character of the land through:

a. Increasing people and animal populations
b. Extracting natural resources (i.e., water)
c. Land clearing
d. Changing soil character
e. Construction

2. Altering natural defenses

3. Foreclosing important uses

4. Irreversible, inefficient commitments

5. Jeopardizing humans of their work

B. WATER QUALITY

1. Physical state of water

2. Chemical and biological states

3. Ecological balance of a water body

C. ATMOSPHERIC

1. Air additives

2. Air pollution

3. Noise pollution

D. CULTURAL

1. Altering physical symbols

E. SOCIOECONOMIC

1. Changes in economic/employment patterns

2. Changes in population

3. Changes in cultural patterns

F. HEALTH

1. Human nutrition

2. Pesticide toxicity

LEGEND:

N = No environmental impact
L = Little environmental impact
M = Moderate environmental impact
H = High environmental impact
U = Unknown environmental impact
+ = Positive impact
- = Negative impact