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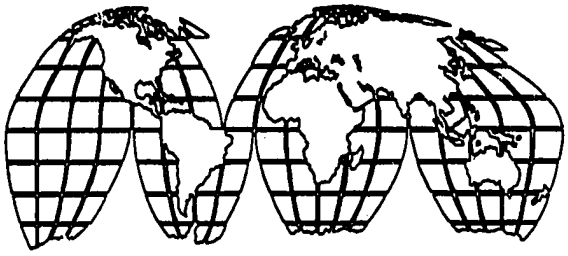

Forestry and the Environment

The Gambia Case Study

September 1994

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

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FORESTRY AND THE ENVIRONMENT
THE GAMBIA CASE STUDY

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This Working Paper is one of a number of case studies prepared for CDIE's assessment of USAID Protecting Biological Diversity programs. As an interim report, it provides the data from which the assessment synthesis is drawn. Working Papers are not formally published and distributed, but interested readers can obtain a copy from the DISC.

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PREFACE

A.I.D.'s Center for Development Information and Evaluation (CDIE) is conducting a worldwide assessment of its environmental programs. Initially, the assessment is focusing on the environmental impact of A.I.D.-supported programs in three areas: forestry, biological diversity, and sustainable agriculture. Other environmental areas may be covered in subsequent assessments.

This assessment of forestry and the environment in The Gambia is one of six country case studies. Similar studies have been completed for Pakistan, the Philippines, Mali, Nepal, and Costa Rica. The results of the six case studies, all of which follow a similar analytical framework, will be synthesized into an overall assessment that summarizes lessons learned from a worldwide perspective and highlights the program and management implications for A.I.D.

* * *

The evaluation team received excellent support from numerous individuals in The Gambia and from USAID/Banjul during the course of the assessment. The team is particularly grateful for the assistance provided by its four Gambian counterparts-cum-researchers: Kabir Sonko, Isatou Sawaneh, Musa Suso, and Kotu Bojang.

SUMMARY

The vast majority of The Gambia's population depends directly on the country's natural resource base for food, energy, and income. However, the natural resource base has been weakened and degraded over time as a result of population growth and a decline in rainfall. The amount of land comprised of closed forest and woodland savannah has declined from 60 percent of total land area in 1946, to 8 percent in 1968, to an estimated 5 percent in 1992. Dependency on firewood as a primary source of fuel has been the major factor causing the depletion of the forest resource base.

A.I.D.'s involvement in the forestry sector has been modest. The principal activity supported by A.I.D. in this sector was the Gambia Forestry Project (GFP) which began in 1979 and ended in 1986. Funded at $1.575 million, the GFP introduced four technologies that were designed to slow and eventually reverse the depletion of the natural resource base. Two of the technologies were designed to augment the resource base: (a) large-scale, industrial-type plantations to increase fuelwood and timber production, and (b) community woodlots to increase fuelwood production. The other two technologies were designed to reduce the consumption of wood products by increasing the efficiency of how forestry products were used: (a) improved sawmills, and (b) improved woodstoves.

A four person team conducted an assessment of the environmental impact of A.I.D.'s support to forestry in The Gambia during a four week period in October 1993, 14 years after A.I.D. had begun to support forestry activities in 1979. The team based its findings on a careful review of existing documentation, especially past evaluations; structured interviews with persons and organizations in The Gambia knowledgeable about A.I.D.-supported programs in forestry; and perhaps most important, visits to 13 sites in all five administrative regions of The Gambia to assess impact from the perspective of the intended beneficiaries.

The technologies introduced under the GFP had little effect on the adoption of environmentally sound forestry management practices. Consequently, they had little biophysical impact; they did not result in any significant improvement in the socio-economic well-being of the people at the household level; and they did not generate significant economic benefits for the national economy. Few, if any, community woodlots attained the level of sustained production that had been anticipated. Similarly, the decision to destroy natural forests in order to establish plantations of exotic species did not result in a net increase in the availability of wood products.

In the case of community woodlots, the concept itself was (and is) fundamentally flawed. It is based on the underlying assumption that "the community" will work to establish and maintain the woodlot, and then "everyone" will benefit during the course of pruning and harvesting. In practice, it is very difficult to implement this concept, partly because the offtake from woodlots (unlike rice plots, for example) is not easily divisible, and partly because it is difficult to determine who is responsible for the management of community woodlots (or any common property, for that matter). Because there was no clear linkage between people's participation and the benefit that was to be derived from such participation, the community woodlots were not well maintained.

In the case of plantations, it was determined by 1985 that they were not economically efficient, were difficult to manage, and should not be used for firewood. In contrast, an alternative approach, one that stressed the management of the natural forest, was not only considered economically efficient, but also it provided short-term benefits, thereby enhancing the adoption of environmentally sound practices which had a positive biophysical impact.

Six additional factors help to explain the lack of impact:

1. The choice of species for both the plantations and the woodlots was inappropriate. Gmelina is a poor fuelwood species (because the firewood it produces burns too fast) and it is only a fair timber species.

2. The assumptions concerning the growth and survival rates of Gmelina seedlings were overly optimistic for The Gambia's climate during normal years, but especially during 1984 to 1986 which were among the worst drought years of the decade.

3. Community woodlots require substantial labor to plant (and maintain) the seedlings, labor which is also needed to plant food crops. Long-term forestry benefits could not compete with the basic short-term needs that agricultural activities fulfill.

4. Although deforestation in The Gambia as a whole is increasing, there are still ample supplies of wood in the forests that people can cut and use for firewood. As a result, community woodlots, though an environmentally sound alternative, were not the only alternative, for securing firewood.

5. Even fast growing species, such as Gmelina, normally require a decade before they can be coppiced and the timber used for poles or sold commercially; thus, they

provide a benefit only in the long-term. (Although Gmelina trees can be pruned for firewood after two years, this is not considered a "significant" benefit in the "short-term.")

6. The community woodlots were not designed to respond to needs as perceived by the villagers (which was for fruit trees); rather, they were designed to respond to needs as perceived by the donors and the government (which was for firewood). As a result, when many of the Gmelina seedlings died after the first year due to drought, many communities replanted fruit trees and/or horticultural crops; they did not replant Gmelina seedings.

Rural people are aware of the dangers of deforestation and the destruction of forest cover, partly because of public education provided by radio and extension communication. However, awareness and education, though effective in generating greater understanding of the risks of environmental degradation, have been less effective in changing behavior. Clearly they were not sufficient to prompt widespread adoption of resource protection and enhancement practices.

Institutional strengthening suffered because the training program was not implemented as planned. At the end of the GFP, one Gambian had received a B.S. degree (two had been planned); funding for the planned M.S. degree had been reprogrammed for specialized short-term training for one person at the diploma level; four agents had received diplomas from the Forestry Institute at Ibadan, Nigeria (five had been planned); and three persons (of five planned) had received technical training in sawmilling and logging. The weak technical capabilities of the Forestry Department still existed as recently as 1992 when the new Agricultural and Natural Resources (ANR) project was designed.

No woodlots visited by the evaluation team were successful in the sense that they were providing a sustainable source of fuelwood for community members. However, a few woodlots were still in existence, and these tended to be ones that had received assistance and support from a Peace Corps volunteer, Forestry Scout, or non-governmental organization (NGO). Most had not received such assistance. In fact, the need for forest management skills and long-term technical assistance had been greatly underestimated in the project design. The experience of the GFP also clearly demonstrated that local institutions and community involvement are necessary to halt and reverse the rate of natural resource degradation in The Gambia. This growing awareness has led A.I.D. (and other donors) to support community resource management agreements which are designed to enhance community control over natural resources.

In the early 1980s the country was "groping in the dark" when it came to establishing an environmentally sound policy framework. For example, there were no disincentives to cutting firewood from the natural forest, because those who did so did not have to pay the true economic costs of the wood. At the same time, there were no strong incentives to participate in a community woodlot because of uncertainty about who controlled the products of the woodlot. The lack of an appropriate economic policy framework or incentive structure clearly undermined the GFP. A major objective of A.I.D.'s new ANR project is to establish a policy and regulatory environment that is conducive to the adoption of improved natural resource management practices.

The effectiveness of the A.I.D.-supported GFP was undercut by the inappropriate choice of forestry technologies. While all community members theoretically had equal access to the benefits to be derived from the project, in practice there were generally few or no benefits generated. Moreover, neither the plantation component nor the community woodlot component produced the consequences anticipated by project designers. The Gambia in 1993 continues to face the depletion of forest cover, with the attendant environmental consequences that provoked the earlier response in 1979.

In addition, the project was not efficient. A 1985 evaluation estimated that the internal rate of return to the plantation component of the GFP was only 1.4 percent. The economic efficiency of the sawmill component was no better. It was converting Gmelina logs into lumber at a cost that was four times the average price at which the lumber could be sold. In addition, it was producing lumber at 62 percent below the target rate because it was operating only two days per week (due to fuel shortages). To realize a profit, the mill would have to operate at 16 times the estimated annual processing rate.

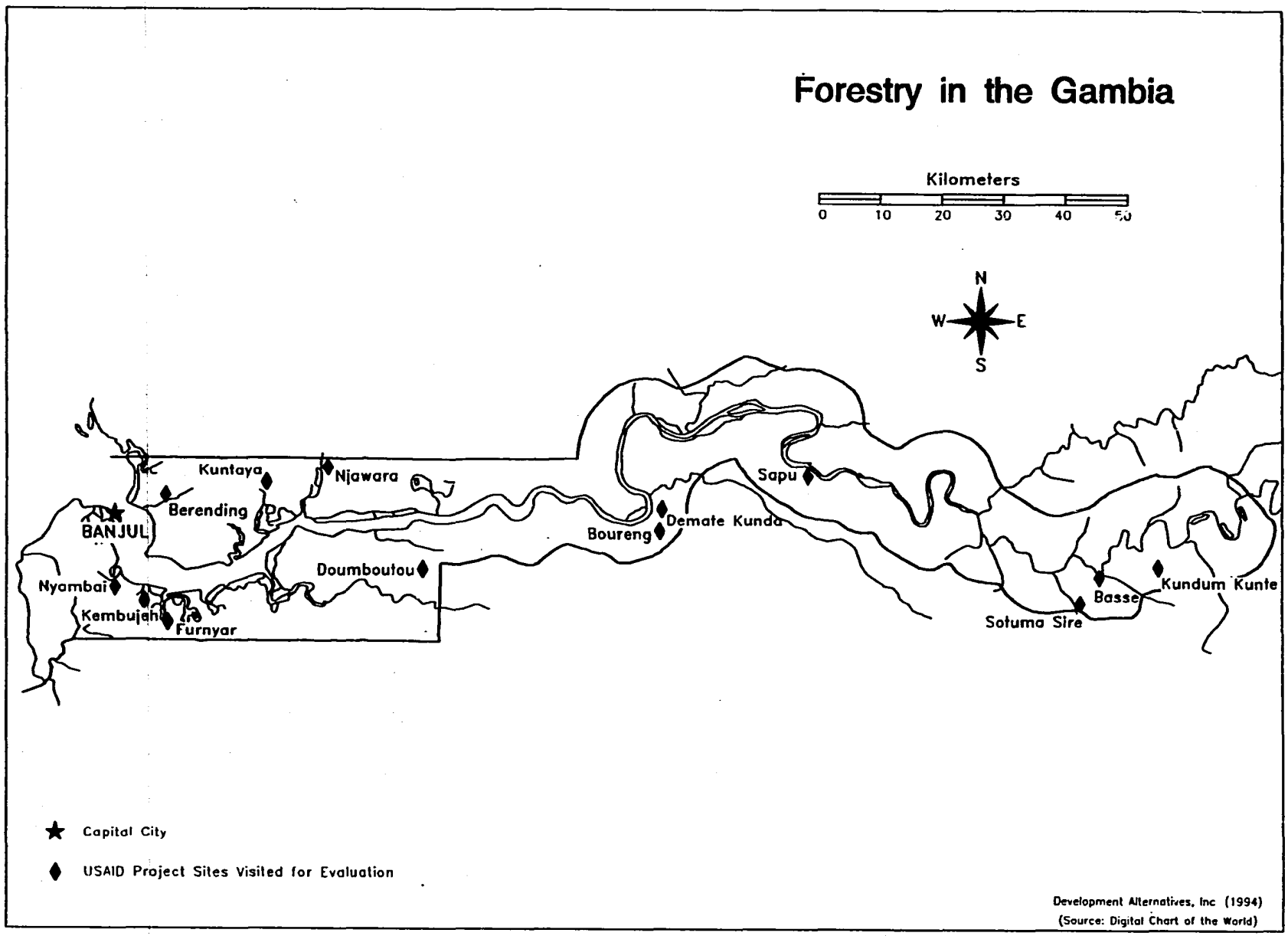
Since the end of the GFP in 1986, none of the A.I.D.-supported community woodlots has become financially self-sufficient. The government discontinued Gmelina plantations in 1985, but those that were established under the GFP continue to be managed by the Forestry Department. The Forestry Department was unable to maintain and operate the sawmill and still recover costs, and as a result the sawmill was privatized.

The dependence of both urban and rural populations on forested areas for firewood and other forest products has not diminished. Indeed, population growth and land pressure have combined to accentuate this dependence. What has changed, in large part due to the relative failure of the GFP, is the approach now used by donors and the government. Rather than emphasizing production alone, priority is placed on the efficient management of natural resources, including the forest resource base, by those who depend most on these resources.

A.I.D., in particular, is emphasizing an improvement in the policy environment to encourage the wise use of resources and, at the same time, to secure community rights to local resources. The recently initiated ANR project has been designed to encourage an appropriate policy environment for the forestry sector, train forest agents, increase revenue flows and revenue retention within the forestry sector, and support community resource management agreements. Since this project is just now getting underway, it is too early to come to any conclusions regarding its impact on or contribution to the environment. However, the design of the project does reflect the very substantial reorientation of A.I.D.'s strategy for natural resources management in The Gambia and for the forestry sector in particular.

GLOSSARY

Alkalo	Village chief
ANR	Agriculture and Natural Resources Project
ANRB	Agriculture and Natural Resource Baseline Survey
CDIE	Center for Development Information and Evaluation
CRMA	Community Resource Management Agreement
CRS	Catholic Relief Services
EEC	European Economic Community
FAO	Food and Agriculture Organization
GFP	Gambia Forestry Project
GGFP	Gambia-German Forestry Project
GOTG	Government of The Gambia
GTZ	German Technical Assistance Agency
IRG	International Resources Group
kafo	Village work group
LTC	Land Tenure Center
MNRE	Ministry of Natural Resources and Environment
NGO	Non-governmental Organization
PAAD	Program Assistance Approval Document
PCV	Peace Corps Volunteer
PIL	Project Implementation Letter
PVO	Private Voluntary Organization
UNDP	United Nations Development Program
UNSO	United Nations Sudano-Sahelian Office
USAID	United States Agency for International Development


Forestry in the Gambia
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Sapu
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Doumboutou
Nyambai
Kembujah
Furnyar
Basse
Kundum Kunte
Sotuma Sire
Capital City
USAID Project Sites Visited for Evaluation
Development Alternatives, Inc (1994)
(Source: Digital Chart of the World)

1. INTRODUCTION

In 1992 USAID/Banjul launched a new 10 year, $22.5 million Agricultural and Natural Resources (ANR) project. The Program Assistance Approval Document (PAAD) for that project describes a Gambian environment in 1992 that is strikingly similar to that which existed in 1978, 14 years earlier, when A.I.D. launched its initial efforts to reverse the trend of environmental degradation. Not only is the environment of 1992 similar to that of 1978; in addition, the twin problems that caused that unsustainable trend remain the same, or are worse: rapid population growth and drought.

The vast majority of The Gambia's population depends directly on the country's natural resource base for food, energy, and income. However, the natural resource base has been weakened and degraded as a result of population growth (reported in the 1992 PAAD as 3.4 percent annually and revised in the 1993 decennial Census to 4.1 percent annually). Even if it were growing at the 3.4 percent rate, The Gambia's population would double in approximately 21 years, and the country's population density (80 persons per square kilometer) is already one of the highest in Africa.

A continuous decline in rainfall has compounded the problem. The length of the rainy season and total rainfall have been declining in The Gambia. Rainfall records for the Banjul area indicate that, for the period 1886 to 1968, 50 percent of the years were wet and 25 percent were dry. In contrast, during the period 1968 to 1990, 5 percent of the years were wet and 75 percent were dry.

Traditional resource management practices in The Gambia have not been effectively adapted to these two long-term trends. The result has been environmental degradation which has had direct adverse economic consequences:

- The decline in rainfall has allowed saltwater to intrude more extensively into the Gambia River valley, and the resulting salinization of floodplain rice paddies has reduced the available land on which to grow rice, thereby encouraging the clearing of new lands for agricultural production and contributing to deforestation.

- Deforestation has resulted in massive runoff, soil erosion, and loss of biodiversity and soil fertility.

- Loss of soil fertility has led to decreased crop yields and an expansion of crop area at the expense of the livestock sector.

- The displacement of livestock onto marginal lands coupled with overgrazing have resulted in rangeland degradation as well as poor animal nutrition and lower milk and meat production.

A.I.D. has supported the development of The Gambia's natural resource base, both in forestry and agriculture, since the late 1970s.

- In forestry, A.I.D.'s support was provided primarily under the $1.575 million Gambia Forestry Project (GFP) which began in 1979 and ended in 1986.

- In agriculture, A.I.D.'s support was provided primarily under three projects: the 13 year, $4.960 million Soil and Water Management project that began in 1978 and ended in 1991; the $9 million Mixed Farming and Resource Management Project which began in 1979 and ended in 1986; and the $16.3 million Gambia Agricultural Research and Diversification project which began in 1986 and ended in 1992.

In October 1993, 15 years after these activities were initiated, a four-person team visited The Gambia to assess the environmental impact of A.I.D.'s support of forestry and sustainable agriculture. The team was comprised of two economists, one of whom focused on the forestry sector; an agronomist who focused on the sustainable agriculture sector; and a social scientist who covered both sectors. The results are summarized in two reports, this one on forestry and a companion report on sustainable agriculture.

2. BACKGROUND

Environmental and Natural Resource Conditions in The Gambia

The Gambia has a long history of natural resource exploitation, which has been linked directly to short-term economic gains (Rauch, 1985). Rubber trees were one of the first natural resources to be mined. Rubber production reached a peak in 1885, and rubber trees were depleted by 1915. West African mahogany (Khaya senegalensis), a valuable export, was nearly depleted by 1904.

Environmental and natural resource degradation has been, and continues to be, exacerbated by increasing human and livestock populations. In addition, inappropriate agricultural and livestock practices, in conjunction with low and poorly distributed rainfall and uncontrolled fires, have increased the rate of forest and natural resource degradation.

Between 1946 to 1968 land use patterns changed markedly. Table 1 shows that in 1946, the majority of land (74 percent) was under a partial to fully closed canopy (25-100 percent closure); by 1968 only 26 percent of the land remained under a partial to fully closed canopy (Crawford, 1979). The amount of land with 50-100 percent closure (that is, closed forest and woodland savannah) declined from 60 percent of land area in 1946, to 8 percent in 1968, to an estimated 5 percent in 1992. In contrast, the amount of land comprised of thorn, small trees, and low bush shrubs increased from about 8 percent to almost 52 percent from 1946 to 1968. Also, the land used for continuous cropping (that is, allowing for no fallow period) increased from nothing in 1946 to 17 percent in 1968.

Forester (1983) reported no decrease in forest area since 1968 but found "a strong tendency of forest degradation" caused primarily by annual bushfires and uncontrolled exploitation. Forest degradation is exacerbated by climatic fluctuations which reduce agricultural productivity, the effect of which is the further clearing of more forest area for agricultural production. The Forestry Department has established 66 forest parks in order to preserve some of the remaining forest area. However, these parks protect only 34,000 hectares, which represents only 3.2 percent of the land area of the country.

In the past, the exploitation of forest products was controlled and licensed almost exclusively by the Forestry Department. Because enforcement of forest policy and laws is very time consuming, few human and financial resources have been available for forest management. More recently local administrative branches

of the government and traditional institutions (village and district chiefs) have assumed a more prominent role in issuing licenses and permits.

Table 1. Land Use Patterns, The Gambia, 1946 and 1968

Vegetation and Land-use Designation	1946 (%)	1968 (%)
Forest (fully closed canopy)	28.9	3.4
Woodland savannah (50% canopy)	31.3	4.6
Savannah (25% canopy)	14.0	17.6
Sub-total	74.2	25.6
Thorn; Small tree	7.8	31.7
Low bush shrub	0.4	19.9
Cropping with fallow	17.6	5.5
Continuous cropping	0.0	17.3
Sub-total	25.8	74.4
Total	100.0	100.0

Source: Crawford, 1979.

Dependency on firewood as a primary source of fuel has been the major factor causing the depletion of the forest resource base. In 1979, fuelwood accounted for 75 percent of all wood used; 15 percent was used to make charcoal; and the remaining 10 percent was used mainly for building and fencing materials (Crawford, 1979). Charcoal production has since been banned in The Gambia. According to ANR program documents, in 1992 approximately 85 percent of the country's energy requirements were met from fuelwood; moreover, the growth rate of fuelwood consumption was greater than the growth rate of the remaining forest resources. In terms of timber production, the country was able to meet only about 25 percent of its lumber requirements from domestic production. In 1979, when A.I.D. support for forestry was initiated, woodlots were seen as one way to increase fuelwood
production, and plantations were seen as one way to increase both fuelwood production and timber production.

A.I.D.'s Forestry Strategy

In the late 1970s, A.I.D. and officials of the Government of The Gambia (GOTG) were increasingly concerned about the rate of loss of total forest cover in The Gambia. The experience of nearby Sahelian countries that were undergoing massive environmental degradation due to the combined forces of drought, deforestation, overgrazing, and aridization was applied to The Gambia, and pressure mounted to act before deforestation was irreversible. Data available at the time of the design of the GFP were interpreted as a forecast of environmental doom. According to the Project Paper, these data indicated that unless there was a substantial change in the rate of wood production and/or wood utilization in The Gambia, "the forest resources there will be completely depleted within the next fifteen years" (Crawford, 1979.

Since fuelwood use was identified as one of the principal factors underlying destruction of the forest cover, project designers focussed on the supply of wood products and especially of fuelwood as the "solution" to the deforestation problem. The GFP emerged with the principal objective of improving the efficiency of wood production and utilization in The Gambia. This was to be accomplished by applying improved technologies -- Gmelina arborea plantations and community woodlots -- and improving utilization efficiency at the sawmill.

The experience of the GFP during implementation soon demonstrated that the solution was going to have to be much more comprehensive than the introduction of improved production and utilization technologies. Despite considerable efforts to redesign and rectify shortcomings of the project, this activity clearly failed to produce any positive effect on the environment or on the adoption of environmentally sound forest management policies and practices.

The ANR project has taken the experiences of the past into consideration. It will contribute to forestry sector activities through the encouragement of forestry sector policy reform, training of forest agents, improved revenue flows from pricing policy reform, revenue retention within the sector, and the development of community resource management agreements (CRMAs), which are agreements between resource users and the state. In addition, its focus is on the participation of resource users in the management of the resource base and on the reform of policies that impede this participation, with the objective being the sustained management and conservation of these resources. Since this project is just now getting underway, it is too early to come to any conclusions regarding its impact on or contribution to the environment, how it will improve national institutional capacity to manage public lands such as forest parks, or how it will address the growing demand for wood products by The Gambia's expanding urban population.

Although the GFP (1979-1986) is the principal activity supported by A.I.D. in the forestry sector, A.I.D. has also supported biodiversity conservation in Kiang West Forest Park as well as agroforestry activities (through support provided to Save the Children/USA and the Peace Corps. Funding for these projects totaled $2.6 million in current dollars (about $1.6 million from 1979 to 1986 and about $1 million from 1989 to 1990). Thus, A.I.D.'s involvement in the forestry sector has been modest both in terms of the volume of financial commitments and the number of interventions. The recently awarded ANR project represents a much more substantial investment, $22.5 million, including about $10 million in non-project assistance.

This assessment focuses on the GFP because the activities of the project are directly linked to the forestry sector and because a significant period of time has elapsed since the end of the project, thereby permitting an assessment of its long-term biophysical and socio-economic impacts.

3. EVALUATION FINDINGS: PROGRAM IMPLEMENTATION

This section assesses the relative importance of four specific strategies that are typically associated with successful forestry programs: (a) technological change; (b) awareness and education; (c) institution building; and (d) the policy environment. In order to assure comparability, the relative importance of each of these four strategies was assessed in the other CDIE-sponsored country studies on forestry as well.

Technological Change

The GFP introduced several technologies designed to achieve the goal of slowing and eventually reversing the depletion of the natural resource base. Two of the technologies were designed to increase the resource base: (a) large-scale, industrial-type plantations; and (b) community woodlots. The other two technologies were designed to improve efficiency and, as a result, reduce consumption of wood products: (a) improved sawmill technologies; and (b) improved woodstoves. For the reasons suggested below, these technologies were not successful and were either modified or terminated during implementation of the program.

Community Woodlots: The primary objective of the community woodlot component of the project was to increase fuelwood production. In the original design, community members of 10 villages were to establish, maintain, and harvest five-hectare woodlots for a total of 50 hectares. Each woodlot was to be planted primarily with Gmelina trees, with a smaller proportion planted with other wood species (such as neem) and fruit trees (such as cashew and mango). Fruit trees, which were preferred by community members, were included as an incentive for them to plant wood species (Danso, 1986; Rauch, 1985; personal interview, 1993). Labor and land were to be provided by each village; fencing materials, seedlings, and technical assistance were to be provided by the Forestry Department. However, the seedlings were often not delivered until late August, which is late in the rainy season, and this severely reduced their survival and growth rate.

Not only were materials and technical assistance delivered late. In addition, community members were not motivated to work to establish the community woodlots because the labor requirements were high while the likelihood of their receiving **any** short-term benefit was low. This was compounded by the fact that control over whatever benefits might be generated was unclear. The evaluation team found that in villages where the distribution of benefits was unclear, the woodlots no longer existed, as in Basse and Berending,

or were no longer managed properly, as in Kembudjeh. In contrast, in villages where the community perceived there to be a more equitable distribution of benefits, as in Kuntaya and Sotuma Sire, the woodlots continued to exist.

In addition, the existence of some particular motivating factor, such as a dynamic or demanding chief, a Peace Corps volunteer, a NGO, or even a strong sense of community solidarity seemed to be associated with those community woodlots that continued to exist, including Kuntaya and Sotuma Sire. For example, Peace Corps volunteers helped to establish nurseries on some of the woodlot sites, and this alleviated the delivery problems as well as the limited quantity and choice of seedlings. Table 2 summarizes the conditions under which community woodlots were more (or less) likely to adopt new technologies and practices.

The wood species of most woodlots were eventually replaced by fruit trees, which the villagers preferred. Also, where live fences were retained, the villagers planted vegetables within the protected areas, especially after wells were dug on some of the sites during the last year and a half of the project.

Plantations: Large-scale, industrial-type Gmelina plantations were planted beginning in 1980. Originally, 1,300 hectares were to be established in two existing forest parks, Finto Manareg and Salagi. Approximately 75 percent of the production from the two plantations was to be for fuelwood and the remaining 25 percent, for lumber, poles, and other non-fuelwood products (Crawford, 1979). As in the case of the community woodlot component of the project, the Forestry Department was to provide technical assistance and seedlings, and community labor was to clear the land, plant the seedlings, weed, and maintain the plantations. Benefits in the form of firewood and sawlogs were to accrue to the community members who helped establish and maintain the plantations and who thinned and harvested the wood products (personal interview, 1993).

The survival and growth rate of seedlings and trees is heavily dependent on planting the seedlings at the proper time and on favorable climatic conditions. In fact, late planting, low rainfall, and uncontrolled bush fires caused high mortality of the seedlings. As a result, considerable replanting was

Table 2. Conditions for Adoption of Community Woodlot Technologies and Practices, The Gambia

Village and Status of Woodlot		Conditions for Adoption						
Village	Woodlot Exists[a]	Appropriate Technology	Participation Benefit Link[b]	Alternatives to Practice	Short-term Benefits	Demand Driven	National Institutions	Local Institutions[c]
Kuntaya	Yes (but unmanaged)	No	Strong	Yes	Moderate	No	Weak	Strong
Sotuma Sire	Yes (but poorly managed)	No	Strong	Yes	Moderate	No	Weak	Strong
Kembudjeh	Yes (but poorly managed)	No	Weak	Yes	Moderate	No	Weak	Strong
Kundum Kunte	No, except live fence (garden and fruit trees)	No	Moderate	Yes	Low	Yes	Moderate	Strong
Demate Kunda	No, except live fance (garden and fruit trees)	No	Moderate	Yes	Low	No	Moderate	Strong
Basse[d]	No (agricultural production)	--	--	--	--	--	--	--
Berending	No (fallow)	No	Weak	Yes	Low	No	Weak	Strong

Explanation of Columns:

Appropriate Technology: The technology, planting fast growing Gmelina trees, was inappropriate because the firewood it produces burns too fast. In addition, planting seedlings (which are difficult to maintain) places additional demands on labor and involves learning new husbandry practices.
Participation-Benefit Link: "Strong" indicates that the participants perceived clear and direct benefits resulting from the work they put into building and maintaining the community woodlot.
Alternatives to Practice: Alternatives to practice refers to whether or not members of the community could achieve the same objective (obtaining firewood) through other means or by adopting other technologies .
Short-term Benefits: Short-term benefits are those which are realized within one or two years after implementation of the intervention.
Demand Driven: "Yes" indicates that all or most of the intended beneficiaries supported implementation of the intervention.
National Institutions: The existence and strength of national institutions is assessed.
Local Institutions: The existence and strength of local institutions (including NGOs, PVOs, and Peace Corps volunteers) is assessed.

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[a]A woodlot was considered to "exist" if at least 50 percent of the trees were still standing.

[b]The community woodlots did not succeed in Kundum Kunte (because of drought) or in Demate Kunda (because of wildfires). However, live fences still exist, and both woodlots now have wells and are used for gardens and fruit trees. The participation-benefit link was judged "moderate" for both woodlots.

[c]Two villages, Kuntaya and Sotuma Sire, not only had relatively strong local institutions, but also NGO support, and Sotuma Sire had a Peace Corps volunteer as well.

[d]Data for Basse were based only on observations, not on personal interviews.

required in order to achieve the modified target of 578 hectares, reduced substantially from the original target of 1,300 hectares (Lindberg, 1985). In addition, plantations require considerable labor over a very long period of time, because significant benefits, in the form of timber that can be sold commercially, are not realized for ten years.

In 1985 it was determined that the plantations were not economically efficient, were difficult to manage, and should be used to produce sawlogs (not firewood), which was the only use that was potentially economically viable (Rauch, 1985). However, a plan to manage the two plantations was never developed, and the Forestry Department continues to maintain them (personal interview, 1993). Beginning as early as 1980, the Forestry Department in conjunction with the German Technical Assistance Agency (GTZ) had initiated an alternative forestry program stressing natural forest management of national forest parks. This approach, in contrast to the plantation approach, was not only considered economically efficient, but also it provided short-term benefits, thereby greatly enhancing the adoption of the practices as well as their biophysical impact.

Sawmill: The revitalization of the government-owned sawmill at Nyambai was intended to improve the efficiency of the production of sawn timber. New equipment was procured, old equipment was repaired, and personnel were trained in sawmill operation and management. By 1985, the sawmill was processing logs at an improved, but below target, conversion rate of 54 percent; output had also improved, but was 62 percent below target. Only 47 percent of the boards were of normal size, substantially less than 80 percent which is considered "acceptable" (Rauch, 1985).

Delays in procuring equipment as well in training, together with constraints on the type of timber that could be sawn with the equipment, exacerbated progress in improving the quantity and quality of sawmill output and efficiency. By the end of 1986, the sawmill was operating at a lower output rate than in 1985, and it was eventually sold to a private business (Danso, 1986). However, the Forestry Department continues to supply the sawmill with Gmelina logs from the nearby plantations (personal interview, 1993).

Woodstoves: Improved woodstoves were introduced in 1982 to reduce fuelwood consumption and to conserve forest resources. The program used a woodstove design that had been effective in Burkina Faso. During the training period in 1981, 112 stove construction specialists who had been trained for the project built over 400 stoves; these stoves were introduced primarily in rural areas by A.I.D. in collaboration with the Community Management Office of the Ministry of Local Government and Lands. The project also trained 41 stove construction specialists to work in urban areas, but the number of stoves constructed was not documented (Rauch, 1985).

The efficiency of the woodstoves is highly dependent on the quality of stove construction and the frequency of use. Based on a sample of project stoves, efficiency varied between 25 and 50 percent, and frequency of use varied between one and three meals per day (Wood, 1982).

Summary

Key issues concerning the technologies and practices introduced under the GFP can be summarized as follows:

- The choice of the primary species for the plantations and woodlots was inappropriate. Gmelina is a poor fuelwood species and only a fair timber species, but in any case it is not appropriate for the climatic conditions of The Gambia.

- The assumptions concerning the amount and distribution of rainfall were overly optimistic. The years 1984 to 1986 were among the worst drought years of the decade. Consequently, the assumptions regarding growth rates and seedling survival rates were also overly optimistic and quickly proved false.

- Labor (which was a constraint to increased agricultural production) was used to achieve short-term food requirements rather than long-term forestry benefits.

- Villagers did not perceive the fuelwood shortage to be acute enough to plant wood trees to supplement their existing sources of fuelwood; this is evident by the poor maintenance of the woodlots and the preference for fruit trees.

- The weak management capabilities of the Forestry Department and the need for long-term technical assistance were greatly underestimated.

- Implementation was often delayed. For example, procurement of the sawmill equipment and training of the sawmill personnel were completed less than one year before A.I.D. involvement ended (Rauch, 1985).

Awareness and Education

The awareness and education strategy that was implemented under the GFP included three components: (a) a new extension unit was established in the Forestry Department; (b) educational materials (films and radio spots) were developed; and (c) long- and short-term training in extension communication and community development was provided to personnel in the Forestry Department.

In addition, forest protection technologies, primarily bush fire control practices, were introduced in awareness and education programs.

The extension unit continues to exist. Its first director had received an undergraduate degree in extension communication in the U.S., but this person served for only a limited period of time in the Forestry Department after returning from the U.S.

Because the educational materials, primarily films on fire control and prevention, were purchased from the U.S., they had a U.S. orientation and were of only limited utility in technical training programs in The Gambia (Lindberg, 1983/84). Therefore, a local Gambian firm produced a film on bush fire prevention and control which was shown at regional gatherings. Although the film was considered an effective way to educate large groups of people, it is no longer used regularly in any public awareness campaigns. The extension unit developed a weekly radio spot to report on forest resource management issues. These radio messages were credited for prompting requests from three communities to establish CRMAs with the Forestry Department.

In-service training materials and workshops were developed for Forestry Department personnel who were involved in the community woodlot activities and other community resource education and management programs. Developed in collaboration with Peace Corps volunteers, the materials focused on social forestry, nursery management, silviculture, and management of local and exotic tree species (Brenney, 1986).

Community awareness of the long-term impact of deforestation and uncontrolled bush fires appeared to be high. During interviews and site visits, villagers cited the intergenerational impact of the decrease in forest cover and the increase of women's and men's time required to collect firewood and building materials. Consequently, people are aware of the importance of planting trees. At the Sapu nursery, for example, the purchase of seedlings has increased in the last couple of years. The records show that people tend to prefer fruit trees rather than wood species; however, when wood species are purchased, they are generally used for live fencing (personal interview and Sapu records, 1993)

Summary

- Rural people are increasingly aware of the dangers of deforestation, bush fires, and destruction of forest cover. However, a fairly high level of awareness of resource degradation among much of the population is not a sufficient condition for the adoption of resource protection and enhancement practices. Future education and awareness programs need to focus on promoting action.

- The public education services have been effective in generating a greater understanding of the risks of deforestation. Radio spots, extension communication, and gatherings where films are shown provide effective and efficient approaches to

improving education and awareness. Special events such as tree planting day and visits by government officials have been used effectively to convey timely forest resource use and management messages.

- Implementation of awareness and education activities was hampered by the limited number of trained field personnel, the lack of mobility of field personnel, and overall financial constraints.

Institution Building

Building National Capacity

Technical Assistance: The GFP design determined that adequate technical resources existed in the Forestry Department, and as a consequence no long-term technical assistance was provided. In 1982, at the time of the first project evaluation, the project was already behind schedule by 14-20 months, due in part to the limited technical capability of the department. As a result, a decision was made to hire a long-term technical advisor to assist the Forestry Department implement the tree plantation and village woodlot components of the project. However, the technical assistance that was provided did not address the department's need for expertise at the management level. With the retirement of the Chief Conservator early in the project, Forestry Department senior staff was reduced by 50 percent. With only one senior forest supervisor responsible for all afforestation activities including plantations, woodlots, and national tree planting day activities, the afforestation component alone overwhelmed department resources.

The failure to provide senior technical assistance to the Forestry Department clearly hampered project implementation.

Training: A.I.D. has actively contributed to institutional capacity by providing training to Gambian forestry agents through long- and short-term training programs, including in-country training. Gambians received training under a number of mechanisms, including the Sahel Manpower Development Project (one M.S.) as well as the GFP. Forestry Department personnel have also received training from the German-funded Gambia-German Forestry Project (GGFP).

At the end of the GFP, one Gambian had received a B.S. degree (two had been planned); funding for the planned M.S. degree had been reprogrammed for specialized short-term training for one person at the diploma level; four agents had received diplomas from the Forestry Institute at Ibadan, Nigeria (five had been planned); and three persons (of five planned) had received technical training in sawmilling and logging. Training in extension communications (nine months) provided important assistance to the Forestry Extension Unit. Additional skill development was provided through

short-term training of one person in forest administration and of another in species development for plantations. Finally, extension training and in-service technical training were provided to all field staff.

Continued weaknesses in the technical capabilities of the Forestry Department were identified in the ANR design, and provision has been made under that activity to provide: (a) degree training in forestry; (b) certificate training for six foresters; and (c) short-term training, internships, site visits, and workshops. The GGFP, which has a strong training component as well, plans to train five forest recruits per year, offer two-year diploma level training in Cyprus to 20-25 foresters, and train three foresters at the B.S. level.

Planning, Policy, and Management Capacity: The policy focus for the forestry sector is unclear, and the overall role and priorities of the Forestry Department are ambiguous, despite the stated interest in specific areas such as community forestry and natural forest management. Senior forestry officials are aware of these deficiencies but do not appear to be taking concrete measures to improve the situation. It appears that the department's policy orientation will be determined largely by the results of studies conducted by consultants provided under the ANR project.

This is a matter of concern for the long-term sustainability of the forest resource base and the effectiveness of the GOTG in managing the forest resource base. While more agents have received technical training in forest related disciplines, and two members of the department have M.S. degrees (the Director and Deputy Director), there appears to be a clear need for technical assistance for higher level management and in policy analysis and planning. Neither the GGFP nor the ANR project is providing this form of technical assistance or training.

Building Local Capacity

The experience gained under the GFP clearly demonstrated the importance of community involvement and local-level factors in the success of village woodlots and the protection of plantations. While the design of the GFP did not call for the use of Peace Corps volunteers (PCVs), they were added to support the village woodlot component shortly after project start-up. While no woodlots visited by the evaluation team were successful in providing a sustainable source of fuelwood for community members, those that were still in existence (including Kuntaya and Sotuma Sire) tended to be ones that had received assistance and support from a PCV, Forest Scout, or NGO (Table 2).

Community Resource Management Agreements: There is growing awareness among donors and within the government that popular involvement in resource management is necessary to halt and reverse

the rate of natural resource degradation in The Gambia. This has led to a number of pilot efforts to enhance community control over key resources, such as a natural forest area or range. The longest such experience in The Gambia has taken place under the UNDP-supported Rangeland and Water Development Project (1986-92) in Dankunku and Niamina West districts. More recently, in 1989, GTZ in cooperation with the Forestry Department initiated pilot activities in community forestry, and, in 1991, a Community Forestry Management Agreement was signed between the community of Brefet and the GOTG. The agreement was based on thorough public discussions with the community and includes a comprehensive forest management plan. Along with granting authority to the community to manage the forest area are special exonerations from forestry license fees, a prohibition on the granting of licenses to outsiders, and the right to collect and manage revenues generated from the sustainable development of the resource base.

Similar community forestry management agreements have been undertaken in other communities in the same area. A forested area known as the Kazilla forest is under joint management by three villages (Brefet, Demba, and Bessi) that have traditionally had access to the forest resources. This joint effort is of particular interest and sensitivity since it will require careful reconciliation of competing claims over resources. Save the Children Foundation/USA has initiated an integrated development program in the community of Njawara that includes massive tree planting and the establishment of a nursery for seedlings, along with other soil and water conservation measures. The Natural Resource Management Agreement for Njawara is included in Annex B.

The ANR project has given special priority to the establishment of CRMAs in forestry, agriculture, and range management. The CRMA is viewed as a key instrument allowing communities to assume management control of, and benefit financially from, local land-based resources. The adoption of this instrument reflects a fundamental change, or evolution, in A.I.D.'s perception of the role of rural populations in resolving environmental conflicts and halting degradation of the resource base. The focus has changed from simple participation to an emphasis on local management and empowerment.

Land and Resource Tenure Systems: Land tenure systems in The Gambia are similar in structure to those found throughout much of West Africa. Founding lineages hold primary rights to land areas that were unclaimed upon their arrival. Land is granted to new arrivals in the form of an outright grant of permanent usufruct, a long-term loan, or a short-term loan. Land is also held by the extended family unit, with collective fields being farmed by all household members and individual plots assigned to men and women for their own production activities. Within this general model, there is substantial variation by region and ethnic group. The important feature of tenure in The Gambia is its flexibility. Studies conducted by the Land Tenure Center (LTC) at the University

of Wisconsin have found that Gambian customary tenure systems ". . . are not static but show considerable flexibility in responding to needs for rule changes created by increasing population densities, new technologies and new markets" (Bruce *et. al.*, p. 5). Tenure specialists at the LTC have recommended tenure evolution (or an adaptation thereof) rather than the replacement of customary tenure with state-conferred tenure.

The use of CRMAs will tend to reinforce the rights and authority of communities and organized groups over resources specified in the agreement. If properly managed, this may lead to enhanced security of tenure, increased investment in the sustainable development of the resource base, and improved productivity. These agreements and resource management plans may also serve as grounds for granting long-term (99 year) leases over a clearly defined area to the institution to which authority has been conferred in the agreement. A.I.D.'s support of the development and monitoring of CRMAs represents an important contribution to the reduction of environmental degradation in The Gambia.

Policy Environment

According to the Permanent Secretary of the Ministry of Natural Resources and Environment (MNRE), in the early 1980s the country was "groping in the dark" when it came to establishing an environmentally sound policy framework that would encourage the sustainable use of the country's forest and other natural resources. Yet, it was not until the late 1980s that the government began to come to grips with the problems of resource degradation and to take steps to address them. In 1987 the National Environmental Management Act was passed which established the legal foundation for addressing these problems. In 1990 the Ministry of Natural Resources and Environment was established. And in 1992 the Gambia Environmental Action Plan was drafted. Thus, the forestry activities that were initiated in 1979 were implemented in the absence of a satisfactory policy environment.

Under formal and customary land tenure law, standing timber and forest resources belong to the government. As a result, there is no incentive for rural communities to manage the forest resources in their vicinity in a sustainable fashion or to take long-term responsibility for these resources. Moreover, because people do not feel responsible for the forest, they cut it down for firewood and the result is over-exploitation. The Forestry Department is responsible for issuing (for a fee) licenses and permits that must be secured by those who want to cut timber and produce lumber; it is also responsible for confiscating and then selling forest products that have been harvested illegally. However, these fees and penalties are not high enough to reflect the true economic value of the forest products, nor do they deter the illegal felling and transport of trees, nor are there enough

agents to enforce the law. These ineffective laws, together with the lack of forestry staff to enforce even these laws, is another manifestation of the inadequate policy environment that characterized The Gambia in the early 1980s.

As a result, there was little incentive under the GFP for people to establish and maintain community woodlots as long as: (a) the individual did not have to pay the true economic costs of harvesting firewood from the natural forest; and (b) there was uncertainty over who controlled the products of the woodlot. This ineffective policy environment contributed to the poor performance of many A.I.D.-supported community woodlots. As far as securing timber on government forest land is concerned, the best approach is still uncertain. It is not clear, for example, whether it is it more efficient and environmentally sound to clear land and plant trees as a plantation (as was done under the GFP) or whether it is more appropriate to encourage the regeneration and natural resource management of existing forest resources (as is currently being done under the GGFP). The environmental economics of the two options has yet to be worked out.

A major objective of the ANR project is to establish a policy and regulatory environment that is conducive to the adoption of improved natural resource management practices -- something that was clearly absent when the A.I.D.-supported forestry activities were implemented. Virtually all of the 11 conditions precedent to disbursement that are spelled out in the PAAD for the ANR project will help achieve this objective. These conditions are organized under three broad categories designed to: (a) help the government implement the environmental action plan; (b) rationalize the funding of, and revenue from, natural resources; and (c) liberalize natural resource markets. The ANR project will also help to reduce the uncertainty associated with common property resources which has hindered implementation of community woodlot activities. The use of CRMAs will create an enabling environment that allows local communities to manage, and benefit financially from, local forestry resources.

4. EVALUATION FINDINGS: PROGRAM IMPACT

This section assesses the impact of A.I.D.'s forestry program in The Gambia. It covers three levels of impact: the impact of the GFP on peoples' practices; its biophysical impact; and its socio-economic impact.

Impact on Practices

The forest resource management and use technologies and practices that were introduced under the GFP were generally not adopted. All of the practices were either modified or discontinued by the end of the project.

Community Woodlots: The practices that were introduced under the GFP for community woodlots were not widely adopted. From 1980 to 1986, 45 hectares of woodlots were established in 50 villages (Danso, 1986). The status of the woodlots in 1986 varied. Some were characterized as "well maintained;" others, as showing "good survival" (less than 20 percent); still others, as "abandoned" (Danso, 1986). The Agriculture and Natural Resources Baseline (ANRB) survey of 1992 found that only 4 percent of the households sampled claimed to have a woodlot in or around the village (DeCosse, 1992).

In contrast, many individuals did plant fruit trees in compounds and orchards (even though most communities did not plant wood species in woodlots). Almost everyone in the villages visited by the evaluation team had planted at least one fruit tree. (personal interviews, 1993). The ANRB Survey estimated that in 1992, 37 percent of households had planted a tree within or around the compound in the previous year. The Survey also estimated that only three percent of the farmed plots in The Gambia had trees planted on them, but of these, 92 percent of the trees were fruit trees (DeCosse, 1992).

Plantations: Since 1984, the Forestry Department has been managing about 1,800 hectares of Gmelina plantations, or which 578 hectares were established between 1980 and 1985 when the GFP was implemented. The number of plantation hectares has remained constant since 1984 because the plantation approach to forest management has been replaced to a large extent by natural forest management of existing forest areas in the national forest park system. Natural forest management practices are not new. They have been used since 1963, and they continue to be used in 1993 under the GGFP. The decision to use this approach (rather than the plantation approach) was based in part on the results of the early

A.I.D.-supported plantations near Nyambai (McEwan, 1979; Forester, 1983).

Local communities have recently become involved in the management of the national forest parks. CRMAs covering approximately 700 hectares have been developed with at least two communities, and three other communities have expressed interest in developing CRMAs with the Forestry Department (personal interviews, 1993). The Forestry Department provides technical assistance to the communities covered under the CRMAs.

Sawmill: The sawmill technologies and practices adopted under the GFP in 1979 had been used before and were still being used in 1993. However, a new sawmill technology had been introduced since the GFP ended. It was designed to improve the capacity to process larger logs, most often dead logs found in the fields and forests. (In contrast, the bolter sawmill technology used under the GFP at Nyambai is mainly for cutting relatively small logs.) Two sawmills have been built with GOTG and GTZ financing to process these larger logs.

Woodstoves: The woodstove technology was not widely adopted by villagers. A 1982 evaluation of the program sampled 52 woodstoves and found that 50 percent of them were either unused or in need of repair (Wood, 1982, p. 16). However, the concept of fuel efficiency has been adopted by other funding agencies and the GOTG. Projects implemented primarily in urban areas have introduced fuel-substituting technologies, those that use butane gas rather than fuelwood (UNSO, 1981). By 1992, 13 percent of the households sampled in the ANRB survey (a total of 660 households) were using the improved stove.

Biophysical Impact

The biophysical impact of improved forestry practices is typically measured by the increase in the amount of biomass that is achieved by increasing the amount of land under forest cover, or by the increase in the rate of growth of biomass, or both. The community woodlots and plantations were designed to increase the land area under forest cover with species that would grow at a significantly faster rate than indigenous species; the sawmill and woodstove interventions were designed to improve the efficiency of wood product use and to decrease the demands on the resource base. There was no significant positive biophysical impact that resulted from these interventions.

Community Woodlots: The net gain in forest cover and biomass production due to the establishment of community woodlots was insignificant. Only 45 hectares of woodlots had been established from 1980 to 1986, and there was no information concerning their status in 1993 (Danso, 1986). The evaluation team visited seven of

the woodlot sites. Of these, three were judged relatively successful because more than 50 percent of the trees were still growing (Kuntaya, Sotuma Sire, and Kembudjeh); two had been converted primarily to gardening, with only a few fruit trees and live fencing (Kundum Kunda and Demate Kunda); one had reverted back to agricultural staple crop production (Basse); and one had remained in fallow since being abandoned as a woodlot (Berending). (See Table 2.)

In order to determine whether or not there was a net gain in biomass production, it is also important to know how the woodlot site was prepared and what it was used for previously. For example, some sites previously consisted of bush land (mainly small trees, bushes, and plants), while others were formerly used for agricultural production and had little vegetative cover except for grasses. There may have been a gain in biomass production on the sites that were left in fallow for many years. However, no data were systematically collected to permit a judgement one way or the other.

Plantations: The two A.I.D.-funded plantations did not contribute to an increase in the amount of land under forest cover because the land first had to be cleared of forest cover to make way for the plantations. In the case of the Finto Manareg plantation, approximately 80 cubic meters of wood per hectare was destroyed to make way for the Gmelina plantation (Rauch, 1985). This is equivalent to 2.6 million 10-kilogram bundles of fuelwood valued at $700,000 (in 1981 U.S. dollars).

Although the Gmelina trees were expected to grow at a faster rate than natural forested areas, there is no evidence that this occurred (given high failure levels due to drought) or that there was a net increase in biomass. After the two plantations were established, they grew at approximately 5 cubic meters of wood per hectare per year, half the originally assumed growth rate. Thus, by 1985, only 80 percent of the Finto Manareg plantation, and only 45 percent of the Salagi plantation, were stocked (Rauch, 1985). The stocking rate for both plantations was lower than expected, partly because of drought. However, the Salagi plantation had a lower stocking rate (and most likely a poorer harvest history) than the Finto Manareg plantation because of the annual bush fires -- bush fires that apparently were started intentionally by community members. This may have occurred because the land originally was used for pasture, and using it for a plantation had never been accepted by the entire community (personal interview, 1993).

Sawmill: Although the sawmill was not expected to have a direct biophysical impact, it was expected to improve efficiency by an estimated 22 percent. This is equivalent to an additional 1,485 cubic meters of logs annually (Rauch, 1985). This might have occurred if the average growth rate of the Gmelina plantations was 15 cubic meters per hectare per year (as assumed by the project).

In fact, the actual average growth rate during the project period was closer to 5 cubic meters per hectare per year. Thus, without additional sawlogs supplied by another source, the improved efficiency of the sawmill was only one-third the original estimate; that is, it produced only an additional 495 cubic meters of logs per year rather than an additional 1,485 cubic meters per year.

Woodstoves: Like the other three components of the GFP, the woodstoves also had an insignificant biophysical impact. A year after the woodstove program began, 50 percent of the stoves (a total of 200) were in disrepair or unused (Wood, 1982). The other 200 stoves that were still in operation had the potential to "save" approximately 225 to 450 cubic meters of fuelwood annually, which is equivalent to the increase in the amount of fuelwood produced on 45 to 90 hectares annually (assuming a growth rate of 5 cubic meters per year). However, this potential level of fuelwood savings is based on several tenuous assumptions including that: (a) each household has nine members; (b) the woodstoves are from 25 to 50 percent efficient; (c) the stoves are used to prepare one-half of the three daily meals (thereby reducing the per capita consumption of wood by one-half); and (d) the per capita consumption of fuelwood is approximately one cubic meter per person per year.

Socio-economic Impact

The technologies introduced under the GFP did not result in significant improvements in socio-economic well-being nor did they generate significant economic benefits for the household or the national economy. The design of the activity was fundamentally flawed both in terms of the introduction of community woodlots for fuelwood production and the prescription of Gmelina plantations within forest parks for fuelwood and timber production.

Community Woodlots: Few if any community woodlots attained the level of sustained production anticipated by the project. In the majority of cases, the trees did not survive the early years when The Gambia experienced drought conditions. In one case, the trees survived the drought but then were destroyed by fire when they were approaching the point of offering some yield. In other cases, only the outside rows were surviving, which served as a perimeter for fruit trees and vegetable plots.

Furthermore, in the case of The Gambia it is not clear that the establishment of a woodlot is the best use of arable land, given the undervaluation of natural resources in general and fuelwood in particular. Population pressure, declining soil fertility, and growing demands for access to land for multiple and sometimes competing uses places a high premium on arable land. In most (if not all) of the sites visited, woodlots were established

on land that had been in crop production. In those cases where the woodlot failed, the land was usually returned to its previous use.

Management and Control. A common problem for communities was the determination of who was responsible for the long-term management of the woodlot, and who had authority to declare what could be harvested, how, and by whom. While this is a problem for other common use and common property goods, it is particularly important for the economic viability of community woodlots, since substantial labor is required over a relatively protracted period of time for their establishment and maintenance. While traditional institutions such as the *alkalo* and village elders, or a specialized organization such as the Village Development Committee, tended to exert authority over the woodlots, they were not successful in managing the production of wood products.

Even for the few sites where some success was visible in terms of the existence of trees, management was sorely lacking. This was reflected by poor maintenance (thinning and pruning) and inefficient off-take, further reducing the level of benefits to participants. This was most directly a failure in the education of community members in woodlot management and the inadequate extension efforts of the Forestry Department.

While land tenure considerations did not play a preponderant role in the success or failure of most of the community woodlots, the issue of authority and responsibility did emerge as a factor. Once land had been given over to the establishment of the woodlot, it was uniformly clear that the trees did not belong to the original landholder but were "owned" by those people responsible for their planting. In most cases this meant "the community;" in at least one case, however, it appeared that the individual (the district chief at the time the lot was established) who was responsible for providing the land, acquiring the seedlings, organizing the labor, and overseeing the operation also had authority over the distribution of benefits.

Distribution of Benefits. The assumption underlying the practice of community woodlots was that "the community" would work to establish and maintain the lot, and then "everyone" would benefit from the wood during the course of thinning, pruning, and harvesting. In practice, however, it is very difficult to assure that all who participate will receive equal or at least commensurate shares of the benefits. Off-take from woodlots is not easily divisible, nor is it necessarily timely in relation to when community members need or desire specific wood products. Women cannot simply collect wood when they need it, nor can one member cut poles for construction purposes without confronting directly the issue of equitable distribution of benefits.

This has major implications, because the establishment of a woodlot requires a considerable investment of labor. The lot, once

selected, must be cleared and fenced. The land must be prepared sufficiently to permit the planting of Gmelina stumps, seedlings, or in some cases, seeds. The new plant growth must be protected from animals and watered when rainfall is inadequate. Weeding is also required during the first three to four years to reduce competition for moisture and to lower fire danger. As the trees mature, they should be pruned and thinned. This is the first activity to generate any benefit to participants, and it comes only after at least two years of labor investment. The small branches and sticks that are obtained by these maintenance activities are meager compensation for the work, and even these benefits are difficult to distribute in an equitable manner. In a number of cases, respondents stated that the wood generated from these activities was left to those who wanted it, implying that there was no linkage between labor investment and benefits, given the insignificance of the benefits.

Communities face a more serious problem when the trees become large enough to yield poles, large branches, and logs. At this point there is a clear sense of economic value to be gained, and the question arises as to how the distribution of benefits is to take place. Some communities have insisted that the produce from a woodlot belongs to everyone, and nothing is harvested unless all will benefit. While one solution would be to sell all wood harvested and deposit the receipts in a community fund, there is no evidence that this has been done with the A.I.D.-supported woodlots. Another option would be to attempt to divide the harvest among households, or even place the entire harvest in a communal area and allow people to take from it according to their need. There was no evidence that any of these options was implemented.

Thus, the lack of an apparent means of assuring linkage between participation and benefits proved to be a critical weakness in community woodlots, resulting in poor management and a tendency to defer or delay harvesting.

Plantations: The decision to destroy natural forest in order to establish plantations of exotic species did not result in a net improvement in the availability of wood products. Production estimates for Gmelina were much higher than those reached in practice, and the cost of establishing plantations proved to be considerably higher than estimated due to the need for replanting trees that had died from drought, were destroyed by animals, or consumed by bush fires. Although there has been extensive experience with Gmelina in The Gambia, the species did not prove to be a sound choice given the unanticipated decline in annual rainfall during the early 1980s.

Management of the plantations once established was poor, further reducing the economic return from this intervention. While the Forestry Department has maintained the stands by thinning the trees and controlling undergrowth, commercial harvesting has not

been undertaken. The reason for this is unclear, but may be linked to the distance between the plantations and the sawmill, the cost of transportation, and the fact that there are sufficient Gmelina logs in the nearby Nyambai reserve to meet the demand from the mill.

5. EVALUATION FINDINGS: PROGRAM PERFORMANCE

The third section assesses the performance of the forestry program in The Gambia by using four measures of performance: effectiveness, efficiency, sustainability, and replicability.

Program Effectiveness

There are three principal components of program effectiveness: (a) coverage, or the extent to which program activities and benefits were available to all members of the intended beneficiary population; (b) equitable access, or the degree to which participation in activities and benefits was open and accessible to all potential beneficiaries; and (c) intended consequences, or the extent to which the anticipated benefits and effects of the activity or technology were realized. A program is therefore relatively effective if it reaches the population it intends to benefit, all who can benefit from the activity have an equal opportunity to do so without undue restriction, and the results or outcomes are generally those that were anticipated and desired in the design of the activity. A.I.D.-supported activities in the area of forestry management have not been effective. However, the new policy orientation and community-based focus of the ANR project offer potential for future program effectiveness on all three counts.

Coverage: The effectiveness of initiatives under the GFP was undercut by what proved to be an inappropriate choice of technology. While the project design called for the establishment of 1,300 hectares of plantations, only 578 hectares were completed. The anticipated number of woodlots was also revised, from a total of 50 hectares in 10 villages to 35 hectares in 13 or more villages (PIL No. 12, 1984). By 1985, there were a total of 17 hectares of woodlots in approximately 25 villages (Rauch, 1985). In 1986, according to a report prepared by the Deputy Director of the Forestry Department, there were 45 hectares of woodlots in 50 villages; however, some of these may have been funded by other donors (Danso, 1986, Appendix 1).

Equitable Access: While all community members theoretically had equal access to the benefits to be derived from a community woodlot, in practice there were generally few or no benefits generated. This was often due to the failure of the woodlot following drought conditions, or the loss of trees from some other cause such as animal destruction or fire. However, as noted above, the critical issue concerning community woodlots developed for fuelwood production lies not in access to benefits, but in the

difficulty of dividing benefits among participants and of managing the woodlots efficiently.

Intended Consequences: Neither the plantation component nor the community woodlot component of the GFP produced the consequences anticipated by project designers. The Gambia in 1993 continues to face the depletion of forest cover, with the attendant environmental consequences that provoked the earlier response in 1979. The dependence of both urban and rural populations on forested areas for firewood and other forest products has not diminished. Indeed, population growth and land pressure have combined to accentuate this dependence. What has changed, in large part due to the relative failure of the initial project activity, is the approach now used by donors and GOTG forestry specialists. Rather than emphasizing production alone, priority is placed on the efficient management of natural resources, including the forest resource base, by those who depend most on these resources. A.I.D., in particular, is emphasizing an improvement in the policy environment to encourage the wise use of resources and, at the same time, to secure community rights to local resources.

Program Efficiency

The efficiency of environmental and natural resource programs is particularly difficult to analyze. Inputs are often introduced over an extended period of time, as was the case with the plantations and community woodlots under the GFP. Benefits are often realized only several years after the initial investment. Indirect benefits (such as increased water infiltration and improved soil conservation) are often difficult to determine and quantify. The 1985 evaluation assessed the efficiency of the GFP and estimated that the internal rate of return to investments in the plantations was only 1.4 percent (Rauch, 1985, Annex VI). Delays in establishing the plantations, low seedling survival rates, and growth rates that were substantially below those originally estimated explained the low returns to this component of the project.

The evaluation also compared the efficiency of the plantation system with that of natural forest management. The analysis assumed that at the end of a 30 year sawlog rotation, the plantations would produce an additional 90,000 cubic meters of wood which would meet the firewood needs of 60,000 people, or 8 percent of the population. In contrast, natural forest management would produce an additional 145,000 cubic meters of wood, or 160 percent of the estimated production from the plantations (Rauch, 1985). In addition, the evaluation compared natural forests that were managed with those that were unmanaged. It found that natural forested areas that were managed would yield three times that of natural forested areas that were unmanaged, or 1.5 cubic meters per hectare per year. It also found that the natural forest species would

provide more heat than Gmelina logs (200 percent more) and more valuable lumber, rosewood and mahogany (Rauch, 1985, Annex 5).

The evaluation estimated that the cost of producing lumber with the bolter sawmill, which was determined to be the most appropriate technology for converting Gmelina logs into lumber, was four times the average price at which the lumber could be sold. In addition, the sawmill produced lumber at 62 percent below the target rate of 5,000 board feet per day, or 142 cubic meters per year (Rauch, 1985). The low production rate was due to fuel shortages that allowed the mill to operate for only two days per week, or 104 days per year. To be profitable, the mill would have to operate for 240 days per year and produce 2,256 cubic meters of lumber per year, more than 16 times the estimated annual processing rate.

Program Sustainability

There are three principal components of program sustainability: financial sustainability, institutional sustainability, and environmental sustainability. Financial sustainability is the capacity of the implementing agency to be financially self-sufficient and independent of A.I.D. funding, either through revenue-generating activities or through substitution of other public, private, or donor sources of funding. Institutional sustainability refers to the organizational capacity of the implementing agency to manage its operations independently. Environmental sustainability concerns the capacity of the program to survive in the external environment in which it must operate, including the political and policy environment.

Financial Sustainability: Various NGOs and other funding agencies have been involved in implementing forestry activities in The Gambia. Prominent among these are GTZ, EEC, Save the Children/USA, UNSO, as well as A.I.D., and the Peace Corps. Despite the attempts of many of these agencies to cost-share with the GOTG in order to assure that the activities would eventually become financially self-sufficient, these attempts have not met with much success.

Since the end of the GFP in 1986, none of the A.I.D.-supported community woodlots has become financially self-sufficient. However, some have been sustained with financing from the EEC, which has supplied plastic pots, salaries for some of the nursery staff, fences, wells, and technical assistance. Peace Corps volunteers also have provided technical assistance and nursery materials to some of the woodlots. The Forestry Department is attempting to introduce a cost recovery system so the nurseries and the woodlots will become financially self-sufficient (personal interviews, 1993).

Gmelina plantations were discontinued in 1985, but those that were established under the GFP continue to be managed by the Forestry Department (personal interviews, 1993). The degree to which the plantations recover costs is unclear, but at least some budgetary resources are required (and allocated) annually for plantation management and protection.

The Forestry Department was unable to maintain and operate the sawmill and still recover costs (personal interview, 1993). As a result, the sawmill was privatized, and the Forestry Department is now under contract to supply logs to the sawmill.

When the GFP terminated, the woodstove activities were absorbed into a non-A.I.D.-funded project which incorporated a partial cost recovery feature. Under the successor project, the user of the woodstove was required to pay the person who built the stove. However, the materials that were used to build the stoves were at least partially subsidized by the project.

Institutional Sustainability: The Forestry Department provided personnel to help implement the GFP, but the number of personnel provided and their level of education and training was inadequate to assure success (Mullally, 1982; Rauch, 1985; personal interviews, 1993). To the extent the GOTG lacks a sufficient number of personnel to manage the forests, there is likely to be a continued emphasis on enforcement activities rather than on forest resource management activities.

Several key village institutions, including Village Development Committees and women's and men's *kafos*, were involved in forestry activities. For the most part, these local institutions are self-sustaining and require no outside funding to continue functioning. However, regular site visits by national- and regional-level government and NGO personnel, and the training of key community leaders in management and community participation, would enhance the sustainability of these local institutions.

Environmental Sustainability: The political environment in The Gambia has been supportive of sustainable forest resource management. The President and key ministers have taken a keen personal interest in resource management as evidenced by their visits to community woodlot sites and by their support of CRMAs. The Environmental Unit, which was recently established, was given special status by being located in the President's office. Similarly, the creation of the Policy and Planning Unit in MNRE signifies strong political support. In the past, the policy environment has not provided the much needed vision required for the development of the country's forestry resources. However, this is likely to improve with the support of the ANR project, and the political and policy environments should be even more conducive to sound forest resource management practices.

Program Replicability

Program replicability refers to whether or not the activities and the benefits of the activities have "spread" to other communities beyond those originally targeted. Replicability is particularly relevant in pilot projects or where it is an explicit objective, which was the case with community woodlots and woodstoves under the GFP.

Community woodlots do not appear to have been replicated. The ANRB Survey results, which provide limited empirical evidence, show that only four percent of the 666 households that were sampled had established a woodlot in 1992 (DeCosse, 1992). On the other hand, the villagers at three of the seven sites visited by the evaluation team believed that at least one neighboring village had established a woodlot after having visited their woodlots.

Likewise, the woodstoves were not widely replicated. The ANRB Survey found that only 13 percent of the 666 sampled households used an improved woodstove in 1992 (DeCosse, 1992). However, the use of butane gas stoves (a substitute for woodstoves) appears to be on the rise in the urban and peri-urban areas of Banjul.

6. LESSONS LEARNED

The concept of community woodlots is fundamentally flawed.

It is based on the underlying assumption that "the community" will work to establish and maintain the woodlot, and then "everyone" will benefit during the course of pruning and harvesting. In practice, however, it is very difficult to implement this concept because the offtake from woodlots (unlike rice plots, for example) is not easily divisible, and thus it is difficult to distribute the benefits equitably among community members. In addition, it is difficult to determine who is responsible for the management of community woodlots (or any common property, for that matter), and thus it is not clear who has authority to declare what can be harvested, how, and by whom.

Moreover, in The Gambia, the design of the community woodlot program (as distinct from its concept) was also fundamentally flawed. The technology that was introduced, planting fast growing Gmelina or eucalyptus trees, was inappropriate because the firewood it produces burns too fast. A better technology would have been to plant hardwood trees that produce slow-burning firewood.

A new technology is more likely to be adopted if it places only minimal additional demands on labor, is easy to maintain, and requires few changes in existing practices.

In The Gambia, the community woodlots satisfied none of these criteria. The demand for labor to plant seedlings competes with the demand for labor to plant food crops; seedlings are not easy to maintain; and new husbandry practices must be learned.

Collective action is most effective when there is a clear linkage between peoples' participation in a common effort and the benefit that is derived from such participation.

In The Gambia, most community woodlots are not well maintained by the community, largely because this linkage is not clear and because there is uncertainty about the distribution of benefits. Maintenance of community woodlots seemed to be somewhat more effective when the community or ethnic group was unusually cohesive or when a Peace Corps volunteer or Forest Scout was present.

A new technology or practice is less likely to be adopted when the intended beneficiaries are able to meet their

needs by using existing technologies or existing practices.

Although deforestation in The Gambia as a whole is increasing, there are still ample supplies of wood in the forests that people can cut and use for firewood. As a result, community woodlots, though environmentally sound, were generally not successful because they did not meet a perceived need.

Technologies that yield significant benefits only in the medium to long term are less likely to be adopted than those that yield benefits more quickly.

Even fast growing species, such as the Gmelina trees that were planted in community woodlots in The Gambia, normally require a decade before they can be coppiced and the timber used for poles or sold commercially. Although Gmelina trees can be pruned for firewood after only two years, this is not considered a "significant" benefit.

Technologies for which there is not a clear, expressed demand on the part of the intended beneficiaries are not likely to be adopted, or if adopted, not maintained.

Community woodlots that were introduced in The Gambia were not designed to respond to the needs as perceived by the villagers (which was for fruit trees), but rather they were designed to respond to the needs as perceived by donors and the government (which was for firewood). As a result, many communities did not replant Gmelina seedlings (many of which had died after the first year due to drought), and instead replanted fruit trees and/or horticultural crops.

Strong institutions at the national level are crucial.

In The Gambia, both A.I.D. and government support of the Forestry Department was insufficient. As a result, the Forestry Department was (and is) unable to promote the government's objective of conserving The Gambia's forest resources through sustained management of these resources. Not only is it unable to provide technical advice at the local level, but also it is unable to enforce existing laws and regulations governing the use (or misuse) of forest resources.

ANNEX A

EVALUATION METHODOLOGY

A four person team carried out this assessment of forestry and the environment in The Gambia as well as a companion assessment of sustainable agriculture and the environment. The team was comprised of two economists (including one who focused on forestry), an agronomist, and a social scientist. The evaluation methodology used to carry out the two assessments was developed by the team during a three day team planning meeting in Washington, D.C. The methodology is relatively straightforward, relying primarily on three main sources of information.

First, the team reviewed documentation available from the A.I.D. data base as well as from USAID/Banjul. Of particular importance were past evaluations of A.I.D.-supported activities as well as analytical work concerning the interface between environmental protection on the one hand and investments in forestry and agriculture on the other. The bibliography cites the main documents reviewed. Second, the team conducted key informant interviews with persons in The Gambia familiar with A.I.D.-supported activities in forestry and sustainable agriculture. These interviews were with key government officials as well as representatives from donor agencies and NGOs. Annex C lists the persons contacted in The Gambia. Third, the team visited various sites throughout the country where A.I.D.-supported activities had been implemented. Annex C lists each site visited, and the location of each site is shown on the Map of The Gambia (p. ix).

The team worked in The Gambia for about four weeks, from September 30 through October 28, 1993.

The evaluation methodology used a common analytical framework, one that had been used to undertake similar assessments in Pakistan, the Philippines, and Mali -- and which would be used for future assessments planned for other countries. This was to assure comparability among all the assessments. This common framework was organized around four strategies that typically had been used by A.I.D. to implement forestry and sustainable agriculture programs worldwide. The framework was designed not only to assess the long-term impact of A.I.D. programs (both biophysical impact and socio-economic impact) but also to understand what caused that impact in terms of one or more of the four strategies: technological change, awareness and education, institution building, and the policy environment. As such the four strategies served as the organizing principle for the survey instruments developed by the team.

The site visits were carried out over a six day period. In order to be able to visit the maximum number of sites within a given period of time, the team split into two groups, a forestry group and a sustainable agriculture group. In addition, a technical expert and a research assistant were recruited to assist each group and to serve as translators and enumerators. This allowed the forestry group to visit 13 sites during the six days and the sustainable agriculture group to visit 10 sites. Each site visit required approximately two and one-half hours. Exhibit I is the interview guide developed by the team to use for the key informant interviews conducted in Banjul. Exhibit II is the instrument used to provide a summary description of each site visited by the forestry group. Exhibit III is the survey instrument used to gather data to assess biophysical impact. Exhibit IV is the survey instrument used to gather data to assess socio-economic impact.

These survey instruments were deliberately designed to be topical guides that would provide a structure in which to conduct the village interviews; they were not designed to elicit quantitative information that could subsequently be statistically analyzed across villages.

Exhibit I

Interview Guide

Background

A.I.D. is conducting a worldwide assessment of its environmental programs. The purpose is to assess the environmental impact of A.I.D.'s assistance in two areas: forestry and sustainable agriculture. We want to know what the impact of these programs has been; and we want to identify the strategies that appear to be most effective in different kinds of country situations.

So far we have conducted field studies in three countries: Pakistan, the Philippines, and Mali. The Gambia is the fourth country, and we expect to complete a fifth field study by the end of the year.

In each country we are looking at completed activities as opposed to on-going activities. In The Gambia, we are looking primarily at four projects, two of which were completed in 1986: the Forestry Project, the Soil and Water Management Project, the Mixed Farming Project, and the GARD (Gambia Agricultural Research and Diversification) Project. One of these projects started in 1978, two started in 1979, and the GARD project started in 1986.

We are using the same evaluation framework for all of the country field studies. This is so we can synthesize the results and the lessons learned from all the country studies into one summary report on A.I.D.'s overall experience in forestry and another summary report on sustainable agriculture.

We want to understand which strategies work better and which strategies don't work so well under different country situations. We are especially interested in four strategies that the A.I.D. projects may have supported: first, support for the institutional framework within which the projects were implemented; second, promotion of environmental awareness and related educational programs; third, the development of environmentally sound agricultural technologies; and lastly, the support of economic and other policies (such as land tenure policies) to help assure a policy environment conducive to sustainable agricultural practices and forestry development.

Key Questions

1. What have been A.I.D.'s main contributions in these four areas or in other areas that you believe are important in promoting forestry development and sustainable agriculture?
2. What has been the impact of these activities? We are thinking here about biophysical changes that occurred as a result of

the A.I.D. projects as well as social and economic benefits that may have accrued to farmers and others. We are also thinking about negative impacts as well as positive impacts.

3. What was the single most important factor that led to these changes; (or, what was the single most important constraint or problem that reduced the effectiveness of the projects)?

4. What other activities, beside activities supported by A.I.D., have been instrumental in promoting sound environmental practices in The Gambia?

5. What do you think are the most important lessons learned since these projects were implemented?

6. What do you think is the most important thing to do now to enhance The Gambia's environment in the forestry and sustainable agriculture areas?

Exhibit II

Site Profile

Date:_____ Interviewer:_____Village name:_____
Site name:_____ Regional division:_____

1. Describe the woodlot site as it looks today (2*2 Gmelina plantation, fence, fruit trees, live fence, firebreak, windbreak, guardian services, nursery):

   tree species:
   average spacing:
   average size of trees (fuel, pole, timber):
   live fence (species) or wire fence (barbed and wood posts):
   evidence of harvest or other activities (coppiced, fruit bearing):
   other general comments:

   1.1. If no remaining signs of woodlot or if woodlot completely abandoned, what is current land use? Go to #3.

2. Size of woodlot now: _____(ha. or dimensions)

3. Distance to water source:_____(km);
   to main road or local market:_____(km);
   to implementing beneficiary(ies):_____(km)

4. Composition of surrounding vegetation (brush, small trees, major tree species, other tree species):

5. Surrounding site condition [slope, erosion, soils (laterite, sand)]:

6. Surrounding land use:

7. Other general site characteristics or other unusual features of site:

8. What is overall assessment of environmental impact (positive, negative, none)? Why (erosion, productivity, water infiltration, soil retention, grass or vegetation growth other than trees, other)? What would site be without woodlot?

9. Other comments:

Exhibit III

Site Impact Assessment

Interviewer:_____Village name:_____

Site:_____Regional division:_____Date:_____

Informant status (role in woodlot activity):_____

Some questions may be less important if the woodlot was not maintained, but try to answer as many questions as possible.

1. When was the woodlot initially established?

2. Who suggested the idea to create a woodlot? How did they hear about it? Why did you decide to create a woodlot?

3. Who selected the site? Why this site?

4. Is this the most productive use of the land?

5. Who participated in the site preparation and planting [village groups (male, female, young, mixed); individuals; NGO; forest ranger]?

   5.1. How many hectares were initially prepared?

6. Were there any maintenance or followup activities (weeding, thinning, intercropping, fencing)? When (what year)?

   6.1. Who did these activities on the woodlot [village groups (male, female, young, mixed); individual; NGO; gov't]?

7. What has been harvested from the woodlot (describe harvests, including quantity and products)? When (date)?

   7.1. Who harvested the products [village groups (male, female, young, mixed); individual; NGO; gov't]? Note especially when women are involved.

   7.2. Was wood (or fruit) received from the woodlot? If yes, who, what, how much, how often?

   7.3. Have <u>you</u> received any wood (or fruit) from the woodlot? If yes, what and how much?

   7.3.1 If yes, what did you do with the wood or fruit from the woodlot?

8. What else besides land and labor was used to establish and maintain the woodlot [seedlings; fence material (posts, wire); technical assistance]?

8.1. Who provided (paid for) these inputs [seedlings; fence material (posts, wire)]? (community, forest service)?

8.2. Are all the inputs readily available (technical assistance, fenceposts or fencing material, seedlings)?_____(yes/no)

9. Did you receive any technical assistance from the forest service or another organization? When? How often?

10. Was any food provided to anyone who worked on the woodlot? Was anyone paid to work on the woodlot? Or were they given wood from the woodlot for working on the woodlot? Did everyone receive the same?

11. Have woodlots been established in other communities or on individual farms?_____(yes/no)

11.1. If yes, how many farmers/communities? _____ How many hectares? _____

12. Has the same or modified intervention been used by non-participating farmers?_____(yes/no)

12.1. If yes, how many hectares do you think they have in woodlots? _____ha.

13. Has the community discussed plans for future activities on the woodlot? If yes, what are they?

14. What is the most important reason that you have this woodlot here today and why? Why did the people work on the woodlot?

15. What was the most difficult step in creating and maintaining the woodlot? Why [too labor intensive/competing; too risky; unclear ownership of harvest or expected product; inadequate access to markets or lack of markets; cost too high; inputs unavailable (credit, seedlings, fence materials, technical assistance)]?

16. Would you establish a woodlot on your own land?_____ (yes/no) Why? Are woodlot activities a good use of your time?

Exhibit IV

Topical Guide: Social/Organizational Dimension

Village_____Population_____Households_____Date _____

I. Background [Ask informant to describe history of activity; dates; actors; process. Note public education, organizing, technical support, post-project support]

1) When did intervention begin? How did community first hear of intervention? Who were leaders? Which technical services involved?

2) Why was site selected, by whom? Who did land belong to? How was it being used? What is present use of land?

3) What services/NGOs were involved? How? What did they contribute? Still helping/present?

II. Participation [Who, when, what did they do, how was it organized. Community role]

1) Who worked? Frequency, tasks, for how long? Males, females, age, families, ward, other grouping

2) Was a group formed to organize work? Name, composition, role, current status

3) Did community meet to decide on activity? Role in design, implementation, management

III. Evaluation of Success/Failure [Overall, and then by components, reasons for success/failure, unanticipated benefits/costs]

1) Was activity successful? Why or why not? What was <u>single most important</u> reason for success/failure?

2) Why were people willing (incentives) or unwilling (disincentives) to continue activity? Profit, access to markets/inputs, insecure tenure, technical problem/failure

3) Did other good/bad things happen because of activity that were not expected?

IV. Socio-economic Impact [Who benefitted, nature of benefits, value/amount, relation between participation and benefits; who lost, nature of loss, etc.]

1) Who benefitted the most? By sex, caste, landholding status, old families or recent immigrants; order (1,2,3)

2) How did they benefit? Money, food security, time saved, labor, prestige, productivity. [Quantify] How was money/crops used?

3) Who lost? Sex, caste/class, ethnicity, etc. How/what did they lose?

4) Did those who worked most, benefit most? Why/why not?

5) Did the community as a whole benefit? How?

V. Sustainability/Replicability [Maintenance (MT) system and status of MT, priority for users, continuity of benefits, spread to other communities]

1) How is activity (infrastructure) to be maintained? Who, organization, frequency, cost

2) Is activity/infrastructure well maintained now? Why/why not?

3) Have others (individuals, villages) asked about activity? Requested assistance? Done it themselves? Who, where, when, status

VI. Remaining concerns/issues

THANKS TO ALL INFORMANTS

ANNEX B

COMMUNITY RESOURCE MANAGEMENT AGREEMENT

NATURAL RESOURCE MANAGEMENT AGREEMENT

BETWEEN

SAVE THE CHILDREN USA (SCF)

AND

THE COMMUNITY OF NJAWARA

APRIL, 1993

ABSTRACT

In April 1992, Save the Children USA and the community of Njawara began implementation of an Agriculture and Natural Resource Management program in the village following a PRA exercise done the previous year. The respective roles of each party were well defined but limited to pre-project and implementation phases. As the program moves to the second phase there is need to re-affirm, expand and document the previous oral agreement.

This written agreement is therefore a reiteration of what has been accomplished and a guideline for the implementation of future activities, namely;

- o construction of anti-salt intrusion dikes
- o liming
- o planting of bund stabilizing vetiver grass
- o tree planting and other agroforestry/agronomic interventions
- o ongoing maintenance activities

BACKGROUND

A two-phase plan of action was developed following identification of soil erosion and salinity as the key problems. The first phase sought to address the more urgent problem of soil erosion in the upland area of the watershed. Early in 1992, SCF contracted the Soil and Water Management Unit (SWMU) to do a detailed survey of the upland and develop a plan for combating soil erosion. SWMU recommended placement of 13.5 kilometers of bunds, vetiver grass hedgerow plantings on the bunds, contour plowing, and tree planting. The community responded positively to the proposal and work commenced in June 1992. Work on this phase was accomplished except stabilization of the bunds through planting of vetiver grass.

SCF met the cost of materials, mechanical equipment, and technical services. In addition, SCF provided 5000 tree seedlings and assisted in the establishment of a village nursery. The community supplied unskilled labour and locally available materials. More importantly, while SCF's contribution may be a one time endeavour, the community's responsibility to ensure sustainance of these conservation efforts goes beyond the life of the project. In the long term, success will be largely determined by both the capacity and commitment of the community to enforce this agreement.

So far the community of Njawara has worked hard to implement the first phase of the Natural Resource Management plan. They have been tireless in their effort and prompt in their maintenance activities. This agreement is being written with the intent to continue with the momentum already demonstrated and to clearly spell out the responsibilities of SCF and the community for a period of 5 years, June 1992 -June 1996.

This agreement will cover both phases and where the work has been accomplished, the item will be marked [DONE]. Where activities are currently being implemented, the item will be marked [In Progress].

THE NATURAL RESOURCE MANAGEMENT AGREEMENT

Save the Children USA and the Community of Njawara, for a five year period June 1992 to June 1996, agree to the following:

The Upland:

For the purpose of soil conservation and water management, Save the Children USA will (has) provided the following services and materials at no cost to the community:

1. All mechanical equipment necessary for the construction of erosion control earthworks [DONE]

2. Contract SWMU to carryout survey work and supervise the construction of water diversion bunds and waterway to divert runoff water. [DONE]

3. Provide vetiver grass, for hedgerow establishment to stabilize bunds.

4. Train community in vetiver planting and care, and bund maintenance.

5. Provide polypots and advise in establishment of a village tree nursery. [DONE]

6. For each of the 5 years, provide up to 5,000 polybags per year and some, but not all, tree seeds to the nursery. [In Progress]

7. Inspect bunds, hedgerows and trees for maintenance, care and survival each year and advise VDC on any necessary action. Such action may require direct intervention by SCF or mobilization by the village.

8. Advise on contour ploughing/planting, and other recommended practices.

9. Collect data on effectiveness of interventions including:
   - o yields
   - o adoption of recommended practices
   - o rate of tree survival
   - o hedgerow development

The Njawara Community will be responsible for the following:

1. Provide land to allow construction of bunds and waterway. [DONE]

2. Provide labour for ramp and bund construction. [DONE]

3. Plant and tend vetiver hedgerows along the bunds. Planting may begin in July of 1993 after the soil has retained some moisture and the villagers are free to plant the grass. A small trench will be placed on the up slope side of the bunds and the slips of grass planted 10cm apart. Each farmer will be responsible to replace any slips that die and trim the grass to allow rapid closure of the hedgerow.

4. Repair and maintain bunds.

5. Establish village nursery and propagate tree seedlings to be planted in and around the village. [In Progress] A minimum of 5,000 trees will be out-planted each year. At the end of the 5th year, the community may petition additional support from SCF or sustain the effort themselves.

6. Protect the trees from animals and bush fires, which includes building and maintaining structures around each tree until the tree is safe from grazing and, clear grass away for at least a 1 meter radius, from each tree at all times to protect against fire. Failure to protect the trees adequately may result in the withdrawal of support by SCF of the village nursery.

8. Adopt recommended practices e.g. contour ploughing/ planting etc...

The Lowland:

To implement dike construction and carry out recommended agronomic practices in the lowland, SCF will provide the following services and materials at no cost to the community:

1. Contract SWMU to:

   o conduct a detailed implementation survey [DONE]
   o determine placement of dikes [DONE]
   o measure the salinity and PH level of the soil. [DONE]
   o provide technical supervision [In Progress]
   o provide skilled labor and train at least one villager [In Progress]

2. Share information obtained from the survey and discuss the implementation schedule with the village. [DONE]

3. Provide supplementary materials, such as spades, wheelbarrows and headpans, to facilitate dike construction. All materials will be returned to SCF at the end of construction. [In Progress]

4. Provide mechanical equipment necessary for:

   o dike construction [In Progress]
   o land preparation prior to liming
   o clearing neem trees and termite hills [In Progress]

5. Provide construction materials - cement, rods, and BRC for spillways.

6. Provide the recommended amount of lime for the first year only (1993), and train women on liming techniques.

7. Conduct technical training for women in recommended liming techniques.

8. Assess and provide available rice varieties on loan that can perform better under the current ecological conditions.

9. Conduct technical rice production training to promote adoption of recommeded techniques and varieties

10. Along with SWMU, monitor the effectiveness of dikes and spillways and make appropriate recommendations to the VDC.

11. Collect data on the effect of intervention including:

    . yields
    . rate of adoption of recommended practices
    . soil salinity and acidity
    . hectarage reclaimed

    This data will be collected over the 5 year span of the project.

The Njawara Community will be responsible for the following services during and after project implementation:

1. Provide land for dike construction. [In Progress]

2. Handle any land disputes in a quick and just manner.

3. Mobilize labour for dike construction. [In Progress] Select one villager to be trained by SWMU mason.

4. Safely keep all materials and tools provided to the project and return all to SCF at the end of their project use.

5. Use mechanical equipment only for the agreed functions.

6. Participate in technical training on liming techniques rice production, and adopt the recommendations.

7. To those fields affected by acidity, provide lime in the third (1994), fourth(1995) and fifth (1996) years as needed, under supervision of the VDC.

8. Inspect and manage dikes and spillways in a functional manner.

9. Repay the rice seed loan, in kind, at the end of harvest.

Save the Children/USA and the Njawara Community enter into this agreement in good faith and will hold periodic meetings to assess progress of this initiative and take corrective measures necessary in the pursuance and achievement of its major goal of enhancing the agriculture and natural resource management practices in Njawara.

This agreement is valid from June 1992 - June 1996, and will be renewed and amended appropriately as necessary.

Failure by either party to honour their commitment may lead to suspension of this agreement by the wronged party.

Signed: _____ Signed: _____
Alkalo Save the Children/USA

Signed: _____ Signed: _____
VDC Chairman Women's Group Leader

Witness
Signed: _____
Chief Lower Baddibu

Witness
Signed: _____
Commissioner, North Bank Division

Witness
Signed: _____
Forestry Officer, NBD

ANNEX C

PERSONS CONTACTED AND SITES VISITED

Persons Contacted

Government of The Gambia

Mustapha Darboe
Permanent Secretary
Ministry of Natural Resources and Environment

Foday Bojang
Director
Department of Forestry
Ministry of Natural Resources and Environment

Abdoulie Danso
Assistant Director
Department of Forestry
Ministry of Natural Resources and Environment

Kotu Bojang
Department of Forestry
Ministry of Natural Resources and Environment

Fasainey Dumbuya
Department of Planning
Ministry of Natural Resources and Environment

Amadou Taal
Permanent Secretary
Ministry of Local Government and Lands

Sehou Jobe
Ministry of Finance

Ndey Njie
Executive Director
National Environmental Agency

USAID/Banjul

Bonnie Pounds
Director

Gary Cohen
Agriculture Development Officer

Omar Jallow
Project Management Specialist

NGOs and Other Donors

Diane Nell
Director
Save the Children/USA

Turi van Zuten
Action Aid

Solomon Owens
Project Director
CRS

Dominique Reeb
German Team Leader
Gambian-German Forest Project

Ted Wittenberger
Assistant Director
Peace Corps

Mr. Paterson
FAO

Consultants

Asif Sheikh
President
International Resources Group (IRG)

Amare Getahun
Chief of Party
ANR Project

Frank W. Kooistra
Budget Specialist
Ministry of Finance

Isatou Sawaneh
Consultant

Ben Carr
Consultant

Sites Visited

Kembudjeh
Berending
Kuntaya

Njawara
Sotuma Sire
Basse
Kundum Kunte
Demate Kunda
Sapu
Boureng
Doumboutou
Nyambai
Furnyar

(See Map of The Gambia, front, for the specific locations of these sites visited by the evaluation team.)

F-APPEND.GAM::December 12, 1994

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