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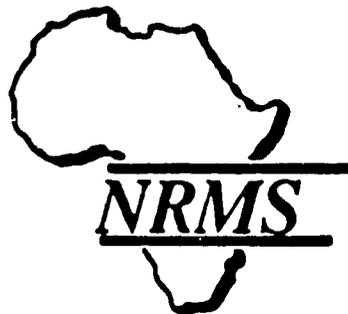
THE GAMBIA NATURAL RESOURCE MANAGEMENT ACTION PROGRAM

G. Edward Karch, Natural Resource Economist, Team Leader, E/DI
Eric Arnould, Cultural Ecologist, ARD
Chris Seubert, Agronomist, DAI

April 10, 1989

Natural Resources Management Support Project
(AID Project No. 698-0467)

Contract No. AFR-0467-C-00-8054-00



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Prime Contractor:

E/DI
1400 I Street, N.W.
Suite 700
Washington, DC 20005

Principal Subcontractor:

Development Alternatives, Inc.
624 Ninth Street, N.W.
Sixth Floor
Washington, D.C. 20001

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THE GAMBIA NATURAL RESOURCES MANAGEMENT ACTION PROGRAM

EXECUTIVE SUMMARY

Background and Approach

The Gambia Natural Resources Management Action Program is a product of the Natural Resources Management Support Project (698-0467). The Action Program is intended to help USAID/The Gambia, the Government of The Gambia, and other donors explore ways that they can refocus projects or develop new ones to support more environmentally sustainable development. The impetus for the Action Program comes from the Africa Bureau's Plan for Natural Resources Management (PNRM) which has the overall objective of promoting actions which will lead to improved soil and water conservation, soil fertility, vegetative cover and biological diversity in major agro-ecological zones.

The Action Program for The Gambia builds on the findings of the Sahel Sub-Regional NRM Assessment that was conducted in late 1987 to identify promising natural resources management activities and describe the conditions under which they had successful outcomes. The NRM Assessment concentrated its efforts in Senegal, Mali, The Gambia and Niger on the arid/semi-arid zone and the sub-humid upland zone. It also examined the riparian and lacustrine environments of the major regional river basins. The NRM Assessment found that, despite a generally deteriorating environmental situation in the Sahel, a small but growing number of farmers are making financial and economic gains. The major question raised by these findings is how can regional governments, donors and farmers work together to diffuse these successes over a wider area? Annex 8 provides more details on this issue.

Sustainable development depends upon implementing activities that have positive, sustainable long-term impacts on soil fertility, soil conservation, vegetative cover, and germ plasm preservation. The Sahel Sub-Regional Assessment showed that many farmers are willing to invest in their resources, but that few are in a position to implement these actions without support. For example, mature Acacia albida trees dominate the farmlands of much of the millet and sorghum areas of the four countries visited, but regeneration is weak. When farmers are asked why they do not put efforts into protecting young seedlings, common responses are either that there is too much pressure on the land to protect the trees effectively, or that the pay-out period for maintaining the young trees is too long. The long-term cost of not protecting the young trees is high in terms of lost soil fertility and forage production, but it will be paid by the next generation. To overcome the farmer's dilemma, the Dosso (Niger) Acacia albida Project (UNSO) shares the costs of protecting young seedlings by giving farmers 15 cents for each seedling that survives. Other projects have provided farmers with food-for work (Keita in Mali) or free seedlings (PAFORCE, PRECOBA, PARCE).

The starting point for The Gambia Action Program was the question: what is required to achieve sustainable agricultural development within a twenty-year time frame over a significant area in a given country? The response to this question begins with the working hypothesis that there is sufficient empirical experience to develop strategies in local

resource management that can help refocus existing projects on the integration of natural resources and agricultural production activities or develop new projects or programs. It is a working document that should be used to inform both policy and programming discussions, rather than begin seen as a definitive plan for natural resources management in The Gambia.

Linkage to the GOTG Indicative Programme for Desertification Control

The Action Program uses the guidelines developed in the SSRA to identify the programs of the GOTG's Indicative Programme for Desertification Control (IPDC) which are linked to PNRM priority objectives. The IPDC programs most directly supporting PNRM objectives are those for:

- o The design and execution of land use management approaches for improved and sustained agro-pastoral production;
- o Training, public information and extension in conservation land management;
- o Reorientation and integration of land use management actions in the activities of local governmental (Village Area Councils) and non-governmental organizations (Conservation Districts, Producers Associations);
- o Supporting measures of legislation and public administration especially in the area of land tenure and local taxation authority.

The Action Program recommends support to the IPDC through the use of sustained investment in local natural resources management strategies and supporting measures in applied research, policy dialogue, technical assistance, training, and environmental monitoring. A geographical concentration on the rural divisions of The Gambia is recommended, because village-based resource management strategies have the best chance to succeed in these areas.

Local Resource Management Strategies

The Local Resource Management Strategies (LRMS) are approaches to sustainable development composed of successful initiatives observed during the Sahel Sub-Regional Assessment and from other regional experiences (See Chapter 3). They provide proposals for implementation of the guidelines outlined in the IPDC. The technical, organizational and financial elements of these initiatives are combined with extension, training and technical assistance to spread their use over time to a significant portion of the population in the rural divisions of The Gambia. The Local Resource Management Strategies contain technologies which have demonstrated the capacity to improve yields of food, forage, wood, and other products, and protect endangered habitats and species under Sahelian conditions.

The strategies emphasize the use of technologies which improve the sustainable natural resources upon which agriculture and forestry in The Gambia are based. They are implemented starting with selected contact farmers to verify technologies and adjust incentives and implementation methods before broader deployment. Economic incentives are provided to farmers on the condition that they follow a management plan and share custodial responsibility with the GOTG for the conservation and improvement of soils and vegetation. Additional incentives to adhere to the plan are provided through local modification of land and resource tenure and access codes.

To ensure that the strategy is employed on a broad enough scale to affect most of the land within a village's control, local organizations are strengthened to serve as sources of agricultural credit and inputs, marketing assistance, and extension services. Farmers failing to follow the plan will not have access to these benefits.

Each of the strategic elements, and combinations of many of them, had to have been observed in the field before they were incorporated into a Local Management Strategy. For the purposes of cost:benefit analysis, total costs of the strategies have been used to evaluate the financial viability of each strategy (these spreadsheets are available on micro-computer diskettes at USAID/The Gambia). In some areas of The Gambia, however, Local Management Strategy can be incorporated into existing programs (Save the Children, Catholic Relief Services, the Gambia Soil and Water Conservation Management Unit, Action-Aid, German-Gambian Forestry Project, EEC Upper River Division Project) with minimal new investments.

In other cases, Local Management Strategies can be used to help structure the implementation of new projects (e.g., USAID Agriculture and Natural Resources Management Sector Grant). In other areas, a local development agency, such as the GOTG or a PVO, can use the Local Management Strategies as a framework to plan and structure its interaction with farmer groups and national programs in a way which integrates both short-term production and longer-term resource conservation objectives. The financial costs of natural resources activities can be reduced by grafting them onto on-going programs and projects.

Four Local Resource Management Strategies are presented (Chapter 4) which follow SSRA guidelines for sustainable development. The four strategies are the:

- o Mixed Farming Strategy - An approach targeting 100,000 hectares over 20 years. The strategy is implemented by local farmer groups which receive loans, training and extension services for near-term investment in sesame, vegetable, and cereals production, improvements of soil conservation and fertility, and water retention, medium-term investment in composting and windbreaks, and longer-term investment in natural and village forest management. A combination of cash crop sales, grain price hedging and forestry and forage crops provides the economic engine for the strategy and financial incentives for farmer adherence to the land management plan. Total cost to the GOTG and donors is \$5.368 million. Loan funds of \$8.104 million are needed as well.

- o **Biodiversity Protection Strategies** - An approach targeting 1,300 hectares. Farmer groups receive loans, training and extension services for near-term investment in National Park development fertilizer, improved beekeeping, multi-purpose tree stands, and sesame production; medium-term investments in fruit trees, windbreaks and improved use of manure, and longer-term investment in activities related to development of National Park woodlot management. Cereal banks and returns from beekeeping, sesame production, tree product sales, and tourism provide the financial basis for the strategy. Total cost to the GOTG and donors is about \$82 thousand. In addition, \$121 thousand in loan funds must be provided.

- o **Forage Management Strategies** - An approach targeting 4,300 hectares. Farmer groups adhere to a land management plan that provides for intensive management of crop residues and forage trees with cereal production a secondary focus. Forage, grazing fees, and hedging cereals provide the financial returns to farmers and to the farmer groups which sanction the management plan. Total cost to the GOTG and donors is about \$242 thousand with an additional \$402 thousand in loan funds.

- o **Woodlands Local Management Strategies** - An approach which targets 100,000 hectares of the 452,646 ha of forest lands in The Gambia. Farmer groups would adhere to management plans to conserve soil and water, improve tree composition and enhance forage availability. Poles, firewood, forage and other forest products are sold for the financial gain for farmers and producers groups, Local Area Councils, and the Forestry Department. Total cost to the GOTG and donors is about \$5.368 million with an additional \$4.983 million in loan funds.

The four Local Management Strategies are presented here as approaches which require refinement and adjustment to fit local circumstances as they are implemented by development agencies. The Local Management Strategies should be adjusted to fit local circumstances. Some components of the Local Resource Management Strategies may need to be deleted or others added depending upon local needs.

Research Conclusions and Recommendations

The GOTG is fortunate to have a baseline for monitoring of changes in water resources, forests, and land-use through the efforts of several recent projects and studies. It does not, however, have a long-term research strategy. There is a vital need to consolidate the research information base on desertification and natural resources management and to use it to guide research programming. The decision about what restructured set of programs best addresses the country's research needs should not be made without the results of a long-term research strategy study. In the interim, applied research opportunities include:

- o applied in-field research to adapt and refine techniques of soil fertility management, soil and water conservation and improvement of natural vegetation management to the different natural and socioeconomic conditions in areas of concentrated development activity;
- o field studies to identify natural resources management interventions in the riverain, riparian and pastoral environments excluded from the SSRA.

Natural Resources Policy

The GOTG and donors should follow a two-tier approach to improve natural resources management policy. One tier is the modification or local negotiation of resource access and use codes on the basis of existing legislation to support development programs. The second tier is use of policy dialogue to modify national codes relating to forests and wildlife. Policy modification is underway at both levels through existing development projects, but improved application of existing legislation is required to show that local management can enhance resource use, increase production and protect the environment against further degradation. Enforcement of existing legislation and some minor changes in resource use policy are needed immediately.

Donors should not wait for statutory change to start program discussions with GOTG. The SSRA experience shows that field actions and ad hoc tenure modifications lead to statutory change over time. Sustained field initiatives of the type outlined in the Local Management Strategies are the major way that consensus can be formed about the benefits of locally-defined use rights linked to local resource management plans. Parks protection, land tenure, tree tenure, tree product harvesting, forage access and fire management are some of the key areas of policy which need to be incorporated in negotiation of local initiatives.

The Forestry and Wildlife Departments have roles as protectors of the natural resources base and as promoters of its rational use. Current institutional incentives for the Forestry and Wildlife Departments are not strong enough for them to effectively carry out these roles. If local resource management areas (e.g., Resource Conservation Districts) are to spread beyond their points of initial testing, policies and implementing agencies will have to change towards greater local supervision and responsibility for resource use and protection. The Forestry Department needs to be supported to enable it to manage Forest Parks and regulate the use of other lands through user fees, licensing and promotion of better resource management.

Donor Coordination

Donor coordination in the area of natural resources management lags behind that which exists in neighboring countries such as Mali. Two areas are central to donor coordination for natural resources management purposes--policy dialogue to encourage institutional reform and support to implementation of the Indicative Programme for Desertification Control. Donor effort is needed to reinforce the current GOTG initiatives to test and implement policy changes to move to a user fee and sustained use approach to

resource management through integrated Local Management Strategies and a more holistic approach to extension.

The second major area for donor coordination should be the joint monitoring and review of the Local Management Strategies. As implementation of the Local Management Strategies is intended to develop models of broader application, donor roundtables with the GOTG should continue to be regular affairs examining both technical approaches and the implications of the results of Local Management Strategies for further donor assistance.

Monitoring and Modifying the Action Program

The Action Program provides strategies for natural resources management in The Gambia that addresses the major concerns of three groups: the GOTG, the farmers and the donors. Before there is widespread adoption of Local Management Strategies, farmers must be reasonably confident that technologies and other conditions are viable and do not entail excessive risk. Host governments need to have some assurance that modification of national laws in the context of Local Management Strategies will not lead to further degradation of the resource base and that on-farm recurring costs can be covered by benefits. Donors must have a way of monitoring the impacts of their investments.

Perhaps the best way to institutionalize the monitoring and adjustment process is to train technicians and managers in natural resources management. At least in the near-term, even the best strategies will have an effect over limited areas where development projects are active. Monitoring and evaluation units of existing projects and research organizations should be able to assess change in these areas. This effort needs to be seconded by a broad, but relatively inexpensive, monitoring approach that can be maintained for decades. This effort, and broader programmatic monitoring, probably needs to be undertaken by the Project Planning and Monitoring Unit (PPMU) which serves both the Ministry of Agriculture and the Ministry of Water Resources, Fisheries and Forestry.

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Any errors in fact or interpretation are the fault of the team. This report presents the opinions of the authors and not necessarily the views or policy of USAID or the Government of the Gambia.

GLOSSARY

AAPL	Approved Assistance Planning Level
ADB	African Development Bank
AEPRP	African Economic Policy Reform Project
AFSI	US Peace Corps African Food Systems Initiatives
AID	Agency for International Development
AJAC	Association des Jeunes Agriculteurs de la Casamance (Senegal)
CARE	Care and Relief Everywhere (USA)
CILSS	Permanent Inter-State Committee for Drought Control
CDA	Community Development Assistant, Ministry of Local Government and Lands
CDSS	Country Development Strategy Statement
CLUSA	Cooperative League of the USA
NCBA	National Cooperative Business Association
EEC	European Economic Community
FAO	United Nations Food and Agriculture Organization
FFHC	Freedom From Hunger Campaign
FLUP	Forestry and Land Use Project (Niger)
FRG	Federal Republic of Germany
GARD	Gambian Agricultural Research and Diversification Project
GOTG	Government of the Republic of The Gambia
GTZ	German Technical Assistance (FRG)
IBRD	International Bank for Reconstruction and Development (World Bank Group)
ICRAF	International Council for Research in Agro-Forestry
ICRISAT	International Center for Research in the Semi-Arid Tropics
IITA	International Institute of Tropical Agriculture
ILCA	International Livestock Center for Africa
IPDC	Indicative Plan for Desertification Control
IRR	Internal Rate of Return
ITC	International Trypanotolerance Center
IUCN	International Union for the Conservation of Nature
LMS	Local Natural Resources Management Strategy
LRD	Lower River Division of The Gambia
LRD-ODA	Land Resources Division, British Ministry of Overseas Development
MDI	Management Development Institute, The Gambia
MFP	USAID Mixed Farming Project
MID	McCarthy Island Division of The Gambia
NBD	North Bank Division of The Gambia
NGO	Non-Governmental Organization
NPV	Net Present Value
NRM	natural resources management
NRMS	Africa Bureau's Natural Resources Management Support Project
ORSTOM	Office de Recherche Scientifique et Technique Outre-Mer (France)

PNRM	Africa Bureau's Plan for Supporting Natural Resources Management in Sub-Saharan Africa
PVO	Private Voluntary Organization
FRG	Federal Republic of Germany
SSRA	Sahel Sub-Regional Natural Resources Management Assessment
STC	Save the Children, U.S.A.
SWMU	Soil and Water Management Unit
UNDP	United Nations Development Program
UNSO	United Nations Sahelian Office
URD	Upper River Division of The Gambia
USAID	U.S. Agency for International Development
VEW	Village Extension Worker, Ministry of Agriculture
VRP	Village Reforestation Project (Mali)
WD	Western Division of The Gambia

1. INTRODUCTION

1.1 Background

This report contains the proposed USAID Action Program For Natural Resources Management in The Gambia. The Action Program is mandated by the Africa Bureau's Plan for Supporting Natural Resources Management in Sub-Saharan Africa. With a strategic goal of increased agricultural productivity, the Plan for Supporting NRM was developed to "... better articulate and coordinate AID's approach to Sub-Saharan Africa's environmental problems - desertification, soil degradation, loss of biological diversity...".

The starting point for each Action Program is the question: what is required to achieve sustainable agricultural development within a twenty-year time frame over a significant area in a given country? From this comprehensive base the Action Program recommends short-, medium- and long-term strategies for 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. The Action Programs are developed according to the following guidelines:

- o The program should be viewed as tentative, that is, developed without regard to projected Mission approved assistance (AAPL) or staffing levels.
- o Budget and staffing concerns will be considered as separate issues.
- o The tentative Mission Action Programs will be technically based on the findings and recommendations of natural resource management assessments.
- o It should provide clear direction for AID assistance for the short-, medium- and long-range management and rational use of the country's natural resources.
- o It should be specifically tailored to the priority natural resources concerns of the host country and the Plan for Supporting NRM.
- o To satisfy the need for AID to evaluate NRM investments, the Action Program should also include monitoring components to determine the effects of the investments on agricultural productivity and the natural resources base.

1.2 Development of The Gambia Natural Resources Management Action Program

The Action Program mission of February 1989, working in concert with the Government of The Gambia's policies and programs, used the concept of Local Resource Management Strategies as a framework within which to assess available technologies and implementation approaches. In developing these concepts the ad hoc USAID/GOTG/NRMS team studied natural resources management policy and programs

and explored Action Program issues and options with a wide range of GOTG, donor and non-governmental organizations. A list of organizations and people contacted is given in Annex 9.

The Action Program for The Gambia presents scenarios for the adaptation and extension of the Local Resource Management Strategies and provides estimates of the costs of implementing the strategies over a twenty-year period in substantial portions of the ecological zones of Gambia.

The sections that follow:

- o discuss the GOTG's major natural resources policy instruments;
- o give the key findings of the Sahel Sub-Regional Natural Resources Assessment; and
- o present the USAID Action Program for The Gambia.

2. THE GAMBIA NATIONAL NATURAL RESOURCE PLAN

2.1 Plan Development

The Gambia has a long history of efforts to conserve its natural resources. However, much more effort has gone into enacting laws than enforcing them. As early as 1949, the GOTG enacted "The Lands (Bathurst and Kombo St. Mary) Regulation" for the prevention of soil erosion. In the late 1950's, soil conservation was taught in lecture rooms of the ox plowing school by the Department of Agriculture. Topics such as contour plowing, strip cropping, and soil erosion found their way into the terminology if not the practice of trainees and instructors.

The droughts and general decline in overall rainfall levels which began in the Sahel in the last years of the 1960's led to the mobilization of major national and international efforts in relief and development. Following the Land Resources Study of The Gambia in 1975, the GOTG enacted the Forest Conservation Act, 1977, Forestry Regulations, 1978 and the USAID-sponsored Soil and Water Management Project, 1978, as well as a village Woodlot Project.

Unlike a number of states in the sub-region, The Gambia adopted laws in the 1970's and 80's which deal specifically with aspects of sustainable resource use in the country. Review of this legislative effort with UNEP assistance led to the enactment of the most recent piece of general legislation, the National Environmental Management Act, 1987. This Act establishes a healthy policy climate for sustained natural resources development. Further evidence of the Gambian commitment is the new Kiang West National Park Order of 1987, setting aside 10,000 ha in the Kiang West District.

Review of recent development efforts with the Permanent Inter-State Committee for Drought Control (CILSS) and Club du Sahel assistance resulted in drafting of the Indicative Programme for Desertification Control in August 1986 (under review by the GOTG Cabinet). The IPDC and a subsequent Forestry Sub-sector Program submitted to the donor round table in July 1987, identify a set of programs supportive of improved natural resource management. The IPDC identifies the following orientations for policy and project development:

- 1) Meeting the basic needs of the population by providing them with valuable productive resources; and
- 2) Rehabilitating the environment by setting up a framework which would put all energies and resources to work.

In addition, the IPDC targets the following objectives:

- 1) Halting the current degradation processes and abuse of the environment by appropriate measures;
- 2) Promoting the most rational sustained use of the national resources by adapting farming and land use patterns to the changing environmental conditions;
- 3) Achieving self-sufficiency;
- 4) Accelerating the processes of structural adjustment of government and non-governmental development services;
- 5) Improving the population's involvement in all development activities;
- 6) Providing a basis for international collaboration with financial sources for a better coordination of their long-term programmes and projects;
- 7) Establishing and strengthening capabilities for monitoring, evaluating and collecting socioeconomic and agro-meteorological data on the various processes of desertification.

Also, the IPDC identifies the following strategic options consistent with the CILSS Nouakchott Strategy (1984):

- 1) Total involvement of the population;
- 2) A global approach to environmental degradation which is a divorce from classical sectoral experiences;
- 3) Regional planning to allow the allocation of resources to their best use;

- 4) Institutions adapted to the new global approach and other concomitant devices of the regional strategy, in particular, the current land tenure system modified to facilitate the implementation of particular strategic land use options;
- 5) Research, training and education in support of the other strategic components of the plan;
- 6) Coordination of aid reinforced to prevent duplication of effort and to channel funds where they are needed most.

Finally, the IPDC calls for strengthening GOTG policies through:

- 1) restriction of bush cutting and new land clearing;
- 2) intensification of the campaign against bushfires;
- 3) intensified efforts against overgrazing through improved cattle tracks (dappos) and restrictions on entry of foreign stock;
- 4) improvement of the herd through intensive husbandry and range management;
- 5) increase in the availability of agricultural inputs;
- 6) integration of crop and livestock production systems;
- 7) changes in production system to place a premium on livestock quality and, as a corollary, increased use of draught animals;
- 8) efficient use of water resources, especially by control of water losses from rainfall runoff;
- 9) protection of soils prone to saline incursion and acidification and soil fertility loss by erosion;
- 10) clearer definition and articulation of a population policy and a reinforced government program of population control.

The objectives of the Africa Bureau's Plan for Natural Resource Management described in the introduction, and the guidelines resulting from the Sahel Sub-Regional Assessment with respect to the primary criteria for sustainable resource management, lead the Action Program team to endorse the themes, strategies and policies described in The GOTG Indicative Plan for Desertification Control. Chapters 3 and 4 of this Action Program present specific strategies for implementing the IPDC.

3. OVERVIEW OF THE GAMBIA NATURAL RESOURCES MANAGEMENT ACTION PROGRAM

Based on the guidelines of the Sahel Sub-Regional Assessment, the Gambia Action Program describes four resource management strategies. The LRMS's are approaches to sustainable development made up of initiatives observed during the Sahel Sub-Regional Assessment, developed during The Gambia Action Program mission, and from other experience. These strategies combine a series of technical and organizational methods, as well as five benefit generating components (economic engines), along with supporting measures (policy reform, training, technical assistance) to assist in extending them to a significant portion of the population in selected agro-ecological zones of The Gambia.

The four management strategies are the: 1) Mixed Farming Strategy, using the North Bank Division as an example, 2) Forage Management Strategy, using the McCarthy Island Division as an example, 3) Biodiversity Protection Strategy, using the Kiang West District as an example, and 4) Natural Forest Management Strategy, using areas in the North and South Banks where natural forest management is suitable for sustainable production of wood and forage. Detailed descriptions of the strategies are presented in the sections that follow. Spreadsheet models with estimated costs and returns for these strategies are presented in Annexes 3-6. These strategies should be treated as provisional models to be modified as political, economic, technical and environmental changes take place in The Gambia.

Given the range of economic activities and environmental conditions found in The Gambia, and the short time available in the field, the Action Program team was only able to make a first cut at confirming the underlying assumptions on which the strategies are based. The underlying assumptions, which are presented along with the strategy descriptions, should be examined in more detail if used in project design in The Gambia. The Gambia Action Program does not include Local Resource Management Strategies for the river, inland and coastal fisheries, nor deal explicitly with population policy.

Besides the findings of the Sahel Sub-Regional Assessment, the Action Program takes into account information and recommendations from several sources. Included are: the Indicative Programme for Desertification Control, currently under review by the Cabinet of the Government of The Gambia, the GOTG Forestry Sub-sector Programme of July 14, 1987, the publications series of the Project Planning and Monitoring Unit of the Ministries of Agriculture and Water Resources, Fisheries, and Environment, the German-Gambian Forestry Project, the USAID Mixed Farming and Agricultural Research Diversification Projects, results of the Soils Water Management Unit's work, the Land Use and Vegetation Degradation Survey study by Mann (1975), as well as other sources.

The Action Program is aimed at farmers participating in management strategies implemented through farmer groups, especially the traditional age and gender-based village associations (*kafos*), as well as Local Area Councils, and embryonic Conservation Districts. It is recognized that individual farmers could benefit from improved technologies, but long-term and widespread benefits depend upon developing sustainable local institutions and resource use agreements among farmers, herders and other groups.

Finally, the Action Program is designed to address the major concerns of each of the major players: farmers, the GOTG and donors. Before there is widespread adoption of management strategies, farmers must be reasonably confident that the technologies and conditions of the management program are viable and do not entail excessive risk. The GOTG needs to have assurance that modification of national laws in the context of management strategies will not lead to further degradation of the resource base and that on-farm recurring costs can be covered by benefits. Donors must have a way of monitoring the impacts of their investments, especially long-term impacts.

3.1 Addressing Farmer Concerns

Concerns of farmers and herders in The Gambia include:

- income stabilization;
- compensation for labor shortages;
- crop yield stability;
- reclamation of lost productive resources.

The major costs of the Action Program come from the development, verification, and extension of local management plans which help farmers make informed decisions about investing in their homesteads, villages and natural resource base. In the development and verification phase, select farmers receive technical and material assistance to use promising technologies on their homesteads to stabilize the productivity of their natural resource base, primarily land, water, vegetation and labor resources.

In the deployment phase, these model homesteads serve as demonstration sites that allow other farmers to make informed decisions about whether to participate in management strategies. To deploy management strategies to other areas, the program budgets for training and mobilizing GOTG field agents (e.g., Village Extension Workers, Community Development Assistants, Forestry Agents).

To institutionalize ways to offset future recurring costs, the Action Program includes strategies to capture a portion of the benefit streams generated by improved management strategies to pay for annual inputs.

The components of the management strategies aimed at increasing incentives for on-farm adoption of sustainable production technologies include the following:

- o Extension and training programs that increase farmer-to-farmer contact and provide on-farm follow-up;
- o Support for local farmers' groups that accumulate and invest capital in management of soils and vegetation;
- o Tax and tenure policies that increase benefits for farmers participating in the management strategies;

- o **Strengthening of public and private institutions that support participating farmers;**
- o **Financial support that provides participants with loans and grants during the initial 2-3 years, on the condition that a portion of the benefit stream repays the loans over a 4-5 year period;**
- o **Technical assistance for extension of technologies that have short-, mid-, and long-term impacts on soil fertility, soil conservation, vegetation cover, and habitat conservation.**

3.2 Addressing GOTG and Donor Concerns

Both the GOTG and donors need assurances that their investments will give reasonable returns and that benefit streams are sufficient to cover the costs of most, if not all, of the recurring on-farm inputs.

To ensure that tenure and tax policy modifications under the management strategies do not lead to increased erosion and loss of trees and shrubs, participating farmers must comply with the terms of the management plans or lose the benefits of the management strategies.

Actions and conditions addressing GOTG and donor concerns include the following:

- o **Support for GOTG decision makers to visit the sites of promising initiatives, either in The Gambia or neighboring countries in order to make an informed decision about policies and other components of local management plans:**
- o **Stipulation that participating farmers comply with the local management plans or lose the benefits under the plans (compliance may include long-term investments in soil fertility, soil conservation, and vegetation cover and natural habitats);**
- o **Provision of training and transport to GOTG extension agents; and,**
- o **Establishment of milestones and monitoring systems to track the impacts of investments, especially the long-term ones.**

3.3. Components of the Natural Resources Management Action Program

3.3.1 Extension and Training Systems for Farmers to Make Decisions About Strategies for Sustainable Development

The Sahel Sub-Regional Assessment showed that: (1) farmer-to-farmer contact is extremely effective in allowing farmers to make informed decisions; and (2) on-farm follow-up is necessary to assist farmers in adopting technologies. The following vignettes in Volume II of the NRM Assessment support these observations:

- In 1985, 14 farmer leaders were taken from the Koro Region of Mali to visit farmers participating in the CARE-Niger Majjia Valley Windbreak Project. In 1987, agro-forestry activities were being conducted in more than 80 villages in the Koro region. Besides the farmer-to-farmer contact made during the trip, farmers in the Koro area received regular support from CARE and Government of the Republic of Mali personnel to adopt technologies on their homesteads.
- In the early 1980's, the SWMU team rehabilitated five hectares of swamp land near Tendaba with a combined anti-salinity dike and causeway access route. Women from nearby Kwinella were invited by their sisters in Tendaba to help harvest the latter's bumper rice crop. The women in Kwinella had harvested little if anything from their rice fields. In the aftermath, the women of Kwinella, who had requested but failed to capitalize on SWMU offers of assistance for several years in a row, again requested assistance. The villagers of Kwinella now hold the record for the most rapid construction of an anti-salinity reclamation dike of comparable size in The Gambia (34 ha).

Extension Actions Incorporated under Component One

- 1) Establish model sites or test zones with selected farmer groups in each agro-ecological zone; this will take 2-6 years depending on land form, extent of previous extension work, management plans and costs per hectare;
- 2) Support farmer-to-farmer visits;
- 3) Support technical assistance for on-farm follow-up.

3.3.2 Financial Strategies for Long-Term Investments in Soil Productivity, Water conservation, and Vegetative Cover

The Sahel Sub-Regional Assessment showed that farmer groups will form if there are incentives and training available. This proved true even among ethnic groups generally not known to readily form collaborative groups. The Gambian traditional age- and gender-based ascriptive and voluntary associations are very active and greatly facilitate organizational tasks. The farmer groups, in collaboration with the GOTG and donor personnel, will provide credit and will manage input delivery to farmers, collect portions

of the benefit stream to repay loans, develop local resource management plans (e.g., conservation district plans), and receive training from NGOs and PVO's.

Examples where this approach has been used in The Gambia and elsewhere include:

- Gambia Soil Conservation Districts
- Gambia Beekeeper's Associations
- Gambia Sesame Growers Associations
- Senegal Farmers Associations (AJAC and Koumpoutoum Entente)
- Mali "Tons Villageois"
- Guesselbodi Woodcutter's Associations

3.3.3 Tax and Tenure Incentives for Farmers Participating in Improved NRM Strategies

The Sahel Sub-Regional Assessment showed that farmers having tenure and usufruct rights over land and trees increase long-term investments. Some tenure and usufruct rights should be provided only to farmers complying with the Local Resource Management Strategy. Minor modifications to tax structures will also improve natural resource management. If, for example, fuelwood harvested under a management plan (such as the FLUP Project in Niger) is taxed at a lower rate than wood from non-managed land, the incentive to adopt selected management practices is strong.

It was noted in the Sahel Sub-Regional Assessment that all tenure and usufruct policy changes having an impact on management of soils and vegetation were achieved in the context of local initiatives. Thus, the Action Program does not aim primarily at policy dialogue to establish nationwide laws since laws not supported by institutional change and technical and material assistance are seldom effective. Rather, the Action Program links policy modification with the results of technical and material assistance delivered to participating farmers.

The role of the national decision makers is, of course, vital to this process. The Action Program recommends site visits and workshops to discuss the impacts of local policy modification. GOTG extension agents supported in the Action Program will monitor compliance by participating farmers. Farmers who fail to comply with local policies will lose Village Association benefits.

The Sahel Sub-Regional Assessment provided several examples in Sahelian countries of farmers responding to improved tenure and usufruct rights:

- Guesselbodi Agreement (Niger);
- Majjia Valley Windbreak Agreement (Niger);
- "Bouna" Agreement (Mali);
- Djenne garden (Mali).

Examples of activities related to land and resource tenure are:

- 1) Visits to sites with modified tenure and usufruct rights by GOTG decision makers;
- 2) A resource tenure workshop to discuss impacts of policy and tax incentives on improved resource management.

Modifications of land and resource tenure in rural districts of The Gambia, as in other Sahelian countries, must take into account three interrelated factors: resources, individuals, and allocation and enforcement rules. The implementation of Local Management Strategies is complicated by the fact that there is no simple correlation between these three factors. This affects the "legal" ability of people to undertake investments in resources. For example, while founding lineages in a village area represented by the village head (Alkalo) regulate access to land resources to the exclusion of stranger and servile lineage groups, household heads of every status (founder, stranger, "strange" [sharecropper], servile) juggle resource use rights to accommodate collective household needs and individual aspirations. While the local Alkalo may regulate access to resources, the state, in adopting legislation setting aside Forest Parks and tree and animal species, imposes rules which, in theory, abrogate some of the rights held by the Alkalo and household heads.

While customary, Islamic, and government rules set boundary conditions, the capacity of groups and individuals to invest in NRM improvement strategies, depends equally upon individual and household factor endowments, luck, place in the household developmental cycle, etc.

Local organizational structures (lineages, castes, age- and gender-linked decision-making and labor-sharing groups whose interests must be considered in the implementation of Local Management Strategies) have been described by Hasswell, Weil, Linares, Dey and others. Government of The Gambia legislation asserting GOTG interests is comprehensive and far-reaching. A theoretical framework for analysis of renewable natural resource attributes, rules, allocation, and the design of strategies for their devolution to local authorities has been provided by J. T. Thompson (1988). Implementation of Local Management Strategies will require a creative, iterative synthesis of the interests and options determined by the intersection of these factors.

3.3.4 Strengthening Public and Private Institutions that Support Improved NRM Strategies

Public sector field services must have the skills and the operating means to help farmers adapt technologies to their production systems. The Sahel Sub-Regional Assessment showed that strengthening existing technical services in integrating natural resource management with agricultural extension is necessary for successful implementation of activities. Future research results generated by national research programs need to be integrated into local management strategies. Retraining of extension agents has to be combined with operational support to catalyze extension oriented activities by forestry,

agriculture and community development agents. Use of specialized training modules developed by projects in The Gambia (SWMU, Peace Corps, Gambian-German Forestry Project) and neighboring countries (OHV, Mali; CARE, Niger) are effective ways to upgrade the skills of agricultural, community development and forestry department agents. Private institutions, such as NGOs, can provide services to farmers as well as technically skilled individuals to work with farmers. Further, the SSRA found that local revenues to support enhanced technical field services can be generated by fees, licensing, and leasing operations.

The Local Management Strategies include training and operational support as an initial step in deploying the Action Program elements. For some existing projects and NGO programs incremental costs will be quite low where funding can be refocused to incorporate new training elements in established training and refresher course cycles.

Discussions with PVO's and government personnel indicate that The Gambia has a relatively dense distribution of reasonably well-trained extension workers. There are about 100 Community Development Assistants (Ministry of Local Government and Lands), 273 Agricultural Extension Agents (including animal traction), 64 Livestock Assistants in Livestock Extension, 115 forestry agents and agents across all divisions (Protection, Plantation, and Research/Utilization), and 10 parks rangers (Department of Wildlife Conservation). In total, there are about 562 extension agents, about one for every one thousand citizens.

Despite having so many agents, the extension programs do not function well. The main problem is that the agents are ill-equipped and under-supervised. For example the Department of Forestry does not have any four-wheel drive vehicles in working condition, and the head of the Forestry Extension unit has no transportation. Extension workers are almost entirely dependent upon donor projects and PVO support to finance their activities.

Operational support improvements for GOTG staff, especially transportation and travel expenses, must be included in the implementation plans for the Local Resource Management Strategies. Also, the Action Program should include cross-sectoral training in resource management, such as that initiated by SWMU at the Gambia College and Management Development Institute.

There are several examples of public and private institution strengthening in the Sahel:

- SWMU Project Assistance to improve the operations of agents of the Soils and Water Management Unit, Ministry of Agriculture;
- Gambian-German Forestry Project Assistance to improve the operations of agents of the Forestry Service, Ministry of Water Resources, Fisheries and Environment;
- Young Farmer and Village Development Associations initiated support for village extension workers in Senegal;

- Operation Haute Vallee Extension Training Modules in Mali;
- Swiss financing of the operating costs for the Forestry Department in Sikasso, Mali.

3.4.5 Financial Support for Investments That Have Long-Term Benefits for Soil and Vegetative Cover

Actions Incorporated in Resource Management Strategies

Maintaining water diversions, contour berms, vegetative bunds, living hedges, windbreaks and Acacia albida field trees are part of Local Resource Management Strategies for participating farmers in The Gambia. Participating farmers are provided with loans for NRM investments and cost-offsets for protecting seedlings during the first two years. The loans are repaid from portions of the income generated by economic engines included in the strategies (grain storage banks, sesame production, woodlots, beekeeping, range management and fruit and vegetable production). Loan repayment will be over a three- to four-year period.

The incentive for taking part in long-term impact initiatives are the short-term production benefits from early input supply. Farmers not complying with the longer-term management plan will be dropped from the program.

3.4.6 Technical and Material Assistance for On-Farm Adoption of Technologies That Improve Soil and Increase Soil Fertility, Increase Soil Conservation and Vegetative Cover and Conserve Habitats for Preservation of Germ Plasm

This component describes the actions to achieve short- and long-term impacts on the natural resource base. The actions are selected based on the technical criteria of the Action Program and for budgeting purposes. It is understood that the size of the impacts of the actions listed below are site specific and that alternative actions may be more appropriate at some sites.

Soil Fertility Improvement

- o Short-term: application of purchased chemical fertilizers, compost and spreading of animal manure;
- o Long-term: planting Acacia albida and Leucaena spp. and other nitrogen fixing field trees;

Soil and Soil Moisture Conservation Actions

- o Short-term: Diversions, contour bunds, grass waterways and water catchments;
- o Mid-term: Vegetative bunds and living hedges;
- o Long-term: Windbreaks, vegetative strips and field trees;

Vegetation Management for Production of Wood and Forage

- o Natural forest management;
- o Pole plantations;
- o Management of garden hedges and windbreaks for poles and forage;
- o Deferred grazing of natural ranges;

Conservation of Habitat and Germ Plasm

- o National parks;
- o Germ plasm reintroduction (e.g., short-cycle rice, cowpeas);
- o Moving germ plasm to areas where drought has decreased the viability of higher rainfall varieties (e.g., sesame, fonio [Digitaria excelsis]);
- o Medicinal and traditional plant gardens;
- o Forest parks and reserves.

4. COMPONENTS OF THE NATURAL RESOURCES MANAGEMENT ACTION PROGRAM STRATEGIES

This chapter begins with a presentation of four local resource management strategies. It concludes with recommendations for research, policy dialogue, technical assistance, training, and monitoring and modification of the Action Program to support the four strategies.

4.1 Local Resource Management Strategies

Action Program strategies have been developed for two general agro-ecological situations, as well as two specific environments. The Sahel Sub-Regional Resource Assessment did not make extensive study of the riverain and coastal fisheries. These two

areas will be the subject of national attention in The Gambia through the Indicative Program for Desertification Control.

The sections that follow present the four Local Resource Management Strategies developed from the results of the Sahel Sub-Regional Resource Assessment. Each section describes the time horizon, location and rationale for the strategy and has the following components:

- 1) Supporting extension systems that allow farmers to make informed decisions about adopting strategies for sustainable development;
- 2) Supporting farmer groups that accumulate and invest capital;
- 3) Provision of tax, tenure and policy incentives for participants - institutionalization;
- 4) Strengthening public and private institutions that support participating farmers - organization;
- 5) Support farmer groups that accumulate and invest capital in sustainable development - economic engine;
- 6) Provision of technical and material assistance for on-farm adoption of sound technologies that improve natural resources - technical initiatives.

The strategies described below are not intended to be project plans, but instead are detailed approaches which should be used in future programming and design of both GOTG and donor project support. In some cases strategies can even be implemented by refocusing existing activities (SWMU, German-Gambian Forestry Project) or through marginal additional support to ongoing projects or PVO activities (Save the Children's Impact Zone). As each strategy contains a set of assumptions which will vary across the targeted area, it is important that the GOTG, USAID, and other donors critically evaluate and modify the assumptions to meet the circumstances of the areas in which they are working.

Annex 2 presents criteria and intervention menu for sustainable development in The Gambia. Annexes 3-6 present the more detailed assumptions and financial analyses of the strategies. They are also available at USAID/The Gambia in micro-computer format as Lotus 1-2-3 spreadsheets to encourage USAID, GOTG, and others to adjust the strategies for their own needs.

The numbers in the Annexes represent the Action Program team's best estimate of the total costs and returns to implementing the strategies. The cost estimates should be close to the maximum cost of strategy execution, because they disregard existing GOTG and donor commitments to services and projects. The IMF-mandated 15 percent discount rate was used to evaluate the financial returns for the various enterprises in each strategy.

4.2 The Mixed Farming Strategy

The Mixed Farming Strategy (MFS) proposed here grows out of recent analyses of major resource constraints in the North Bank Division by the MFP and GARD projects, among other analyses. These constraints include:

- a) poor infiltration of rainfall;
- b) soil erosion;
- c) soil fertility loss;
- d) salt water intrusion;
- e) a drastic decline in vegetative cover;
- f) out-migration of the economically active portion of the male population;
- g) shortened growing season;
- h) shortened fallowing (57 percent of cleared farmland is cultivated each year);
- i) loss of tidal and swamp rice lands; and
- j) lack of forage resources and watering points.

The Mixed Farming Strategy developed here is consistent with RONCO's (1985) Scenario 2 (small projects scenario), and with the programmatic focus identified in the GOTG's Indicative Programme for Desertification Control. The IPDC ranks the North Bank Division (NBD) as a top priority for combatting desertification. Programmatic elements underlined in the IPDC include:

- a) development of tidal and swamp lands, attractive from technical, cost, operational, socioeconomic and environmental points of view;
- b) maintenance of a high and sustainable level of productivity;
- c) provision of a political environment needed for adaptation to the altered ecosystem; and
- d) support for popular initiatives.

The SSRA and subsequent Action Program teams have identified a series of successful NRM technical initiatives which apply to this zone. These initiatives can be effective in controlling soil and water erosion, reclaiming abandoned land, improving vegetative cover, improving soil fertility, and easing human labor constraints. Organizational interventions identified by the SSRA team in Senegal and Niger can also be applied in this zone. However, the strategy builds primarily upon the distinctive Gambian system of social organization, and the organizational experiences of Save the Children, Action-Aid, and Catholic Relief Services.

4.2.1 Characteristics of the Zone

The North Bank Division of The Gambia lies between the 600 and 800 mm rainfall isohyets (post-1969), although, historically, rainfall averaged over 1,000 mm. Population pressure is relatively high with 112,225 people, representing 16 percent of the total population of the country. Mandinka predominate (43 percent) with a large minority of Wolof (12 percent). The NBD encompasses areas of relatively greater agricultural productivity (Lower Niumi, Jokadu, Lower Badibbu), and those with lesser agricultural

productivity (Central, and western Upper Badibbu). No national parks nor important forest reserves exist. With recurring drought, aeolian soils in the NBD have come under increasing stress due to cash crop production, wind erosion, and salinization. Natural vegetation suffers increased grazing pressure from local herds (83,000 head) and most forests have been cleared for firewood. Closed forest cover has declined from 48 percent of the area to about 3 percent since World War II. The NBD has been relatively marginal to national infrastructure development. Roads are poor, and Kerewan is the only Division capital without electricity.

4.2.3 Time Horizon

Over a twenty-year period the strategy can affect as much as 88,436 hectares of farmlands in the North Bank Division, about one-third the total area of 221,085. It also impacts upon approximately 82,000 hectares of woodlands and range which are unsuitable for agriculture. In addition, 18,000 hectares of uncultivated swamp lands are potentially affected. Taking labor constraints into account, the strategy targets 2,326 hectares of rice land for reclamation using SWMU techniques.

Over twenty years, field level effects would be longer economic life span of fields, higher water holding capacity and reduced erosion of soils, diversified cropping patterns, increased availability of improved forage, increased organic manure application through modified systems of confinement of traction animals, and increased incomes.

At the watershed level, decreased early season run-off, better shallow groundwater recharge, slower rates of land clearing, reclamation of lost swamp and tidal rice land, restoration of vegetative cover, more productive use of natural forest and range lands, and a more even distribution of better fed herds will be seen.

4.2.4 Extension Systems to Help Farmers Make Informed Decisions About Strategies for Sustainable Development

Training and extension funds are released in exchange for compliance with the long-term resource management plan and achieving certain natural resource management targets. Extension has four components: technology transfer, management and accounting skills, conflict negotiation, and environmental education. Costs of these programs are born by the donor. Extension costs \$5.368 million over ten years and is targeted at 23,256 households. Extension agents work with villagers and watershed management associations and each agent will work with 65 farms. The R,F,I costs in the Annex 3 spreadsheet for extension workers, supervisors and Peace Corps Volunteers refers to repairs, fuel and insurance needed to operate the motorbikes and vehicles.

Save the Children, Catholic Relief Services, Action-Aid, and Freedom From Hunger Campaign have carried out long-term technical extension programs in the Division. Use of key village voluntary groups and development of training modules for the on-farm activities can continue. Training of trainers for improved natural woodlands management can be done at Bama Kuno and Katilenge forest parks, and at Gusselbodi in Niger, with subsequent training of extension agents programmed at the Chaman center in the North

Bank Division. The Peace Corps AFSI program can provide a source of trainers for the on-farm and forest management activities. SWMU can continue to train trainers in soils and water conservation at The Gambia College.

NGO-sponsored training of both men and women representatives of producers associations for cooperative management will be a second major thrust of the extension program.

The donors must develop new programs in environmental education and conflict resolution to foster the success of new NRM agreements. Costs for these programs have been estimated and are presented in the cash flow spreadsheet in Annex 3.

4.2.5 Incentives for Farmer Groups to Invest in Sustainable Development

Incentives from compliance with management plans and pay-backs from the technical initiatives are cumulative. Here they are broken out as short-, medium- and long-term incentives for both individuals and groups. Short-term incentives to individual men and women farmers include increased agricultural production. Medium-term incentives include revenues from these crops, forage products and poles, and improved soil fertility. Long-term household (suo, korda, dabada) financial incentives include increased sales of legume, tree, and wood products.

Incentives for farmer groups over the near term include increased security of productive investments in agriculture and natural resources as well as sesame oil and cereals sales. Over the medium-term greater income from forage and wood sales, decreased conflict over grazing rights, and decreased pressure to expand cultivated areas would be added. Over the long-term, more reliable access to seasonal forage, and increased offtake or value of wood products adds incentive for continued cooperative resource management.

In the long run, one expects members of village founder-settlers castes (langsarlu) to take pride in the improved husbandry of their communal heritage i.e., the land (see SSRA case: Bignona Women's Fire Brigade). This apparently is the case in the Foni Jarroll conservation District. One also expects household (suo) heads (sutio) to appreciate overall improvements in economic well-being and resource endowments, because these mitigate against perennial and intensifying intra-household pressures (individual self-interest, fadingya) which lead households to subdivide into smaller, economically vulnerable units of production and consumption (dabada).

4.2.6 Tax, Tenure, and Policy Incentives for Participants - Institutionalization

Institutionalization requires that the on-farm and woodland activities repay farmers' investment of time and capital, the association covers its costs, and land use conforms to the letter and spirit of the 1987 Natural Environmental Management Act. Therefore, institutionalization also requires the negotiation of durable agreements between farmers, herders, and the state to avert conflict over access to forested areas and forest products.

The most pertinent Gambian example of a land use agreement is that which established the Foni Jarrol Conservation District in 1984. This text may serve as a model for some land use agreements for agricultural land. Section 10(d) of the Forest Act of 1977 states that a forest park may be declared for the use of a particular person or group. It may serve as the legal basis for the negotiation of more comprehensive land use covenants involving natural forests in The Gambia. Other examples of resource use agreements include: those between sedentary producers and transhumants regulating access to forage resources in Mali's inner delta "The Bouna Convention", the Banamba (Mali) village territory association agreements, and the Guesselbodi and Majjia Valley forest management agreements between the state and local groups in Niger.

Success of technical initiatives calls for customary authorities to strictly enforce the protection of declared wind erosion areas (section 11,[1]), woody anti-erosion strips (section 11,[2]), in addition to all lands from bushfires as called for in Section 5 of the Forestry Regulations. Customary authorities should also have authority to enforce wildlife conservation laws as called for in the Wildlife Conservation Act, 1977, the Wildlife Conservation (Sales) Regulations, 1977, and the National Environmental Management Act, 1987.

Key policy changes required to support institutionalization of reformed NRM management include:

- o modification of Section 3 of the Forestry Regulations to permit harvesting of forage and trees in natural Forest Parks in exchange for acceptance of land-use plans as called for in Articles IV and VI, Section 1, of the National Environmental Management Act, 1987;
- o to allow for controlled early burning under Section 8 of the Forestry Regulations;
- o to allow the associations or communities to sell grazing leases to herders (Section 12,[2], Forestry Regulations, 1978);
- o to revise revenue sharing and management responsibilities arrangements for forest products among the Forestry Department, Local Area Councils and Producers Associations (Section 22[1], Forestry Regulations, 1978);
- o to recognize community rights to grant commercial and non-commercial licenses and transit permits for multi-purpose local forest resources (Sections 12,[2] and 23[1]);
- o increase fines for bushfires and impose new, local fines for infraction in addition or in the place of those specified in Section 29 of the Forestry Regulations, 1978.

Easing of regulations on exports of forest products, prohibited by Section 25 of the Forestry Regulations except with Ministerial approval, in exchange for rigorous adherence to land-use plans may also be merited, especially on the North Bank where Senegalese markets are an obvious target of opportunity for local producers associations.

Enforcement of resource conservation rules will require amendment of the Forestry Regulations, 1978 to allow for customary authorities to share fining responsibilities and benefits with the Forestry and Wildlife Departments.

Finally, in the long run, recognition by the commercial banks of watershed management units and producers associations as credit worthy corporate entities is required. This goal can best be achieved by transferring accounting skills to the producers associations and/or conservation district committees so that they may qualify for commercial credit on terms acceptable to the banks.

4.2.7 Strengthening Public and Private Institutions that Support Farmers - Organizations

The long-term success of the strategy hinges on institutionalizing a watershed management unit. The watershed is an area within the confines of a drainage divide ideally including forested uplands (Land Resource Division soils types 8-12), uplands (LRD soils types 1,2,6,7) and seasonally inundated soils suitable for swamp and/or tidal rice production with and without reclamation (LRD soils types 13, 15-17). The watershed management unit and its constituents execute, and are the beneficiaries of, the resource management efforts enumerated above.

Ideally, the watershed unit coincides with a village areas lands. SSRA examples indicate that such organizations will evolve naturally in a favorable policy environment with sustained extension support and benefit flows from NRM interventions (Koumpentoum, AJAC, Guesselbodi). The GOTG is committed to a policy of decentralization. NGO and SWMU experiences show that rural Gambians have a remarkable capacity for organization and consensus building around benefit generating activities.

In the short- and medium-term, the success of the strategy depends upon mobilizing local organization(s), age grade groups, women's associations, work groups and, Village Area Councils. Within the watershed management unit, participating producers groups will take loans (revolving funds) to finance the on-farm, benefit-generating activities described below. Local groups manage grants and loans, stock inputs, process products, pay forest guards, hire supplemental daily labor, etc. A portion of the benefit streams generated by the grain banks, vegetable and sesame production initiatives will fund improved soil, water, and natural forest management interventions.

This organizational model is already used to some extent by beekeepers (Action Aid), who have begun to plant Gmelina and Eucalyptus for nectar production, and vegetable growers (STC), who supply their own inputs. Implementation on an expanded scale will not require major modifications of the process. The presence of groups already managing credit flows should enhance the probability of success. However, the concept of

co-responsibility whereby disbursements to the revolving fund are conditioned by implementation of long-term management strategies (e.g., Farako Forest, Sikasso Mali; Malian Textile Development Company [CMDT] soil management in Koutchiala, the Guessebodi forest cooperative, Niger) will be a new one. Peace Corps volunteers, PVOs and/or CLUSA/NCBA could assist in the development of association management skills, especially the accounting skills which will enable the groups to qualify for commercial credit.

4.2.8 Support to Farmer Groups That Invest in Sustainable Development - the Economic Engine

The MFS strategy is driven financially by several benefit-generating activities including, in the short run:

- a) sesame seed and oil production,
- b) cereals banks,
- c) cash crop gardens,
- d) seed multiplication;

and in the medium-term:

- a) increased production and sales of diversified crops;
- b) sales of forage through relay cropping or living hedges of forage trees in multi-purpose gardens; and
- c) wood products and forage from jointly-managed, improved natural forest land and gazetted village forest parks.

Local market opportunities are strong in the near term for sesame and sesame oil, garden vegetables (both tropical and temperate zone), and cereals. Production and sales organized through the indigenous, and highly flexible, *kafos* (age grades) already produce sizable benefit streams (CRS and STC programs). Individuals sell groundnut hay and fodder grass. SWMU constructed fresh water retention dams and salt water dikes have dramatic sustainable impacts on rice yields and high internal rates of return when combined with upland conservation, although they are not big money makers. Seed multiplication, while not a big money earner, promotes diversification of productive germ plasm, creates dynamic new linkages between farmers, research, and extension, and provides a conduit for introducing improved farming practices.

Recent experiences with cereals banks in The Gambia (FFHC and CRS) have been very positive. They have been modeled on Mali's STC experience and have been used primarily as a hedge against market fluctuations. This program recommends cooperatively-managed revolving funds to facilitate investments in upland soil fertility management. As proposed in the MFS, cereals banks should be used to generate significant benefit streams for investment in NRM.

In the medium-term, the export potential of white sesame should improve as farmers' experience with the crop builds. Leguminous fodders represent another market opportunity in the medium-term. Finally, forest products will be made available from individual plantations and, through natural forest management in government Forest Parks, Community Forest Parks and natural forests. These products will range from fruit to fuelwood, fodder to poles.

This component of the strategy builds directly upon the example of the indigenous village development committee self-financing systems seen in nearby Senegal. These are described in the SSRA. Financing of the strategy works very much like a sector grant. The (overlapping) producers groups (kafos) or umbrella village association (keba kafo or elder's age grade) is granted some monies for extension. They are also given loans for inputs in exchange for compliance with a jointly-developed, long-range, financial land use plan. The total loan bill is about US\$8 million. Villagers provide the labor for the long-term, resource-conserving investments in return for the inputs. As conservation or production targets are achieved, the loans are paid off over one to fourteen years e.g., sesame production and milling and swamp rice reclamation, respectively (See Annex 3). In addition, as natural resource management targets are obtained, further incentives may be provided to the groups, such as field trips and training. However, through the revolving fund mechanism, over five years the group soon finds itself in the position of financing more and more of its own investments in natural resources and other social welfare activities. For example, the grain bank buys 80 percent of production from participants at 5 percent above the harvest market price. Later in the season, it sells the grain at 10 percent below the "hungry season" market price. Producers associations could realize as much as US\$7 million per year on 100,000 hectares from this activity.

A financial analysis of the twenty-year Mixed Farming Strategy presented in Annex 3 shows an internal rate of return (IRR) of a staggering 480 percent, and a net present value of \$259 million for all components. These values are quite robust at varying scales of operation. If implemented on only 10,000 hectares rather than 100,000 hectares, the IRR is 478 percent and the net present value (NPV) is \$26,000.

The MFS involves 23,256 farm households holding an average of 4.3 ha each. Overlapping producers associations bear the costs for inputs and protection measures. The distribution of costs and benefits over time varies. For example, from Year One of full implementation of the crop and grain bank strategy, households realize combined yield increases of 719 kgs. In Year Ten, they begin to realize benefits from improved natural forest management financed by profits realized by the grain bank. In Year Two, the association realizes a net of \$42 per hectare, an amount which increases to \$89 per hectare in Year Six.

From the sesame production and milling strategy, households earn an average of \$270 per hectare per year from oil sales. The association nets \$275 per hectare from sales of oil and \$16.89 from oil cake. The initial cost of the sesame oil press is high - \$11,000 each. But, maintenance costs are low, and the returns from selling sesame oil and cake to both the individual producers and the association are high. The cash flow analysis assumes

that each extractor can process the sesame from 300 ha per year. This assumes results a need for slightly less than 13 oil extractors (12.92) to process the oil from 3,876 ha.

From swamp rice reclamation, participants realize 80 percent of the benefits of production on reclaimed land, the remaining 20 percent going to the association to defer input and infrastructure maintenance costs. Producers earn \$134 per hectare in the first year of production after reclamation. While the association must carry loans for 14 years, the NPV of this intervention is still over \$2 million. It is assumed that yields will increase by about 1500 kg/ha with reclamation. For details on the inputs and outputs from the strategy, see the spreadsheets presented in Annex 3.

4.2.9 Technical and Material Assistance for Adoption of Technologies That Improve Natural Resources

Sustainable on-farm initiatives included in the MFS (and where the SSRA observed them working) include:

- o application of chemical fertilizers (OHV and Sikasso, Mali);
- o seed multiplication for rice, maize, sesame, fodder grasses (Lamin);
- o sesame production for seed, oil, and oil cake (CRS);
- o multipurpose gardens for vegetables, poles and fodder e.g., *Stylosanthes* and *Leucaena* (Angel Togo, Mali);
- o compost/urea (OHV and CMDT Mali);
- o contour bunds and vegetated berms (Sintet, Sare Ngai);
- o gully plugs to retain water for recharge (Sintet, Sare Ngai; Tahoua, Niger);
- o polewood plantations for poles (PRECOBA, PARCE, PAFOCSE, Koumpentoum, Senegal; Angel Togo, Mali; Guesselbodi, Niger);
- o wind breaks (Maggia Valley, Niger; Koro, Mali);
- o live fences (*Prosopis*, *Parkinsonia*) (Mali, Niger, Gambia);
- o salt water intrusion dikes and fresh water retention structures (Sintet, Sare Ngai, Kwinella, etc.).

Upland woodland initiatives observed under joint management include:

- o restoration using protection stand enrichment (Bama Kuno and Katilenge forest parks; Sikasso, Mali);
- o tree planting for firewood and polewood (PARCE, PRECOBA, Koumpentoum, Senegal);
- o restoration and enrichment using local multi-purpose grasses such as *Andropogon* (Guesselbodi, Niger);
- o hay harvesting from natural grass.

4.2.10 Strategy Adjustments

The economic engine on which the MFS is based includes a number of options, all of which have a proven payoff under the currently prevailing economic climate. However, not all will be appropriate for any given ecological zone, producers or village association. Gardens growing temperate and tropical vegetables, for example, pay back well in the Banjul Kombo St. Mary's Division and in the North Bank Division, but less well in areas remote from the urban markets of Senegal and The Gambia. Some of the options may prove lucrative in the short run, such as sesame oil production and oil extraction, but less so as production generalizes. The same may be true of contract seed multiplication. Others, such as pole wood production, may become more lucrative with time. Honey production may become an option on the North Bank in the future with improvement of vegetative cover and if a larger market niche can be tapped for this product. Further, the policy adjustments mentioned above will require constant readjustment as conditions evolve. It is up to donors, extension workers, and the village associations themselves to adjust their orientation as conditions evolve. These assertions underscore the importance of monitoring the Local Management Strategies over time.

4.3 The Woodlands Strategy

4.3.1 Introduction to the Woodlands Strategy

The woodland management strategy concentrates on wooded areas rather than open cropland. It may also contain an integrated sylvo-pastoral component for manure production, improved fodder production and animal stabling and fattening. This component would be appropriate under a management plan for forest parks or for local management of community forest held in common. It may be appropriate to include this strategy as part of other strategies where natural forest land occurs. This strategy is also referred to as the Natural Forest Management Strategy in the cash flow spreadsheet in Annex 4.

4.3.2 Characteristics of the Zone

In The Gambia, the total area of forest parks is 34,000 ha or 7 percent of the land surface. It is administered by the Forestry Department with about 20 percent of it under management either in plantations or natural forest management, with additional area coming under management as funding becomes available.

About 40 percent of the total land area is forest which is under customary use rights. Thus, 93 percent of all forest land in The Gambia is already under the control of village communities. Licence and supervision responsibilities for commercial forest products exploitation on these lands, nevertheless, rests with the Forestry Department.

While some 2,000 ha of gazetted Forest Parks have been lost to encroachment nationwide, forest parks on the north bank are generally more seriously degraded than those on the south bank. Those on the north bank are appropriate targets for Guesselbodi type interventions. Examples include Pakala (1,161 ha) and Dobo (704 ha). Those on the

south bank, particularly in the LRD, are more appropriate targets for natural forest management and small-scale commercial logging operations. Both types, however, are suitable for community forest management.

4.3.3 Time Horizon

Immediate returns are available from the cutting of dead wood or over-mature stems of indigenous species in natural stands. Some hay may be available in the first year with production increasing as restoration work and the effects of regeneration in set-aside zones come on-line. Under natural forest management, yields should increase as there is a gradual, long-term build-up of the resource base.

4.3.4 Firewood, Logs, Poles and Hay - the Economic Engine

The returns are produced by placing the woodlands under management and making a coppice cut for wood products including firewood, saw logs, poles, etc. Additional income can be realized from the cutting of hay and from grazing contracts (to control bush fires) granted by the association management to transhumants and local herders.

The cutting of wood will increase the growth and production of the stand as the new coppice growth occurs immediately from the old stumps. Annual growth rates can increase from less than 1 m³ per hectare to 1.5 - 2 m³ per hectare just from the harvest (Guesselbodi). Establishing set-aside areas protected from burning and grazing will also increase natural regeneration of economically valuable species such as Combretum, spp., Khaya, Pterocarpus, Bombax, Prosopis africanus, Acacia, spp., etc., the actual species mix varying with the local ecology.

Systems of rotating pasture reserves would be established and minimal soils and water conservation techniques initiated, in order to increase yields of forage grasses, shrubs and trees. In some cases, reseeded protected areas with native grass species will become appropriate.

4.3.5 Income, Tax and Tenure Incentives

Income from wood, forage, permits, contracts, decentralized control of land management decisions, permanence and stability of resource tenure are part of the incentives package. Individuals benefit from the sales of wood products to the producers association and retail resales of products bought back from the association (as at Guesselbodi). The associations benefit from sales of cutting and grazing licenses, transit fees, royalty payments, and sales of wood products. The association uses its revenues to pay back its loan and build up its revolving fund and an investment fund (fangkanto) with which the association can make other investments in improved resource management or community infrastructure (e.g., wells). Both the Village Area Council and the Forestry Department will benefit from a portion of these revenues, the latter depositing them in a National Forestry Fund. Distribution of returns would differ depending on whether the forest was communal or national Forest Park. In both cases, the Village Area Council, represented by the Alkalo or Seifu, and members of the Producers Association, as well as

the Forest Department work out arrangements for the distribution of benefits. Currently, 30 percent goes to the VAC and the rest to the National Treasury. Under this strategy, the allocation requires modification.

4.3.6 Technical Interventions Behind Strategy

Technical interventions employed in this strategy include:

- 1) restoration using contour ridging and stand enrichment (Farakou forest);
- 2) tree planting for poles and fuelwood (Guesselbodi, Niger);
- 3) Pennisetum and Andropogon planting for hay production (Guesselbodi, Niger);
- 4) contract grazing and early season burning (Dinderesso, Burkina Faso); and
- 5) Additional techniques used by the Gambian-German Forestry Project for natural forest management in the forest parks would also be applicable in the higher rainfall zones.

4.3.7 Extension and Training

As part of the donors' contribution to the scheme, technical training of trainers (Department of Forestry and PVO/NGO personnel) could be done at Guesselbodi, Niger, with subsequent training of extension agents within Gambia. Leaders of the producers associations would also receive training from a field trip to a functioning woodcutters association in Niger. Training in nursery management, forest lands reclamation, forest management, natural forestry and the like is also provided through short courses. An NGO/PVO, such as STC or CRS, or Gambian Forestry Extension personnel, or Community Development Assistants trained by them, train members of the association in administration and accounting. Provision of training is triggered by acceptance of the management plan and gazetting of the forest park.

4.3.8 Woodcutter Associations - Organizations

The strategy is based on the idea of a multi-village association of woodcutters (Guesselbodi model) obtaining access to revolving funds to undertake land reclamation and improved forest management. The association requires that the customary authorities (alkalo and keba kafo) in the village area agree to setting aside a community forest park. Participants in the association are recruited on a voluntary basis, but presumably modelled on the structure of young men's age grade (sati kambani kafo), and the principle of cooperation (badingya). An NGO/PVO assists the association in learning the required management and accounting skills for the revolving fund and the capital fund or reserve (fangkanto) generated from the proceeds of management. The Forestry Department extension service assists in planning and developing forest management skills.

4.3.9 Legislation That Forms the Basis for Institutionalization

Legislation is already in place which provides a basis for the institutionalization of this strategy (i.e., the 1978 Forestry Regulations, the 1987 Environment Management Act). Donor support is required to implement this legislation through: a) policy dialogue to encourage the GOTG to implement the legislation; b) provision of operating funds to the Forestry Department; and c) appropriate extension training. Extension can be carried out by the Forest Department, PVO/NGOs, and by members of the association itself as they become more experienced (association employment of extension workers occurred in Koumpentoum, Senegal). The area to be serviced by the strategy is extensive. However, a "training of trainers" approach to extension, use of retrained extension agents from other technical departments, and supervision by agents with more advanced experience will permit adequate coverage.

4.3.10 Revenue Allocation - Policy Issues

The legal framework is in place to allow community forest management. Community forests may be designated as Forest Parks with the benefits accruing to the community. However, several policy issues will have to be addressed to allow for local management of forest resources; for example, under present law and policy, anyone with the proper permit can exploit common lands. The allocation of revenues to the Village Area Councils and the Treasury will have to be renegotiated so as to allocate a portion of revenues to the producers association and to the Forestry Department. To do this, a National Forestry Fund needs to be established. Compliance with a forest management plan by the association before a forest is designated a community forest park, is part of this component. Donor support is required to implement this legislation through: a) policy dialogue to encourage the GOTG to implement the legislation; and b) provision of operating funds to the Forestry Department. Further, the donor or implementing agency can play an important role in supporting the negotiation of the community forest park designation and cross-compliance of the management plans.

4.4 The Biodiversity Protection Strategy (Kiang West National Park, Abuko Nature Reserve, and the Coastal Aviary Reserve)

4.4.1 The Biodiversity Protection Strategy Goal

The goal of the biodiversity protection strategy is to protect Gambian native flora and fauna species by preserving their natural habitats from excessive human exploitation. Three locations have been identified as important biodiversity zones to preserve. The three are: the Abuko Nature Reserve (fully operational), Kiang West National Park (location is gazetted and infrastructure development is proposed), and the Coastal Aviary Reserve (suitable location exists).

The strategy and activities to preserve the Kiang West National Park and develop the peripheral areas is presented first. This is followed by a brief description of a recommended approach towards the establishment of the Coastal Nature Reserve. The

Abuko Nature Reserve, which forms an important part of the overall strategy, is already operating.

4.4.2 Characteristics of the Zone

The Kiang West National Park is, approximately, 10,000 ha in area and located along the South bank of the River Gambia in the Kiang West District at the Western end of the Lower River Division. The northern border is about 12 km and runs along the River Gambia from just West of Manita Bolon to near Tubabkollon Point. The Western and Eastern borders run South from the river about five and eight km, respectively.

The park, which occupies one of the least densely settled areas in The Gambia, contains many animal and plant species native to The Gambia and has the capacity to sustain and protect several endangered species. As one of the few remaining habitats for the severely endangered West African Manatee and Sitatunga antelope, the park has a special role to play.

The soils in the park and adjacent perimeter areas consist of two general types: 1) soils along the River Gambia and bolons that are inundated by tidal fluctuations and covered with mangrove vegetation or barren flats without vegetation, and 2) upland shallow and deep plateau soils with disturbed woodland and shrub understory. Records at Kaur, the nearest meteorological station, indicate that the annual rainfall is 926 mm and the mean annual maximum air temperature is 36.7⁰ C.

The land contained within the park boundary does not have any villages, nor is there any permanently cultivated land. There are four villages near the park perimeter: Batelling, Jali, Kuli Kunda and Dumbutu. The paved road from Banjul to Basse Santa Su runs through the village of Dumbutu. Dumbutu is about 150 km from Banjul and can be reached by car in about two hours.

The border of the park will be marked by a 36 km fence. The park perimeter area will start at the fence and extend for approximately 500 meters away from the park border, occupying an area of about 1,300 ha. The width of the multiple use perimeter will be changed to accommodate existing fields, villages, grazing areas and other features in the terrain. The first 30 meters of the perimeter will serve as a firebreak and will be kept clear of brush and grass through cutting and controlled grazing.

Some of the activities envisioned for the multiple use perimeter that will form a part of the strategy to increase the sustainable natural resource base include: managed grazing, hay, forage and thatch cutting areas; woodlots for building poles; managed and improved fallow lands; and fruit tree groves. Other activities to improve the natural resource base will take place outside the perimeter in nearby village lands. The village and village lands based activities that improve the natural resource base will include: beekeeping, fruit tree production, wind and water erosion control structures, sesame production and oil extraction, windbreaks, fire breaks, and a natural resource education program.

The foundation of the park perimeter strategy has two facets. First, direct benefits from the park should accrue to the people who live adjacent to the park and who have given up their rights to unrestricted use of the park. This is the most cost effective way to ensure protection. Second, education about natural resource issues and experience in the successful management of natural resources combined with direct economic benefits will create a more positive attitude toward the park and will demonstrate the advantages of improvements to the natural resource base of the area.

4.4.3 The Time Horizon

The long term improvements to the natural resource base will take from 15-20 years to take effect. Soil erosion control will increase soil fertility, organic matter, and soil moisture retention and will result in sustained food crop and animal forage yield increases. Stabilization of the soils will also reduce stream sediments, improve the quality of water in the streams and rivers and increase groundwater levels in the area. Improved grazing management will increase ground cover, stabilize soils, reduce noxious plant species as well as increase total plant biomass. The control of bush fires will increase forage and tree biomass and diversify plant species.

The short-term benefits expected to take place within 3-4 years include: local wage employment in the park, increased local income generation from park-related tourist and craft industries, cash income from sesame production and processing and from beekeeping, and improved human nutrition from vegetable gardening.

4.4.4 Income Generating Activities - the Economic Engine

The economic engine for the early stages of sustainable development include: the sale of honey, crafts, revenue generation from the park (the Abuko nature reserve generated one million Dalasis of identifiable revenue in three years), wage earnings from park infrastructure construction, grain bank and sesame production. As progress is made towards involving villagers in the natural resource base improvement process and interventions, and technologies are in place and begin to have their effect, these economic engines will also include: hay and thatch cutting, grazing fees, fruit production, improved crop yields, earnings from natural forest management, tourism, and employment in park maintenance.

4.4.5 Cash Generation - the Incentives

The short-term incentives for adopting innovative practices will be the cash returns from wage employment and the sale of honey and crafts, as well as access to the Village Association's revolving loan fund for farming and land related input purchases. The improvement of soil fertility and moisture retention will result in long-term, sustainable improvements in crops and fodder yields for maize, groundnuts, millet and grain sorghum. Improved pasture management will result in improved forage biomass production and better ability of herders to carry their cattle through the dry season.

The cash flow spreadsheet in Annex 5 provides details on the returns for components of the Biodiversity Protection Strategy. The net present value for the components are: grain bank, \$2.744 million; natural forest management, \$195,599; sesame, \$141,728; beekeeping, \$55,758; and fruit production \$145,197. The tourism association has only \$4,200 in start-up costs and covers all operating within the first year.

4.4.6 Technical Initiatives Supporting the Strategy

Improved farmer management practices and technical innovations include:

- fruit production;
- beekeeping;
- sesame production
- natural resource education programs for villagers;
- conservation farming practices, including contour bunds, diversions, gully structures and contour plowing;
- fertilizer use;
- village tourist camps;
- Village Association grain bank and revolving loan funds;

4.4.7 Existing Organizations Can Provide Extension and Training

Numerous organizations, many of which are already working with the above mentioned interventions, will be involved in providing extension advice to farmers and villagers. Included will be: the Soil Water and Management Unit staff (soil and water conservation); Action Aid (beekeeping, fruit tree planting and Village Association revolving funds); Catholic Relief Services (sesame production and oil press operation); Canadian International Development Agency (rangeland fire control); Department of Livestock, International Trypanotolerance Centre and Peace Corps - African Food Systems Initiative (grazing management, fire control, rangeland and fallow lands improvement, animal health, improved animal feeding techniques); Department of Agricultural Research (grazing management, biological terraces); and Department of Forestry (natural forest management).

An important component of the Biodiversity Protection Strategy, and one that is also a training activity, is to teach the benefits of natural resource management to villagers. The EEC, UNDP, The Gambia Ornithological Association and IUCN are agencies that should be called upon to initiate programs of natural resource education in village schools (an example is the Walia magazine and environmental education program in the Mali Inner Delta region). In addition to formal education programs, there will be a considerable amount of learning about natural resources through the implementation of improved practices and experiential activities. Positive attitudes and a significantly better understanding about resource base improvement will come from the experience in managing resources that provide a combination of short-term, direct economic benefits and long-term, direct and indirect benefits.

The government extension and NGO staff that are involved in working with villagers to disseminate improved practices and technologies will need training. This training will consist of in-country short courses in areas such as: range management, agro-forestry, livestock health, nutrition and management, draft animal management, soil and water conservation, crop production, conflict negotiation, natural resource education and accounting.

4.4.8 Village Associations - Organization and Institutionalization

One of the key features of the park perimeter strategy is to structure the organizations, economic engines and incentives such that the villagers, herders and farmers perceive that they receive benefits from the existence and preservation of the park and perimeter zone. Their perception of receiving benefits from the park will increase their support in maintaining firebreaks, stopping fires and poaching, as well as improve the natural resource base of the areas surrounding the park.

The Village Association will be organized to handle funds, manage their resources, organize their labor and collect use fees for the resources that fall under their supervision. Action-Aid has extensive experience organizing village associations in revolving loan funds and income generating activities in the Kiang West area. A strong Village Association will provide a good base for the villagers to continue to make improvements in their resource base, as well as increase their opportunities for increased cash income.

The institutionalization of village resource management will come about through the active participation of the Village Association in the revolving credit fund, cash generating activities, maintenance of firebreaks, grazing and forest lands, production of forage seed material, and erosion control structures. A strong Village Association will improve the capacity of the village to take on other development activities as well as sustain existing activities.

4.4.9 National and Local Policy Changes

Both national and local policy changes will need to be made in implementing the perimeter strategy. National policy changes that will need to take place include allowing entrance into the forest to collect medicinal plants or for other similar activities. Local policy changes will include different usufruct and land tenure arrangements for deferred grazing areas, and hay cutting and animal grazing fees.

4.4.10 Strategy Changes Needed

The foundation of the park perimeter strategy is that some park benefits should accrue to the people who live adjacent to the park and who have given up their unrestricted use of the park. In the past, the attitude that the park had to be protected from the people in the surrounding area prevailed. The basic strategy change proposed here is to enlist the support of the people in the surrounding areas by providing them with direct benefits from the park.

Another component of this strategy is to teach the benefits of natural resource management through experiential activities. Positive attitudes about resource base improvement will come from the experience gained through managing resources which provide a combination of short-term, direct economic benefits and long-term direct and indirect benefits.

4.4.11 Coastal Aviary Reserve

The Coastal Aviary Reserve is proposed as a bird sanctuary along the Atlantic coastline between Sanyam and Kunjur. Due to population growth and the demand for resort property along the coast it is anticipated that, unless protected, many of the currently undisturbed natural habitats for birds will disappear in the next ten to fifteen years. If land for these natural habitats is set aside and protected now, these valuable bird habitats will be saved.

The best option would be to set aside a contiguous 10 km block of land along the beach and going inland 500 m. This rectangular area would reserve about 500 hectares and would make an excellent tourist attraction for bird watching.

If a contiguous block of land is not available, it is proposed that about ten strips be demarcated in the same area. The strips would be about 500 m wide and extend inland from the beach for about 1000 m. The strips would be separated by "development zones" about 500 m wide. Ten such strips would also set aside a total of 500 hectares of land while permitting development and access for the fishing and tourist industries.

The contiguous block approach has the advantages of being easier to demarcate, administrate and protect. The strip approach has the advantage of accommodating both existing and future development. In both situations, government policies to set aside and protect the proposed area are needed. The advantage of acting now is that the land is readily available, whereas waiting will make it much more difficult to set aside suitable blocks of land.

4.5 Range Management Strategy in the Upper River and MacCarthy Island Divisions

4.5.1 Strategy Goal and Approach

The goal of the range management improvement strategy is to increase the production of dry season forage available for livestock production. The approach will be to make sustainable improvements in the soil and vegetative resource bases by helping villages and individual herders and farmers realize direct, short-term economic benefits from natural resource sustaining activities.

4.5.2 Characteristics of the Zone

The farming systems of the Upper River and MacCarthy Island Divisions are caught in a cycle of activities which cause a continued decline in the natural resource base. The most damaging practices are: a shortened soil fertility regenerating forest fallow, exhaustive

cropping practices, overgrazing, grassland burning, and soil erosion. The practices destroy the soil and vegetative resource base and each year the gradually degenerating resource base has less capacity to supply animal and human subsistence needs. This results in more intensive use and an increased rate of natural resource degradation.

The soils and vegetation in the Upper River and MacCarthy Island Districts fall into five general groups: 1) river floodplain subject to wet season inundation and vegetated with medium height grassland; 2) terraces and levee floodplain not subject to inundation, also with medium height grassland vegetation; 3) river tributary valley soils occupied by riparian thickets and woodlands; 4) colluvial scarp and plateau edge soils with woodland and shrub understorey and some fallow lands; and 5) inner plateau zone soils with woodlands, shrub understorey and woody fallow.

Both districts are now considered to be in the 600-800 mm annual rainfall zone. The average annual rainfall for the 1985, 1986 and 1987 seasons recorded was 853 mm at Georgetown and 867 mm at Basse Santa Su. Mean annual maximum air temperatures for the two districts is about 36°C.

The Upper River and MacCarthy Island Districts have human populations of 179,798 and 57,594, respectively (1986 census data). The town of Kaur, which is to the north of the River Gambia, is accessible from Barra by way of an unpaved, but improved, all weather road. Basse Santa Su and Georgetown can be reached by way of the paved road from Banjul.

The two districts contain about 60 percent of the cattle population of The Gambia. Herders normally graze their animals in the upland forests of the plateau area during the rainy season, in the newly harvested croplands and planted fallow of the colluvial slopes at the onset of the dry season, in the swamps later in the dry season, and anywhere where forage is available late in the dry season.

4.5.3 Time Horizon

Long-term improvements to the natural resource base will take from 15-20 years to take effect. Soil erosion control will increase soil fertility, organic matter, and soil moisture retention and will result in sustained food crop and animal forage yield increases. Stabilization of the soils will also reduce stream sediments, improve the quality of water in the streams and rivers and increase groundwater levels in the area. Improved grazing management will increase ground cover, stabilize soils, increase soil organic matter and reduce noxious plant species as well as increase total plant biomass. The control of bush fires will increase forage and tree biomass and diversify plant species.

4.5.4 The Economic Engine

The economic engine for the early stages of sustainable development include the sale of hay and thatch grass, and fertilizer. As progress is made towards involving villagers in natural resource base improvement and interventions and improved technologies are in

place and begin to have their effect, additional economic engines will include: grazing fees for improved pastures and managed grazing lands, improved crop yields, and improved condition and number of livestock, especially cattle.

4.5.5 Incentives to Adopt Improved Practices

Short-term incentives for adopting innovative practices will be the cash returns from access to the Village Association's revolving loan fund for farming and land related input purchases. Increases in soil fertility and moisture retention will result in some short-term crop and forage yield increases, as well as long-term sustainable improvements in crop and fodder yields for maize, groundnuts, millet and grain sorghum.

The costs and returns for ten 10 ha deferred grazing scheme are presented in Annex 6; additional schemes can be implemented if funds are available. Improved range management will result in improved forage biomass production with subsequent ability of the range to carry more cattle through the dry season. The increased range productivity comes from increased carrying capacity (2 more cows per 10 ha area per year), higher calving rate (2 calves in 3 years instead of 2 in 4 years), faster weight gain because of lower dry season weight losses (3 years to market weight instead of 4 years). The principle improvements include a water well, the use of sesame seed cake for part of the year, and access to improved range for part of the year.

The improved range will result from deferring an area from use during part of the year. Live fencing, such as *Prosopis* or *Parkinsonia*, will be used to enclose and protect the areas. The area will be protected from burning to prevent loss of biomass. The water well will be placed outside of the deferred grazing area and additional revenue will be generated by charging a watering fee to herds in the area.

The details of the returns to the interventions recommended are shown in the cash flow spreadsheet in Annex 6. For the Range Management Strategy the overall net present value is \$10.070 million and the internal rate of return is 371%. The NPV's for the interventions are: grain bank, \$9.087 million, natural forest management, \$646,980; sesame production \$468,819; and deferred grazing, \$9,023.

4.5.6 Technical Initiatives in Range and Natural Resource Improvement

The improved practices and technologies utilized in the Range Management Strategy are:

- improved grazing management techniques, especially fire control;
- natural resource education programs for villagers;
- living fences and/or improved grazing area protection;
- conservation farming practices including contour bunds, diversions, gully structures, grass strips and waterways and contour plowing;
- natural forest management;
- hay harvesting in waterways and forests;
- improved hay storage and feeding techniques;

- increased fertilizer use;
- biological terraces;
- windbreaks;
- Village Association revolving loan funds;
- introduction of sesame seed production;
- introduction of sesame seed oil presses to Village Associations;
- introduction of grain banks to the Village Associations.

4.5.7 Training and Extension Requirements

Like the previous strategies, numerous organizations will be involved in providing extension advice to farmers and villagers. They are: Soil Water and Management Unit staff (soil and water conservation); Action Aid (Village Association revolving funds); Catholic Relief Services (sesame production and oil press operation); Canadian International Development Agency (rangeland fire control); Department of Livestock, International Trypanotolerance Centre and Peace Corps - African Food Systems Initiative (grazing management, fire control, rangeland and fallow lands improvement, animal health, improved animal feeding techniques); Department of Agricultural Research (grazing management, forage improvement, multiplication and reseeding, biological terraces); and Department of Forestry (field trees and windbreaks).

An important component of the Rangeland Management Strategy, as well as the other strategies, and one that is also a training activity, is to teach the benefits of natural resource management to villagers. The EEC, UNDP, and IUCN are agencies that should be called upon to initiate programs of natural resource education in village schools. In addition to formal education programs, there will be a considerable amount of learning about natural resources through the implementation of improved practices and experiential activities. Positive attitudes and a significantly better understanding about resource base improvement will come from experience gained in managing resources that provide a combination of short-term, direct economic benefits and long-term, direct and indirect benefits.

The government extension and NGO staff that are involved in working with villagers to disseminate improved practices and technologies will need training. This training will consist of in-country short courses in areas such as: range management, agro-forestry, livestock health, nutrition and management, draft animal management, soil and water conservation, crop production, conflict negotiation, natural resource education and accounting.

4.5.8 Organization - the Village Associations

As with the other strategies, a key feature of the Rangeland Management Strategy is to structure the supporting organizations, economic engines and incentives such that the villagers, herders and farmers perceive that they receive benefits from their efforts at improving the soil and vegetation resource base of their lands. Their perception of benefits will enlist their support in maintaining erosion control structures, stopping fires, improving

and controlling access to grazing lands, improving farming practices, and the numerous other natural resource base improvement activities.

The Village Association will be organized to handle funds, manage their resources, organize their labor and collect use fees for the resources that fall under their supervision. Action-Aid has extensive experience organizing village associations in using revolving loan funds and income generating activities in The Gambia. Other organizations can provide similar assistance.

Individual villagers will benefit directly through increased crop, fodder and livestock production, as well as through significantly increased opportunities for cash generating activities such as sesame production, hay sales, and wage employment in the various processing and marketing activities undertaken by the Village Associations.

4.5.9 Institutionalization Through Participation

Creating an organization that can maintain and expand the development activities of the villagers is an integral part of both sustainable development and improvement of the natural resource base. The institutionalization of village resource management will come about, in part, through the active participation of the Village Association in the revolving credit fund for purchasing fertilizer and animal health supplies, and grain storage bank, cash generating activities, collection of grazing fees, fire control, rangeland, fallow and forest improvement, production of forage seed material, and erosion control structure construction and maintenance. The empowerment of the Village Associations to derive cash benefits from communal resources (grazing fees, range and forest improvement, etc.), as well as from large-scale activities (fertilizer and veterinary supply purchases, sesame seed pressing, etc.) creates a strong local and traditionally-based institution which can continue the development process.

4.5.10 Policy Changes Called For

Some national and local policy changes are needed to set the stage for rural development and to ensure sustainability. Necessary national policy changes include: 1) providing financial incentives to village associations for natural resource improvement activities; 2) mandating demarcation of village boundaries and cattle access routes; and 3) permitting collection of grazing fees on improved and protected rangeland. Local policy changes will include: 1) different usufruct and land tenure arrangements for deferred grazing areas and improved and protected rangelands; 2) agreements on hay cutting and animal grazing in vegetated waterways and other soil conservation structures; 3) grazing restrictions on crop lands which need protection for species establishment; and 4) policies and procedures regarding fines and enforcement of national and local policies.

4.5.11 Necessary Strategy Changes

There are four important features that are integrated into the Rangeland Management Strategy: 1) changes and improvements are identified and interest in action is at the local level; 2) improvements are sustainable at the local level; 3) outside material and technical assistance is focused on materials and/or advice which villagers would have great difficulty in getting on their own; and 4) short-term benefits to individuals and villages are used to encourage the investment in long-term benefits that improve the natural resource base.

4.6 Research and Extension Approaches Needed to Support Natural Resource Base Improvement

4.6.1 The Adaptive Research Process

The SSRA showed that farmers and herders need new information to overcome the problems preventing them from conserving and improving their natural resource base. Generating such new information and making discoveries is the goal of the agricultural research process. Because a small country like The Gambia does not have abundant human and financial resources to conduct research, it is important that the research process

of most technically trained people, successful interdisciplinary collaboration takes time to develop.

4.6.2 Previous Adaptive Research in The Gambia

Adaptive research has been conducted by several agricultural projects in The Gambia. However, the process steps were often conducted intuitively and through observation and discussion rather than formal surveys and assessments. Examples of the process in The Gambia include: the introduction and testing of soil conservation structures by the Soil and Water Management Unit, the introduction of sesame seed production and processing to villages by the Catholic Relief Services, the introduction of new rice varieties and seed multiplication techniques by Save the Children Fund and The Gambia Agricultural Research Diversification project, the dissemination of improved maize cultivation packages by the Mixed Farming Project, and the introduction of beekeeping to villages by Action Aid.

4.6.3 Agricultural Research Topics

Agricultural research in The Gambia includes six program areas: 1) cropping systems and resource management which include work on soil fertility, intercropping and cropping rotations and fallow, alley cropping, tree species and soil moisture management; 2) grain legumes and oilseeds, including variety trials, disease and insect control and plant population and date of planting trials for groundnuts, cowpeas and sesame; 3) upland cereals, which includes mainly variety trials and some seed multiplication activities; 4) the rice program, including work on varietal evaluation, weed and fertilizer management and labor saving production practices; 5) animal traction research, which includes work with improved farm equipment; and 6) livestock research with small ruminants, horses, and feed, pasture and grazing land management.

A small amount of informal research is also carried out by the Department of Forestry, the Soil and Water Management Unit, as well as numerous NGO and donor projects. These efforts have not been assessed by the Action Program team, but are recognized as significant.

The above-mentioned research programs, when combined with past programs, as well as informal research done by individuals and NGOs provide a rich base from which to provide new information to farmers. Examples of recent innovations that have been tested and which need further dissemination are: anti-salinity barriers, short season maize and rice varieties, production potential of Leucaena and Stylosanthes forages, beekeeping, sesame seed production, natural forest regeneration, maize storage and preparation, contour plowing, grass waterways, contour strips, and new fertilizer recommendations for cereals and groundnuts. The list could be added to, but the point is that there are numerous new practices and technologies available to extend to farmers and herders throughout The Gambia.

4.6.4 Linkages With GOTG Extension, Community Development Workers and Other Rural Based Organizations

Research organizations and NGOs can mutually benefit each other and play complementary roles in the technology generation and dissemination process. Research workers are not organized to conduct the verification trials and demonstrations needed to generate interest and support from rural communities. Rural-based organizations are often in search of promising interventions to extend to farmers. Both sides have valuable inputs to provide in the development equation.

The Action Program team recommends seven collaborative activities for research and extension workers (including NGOs and PVO's) that will increase the flow of new technologies from the research and testing stages to the extension stage.

- o Researchers should work to increase the interdisciplinary thinking of NGOs and extension workers;
- o The economic and sociological ramifications of interventions should be discussed before they are verified in the field;
- o Extension workers and NGOs should receive technical backstopping from researchers;
- o Formal biannual meetings, memoranda of understanding, and program and planning reviews between research and extension workers and NGOs should be set up;
- o Field days should be organized so that the successful implementation of extension activities and research work is viewed by all parties;
- o Extension workers, NGOs and researchers should have opportunities to travel together to see successful research and extension programs in countries with similar agriculture and rural development problems;
- o Professional in the research and extension systems should review the results of farmer and extension assessments of field tested interventions and agree and assist each other to make any necessary modifications.

4.6.5 A Broader View of the Resource Base and Needs of the Rural Family

Most research and extension activities are directed towards making incremental improvements in a particular part of the overall farming enterprise. For interventions to be adopted, it is critical that farmers and herders see that, in the short run, they are better off with the changes being proposed. Otherwise, the incentive for change is weak. However, the incremental improvements should also be selected on the basis that they are sustainable and they improve the natural resource base upon which the family livelihood depends.

Thinking through the long-term implications of interventions and their effects should form an integral part of overall development strategy. NGOs, extension workers and researchers should be well aware of the policies and strategies for improving the natural resource base of their client farmers. Their work should be in harmony with the strategies being used to implement natural resource policies.

4.7 Policy Dialogue

Unlike many countries in the sub-region, legislation already on the books in The Gambia provides the basis for the implementation of strategies for sustained, improved natural resource management. A list of this legislation is available from the Forestry Department, and in first draft of this report (at the U.S. AID Mission in Banjul). It includes acts covering both forestry and wildlife conservation, as well as the Environmental Management Act passed in 1987.

Two types of policy dialogue are called for to implement improved natural resources management. The first will be devoted to encouraging implementation of these statutes. For example, Section 10(d) of the Forestry Regulations, 1978, allows for the responsible Minister, now the Minister of Water Resources, Fisheries, and Forestry to direct his staff to gazette (or demarcate) Community Forest Parks to come under local management authority. To date, this has not been done. It should be one of a series of steps necessary to control bush fires and increase the productive use of The Gambia's forest lands by conferring a sense of ownership on the de facto managers of most forest lands--the local authorities. Both of these goals, controlling fires and increasing productivity are enshrined in the GOTG's Indicative Program for Desertification Control. Of course, creation of Community Forest Parks should be carried out in the framework of locally negotiated land-use plans, such as the Foni Jarroll Conservation District, and co-management arrangements with the Forestry Department.

Another example of policy dialogue stressing implementation of existing legislation would be the gazetting of 500 hectares or a series of small (20-50 hectares) faunal reserves along the coast between Bufut and Gunjur to protect The Gambia's rich and extraordinarily varied local and migratory avian fauna. This fauna is one of the main pillars of the country's fledgling tourist industry and is likely to become a more significant source of foreign exchange in the future.

The second type of policy dialogue requires modification of current legislation. Examples include the creation of National Forestry and Wildlife Funds through modification of fiscal policy. Licenses, royalties, and fines from the forestry sector are split between the Local Area Councils (30%) and the Treasury (70%). It is a virtual certainty that if Producers Associations, Conservation Districts, or Parks boundary communities were organized so as to benefit directly from the management, conservation, restoration, and commercial exploitation of the nation's forestry resources and natural preserves, revenues could be increased. While the percentage allocations would have to be modified such that revenues from licenses, transit fees, royalties, and fines were shared amongst Producers Associations or Conservation Districts, the Village Area Councils, the Departments of Forestry and Wildlife, and the Treasury, local reinvestment of these funds in improved

management should, in the medium term, make up for the temporary loss of funds to the treasuries of the concerned institutions. Precedent for temporary cushioning of national institutions from the impacts of fiscal reform exists within the framework of the World Bank's Structural Adjustment Program and USAID's Economic and Fiscal Policy Reform Project.

4.8 Donor Coordination

Indications of ongoing activities supported by the donors are contained in the annual GOTG Estimates of Recurrent Revenue and Expenditure and UNDP's Development Co-operation. According to the UNDP's estimates of total assistance to The Gambia by sector in 1987, NRM related funds were distributed as follows:

<u>Sector</u>	<u>Technical Assistance</u>	<u>% of Total</u>	<u>Capital Assistance</u>	<u>% of Total</u>	<u>Total Assistance</u>	<u>% of Total</u>
Natural Resource	2.262	8.6	3.502	3.0	5.764	4.1
Agriculture, Forestry & Fisheries	9.061	34.7	20.494	17.8	29.555	20.9

While these figures appear to indicate ample levels of support, it should be pointed out that those for Agriculture, Forestry and Fisheries include structural adjustment credits. The budget breakdown (not shown above) shows that most financial support goes to capital improvements, although the greater need is for strategic extension, credit, and technical training.

Only the RFA, the EEC, UNSO and USAID, among the major bi- and multilateral donors, are funding or contemplating projects with a NRM emphasis (functionally defined in this report as soils, water, vegetative cover and biodiversity management). The UNSO work includes the diffusion of improved woodstoves and improvement of livestock grazing. Other UN projects are in the area of groundwater and livestock development and support to agricultural research, planning, and monitoring. Japanese technical assistance emphasizes improvements to fisheries.

To date, the efficacy of donor coordination has been hampered by limited interdepartmental coordination and a checkered pattern of commitment to a coordinated natural resources management strategy among donors. In the IPDC, the GOTG calls for more holistic, yet decentralized, management strategies while government departments continue to vie for sectoral improvements in donor support. Coordinated donor effort is necessary to reinforce the political will of the GOTG so that they can test and implement policy changes that move from an imbalanced enforcement approach to a user fee and sustained use approach.

An important area for donor coordination in natural resource management is to encourage policy dialogue and institutional and financial reform. The GOTG has accommodated environmental changes in its code revisions. Implementation of code revisions has proven to be more difficult because of the administrative structure of institutional incentives. Some donors (e.g., the FRG) have been able to negotiate what are essentially policy easements for their areas of project intervention. If localized reforms are to be institutionalized, one of the donors should take the lead in coordinating more consistent efforts.

A second major area for donor coordination should be joint monitoring and review of the implementation of the IPDC and, eventually, the Local Management Strategies. Because the IPDC and Local Management Strategies are intended to develop models of broader application, donor roundtables with the GOTG should become regular affairs. These meetings should serve to examine both technical approaches and implications of the results of Local Management Strategies with a view to additional donor assistance.

4.9 Training Needs

In the next 10 years, long-term, short-term, and in-country, in service training is required to improve the capacity of GOTG cadre to plan, implement, extend and monitor improvements in natural resource management. Two main types of training required are: a) technical training in key disciplines; and b) training in adaptive research and extension.

Table 4.9 presents the projected needs of those Ministries primarily involved in NRM activities. Donors need to insist on enforcement of GOTG regulations requiring five years of post-training service from cadre receiving training.

Oxford, Ibadan, Dar Es Salaam Universities, and the University of Idaho are appropriate destinations for training in forest management. The University of Arizona's program in renewable natural resources and natural arid lands studies, Utah State University's program in agricultural engineering and water resources management, Colorado State University's Program in range management, and Oklahoma State's program in conservation are other possible destinations. A number of British Universities may also be appropriate destinations. The forestry programs at the Universities of Ibadan and Dar Es Salaam, and the irrigation engineering and water resources management at Hassan II University in Morocco have good reputations among third country training programs for non-degree training. For wildlife and parks management, the Mweki School in Tanzania, Garoua in the Cameroon (if bi-lingual programs are still offered), and the Kenya National Parks system are appropriate destinations for Gambians who will manage the National Parks. Suggested destinations for short-term trainees include ICRAF in Kenya, Hassan II, and IITA in Nigeria among other possibilities.

Table 4.9

Manpower Development in Natural Resources Management 1990-2000

Level/ Number	Subject	Potential Sites	Cost (\$)
(Two-Year Degree Programs)			
M.Sc. 4	Forest Management	U. Idaho; NC State; Oxford	260,000
M.Sc. 3	Social Forestry	Yale University	100,000
M.Sc. 3	Wildlife Mgmt.	Mweki, Tanzania; Garoua, Cameroon	69,000
M.Sc. 1	Parks Management	Mweki; Garoua	20,000
M.Sc. 2	Arid Lands Ecology	University of Arizona	130,000
Sub-total			579,000
(Four-Year Degree Programs)			
B.Sc. 8	Forestry	U. Idaho; U. Ibadan Dar Es Salaam	450,000
B.Sc. 4	Ecology	U. Arizona; Oklahoma State	200,000
B.Sc. 4	Ag. Engineering	U. Arizona; Neb U. Tr. Sch.	200,000
B.Sc. 2	Soil Scientists	Nebraska U. Trade School	100,000
B.Sc. 2	Ground Water	Utah State University	100,000
B.Sc. 2	Range Management	Utah State, Colorado State	100,000
Sub-total			1,150,000
(Two-Year Non-Degree Programs for Higher Diplomas)			
10	Forestry	U. Ibadan; U. Dar Es Salaam	250,000
4	Parks Management	Mweki, Kenya National Parks	200,000
16	Conservation Techs	Nebraska U Trade School	800,000
Sub-total			1,250,000

Table 4.9

**Manpower Development in Natural Resources Management 1990-2000
(continued)**

(Short-Term Training - Six to Ten Weeks)

12	Forestry, forages & soil and water mngmt topics	ICRAF; IITA; Oxford	72,000
10	Ten-week guided tour of SCS District practices		48,000
8	Swamp and tidal rice agronomy	WARDA, Monrovia; IITA	72,000
8	Irrigation	Hassan II U, Morocco	72,000
		Sub-total	264,000

(In-country Training Seminars)

It is recommended that about sixty in-country training seminars be held. Possible training locations include: The Gambia College Department of Communications, The Gambia College Development School, and the Management Development Institute. Each course should last about two weeks and provide experiential training for 10-20 participants. The total budget for these in-country training seminars is \$1,440,000.

The total budget for all recommended natural resource related training is US\$5,000,000.

In-country seminars should be offered in soils and water conservation by the U.S. Soils and Conservation Service based on its extensive experience in the Gambia, the WWF/IUCN based upon experiences in Youvarou, Mali and Niger, and the experiences of individual consultants.

In addition, donors should fund visits by the Gambian Department of Community Development, Agriculture and Forestry extension agents and possibly farmers to successful model sites in neighboring countries, e.g., Niger (CARE and Guesselbodi agro-forestry initiatives); and Burkina (OXFAM soil and water conservation initiatives).

Key participants targeted for in-country seminars and workshops include technicians associated with the departments of Forestry, Agriculture, Community Development, Water Resources, and Livestock Services, as well as national and expatriate PVO/NGO field staff.

A nationwide program of environmental education modelled after the programs initiated in Kenya and Mali by the International Union for the Conservation of Nature and the World Wildlife Fund is needed. Foreign volunteers, such as Peace Corps, UN, and volunteers of other nationalities could be called upon for curriculum development and teaching. Such a program should target primary and secondary schools and residents in areas adjacent to The Gambia's national parks. Such a program should be instituted in conjunction with a publicity campaign encouraging citizens to visit their parks, and a Parks policy of open admissions to Gambian citizens.

4.10 Technical Assistance

The NRM team emphasizes the need for two types of technical assistance to improve natural resources management in The Gambia over the next ten years. The most critical need is for sound, anthropologically-informed expertise in all branches of extension, especially for trainers of trainers. Donor-financed training programs are almost exclusively devoted to providing technical training. While important, technical training fails to equip technicians with the skills necessary to extend and adapt known technologies, such as those identified by the Sahel Sub-Regional Assessment, to the farmer.

The second requirement is for technical assistance in the area of natural resources planning and monitoring. The Project Planning and Monitoring Unit of the Ministries of Agriculture and Water Resources, Forestry and Fisheries is understaffed and neither the SWMU nor the Forestry Department, for example, have the cadre needed for this type of work (the MWRFF is now considering establishing its own planning and monitoring unit but the staff are trained in narrow technical specialties). What is needed is not so much natural resources technicians as senior ecologists, social foresters, economists, and others with a multi-disciplinary orientation who are capable of developing a broad range of indicators of processes and impacts.

4.11 Monitoring and Modifying the Program

The GOTG and donors have made substantial investments in the livestock sector. There is an evolution within the livestock services towards a better balance of effort between animal health and animal production, privatization and cost recovery from animal health services, and sedentarization of livestock through integration in farming systems. The livestock, range and use conflict issues are important ones and need more study. A few projects and programs (GARD, ITC, EEC Upper River Division Project) are grappling with these issues and testing interventions in pastoral systems. These experiences need to be monitored over time and an evaluation made of promising interventions.

Fisheries is another area where the production environment and organization of the industry have been changing rapidly (SCAN-GAMBIA, equipping of specialized fishing village centers) and these experiences are in need of monitoring.

Although a forage management strategy has been developed in this Action Program, the basic recommendation in the areas of fisheries and range management is that the search for successful interventions should continue. Reinforcement of field studies to

generate primary data and applied research are needed to develop action program strategies in areas where livestock or fisheries are a dominant economic activity.

The underlying principal of the Action Program is that it is based on increments to existing practices which promise sustained returns from local investment. As new techniques or organizational practices prove themselves, they should be added to the Action Program. In practice, the identification of successful techniques will take place as projects are implemented and applied research tests new ideas off the research stations. Perhaps the best way to institutionalize the monitoring and adjustment process is to train technicians and managers at several levels in natural resource management approaches. Over the near term, this effort will need to be seconded by monitoring of the IPDC program overall which should be done by some national structure within the Ministries, perhaps the PPMU.

The GOTG will wish to develop a set of indicators for monitoring natural resources. Baseline data have been collected by the Land Resources Division/German-Gambian Forestry Project, the OMVG, and the SWMU. The Action Plan developed for USAID/The Gambia contains a number of suggestions for NRM monitoring indicators as does the RONCO study done for the OMVG.

The less formal forum of GOTG and donor roundtables is a less costly option for the monitoring and adjustment of donor strategies for sustainable improved NRM in The Gambia.

Annex 1. Scope of Work Cable

APPR:	JG	<i>JG</i>
DRAFT:	MM	<i>mm</i>
OTHER:	AH	<i>AH</i>
OTHER:	TH	<i>TH</i>
OTHER:		---

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AID/AFR/TR/ANR:AHOGAN
AID/AFR/SWAF YJOHN {DRAFT}
AID/S&T/FE GALLEGOS{INFO}
AID/AFR/TR/ANR:JGAUDET{INFO}

AID/AFR/TR:THOBGOOD
AID/AFR/DP:ESIMMONS {INFO}
AID/AFR/PD:JSCHLESINGER{INFO}
AID/AFR/PD:KREINTSMA{INFO}

ROUTINE BANJUL

ROUTINE ABIDJAN

AIDAC ABIDJAN FOR REDSO/WCA FOR J. GOODSON

E.O. 12356: N/A

TAGS:

SUBJECT: ACTION PROGRAM AND ACTION PLAN FORMULATIONS IN THE GAMBIA

REF: {A} FAX JALLOW-ABEL OF 1/24/89 {B} DRGA -MCGAHUEY
TELCON OF 1/30/89 {C} BANJUL 00056

1. AS PER REF {A} PROPOSED ACTION PROGRAM ACTIVITIES ARE SCHEDULED FOR FEB. 5 - 25, 1989. TEAM MEMBERS AND ETA'S ARE AS FOLLOW:

- MR. EDWARD KARCH, TEAM LEADER-- 4:25 AM, FEB. 5
- DR. ERIC ARNOULD, SOCIOLOGIST-- 4:25 AM, FEB. 5
- DR. CHRIS SEUBERT, AGRONOMIST-- 6:35 PM, FEB 5 ON NIGERIAN AIRWAYS

TEAM MEMBERS APPRECIATE CONFIRMATION AT HOTEL FAJARA AND BEING MET AT AIRPORT AS PER REF {A}

2. AS PER REF {C}, TEAM WILL DEVELOP A COUNTRY NRM ACTION PROGRAM AND ASSIST THE MISSION TO DEVELOP AN ACTION PLAN. IN DEVELOPING THE ACTION PROGRAM, THE TEAM

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WILL USE THE SAHEL SUB-REGIONAL ASSESSMENT AND OTHER DOCUMENTS AS THE DATA BASE TO DEVELOP A LONG-RANGE STRATEGY FOR SUSTAINABLE DEVELOPMENT. BASED ON THE ACTION PROGRAM, THE TEAM WILL DEVELOP A MISSION NRM STRATEGY BASED ON CURRENT AND PLANNED PROJECTS AND PROGRAMS.

3. AFR/TR/ANR REQUESTS THAT THE MISSION CONTACT GOG OFFICIALS IN THE DEPARTMENTS OF AGRICULTURE, FORESTRY, AND LIVESTOCK TO MEET WITH TEAM MEMBERS ON A REGULAR BASIS IN ORDER TO DISCUSS THE WORKING ASSUMPTIONS UPON WHICH THE ACTION PROGRAM IS DEVELOPED. IF POSSIBLE, THE TEAM WOULD LIKE TO MEET WITH GOG OFFICIALS EARLY IN THE FIRST WEEK.

4. PROPOSED SCOPE OF WORK FOR ACTION PROGRAM.

A. GENERAL. THE TEAM WILL DEVELOP A LONG-RANGE NRM ACTION PROGRAM AIMED AT ESTABLISHING SUSTAINABLE SYSTEMS THAT PRODUCE INCREASED YIELDS OF FOOD, FORAGE, WOOD, AND OTHER NECESSITIES AND THAT CONSERVE/CREATE HABITATS TO FOSTER BIOLOGICAL DIVERSITY. THE TEAM WILL BASE THE ACTION PROGRAM DEVELOPMENT ON THE FOLLOWING PNRM PRINCIPLES:

- FOCUS ON SUSTAINABLE MANAGEMENT OF SOIL, WATER AND VEGETATION;
- INTEGRATES NRM AND AGRICULTURAL DEVELOPMENT CONCERNS;
- PLANS FOR DEVELOPMENT OF HUMAN RESOURCES, POLICY FRAMEWORK, AND AN INSTITUTIONAL BASE THAT SUPPORTS NRM ACTIONS;
- DEVELOPS OPTIONS FOR COVERING RECURRING COSTS FROM SUPPORTING NRM ACTIONS;
- STRENGTHENS DONOR COOPERATION AND COORDINATION;
- STRENGTHENS GOG AND LOCAL CAPACITIES TO SUSTAIN NRM ACTIONS; AND,
- ADDRESSES WAYS AND MEANS TO MOBILIZE THE LARGELY UNTAPPED RESOURCES OF WOMEN IN RURAL DEVELOPMENT.

B. INITIATIVE MATRIX. THE TEAM WILL DEVELOP, IN MATRIX OR CHART FORM, A LIST OF INITIATIVES IDENTIFIED IN THE SSRA AND OTHER SOURCES THAT CREATE LOCAL CONDITIONS CONSIDERED NECESSARY FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT. THE MATRIX WILL INCLUDE THE LOCATIONS FOR EACH INITIATIVE OBSERVED. INITIATIVES SHOULD BE LISTED UNDER THE FOLLOWING CATEGORIES {AMONG OTHERS}:

-RESOURCE TENURE POLICIES THAT INCREASE THE INCENTIVE FOR FARMERS AND VILLAGERS TO INVEST IN MANAGEMENT OF SOILS, VEGETATION, AND HABITAT;

-TAX POLICIES THAT INCREASE INCENTIVES FOR LOCAL NRM INVESTMENTS;

-INSTITUTIONS, BOTH PUBLIC AND PRIVATE, THAT SUPPORT LOCAL NRM INVESTMENTS;

-EXTENSION AND TRAINING METHODS THAT ALLOW FARMERS AND NATIONAL OFFICIALS TO MAKE INFORMED DECISIONS ABOUT ADOPTION OF NRM PRACTICES AND POLICIES;

-FINANCIAL STRATEGIES TO ASSIST FARMERS AND VILLAGERS TO MAKE LONG-TERM INVESTMENTS IN SOIL PRODUCTIVITY, AND VEGETATIVE COVER; AND,

-TECHNOLOGIES APPROPRIATE FOR SUSTAINED IMPACTS ON SOIL FERTILITY, SOIL AND MOISTURE CONSERVATION, VEGETATION MANAGEMENT, AND CONSERVATION OF HABITATS THAT PRESERVE GERM PLASM.

C. LONG-TERM STRATEGIES. TEAM WILL ORGANIZE ABOVE DATA INTO COHERENT, INTEGRATED STRATEGIES FOR AGROECOLOGICAL ZONES THAT MEETS THE PNRM PRIORITY CRITERIA. THESE STRATEGIES WILL SPAN A 20-YEAR TIME FRAME AND INCLUDE WAYS TO PAY FOR RECURRING COSTS. THE TEAM WILL CONDUCT COST-BENEFIT ANALYSES FOR EACH STRATEGY ON AN INTERACTIVE SPREAD SHEET PROGRAM. DURING THE DEVELOPMENT OF THE ACTION PROGRAM, TEAM MEMBERS WILL SEEK FEEDBACK FROM GOG OFFICIALS, OTHER DONORS, AND NGOS TO DEVELOP AND TEST THE WORKING ASSUMPTIONS AND HYPOTHESES UPON WHICH THE ACTION PROGRAM IS DEVELOPED.

5. PROPOSED SCOPE OF WORK FOR COUNTRY NRM ACTION PLAN. THE TEAM WILL WORK WITH THE MISSION TO FOCUS THE RESOURCES OF THE CURRENT PORTFOLIO ON MISSION AND NRM GOALS AND TO DEVELOP THE NRM SECTION OF THE CDSS. AFR/TR/ANR REQUESTS THAT THE TEAM HAVE THE OPPORTUNITY TO WORK WITH THE MISSION'S PROGRAM OFFICERS IN DEVELOPING THE ACTION PLAN.

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Annex 2. Criteria and Intervention Menus For Sustainable Development in The Gambia

Criteria and Menu of Options	Case Examples
I. Biophysical	
A. Soil Fertility Improvement	
1. Deep cycling by field trees	
2. Manure management	
3. Shallow cycling by crop residue	
4. N fixing <i>Leucaena</i> in upland depressions	GTZ
5. Mineral fertilizer	CRS
6. Rotating protected fallow zones	
B. Soil and Moisture Conservation	
1. Contour berms	SWMU
2. Windbreaks	
3. Living hedges	
4. Micro-catchments	
5. Erosion checkdams	SWMU
6. Vegetative bands	SWMU
7. Salt intrusion dams	SWMU, FFHC, STC
8. Water retention dams	FFHC, STC
C. Improved Management of Vegetative Cover	
1. Natural Forest Management	GTZ
2. Village tree plantations	USAID, EEC
3. Sacred woods	indigenous
4. Improved wood stoves	GOTG, UNSO, STC
5. Fruit orchards	STC, CRS, Methodist Mission
6. Fruit tree/cereals intercropping	GARD
7. Polewood intercropping in upland depressions	
8. Village conservation districts	SWMU
9. Guards	
10. Natural resource mapping	OMVG, SWMU, GTZ
11. Crop diversification	CRS, GARD
D. Biodiversity	
1. Natural forest management	GTZ
2. Sacred woods	indigenous
3. Native fruit species	GOTG, Methodist Mission

- | | | |
|-----|---------------------------------------|------------------------------------|
| 4. | Village arboretum | |
| 5. | National parks | Abuko, Kiang West,
River Gambia |
| 6. | Pedagogy | |
| 7. | Use covenants | |
| 8. | Germ plasm movement (sesame, cowpeas) | GARD, STC |
| 9. | Species reintroduction (fonio) | GARD |
| 10. | Beekeeping | Action-Aid |
| 11. | Cola nut grafting | CRS |

II. Extension and training systems that allow farmers to make informed decisions about adopting strategies for sustained development

A. Gambia

- | | | |
|----|--|---|
| 1. | Soil management infra-structure | SWMU |
| 2. | Fruit tree propagation | CRS, STC, Methodist
Mission & Action-Aid |
| 3. | Natural forest management | GTZ |
| 4. | Management Development Institute (short courses) | SWMU |
| 5. | Sponsored visits (Gambian farmers to north. Senegal) | GTZ |
| 6. | Sesame cropping/oil extraction | STC |
| 7. | Simple accounting procedures | FFHC, STC, CRS,
Action-Aid |

B. Other

1. Farmer-to-farmer visits for extension through field days
2. Farmer leaders for extension of woodlots
3. Pilot actions for extension of water catchments

III. Financial strategies to assist farmers and villagers to make long-term investments of capital and labor in soil productivity, water conservation, and vegetative cover

A. Gambia

- | | | |
|----|---------------------------|-----------------|
| 1. | Land reclamation projects | SWMU, FFHC, STC |
| 2. | Orchard gardens | NGOs |
| 3. | Sesame production | CRS |
| 4. | Cereals banks | CRS, FFHC |
| 5. | Beekeeping | Action Aid |
| 6. | National Park development | |

B. Others

1. Village grain banks for establishment of water catchments and agro-forestry in Yatenga
2. Village "tons" grain banks in Mali for check dams and contour dikes
3. Multi-village woodcutter's association in Guesselbodi, Niger
4. Multi-purpose Koumpentoum village "entente", Senegal
5. Women's Fire Brigade, Bignona, Senegal

IV. Provision of tax and tenure incentives for farmers participating in local NRM investments

A. Gambia

?

B. Other

1. Djenne, Mali, private gardener
2. The "Bouna" agreement, Niger
3. Government of Niger agreement at Guesselbodi
4. Government of Niger agreement at Maggia valley

V. Strengthening public and private institutions that support participating farmers

A. Gambia

1. NGO/PVO on-the-job training for Village Extension Workers (VEW) and Community Development Agents (CDA)
2. GTZ training for agents in natural forest management
3. Donor training programs for SWMU and Forestry Department
4. USAID-sponsored fiscal reform of agriculture pricing policy
5. NGO/PVO accounting training to village management committees

B. Other

1. Supporting extension under the village reforestation project, Mali
2. Providing village-based technical assistance to villages participating in Koumpentoum "entente", Senegal
3. Woodcutters cooperative trained in accounting by CLUSA/NCBA at Guesselbodi, Niger
4. Agents trained in forest land use planning (Niger)

Annexes 3-6

- Annex 3. Mixed Farming Strategy Cash Flow Analysis**
- Annex 4. Natural Forest Management Strategy Cash Flow Analysis**
- Annex 5. Biodiversity Protection Strategy Cash Flow Analysis**
- Annex 6. Range Management Strategy Cash Flow Analysis**

Annex 7. Significant Legislation Related to Natural Resource Management

Legal Situation: the most important laws related to natural resource management are:

A. Legislation and Regulation - Land Use

1. Land (Provinces) Act - 1966
 - Section 6 - Protection of Forests and Trees
 - Section 24 - Acquisition of Land for Public Purposes
- Subsidiary Legislation
 - Provinces' Lands Regulations (1952)
 - Provinces' Lands Protected Tree Regulations (1952)
 - Declaration of Forest Parks (1952-1954)
2. Local Government Act - 1963
 - Subsidiary Legislation:
 - Basse Area Council Rhum Palm Conservation By-laws (1965)
 - Kombo St. Mary Palm Wine (Sale & Purchase) Regulations (1947)
 - Kerewan Area Council Fire Precaution & Fire Insurance By-Laws(1966)

B. Legislation and Regulations - Forestry

1. The Forest Act, 1977
2. The Forest Regulations, 1978

C. Legislation and Regulations - Wildlife

1. The Banjul Declaration, 1977
2. The Wildlife Conservation Act, 1973
 - The Wildlife Regulations, 1978
 - Subsidiary Legislation
 - The Wildlife Conservation (Sale) Regulations, 1977
 - The Wildlife Conservation (Extension to the Abuko Nature Reserve) Order, 1978
 - The Wildlife Conservation (the River Gambia National Park) Order, 1978
 - Kiang West National Park Order, 1987 (Legal Notice Number 10 of 1987)

D. Legislation and Regulations - Environment

1. National Environmental Management Act, March 1987

The Conservator of Forests has substantial power to modify licensing, fining and other rules established by the Forest Act and Regulations. Regulations are enacted by the responsible Minister, while Acts can only be changed and enacted by the Cabinet. An extremely significant regulation is contained in section 10d of the Forest Act, 1977 which states that a forest park can also be declared for the particular use and benefit wholly or in part of any class of persons or for the benefit of any community.

Annex 8. Approach and Conditions for Sustainable Development

8.1 The Sahel Sub-Regional Assessment (Sahel Sub-Regional Assessment) Perspective

The Action Program for The Gambia defines the conditions for sustainable development from two perspectives. They are the Sahel Sub-Regional Assessment and the Congressionally-mandated perspectives. The Sahel Sub-Regional Assessment looked for evidence of institutionalization of the interventions--techniques which were integrated or being folded into the behavior of resource users. The successes included both single actions--half-moon micro-catchments for revegetation, for example--and combinations of technical interventions with organizational approaches to conflict resolution and local modification of the usufruct laws by the national forest service--the Guesselbodi, Niger example of degraded forest restoration, coppice management, micro-catchment based forage crop production and negotiation of access and use of forest reserve land in exchange for adherence to a well-defined management plan.

The empirical successes were analyzed financially to estimate the costs, benefits and risks to producers. Strategies were then built from menus of options identified in the Sahel Sub-Regional Assessment combining the technical, organizational and financial approaches which appear to offer the best chances for broad local diffusion and which could, over a twenty-year period, stabilize and improve the productivity of the farm, pasture, or forest resource base in the semi-arid and sub-humid zones of the Sahel. The strategies are flexible implementation frameworks which permit variations in scale and in the selection of the precise techniques included (See chapter 4). These strategies were then presented to USAID, the GOTG, other donors and members of the NGO community for their reaction and comments. The discussions reinforced the findings of the Sahel Sub-Regional Assessment that understanding a set of priority conditions for sustainable development is key to the selection of activities which are capable of being absorbed by local communities over time

Macro-environmental perspective of the Congressionally-mandated assessment of tropical forestry (FAA 118) and biodiversity (FAA 119). This perspective drives a search for initiatives which were likely to have the greatest effect on the productivity of large environments and afford protection of the habitats holding the country's major reserves of endemic plant and animal species--the Abuko Reserve, Baboon Island and Kiang West National Parks, and other preservation and conservation sites. The 118/119 assessment also used the Sahel Sub-Regional Assessment criteria for sustainable development to screen on-going activities and proposed actions.

8.2 Environmental Conditions for Sustainability

The Sahel Sub-Regional Assessment survey identified the following environmental criteria for determining if conditions for sustainability exist:

- 1) soil fertility is improved or further degradation halted;
- 2) soil humidity is increased or the quality of water available is improved;
- 3) vegetative cover is increased, especially with plants that help stabilize soil, improve soil fertility or enhance water capture and use;
- 4) the habitat supporting the endemic biodiversity of an area is improved or maintained or, if the habitat cannot be reasonably protected, that salvage collections of species be made and maintained for future use.

Guiding principles for specific selection of actions include optimization the use of locally-available materials, local organizational forms and management skills, reducing capital outlays and reducing recurrent maintenance costs.

8.3 Sub-Humid Zone Objectives, The Gambia

In The Gambia and throughout the Sahel, this zone includes a higher frequency of cash crops, higher existing vegetative cover, generally higher potential risk for water erosion and soil leaching and increasing integration of crop and livestock activities through animal traction than the semi-arid zone.. Principle NRM objectives are:

- o Near-term: substantially greater use of manure and compost in combination with crop rotation, fertilizer use and soil and water erosion control to increase crop yields;
- o Medium-term: increased production of wood from living hedges, field trees, windbreaks, and forest areas, greater control of run-off and erosion over sub-watershed areas and more widespread improvement in the condition of animal traction animals; and,
- o Long-term: reduced pressure to clear forest lands, increased life span of crop fields, decreased risk of crop failure due to droughts, greater productivity of forest lands, and higher livestock carrying capacities.

8.4 Institutional Development Issues

The Sahel Sub-Regional Assessment presents cases of many initiatives which have worked locally, where donors or PVO/NGOs have concentrated resources and made substantial time commitments to programs. In some cases the initiatives have spread over time to larger areas e.g., the Majjia wind breaks in Niger, improved cookstoves in Mali. The major institutional challenge for the Action Program is the identification of the broader implementation vehicles for widespread diffusion of the Local Management Strategies which can be maintained with low or no investment external to the country.

The public sector does not have the institutional capacity to implement resource protection measures on a scale sufficient to have a major impact on the Sahelian environment. The findings of the Sahel Sub-Regional Assessment show that increased local management responsibility can improve natural resources management. The Gambian government has made public statements calling for increased popular participation in

development activities and decentralization of decision-making authority to local levels. Progress towards achieving the twin long-term institutional goals of decentralized and sustained natural resources management is discussed below.

8.4.1 Decentralization of Authority

While the state will always play the key role in determining the management policies and enforcement of common property use, the most viable level for autonomous public management is, in most cases, the historical seat of social cooperation. Key resource managers include the household, the lineage, kafo (age group), village groups united behind the alkalo and senior age grade, herder fractions or, possibly, the Village Area Council. Further, sustainability of NRMS interventions will depend upon obtaining the official sanction, support and, in some cases, enforcement by District, and Divisional units of government Departments and territorial administration.

The most practical means of achieving autonomous local management have been the further devolution of taxing, spending and resource management authority to the various local levels (i.e., the watershed, the village and below) in the long term (10 years). The likely target organizations are Producers Associations which may develop from the kafo age grades or work groups with membership across traditional caste groups. The development of local NGOs (like those in Senegalese and Malian villages) and/or Conservation Districts is also a possibility.

The best local point(s) of institutional attachment for implementation of NRM strategies will vary according to the following major points:

- o Ethnicity;
- o Political Complexity;
- o Resource Concentration and Overlapping Resource Claims;
- o The Role of Women as Resource Managers;
- o Village Structure and Local History.

The Sahel Sub-Regional Assessment showed that successful natural resources management activities were able to provide economic incentives for organization which frequently overcame the socio-cultural complexity of an area.

Sustained donor support for investment in, and negotiation of, natural resources use management interventions at the level of the natural watershed or District is the best compromise approach for the short and intermediate term (5 years). The devolution of NRM authority will be an interactive process based upon demonstrating success and asserting responsibility for resource use management. It will not be without conflict as, for example, in the revision of Forestry Regulations concerned with licensing, taxation, royalties, and fine structure. If an alternate system gives tax or licensing power to local authorities in some forest areas, as has occurred in neighboring countries, overall receipts would probably go up, permitting greater allocation of fees to support local forest agent activities. However, it is also likely that in some cases, abuse of co-management agreements will occur and a combination of intensive policing and education activities triggered to correct these abuses.

8.4.2 Training

A sustained, iterative training and skill transfer effort at the local level is a key element of improved resource management capabilities for the long run. The range of available NRM techniques inventoried by Sahel Sub-Regional Assessment is not yet widely known by researchers, project implementors, local technicians or farmers. Similarly, the importance of an economic motor to sustained NRM success is understood by few. Consistent with the opinion of some NGOs, donors and factions in the GOTG, successful NRM will require that the narrow sectoral focus of technical services as well as the local producers organizations be broadened in the long term.

Support for revision of curricula and training of forestry and other technical personnel is necessary. Similarly, upgrading the technical capacity of services and local organizations is a necessary part of the institutional reforms required to implement successful resources management strategies. Basically, local technical services must be able to: a) deliver required inputs and advice on time; and b) assure regular follow-up of jointly-managed activities. Many NGOs as well as village associations fault the technical services on this count. For their part, the services fault the donors, and NGOs for leaving them out of planning and implementation activities which would improve their technical capacity.

8.4.3 Legislative Reform

Support for reforms of the Forestry and Wildlife Regulations and the Environmental Management Act in The Gambia, which provides for a transfer of management responsibility into local hands (via partnerships between government, the citizenry and aid organizations), is a necessary component of long-term, improved resource management strategies. Ways of accomplishing this include the development of model sites (e.g., the Conservation Districts), donor round table discussions, and sustained policy dialogue.

8.4.4 Reorienting the Field Services of the Forest Department

Donor pressure to divide the Forest Department into production/extension and enforcement branches on a national scale, and a major strengthening of the latter may be a useful step which donors should support towards the lifting of institutional constraints to improved NRM in The Gambia.

8.4.5 Conflict Resolution

Conflict resolution activities undertaken by agents of the public sector will take on increasing importance in coming years, but conflict negotiation remains as yet underemphasized and under-funded. As the environmental crisis in the Sahel has worsened, so have the potential conflicts between competing interests: between farmers and agro-pastoralists, between local herders and migrants, between merchants, local groups and the state, not to mention the conflicts between agriculture and wildlife driven from their natural habitats and now threatening dwindling agricultural output.

The successful negotiation of local land use and planning agreements is a key element for assuring long-term sustainable resource use. Realization of such agreements involves identifying resource users (villagers, herders, others) and uses, negotiating

consensual agreements at the customary level among traditional authorities as well as with technical services and Village Area Councils, formalizing these agreements at the administrative level (District, Division, Nation) and, finally, providing support and incentives for enforcement. Some examples have been reported in Mali by the IUCN in Yuvarou, and CECI, a Canadian NGO in the Niore de Sahel region (notably along transhumant corridors), as well as by CARE in the Majjia Valley, and the Guesselbodi project, both in Niger. Study of these activities for lessons that may apply in The Gambia, notably around Baboon Island National Park, and the Forest Parks is worthwhile. The primary lesson of the IUCN project in Youvarou, Mali is the need to work with fishermen, farmers and herders to determine sustainable and equitable means of allocating the scarce water resources and land rights in the complex ecosystems of the inner delta.

8.4.6 Choice of Institutional Development Model

Local institutional development can follow two models. One is the Conservation District model which assumes a fixed population exploiting a spatially-delimited resource base. The other is a resource-focused management model which assumes a cyclically-fluctuating resource base which serves different human purposes at different points in time. This model is appropriate for seasonal for transhumant pastures and corridors. Appropriate management institutions for these two situations will differ.

8.4.7 Recommendations

Currently donors do not systematically supports efforts in these areas. What is required is an effort to systematically pursue NRM goals through adjustments in activities within current project portfolios and maximizing new opportunities within upcoming project activities.

In the short-term:

- o Encourage the GOTG to reinforce the Forest Service Divisional and District extension and production branches;
- o Integrate indigenous and expatriate NGOs as well as government agencies and institutions into the execution of natural resources management initiatives;
- o Monitor ongoing resource use and conflict resolution strategies;
- o Assist project-executing agencies to implement the proposed NRMS strategies through partnerships between the NGOs and government technical departments.

In the medium term:

- o Support the implementation of current environmental legislation;
- o Support improved training and curricula of forestry and other extension personnel;

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- o Upgrade technical and delivery capacities of technical departments and local organizations (management information systems, cooperative training, accounting, credit management, conflict resolution, environmental education, etc);
- o Support investment, negotiation and natural resources management interventions at the level of the District, Conservation District, Village Area Council, or Village as the best compromise position for the intermediate term.

Over the long run:

- o Alter institutional incentives for individual and Divisional performance within the Forest Department to higher sustained returns from improved resource management;
- o Through policy dialogue, support revisions of the Forestry Regulations and development of local land use codes which optimize local authority over resources;
- o Extend some variant of the Conservation District model widely through the country from the case examples.

8.5 Policy

8.5.1 Policy Reform Priorities

There are two recommended policy reform priorities: local resource management rights, and implementation of existing legislation.

The single most important public policy issue is that of resource tenure. Land tenure is ill-defined in all four Sahel Sub-Regional Assessment countries. Farmers enjoy use rights only, within the bounds of traditionally-defined land use practices governed either at the village or district levels. Legal title to the land resides in the public domain, in practice the State, and there is no formal protection to landholding. As we have seen, however, environmental crisis has created the need to invest in improvements to the land base to protect it from degradation. Insecurity of tenure reduces the incentive to make such investments. Heightened conflict for resources has further reduced the security of tenure for smallholder. Finally, as communal organization is overlaid with more impersonal structures, the system of vaguely-defined rights increasingly lends itself to abuse by those with access to the levers of authority.

As potential conflicts for natural resources become more acute, resource tenure is likely to take on increasing importance as a constraint to the massive popular participation that will be required to stabilize the Sahelian environment. A number of specific issues will also have particular localized importance, and will require local solutions which even a reform of national legislation will be insufficient to address. Foremost among these are the competing rights of herders and farmers in transhumant zones. New local land-use codes must provide flexible frameworks for the implementation of regional or local policies.

Failure to remove legislative obstacles to private initiative will raise the cost and lower the success rate of all future natural resources management efforts in the region.

Local application of national legislation calling for the creation of land-use plans and community forest parks can result in increased local investment in improved management of the vegetative cover and soil and water conservation. While reform of the basic laws is not needed, implementing legislation and reinforcing local institutions may take years. The donor community in general should encourage and support initiatives to modify Forestry Regulations and implement existing legislation which will permit The Gambian government to accumulate more widespread experience with local resource management.

8.6 Training and Extension Delivery Strategies

One of the findings of the Sahel Sub-Regional Assessment is the need to reverse the emphasis of donor-financed training activities. Those who directly manage resources would be the principal targets for training. The order of priority should be:

- o farmers, herders and fishermen i.e., those people who, in fact, manage The Gambia's natural resources;**
- o extension and forest personnel who extend technologies and enforce existing legislation;**
- o the mid- and upper-level staff who direct and manage institutions and projects.**

This ranking would support the training, information and extension program of The Gambia's Indicative Program for Desertification Control. As the success of training programs in the near- to medium-term is highly dependent on the performance environment in which trainees work, the programs on farmer and field service agent training should be concentrated in areas where projects or other special programs permit training to be put to effective use.

8.6.1 Techniques

NRM training can be based upon a combination of techniques including model sites, user-driven training modules and extension and visit methods. All have been used successfully in The Gambia.

The Model Sites Method

Successful extension activities identified in the Sahel Sub-Regional Assessment frequently involved this technique. There is no better extension worker than the farmer/herder who has participated in a successful activity. In the Gambia, SWMU and the German-Gambian Forestry Project have used farmer-to-farmer extension.

The model sites technique involves taking potential participants from one target area to a model site. Participants include both extension agents and potential beneficiaries. Local consultants (i.e., farmers and extension personnel) explain the intervention to the

visitors at the site. Upon returning to their home area, site visit participants undertake the initiative themselves. In Mali, the DHV Project has recently begun to use this method which it calls "contact farmers".

User-Driven Extension Techniques

Successful extension activities identified in the Sahel Sub-Regional Assessment frequently involved use of this technique. In a number of cases, this method was adopted by extension agents in the aftermath of less successful top-down extension.

The user-driven approach entails local training in packaged extension modules. The modules are developed from needs expressed by the population to extension personnel. Unlike the model sites approach, trainers and training are brought to participants by extension personnel. Key elements of this approach include: iterative identification of extension needs; creation of voluntary participant groups (minimum 15 per theme); identification of local group leader/contact; elaboration of input needs by participating group; modification of the extension module; training of trainers; regular extension visits over the course of the activity; monitoring and follow-up; group evaluation of the extension exercise.

Classical Training and Visit Method

Classical extension and visit techniques may be used for certain management activities. This approach, like the former, should be goal-driven but may entail fewer novel technical elements (for example, GARD-sponsored maize cultivation and rice seed multiplication techniques in the Save the Children impact zone in the North Bank Division).

8.6.2 Identifying Intervention Sites and Beneficiaries

Initial sites should be chosen with an eye to establishing a good reputation for a program of strategic natural resources management interventions. One of the fundamental criterion for site selection must be identification of specific resources. Appropriate characteristics of these resources include:

- o major economic importance to producers;
- o significant user concern over potential or actual degradation of resources;
- o available, low-cost, technical interventions to reverse degradation;
- o minimally-controversial traditional ownership or use rights;
- o nascent policy and institutions able to support increased user authority over the relevant resources.

No less important in selecting eligible communities is evidence of existing, popular, local organizations active in some field of endeavour.

8.7 Financial Support

For any strategy to have sustainability, it must provide sufficient short- and long-term incentives. These incentives usually take the form of sufficient monetary return to satisfy felt needs. Investments which offer no return to the farmer, no matter how environmentally-sound, have little prospect of being widely adopted.

There is a range of technically- and environmentally-sound interventions which are also financially viable as was shown in the Sahel Sub-Regional Assessment. The strategies use grants to create or strengthen extension services to train farmers in technical interventions and cooperatives in organization, marketing and management of their returns. Loans are made to cooperatives to finance in-field activities which allow increased short- and long-term returns. These returns then provide incentives to both individual farmers and the co-op to participate and cooperate.

There are three phases to sustainable development that must be considered in financing. These are the R&D phase, the short-term phase and the long-term phase.

8.7.1 R&D

The R&D phase is where techniques are developed and modified until they can produce sustainable results. Many development projects get stuck in this phase or are terminated as unsuccessful before techniques and delivery systems mature. Financial requirements are heavy because of infrastructure, technical assistance and research requirements. Returns are usually non-existent.

The first generation Sahel Sub-Regional Assessment techniques for crop and land use have already been tested in local settings. By attaching strategic interventions to ongoing programs and projects, the R&D phase is largely bypassed.

8.7.2 The Short-Term

In the short run, techniques are applied and short-term benefits occur. Sustainability may be achieved in this phase only if the natural resources base is sufficiently stabilized through short-term actions. Financial requirements are moderate to heavy with the money going to field actions and extension of proven technologies. Investments in technologies that have a pay-back in the long-term are made during the short-term phase. Returns begin to occur that provide immediate incentives. Both external (donor) and internal (co-op) sources of financing are mobilized, with internal sources taking over an increasing share of the financing required for strategic action.

8.7.3 The Long-Term

Long-term benefits occur. The natural resources base is stabilized and improved enough to allow sustained development. Investments are needed only for the maintenance of the production system. Long-term returns on investments are beginning to be realized. The financing source becomes entirely internal and sufficient capital is generated for use in a broadened array of activities.

Annex 9. Persons Contacted by the NRMS Team in The Gambia

USAID/The Gambia

Mr. Jimmy Stone, AID Representative
Mr. Don Drga, ADO
Dr. Tom Herley, Program Specialist
Mr. Seifou Jobe, ADO Project Officer
Mr. Oumar Njie, ADO Project Officer

Republic of The Gambia

H.E. Mr. Bakary Darbo, Vice President
Ministry of Water Resources, Forestry and Fisheries
Honorable Minister Mr. Omar Jallow
Mr. A.K. Njie, Permanent Secretary

Department of Forestry

Mr. Bye-Mass Max Taal, Director
Mr. Foday Bojang, Assistant Director
Mr. Sherif Jallow, Director of Extension Services
Mr. M.F. Bagura, Gambian Team Leader, German-Gambian Forestry Project

Department of Wildlife

Eddie Brewer, Director
Dr. Camara, Assistant Director

Department of Water Resources

Mrs. Isatou Njie

Ministry of Agriculture

Project Planning and Monitoring Unit
Mr. Sambou Kinteh, Director
Mr. Ken Jome, Assistant Director

Soils Water Management Unit

Mr. John Fye, Director
Mr. Souleyman Secko, Agronomist
Mr. Kabyle Souko, Conservation Agronomist
Mrs. Fatou Jassey, Irrigation Engineer

Department of Livestock

Mr. Touray, Director
Mr. Oumar Njie
Mr. Ndong, Livestock Marketing Board

Ministry of Local Government and Lands
Mr. Demba Jack, Assistant Director

Donors/ Projects

Mr. Bart Quitar, Agricultural Officer, EEC
Mr. Dominique Reeb, German Teamleader, Gambian-German Forestry Project
Mr. Bakary Touray, Deputy Director, International Trypanotolerance Center
Mr. Douglas Little, International Trypanotolerance Center
Mr. Derrick Clifford, International Trypanotolerance Center
Dr. John Rowe, GARD Project
Dr. Earl Gritton, GARD Project
Mr. Sambou Ceesay, GARD Project
Dr. Elon Gilbert, GARD Project
Mr. Phil Decose, GARD Project
Mr. Matthias Lubega, Resident Representative, UNDP
Mrs. Fatoumata Tambagang, Program Officer, UNSO

NGO/PVO Contacts

Ms. Trisha Caffrey, Director, Save the Children
Mr. John Nittler, APCD-Forestry, Peace Corps
Mr. Dan Heihl, Peace Corps Volunteer, Forestry
Ms. Mary Novatny, Peace Corps Volunteer, Environmental Education
Mr. Glenn Knapp, Acting Director, Catholic Relief Services
Mr. Wandifeng Fatti, Secretary General, Freedom From Hunger Campaign
Mr. Eric Christiansen, Gambia Ornithological Society
Dr. Walter Clark, Ms. Bess Clark, Beekeepers, Volunteers in Overseas Cooperation, Brikama Beekeepers Association
Mr. Sano Jabang, Manager, Food Production Support Program, Action-Aid
Ms. Janice Carter, Chimp Rehabilitation Project

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