

PROGRESS AGAINST DESERTIFICATION:

CASE STUDIES OF EXPERIENCE IN GHANA



COVER PHOTO

Cover photo by Stephen Turner.

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PREFACE

The case studies reported here give only a superficial impression of Ghana's progress against desertification. There was little time to prepare our field visits, which themselves could only be brief observations of impressive and time-consuming efforts by rural resource users. A study on this small scale could never do justice to the work that many people are doing in rural Ghana to combat desertification. Nevertheless, we hope that it will give some indication of these inspiring attempts to overcome land degradation in hostile environmental and economic conditions. As we argue at the end of the report, the work that rural Ghanaians are doing in this sector deserves much more systematic monitoring and reporting than we have been able to offer.

We are preparing this report in two versions: with and without photographs. We believe that the photographs are very helpful illustrations of the work that the report describes. But they make the report too big for easy downloading from the internet. Readers accessing this report on the internet may wish to download the individual case studies, which are also posted, with photographs, on the FRAME Website. Those are of course smaller files and should be easier to handle with limited bandwidth.

A draft version of the report was produced in April and circulated to those who collaborated with the exercise in Ghana, with a request for comments. This final version takes into account the comments that have been received.

We are grateful to the Executive Director and staff of the Environmental Protection Agency – in particular the Regional Directors for Northern, Upper West and Upper East Regions – for all their collaboration in the planning and execution of these case studies. We also thank the staff of the many other organisations who gave us time and information, including the Nandom Agricultural Development Project, the Food Security and Rice Producers Organisation Project, TRAX, Community Action Programme for Sustainable Agriculture and Rural Development and the Association of Church Development Projects. We are grateful to USAID and CILSS for funding and facilitating the exercise. Above all we thank all the resource users whom we visited in the three regions for the time they took to explain their work to us and answer our questions. We hope that this report does at least some justice to their many achievements, and take sole responsibility for any errors that it may contain.

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ACRONYMS AND ABBREVIATIONS

AFD	Agence Française de Développement [French Development Agency]
C	Centigrade
CAPSARD	Community Action Programme for Sustainable Agriculture and Rural Development
CBO	community-based organisation
CEMC	Community Environmental Management Committee
CILSS	Permanent Inter State Committee for Drought Control in the Sahel
CIPSEG	Co-operative Integrated Project on Savanna Ecosystems in Ghana
CRIC	Committee for the Review of the Implementation of the UNCCD
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organisation of the United Nations
GEF	Global Environment Facility
GIS	Geographic Information System
FSRPOP	Food Security and Rice Producers Organisation Project
ha	Hectare
IGA	Income Generating Activity
IRG	International Resources Group
ITFC	Integrated Tamale Fruit Company
km	Kilometre
LEISA	Low External Input Sustainable Agriculture
LRDP	Lowland Rice Development Project
m	Metre
M&E	Monitoring and Evaluation
mm	Millimetre
MOFA	Ministry of Agriculture and Food
NAP	National Action Programme
nd	Not Dated
NGO	Non-governmental Organisation
NRM	Natural resource management
NSBCP	Northern Savanna Biodiversity Conservation Project



sq	Square
SWC	Soil and Water Conservation
UNCCD	United Nations Convention to Combat Desertification
USAID	United States Agency for International Development

SUMMARY

Ghana is vulnerable to several kinds of desertification. Added together, these multiple forms of land degradation are causing major environmental damage and significant livelihood vulnerability for rural populations whose poverty is exacerbated by the steady deterioration in their natural resource base.

The country first launched a programme to combat desertification in the mid 1980s, and ratified the United Nations Convention to Combat Desertification in late 1996. In recent years the Environmental Protection Agency and other governmental and non-governmental organisations have launched a range of initiatives to tackle the problem, complementing and supporting the numerous efforts being made by resource users themselves. As required by the Convention, a National Action Programme to Combat Drought and Desertification was prepared in 2002 and approved by government in 2004.

Meanwhile, Ghana has been making periodic reports on its progress against desertification, and was scheduled to present its third national report to the Committee for the Review of the Implementation of the UNCCD (CRIC) in May 2005. In collaboration with the Permanent Inter State Committee for Drought Control in the Sahel (CILSS - *Comité permanent Inter-Etats de lutte contre la sécheresse au Sahel*) and USAID, this set of case studies was undertaken in April 2005 for presentation by Ghana at the CRIC. The objective is to demonstrate the efforts that natural resource users are making to combat desertification.

Five case studies were reviewed during a ten day field visit to northern Ghana. They range from the efforts of individual farmers on their cultivated land to community conservation programmes that include the declaration and protection of reserve areas. While EPA and other external agencies are providing various kinds of support to all five case studies, they all depend heavily on local initiative by resource users and on indigenous knowledge, techniques and environmental commitment – driven by various combinations of economic, environmental and spiritual motives. In several cases the initiative to combat desertification was taken by rural people. Outside agencies only began to support these efforts at a later stage. Nevertheless, the case studies show a range of useful roles that government departments, NGOs, donor agencies and the private sector can play in supporting these local initiatives and the community-based organisations that often drive them.

In the first case study, with support from two external projects (1993-1996 and 2002 to date), the four communities of the **Yiworgu** area in Northern Region have worked to conserve, rehabilitate and extend their sacred grove of trees, grasses and other natural resources. Individuals have planted, and have now started to harvest, teak plantations. They are now establishing mango plantations that are communally owned and managed but divided into individually owned sections.

At various sites in Northern Region, a donor-funded project constructed **bunds on farmers' fields to conserve water and increase their rice production**. Since the end of the project, many farmers have built more bunds. Despite problems with credit, land rights and declining soil fertility, bund construction and water conservation are widely seen as profitable.

Many communities in **Upper West Region** have taken steps to bring **bush fires** under control. Some have also set aside reserved areas where little or no resource harvesting is permitted. Some of these reserves are particularly valued for their medicinal plant resources. In some cases these and other trees and shrubs have been planted in reserve areas. Community Environmental Management Committees have been established to co-ordinate bush fire control and resource management. These activities have had positive outcomes for livelihoods, the natural environment and local governance.

In several areas of **Upper East Region**, an NGO is building on indigenous knowledge and techniques to promote **soil and water conservation** techniques such as composting and contour bunds on heavily

degraded land, with positive results for local livelihoods. The extension approach involves the formation and support of farmer groups over a seven year cycle.

Also in Upper East Region, at **Yameriga**, a community women's group has planted a woodlot and a teak plantation, and established two nurseries. It is now preparing a mango plantation and another nursery, for which a well has been dug and a pump provided. Although there have been few direct economic benefits so far, the group is strongly committed to the environmental future of the community and now anticipates significant income from mango sales to a processing company. Men have now been invited to join the group and are giving leadership that local culture made it difficult for the women to provide on their own.

The report concludes with observations on some of the key issues that arise from these brief case studies.

It is essential to consider the **land tenure** implications of any effort to combat desertification. The efforts to enhance water conservation for higher rice yields in Northern Region failed to do this, which caused confusion and conflict and was one reason why some farmers went on to build their own rice bunds on other land.

Governance is of course critical to the enhanced natural resource management required to combat desertification. The case studies described here generally exhibit strong local institutions rooted in local tradition and culture, which are collaborating well with newer institutions introduced from outside (such as Community Environmental Management Committees) and with the limited extension services that government and other agencies are able to provide. The apparently effective institutional framework that exists in the case study communities owes much to the cultural status of natural resources and environmental protection in northern Ghana. The comparatively healthy governance conditions that these case studies enjoy are reflected in the strong sense of **empowerment** that we encountered among the resource users and community institutions that we met.

Traditional **gender** roles are well entrenched in the communities covered by these case studies. Women's work loads are sometimes increased when, for example, tree nurseries are established or seedlings are planted out and women are expected to water them. Women may also suffer most economically when environmental restrictions are placed on activities like charcoal burning that are of particular importance to their livelihoods. However, it is clear that local governance allows a role and a voice for women, although management of the Yameriga women's tree planting group was reportedly enhanced when, on EPA's advice, senior men in the community were invited to join and help direct the group.

The case studies all offer **economic incentives** to local resource users as a motivation for enhanced natural resource management. Some offer short term gain. Some only promise longer term benefits. In several cases, a number of general livelihood benefits have been linked to the promise of new cash cropping possibilities. The private sector often has a significant role to play in this regard. However, it is important not to view enhanced natural resource management only in these terms of economic instrumentalism. Ghanaians, like many other people around the world, also have cultural, ethical and mystic reasons to care for nature.

Many of the enhanced NRM techniques described in these case studies demand substantial **labour inputs** by resource users. Planning of any such anti-desertification measure needs to consider how much labour will be required, and whether that labour is likely to be forthcoming.

Despite the comparative self-reliance of resource users in northern Ghana as they combat desertification – which bodes well for the sustainability of these activities – the case studies also show how much external **facilitation** can help. Through modest technical inputs and the provision of advice, encouragement and occasional arbitration, external agencies significantly enhance the work of resource users and their local institutions. The **publicity and communications** services that these agencies provide can also be a major stimulus to resource users' efforts to combat desertification.

The report concludes by urging that resources be provided for more thorough **monitoring and evaluation** of efforts to tackle desertification in Ghana. Communicating successful experience is a highly effective way to stimulate more of it. It is essential to learn from problems, too. Case studies like the ones reported here can only be anecdotal. Much more can usefully be done to build up a systematic national picture of progress against desertification in Ghana.

I INTRODUCTION

I.1 DESERTIFICATION IN GHANA

The northern areas of Ghana that are closest to the Sahara experience mean annual rainfall of close to 1,000 mm. Yet that rainfall varies significantly from year to year in both quantity and timing, and can be highly erosive in character. This creates serious vulnerability in the land-based livelihoods of the rural population, and exacerbates the land degradation that is widespread in the country. Overall, some 35% of Ghana is calculated to be prone to desertification – primarily, but not only, in the Upper West, Upper East and Northern Regions.

Ghana is vulnerable to several kinds of desertification. Soil erosion by surface runoff is widespread, and causes the greatest threat in the Guinea and Sudan savanna zones in the north of the country, with Upper East Region being the worst affected (EPA, 2002: 66). Some 70% of Ghana is subject to moderate to severe sheet or gully erosion, with about 40% of this area being in the savanna zones (FAO, 2004). Inappropriate mechanisation of agriculture in the 1960s also caused loss of topsoil and compaction of lower horizons in some areas. Elsewhere, iron pan or plinthite formation is a major cause of land degradation, being caused in turn by practices like deforestation, overgrazing and bush burning (EPA, 2004: 10). An estimated 72,000 ha of forest land is lost to agriculture each year through practices such as bush fires, fuel wood cutting, wasteful logging, charcoal burning and overgrazing (Boadu, nd: 21).

Soils throughout the country are also suffering widespread nutrient depletion. This hazard is worst in the Coastal, Guinea and Sudan Savanna zones, where low organic matter content is exacerbated by annual burning and the removal of crop residues (EPA, 2002: 67). Declining soil fertility is now described as a major constraint to agricultural production in Ghana (FAO, 2004). Meanwhile, the rainfall regime causes land in the Guinea and Sudan Savanna to suffer periodic waterlogging.

The desertification that is taking place in Ghana has many adverse effects on rural livelihoods, and is putting increasing pressure on urban areas too, as people migrate there from the countryside. Rural populations suffer lower crop and livestock productivity as a result of desertification, which deepens their poverty. Malnutrition among children aged under five in communities with severely degraded soils increased from about 50% in 1986 to 70% in 1990 (EPA, 2002: 76). A whole range of forest products are becoming scarcer: rural people must devote more and more time and effort to extract fuel wood, make charcoal, and harvest building materials, medicinal plants, honey and bushmeat. Overall, soil degradation is estimated to cause productivity losses of 2.9% per year in all forms of agriculture except cocoa, which suffers a loss of 2.1% (Alfsen *et al.*, 1997, quoted in EPA, 2004: 77). Bojo (1996, quoted in EPA, 2002: 77) estimated that the gross annual economic loss due to erosion was between 2% and 5% of Ghana's Agricultural Gross Domestic Product.

I.2 GHANA'S NATIONAL ACTION PROGRAMME TO COMBAT DROUGHT AND DESERTIFICATION

Through its Environmental Protection Council (established in 1974), Ghana first applied for assistance to combat desertification from the United Nations Sudano-Sahelian Office after the severe drought of 1981-1983. Between 1985 and 1987 it drew up a National Plan of Action to Combat Desertification (EPA, 2002: 38). Following the Rio conference on sustainable development in 1992, the United Nations Convention to Combat Desertification (UNCCD) came into force in late 1996. Ghana ratified the Convention the following day, on 27 December 1996.

Having drawn up a National Environmental Action Plan in 1991, Ghana already had an integrated framework – co-ordinated by the Environmental Protection Council – for tackling land degradation and other

environmental problems. The Environmental Protection Council became the Environmental Protection Agency (EPA) in 1994. Since ratifying the UNCCD, Ghana has undertaken a series of studies and consultations in order to draw up a National Action Programme (NAP) to Combat Drought and Desertification, as required by the Convention. The NAP was completed in 2002 (EPA, 2002).

The overall objective of the NAP is to emphasise environmentally sound and sustainable integrated local development programmes for drought prone semi-arid and arid areas, based on participatory mechanisms, and on integration of strategies for poverty alleviation and other sector programmes including forestry, agriculture, health, industry and water supply into efforts to combat the effects of drought.

EPA, 2002: 39.

The core strategy of the NAP is “the establishment of permanent and temporary vegetative cover on the land. This, however, should be done in the context of economic growth, environmental sustainability and enhanced livelihoods” (EPA, 2002: 99). The NAP is based on the following principles, with which all its component activities are intended to comply (EPA, 2002: 100):

- full involvement of resource-using communities;
- community ownership of desertification control measures, which implies developing the community capacity for this purpose;
- gender sensitivity;
- cost-effective approaches that are amenable to operation and maintenance at district and community levels;
- socially acceptable solutions that are feasible with available human and financial resources;
- a balance between economic and environmental criteria in the design and implementation of activities under the NAP;
- awareness creation about the environmental issues inherent in reversing desertification.

The NAP is intended to be executed in an integrated manner, but is presented in seven thematic Action Programmes:

- land use and soil management;
- management of vegetative cover;
- wildlife and biodiversity management;
- water resources management;
- rural infrastructure development;
- energy resources management;
- improvement of the socio-economic environment for poverty reduction.

Each of these component Action Programmes comprises a number of Action Plans. For example, there are Action Plans for soil and water conservation, for range management, for mining activities, for bushfire management and for fuel wood and alternative energy resources.

Implementation of the NAP, which was adopted by government in July 2004, is still at an early stage. The 2002 programme document proposes a number of projects which, if funded from donor and domestic

sources, will assist in the execution of the Action Programmes and Plans. Not all these projects have been funded or launched, although Ghana's third National Report to the Committee for the Review of the Implementation of the UNCCD (CRIC) outlines a number of projects that are currently in progress (EPA, 2005b: 19-26). Execution of the NAP now takes place within the framework of the Ghana Poverty Reduction Strategy, which was launched in 2002.

Although the EPA co-ordinates the implementation of Ghana's NAP, it cannot execute much of the work itself. Nor, even with donor support, does the Government of Ghana have all the resources that are needed to combat desertification and achieve the objective of the NAP. If the nation is to succeed in combating desertification, all sectors of society must work together to that end. The NAP recognises the different roles that need to be played by resource users, CBOs, NGOs, government, academics, chiefs and traditional rulers, and the private sector (EPA, 2002: 127). In fact, it is civil society – and above all, resource users and their local institutions – that must take the lead and do most of the work to accomplish the NAP. It is therefore essential for EPA and government to reach out to the nation as they seek to stimulate awareness and action to tackle the problem.

Some steps are being taken in this direction, as the EPA works with District Assemblies and traditional authorities to combat desertification at local level through action plans and natural resource management projects in 20 pilot communities. In many other cases up and down the country, resource users are not waiting for EPA or any other agency to help them tackle land degradation. They are taking action themselves as they recognise the increasing gravity of the situation. To appreciate the progress that Ghana is making against desertification, it is necessary to appreciate not only what government is doing, but also what local people are doing for themselves. Although the latest national report to the CRIC can only point to a limited number of activities and interventions by government, a lot more is happening on the ground.

1.3 THE PURPOSE OF THIS REPORT

As Ghana made its third report to the CRIC in May 2005, the purpose of this report (submitted in draft in April) was to amplify the formal statements about projects and programmes with case studies of what rural people are doing to combat desertification and manage natural resources more sustainably and profitably. There is a natural tendency for formal meetings of the Parties to the Convention to be dominated by discussion of official programmes, budgets and reports – while much of what is actually done on the ground to combat desertification may go unnoticed. Often, local initiatives start without outside help but then come to the attention of the authorities, which begin to support them with additional resources. This is what happened in several of the case studies reported here.

This report therefore presents the results of a brief exercise undertaken in April 2005 to identify and illustrate a few case studies of Ghana's practical progress against desertification. It is meant to complement the two presentations that were prepared for Ghana to give at the CRIC, which also reported on these case studies. The available time and resources meant that only five cases could be visited and reported. But even this brief visit to the rural areas of northern Ghana made it clear that there are many other initiatives being taken by local resource users to tackle the widely perceived problem of desertification and thereby enhance their livelihoods.

The United States Agency for International Development funds the FRAME programme, which is co-ordinated by the International Resources Group (IRG). The purpose of FRAME is to build knowledge-sharing networks of natural resource professionals, by fostering discussion on emerging trends in environmental and natural resource management across disciplinary and geographical boundaries and to provide timely and relevant information on innovative and strategic options to address these issues.

In West Africa, IRG and the FRAME programme have been collaborating with the Permanent Inter State Committee for Drought Control in the Sahel (CILSS) to pursue their joint objective of enhanced NRM and livelihoods for rural resource users across the region. A key strategy in pursuit of this objective is the effective execution of countries' National Action Programmes to combat desertification. West African countries'

performance in this regard can in turn be enhanced by fruitful dialogue at intergovernmental meetings such as the CRIC, based on instructive presentations of field experience. CILSS and IRG therefore agreed to support Niger, Ghana, Burkina Faso and Mali with FRAME resources to present some of their field achievements at the third CRIC, which was held in Bonn, Germany from 2 to 11 May 2005. This report presents the Ghanaian component of this exercise.

I.4 APPROACH AND ACTIVITIES

Two weeks were available for this field study, which was undertaken with the guidance of the EPA. Short visits were made to each of the Regions most affected by desertification: Northern, Upper West and Upper East. In each, the Regional Directors of the EPA identified cases of progress for us to visit. During necessarily short visits to each of these sites, we met local leaders and resource users, who explained their activities to us and showed us the impact of those activities on the ground. In the EPA offices and elsewhere, we sought as much background documentation as possible on these cases. In some cases, however, there is not much documentation – which is not surprising, given that many of the activities are local initiatives in which outside agencies only became involved at a later stage.

Guided by the ‘nature, wealth and power’ analytical framework (USAID, 2002), the FRAME project has developed a pilot format for the reporting of case studies. We used this format to present experience from Ghana in this report. It therefore provides the structure for the case study descriptions in chapters 1 - 1 below. The individual case studies are being posted to the FRAME Website (www.frameweb.org) along with other descriptions of NRM experience around the world.

2 ANTI-DESERTIFICATION MEASURES IN NORTHERN GHANA: AN OVERVIEW

2.1 TYPES OF INITIATIVE

There are many different efforts being made across northern Ghana to combat desertification, and several ways in which these efforts can be classified.

We can distinguish first between autonomous initiatives by resource users, and those stimulated by outside agencies such as the EPA, the Ministry of Food and Agriculture and the Forestry Department. Sometimes, efforts that were started by rural people with their own resources later attract the attention and support of government agencies or NGOs, as happened at Yiworgu (chapter 1), Zumaperi (chapter 1) and Yameriga (chapter 1). In many cases, external interventions have complemented, enhanced or built upon indigenous knowledge and techniques, as in the case of bund construction for rice production in Northern Region (chapter 1) and the promotion of soil and water conservation by the NGO TRAX in Upper East Region (chapter 1).

It is also interesting to distinguish anti-desertification measures that government is supporting with its own, domestic resources and those for which external donor funding has been secured. All five of our case studies have attracted some donor funding. For example, through the Northern Savanna Biodiversity Conservation Project (NSBCP), the EPA has been able to provide some material support to the Yiworgu, Goziiri and Yameriga communities (chapters 1, 1 and 1). But there are many cases, notably in EPA's support for some 48 Community Environmental Management Committees (CEMCs) in Upper West Region (Nkegbe, 2005), where little or no donor funding is available and the external input consists only of facilitation and advice.

Another key differential is between anti-desertification measures on cultivated land and those in forest and bush areas that are subject to communal tenure and management. Whereas the former are the responsibility of individual farmers, the latter are community ventures. Even on-farm activities often involve some group work, however, as farmers come together to form co-operatives or other groupings in order to provide mutual support and to share the hard physical labour that resource conservation measures may entail. Community land management initiatives have to be authorised and guided by local leadership structures, which typically span traditional authorities such as the chief and the *tindana* or earth priest and modern agencies like the CEMCs, whose establishment is promoted by EPA across Ghana.

Community NRM initiatives sometimes focus on a particular area or resource, such as a sacred grove (chapter 1), a medicinal plant reserve (chapter 1) or a woodlot (chapter 1). Usually, however, the NRM and institutional implications of these initiatives spread into other parts of the landscape or the social structure of the community. Efforts to protect a particular area may be expanded so that other resources or areas are protected too (perhaps with less stringent regulations, if they do not fall within a demarcated reserve area). Local institutions that are empowered and capacitated by early NRM efforts typically broaden their ambitions and competence to govern more of the landscape and natural resource base in more effective ways.

There are three sets of reasons why Ghanaian resource users are combating desertification. Especially in the case of community initiatives, they overlap. Rarely does a community launch an NRM effort for just one kind of reason. The three types of motive are economic, environmental and spiritual. For individual farmers combating the degradation of their cultivated land, economic concerns about productivity and yields drive the

conservation effort. For communities, too, awareness of declining timber, grazing and other resource availability can be a key reason to combat desertification. Sometimes, these broad concerns are subsumed into an overall perception of declining environmental quality, which translates not only into direct economic costs but also into a wider degradation of the quality of life. Overarching this general environmental awareness for people who have lived in their landscapes for generations are the spiritual ties that bind them to their natural resources. These ties are often embodied in the structure of traditional leadership, in which *tindanas* or earth priests play a prominent role, and in the importance of sacred groves in the culture of the community. For the ancestral spirits to go naked in the sun because a sacred grove was no longer there to shelter them would constitute a cultural and moral crisis.

2.2 ROLES AND CAPACITY

We noted in section 1.2 above that Ghana's NAP can be co-ordinated by EPA, but not executed by it. Indeed, successful execution of the NAP requires effort not only by many other government agencies, but also by civil society as a whole.

Our case studies were guided by EPA and show the co-ordinating role that the organisation is playing at field level. At this local level, the Community Environmental Management Committees are proving to be important, although their success depends heavily on the achievement of a satisfactory balance of roles, responsibility and authority between these new institutions and the traditional and cultural leadership of the community. In most cases, the critical factor for success is the attitude and commitment of these traditional authorities. Even at Yameriga, where a local woman had the initiative and commitment to start local tree planting activities (chapter 1), the success of these activities owes much to the support and encouragement given by the chief of the area.

There are a host of NGOs in the three northern Regions of Ghana. They vary widely in their quality, credibility and performance. These case studies encountered three such organisations: the Nandom Agricultural Project in Upper West Region, sponsored by the Catholic Church (see chapter 1), the Community Action Programme for Sustainable Agriculture and Rural Development (CAPSARD), which runs an extension programme to support rice farmer groups in Northern Region (chapter 1), and TRAX, a well established NGO in Upper East Region that also works in nearby areas of Togo (chapter 1). All these agencies have been able to secure external donor funding and to build up a professional cadre of staff. They have good working relations with EPA in their respective Regions, and demonstrate the essential and positive contribution that NGOs can and must make if desertification is to be combated successfully.

The case studies also illustrate the role that the private sector can play in enhancing natural resource management. Many communities, especially in Northern and Upper East Regions, are planting new mango plantations that upgrade their local environment and promise significantly increased incomes once they are in production (see chapters 1 and 1). The Integrated Tamale Fruit Company provides training and marketing arrangements for these producers and has stimulated significant amounts of tree planting in northern Ghana.

Our case studies include examples of two kinds of donor-funded project working through government agencies. In Northern Region, the French-funded Lowland Rice Development Project (chapter 1) made a positive technical contribution. But its unrealistically short time-frame, emphasis on quantitative targets and inadequate attention to tenure and other socio-economic issues were unfortunately typical of conventional donor-funded interventions in the NRM sector. A successor project, the Food Security and Rice Producers Organisation Project, is now working on some of the institutional issues that the original intervention was unable to resolve. The GEF-funded Northern Savanna Biodiversity Conservation Project has a complex institutional history in the only partly effective Savanna Resources Management Project, and has not been without operational problems of its own. But it has provided the opportunity for small-scale support to be provided to many communities on a flexible basis by the EPA, which is responsible for implementation of two of its components (restoration of degraded areas and awareness raising).

One of the main lessons from this brief set of field studies is that, however important external agencies may be in providing guidance and (sometimes) resources, their role and capacity are far smaller than those of rural resource users and their local institutions. Although this reflects the deep poverty of northern Ghana and the limited resources at the disposal of government and other development agencies, it does mean that people affected by desertification often start to combat it without waiting for outside help. In many environment and development settings across Africa, decades of external interventions have created a dependency that reduces rural people's willingness or ability to act of their own accord. This is not the case in northern Ghana.

3 YIWORGU SACRED GROVE, NORTHERN REGION

3.1 SUMMARY DESCRIPTION

With support from two projects (1993-1996 and 2002 to date), the four communities of the Yiworgu area have worked to conserve, rehabilitate and extend their sacred grove of trees, grasses and other natural resources. Individuals have planted, and have now started to harvest, teak plantations. They are now establishing mango plantations that are communally owned and managed but divided into individually owned sections.

Figure 1: A Beehive in Yiworgu Sacred Grove



3.2 BACKGROUND

3.2.1 LOCATION OF THE CASE

Yiworgu is some 6.5 km W of Savelugu in the Savelugu/Nanton district of Northern Region, Ghana, on the road to Ada at approximately 9° 38' N, 0° 54' W. Yiworgu is closely associated with three other communities: Kpendua (some 400m away), Bogo (1 km) and Sankpem (5 km).

3.2.2 ENVIRONMENTAL AND GEOGRAPHIC SETTING

The Yiworgu area experiences a dry season from about October to April, during which temperatures often reach 40°C during the day. At nearby Tamale, March is the hottest month, with a mean temperature of 31.4°C. The rainy season normally lasts from May to September, and total mean annual rainfall for Tamale is 1,033 mm. But the distribution of rain within the season is erratic, and there is substantial variation from year to year.

The Yiworgu area is largely flat, with gravel soils underlain by some oxidised lateritic material. There are signs of sheet and gully erosion in some parts of the area. The local vegetation is of the Guinea savanna type, although there is little tree cover outside protected areas.

Savelugu is the nearest market town to Yiworgu. The influence of Savelugu can be seen in the extensive cultivated areas on the side of Yiworgu closest to the town. The community can also sell crops and livestock in the capital of Northern Region, Tamale, which is some 30 km away by road. Over half the Yiworgu area remains uncultivated, however, including valley bottoms that are sometimes flooded.

3.2.3 LIVELIHOODS, SOCIAL AND ECONOMIC ASPECTS

Yiworgu is composed of 11 households. Each household has about 16 people. The smallest household has six people while the largest has 26 members. There are 163 people in the community as a whole: 31 adult males, 40 adult females, 42 boys and 50 girls.

The community that constitutes Yiworgu today is one of the oldest in the Dagbon kingdom. The purpose of the occupation of the area by the first settlers (who were Dagomba) was fishing and farming. The exact age of the community is not known but it is believed to be around 815 years old.

The major ethnic group of the area is the Dagomba, comprising 96 % of the population. A small Fulani group is living with this community. The Dagomba people who own cattle hire these Fulani community members to herd their animals.

Farming is the first and main source of livelihood for this community. The crops farmed at Yiworgu include: 1) Cereals: maize, rice, millet, sorghum; 2) Legumes: groundnuts, soybean, cowpea, Bambara beans, pigeon pea; 3) Roots and tubers: yam, Irish potatoes and sweet potatoes; 4) Vegetables: okra, pepper, etc. Stimulated by local development projects, the community has started investing in plantations of mangoes and cashews. The Integrated Tamale Fruit Company (ITFC), for example, has provided seedlings and some other materials to encourage fruit production.

Figure 2: Fuel Wood at Yiworgu



In the late 1990s, members of this community received technical assistance from the Lowland Rice Development Project, funded by the French Development Agency, to produce paddy rice on bunded fields. During that period, they could harvest up to 30 bags of rice (1 bag contains in average 100kg) per acre. Now, the bunds are not all in good condition and the soil fertility has gone down. Current rice harvests are up to 20 bags of paddy per acre.

Although maize is the most cultivated and consumed crop in this area, the major source of income is rice. In addition to rice, the community sells firewood (particularly women) and livestock to earn money in order to satisfy its basic needs. Adult males are also engaged in selling poultry and weaving straw “Zana” mats. The community mentioned that the income they got from marketing these products is very low, and insufficient to meet people’s subsistence needs.

Some naturally grown fruit trees such as baobab and *kultia* (*sy zgium guinesis*), shea trees, black berries, *sinsaba* (*lannea acida*), *narima* (*vitex do miana*), *dawa-dawa* (*parkiya biglobosa*) and *gobla* are also found in the area. The leaves of some of them (baobab and *kultia*) are consumed. The others have nutritious and economic values to the community.

There are no health facilities in Yiworgu. The closest health centre is in Savelugu. The community has two women who are trained as traditional birth attendants, and two traditional healers. Common ailments in the area include fever, convulsions, headache, diarrhoea, and snake bites. Traditional methods involving the usage of plants are employed to treat many of these diseases. Some of these plants used for medicinal purpose include: *tan tia* (*butyrospermum parkil*), *doo* (*parkia clappertoniana*) *chinchelin chegu* (*entada abyssinia—africana*), *garin sabinli* (*ficus* sp), *zugbe tia* (*parkinsonia acculeata*), *kinkinga* (*ficus gnaphacarpa*).

3.2.4 RESOURCES USED OR MANAGED

Through its local institutions, the community practises integrated management of the natural resources in its landscape: cultivated areas, grazing resources, trees, other plant resources such as thatching grass and medicinal herbs, and water. This case study focuses on Yiworgu's conservation, management and expansion of its sacred grove, a small area of denser tree and bush cover intimately linked with the history of the community. It is located some 135 m north of the Yiworgu settlement. While sacred groves occupied by ancestral spirits are a common feature of the cultural landscape in Ghana, people at Yiworgu told us that the community was established by someone sent specifically to take care of a sacred grove. This conservation function is thus even more central to community identity than it is in other places, and the roles of chief and *tindana* (earth priest) are more closely integrated.

3.2.5 AUTHORITY TO USE OR ALLOCATE RESOURCES

Yiworgu has a *Naa* (Chief), a *Tindana* (earth priest), a *Magazija* (women's leader) and a *Nachin naa* (youth leader). Other institutions within the community include the Community Environmental Management Committee (CEMC), the Baptist church (headed by a catechist/pastor), a mosque (headed by an Imam), and a soothsayer. The community has three women's and three men's groups, all involved in economic activities. There is no school in the village.

Figure 3: A Meeting at Yiworgu



Yiworgu land is owned by its chief, in trust for the people of the community. The chief's consent is required for any land use in the area, and is given in consultation between the chief and the community elders.

3.2.6 FUNDING, ORGANISATION

Support to Yiworgu's conservation and rehabilitation of its sacred grove was first provided by the Co-operative Integrated Project on Savanna Ecosystems in Ghana (CIPSEG), between 1993 and 1996. This project was funded by the German government and implemented through UNESCO. Repeated appeals by the community to the Environmental Protection Agency (EPA) for further support after the termination of CIPSEG finally bore fruit when EPA arranged assistance from the Northern Savanna Biodiversity Conservation Project, which is funded by

the Global Environment Facility. EPA is the implementing agency for some components of the NSBCP. When it began work at Yiworgu with NSBCP funds in 2002, it facilitated the revival of the CEMC. A similar body had existed at the time of CIPSEG, but some of its members had since died.

3.3 DETAILED DESCRIPTION

3.3.1 GOAL OF ACTIVITY

People describe their main goal as the creation of environmental and livelihood benefits for their children through reversal of the resource degradation that is currently causing hardship.

3.3.2 INITIAL OBJECTIVE/IDEA/PROBLEM TO BE SOLVED

The main problem that the people of Yiworgu sought to tackle was the degradation of the sacred grove whose continuity and sanctity is central to the identity of this community and whose resources are important for local livelihoods. Bush fires were a major cause of this degradation. The degradation has led to the decline of soil fertility and a decrease in the level of the groundwater table (wells dry up frequently).

3.3.3 DESCRIPTION OF ACTIVITY/EXPERIENCE

Although there is a strong rationale in local culture and tradition for these activities, local people (in the presence of EPA staff) emphasised the importance of project interventions in stimulating what has happened. From 1993 to 1996 CIPSEG worked in the area, focusing on the degradation of the forested resources of the sacred grove area and encouraged people to protect it, notably by the annual clearing of a fire break. During the CIPSEG period, individually-owned teak plantations were also established. After CIPSEG ended, the local leadership visited EPA repeatedly to ask for more support.

Since 2002, the Northern Savanna Biodiversity Conservation Project (NSBCP) has provided funding for further work in the area, which is coordinated by EPA. This work has included the establishment of a nursery that produces seedlings for the replanting of neem and other trees in the sacred grove area. The replanting is intended to join what have become three fragments of the grove back into one area. A total ban has been imposed on resource use in the area. Even the chief, who is also a herbalist, now sends people to collect medicinal plants for him from other places further away, and not from the grove. Severe punishments are inflicted on anyone who sets a fire in the area.

The whole community continues to provide annual labour for the clearance of the fire break around the whole area. They have also come together to cut poles for the planned mango plantation, which has been organised with the support of NSBCP, EPA and the Integrated Tamale Fruit Company (ITFC), a private concern. A live fence had been planted for the mango area, which has been partially cleared. But the live fence is taking so long to grow that the community has now decided to use a pole fence instead. The idea is that individual households will have management responsibility for, and will be able to market the produce from, separately allocated sections of the community mango plantation. The ITFC has guaranteed a market for the fruit.

Figure 4: Firebreak Cleared Around the Yiworgu Sacred Grove



Under the current project a nursery has been established to provide neem and other seedlings for planting in the grove. The big problem, however, is provision of adequate water for the nursery. Seedlings are rarely watered once they have been planted out. Women are responsible for the watering of the nursery. They say that the resource conservation and rehabilitation activities have increased their work load.

Individual households also own beehives that have been placed in the sacred grove with support from another project.

All these resource conservation and management activities are overseen by an Executive Committee of 11 members, of whom three are women. (There is a separate women's committee of nine members, which sends these three to the main community body.) The Committee and its activities span four small villages in the Yiworgu area. The Chair of the Executive Committee is a brother of the chief. Unusually, because of the history of this area and its roots in the existence of the sacred grove, the chief is also the principal cultural guardian of the grove.

3.4 RESULTS

3.4.1 LIVELIHOOD OUTCOMES

This is still a very poor community. The people appear to have realised few direct livelihood benefits from the activities so far, describing them mainly in terms of the benefits they will achieve for future generations. However, those who own teak plantations established with CIPSEG support are now starting to earn money by selling poles. Those who have beehives in the grove presumably also achieve some small-scale benefits from the honey they produce.

The major problem for women is the water shortage, which imposes a major work load on them as they walk long distances to remote sources when the local boreholes and dam are dry. They also yearn for credit facilities that might lend them the capital to start trading activities.

At present, charcoal burning and fuel wood collection for sale in town are still necessary livelihood strategies for many people.

3.4.2 NATURAL RESOURCE AND ENVIRONMENTAL OUTCOMES

People report (and the casual observer can see) a marked regeneration of the trees and grasses in the protected area. Combined with the new tree growth that has been planted, this creates a densely vegetated area even at the end of the dry season when we visited it. They also report improved soil fertility. There has been no improvement yet in local groundwater levels. Water shortages are a serious problem in the area.

Figure 5: Yiworgu Sacred Grove



3.4.3 GOVERNANCE OUTCOMES

CIPSEG stimulated the creation of a steering committee for the activities in the Yiworgu area. Most members of that old committee have since died, and a new executive committee was established for the current activities. The chair of the old committee is still alive and serves as an adviser to the new one. The kinship links between the chair of the current committee and the chief, and the fact that the chief is also the principal cultural custodian of the grove (while the functions of chief and custodian are usually separate) all strengthen the integration of customary and modern institutions in this case. The outcome, reportedly, is effective governance of the sacred grove and effective management of the conservation work.

Yiworgu is a well-led community. EPA staff report that they find the community more reliable, responsible and committed than most. Current policy in Ghana gives communities full control over their local resources and the benefits they produce, so strong governance in Yiworgu can generate real economic benefits for the population as well as combating desertification.

Figure 6: Women of Yiworgu**3.4.4 UNEXPECTED OUTCOMES**

The one unexpected outcome of the earlier, CIPSEG-sponsored work, which at first people had not taken very seriously, was that the teak plantations started to generate income for some households. Seeing this, the community took the more recent round of conservation and rehabilitation work more seriously

3.4.5 LESSONS LEARNED

This leads the people of Yiworgu to offer this lesson from their experience: if you take resource conservation and rehabilitation of degraded land seriously, you may well achieve substantial economic benefits.

Another clear lesson is that the cultural importance of natural resources in sacred groves can be a real stimulus to resource rehabilitation and effective NRM. The Dagomba consider it essential that the spirits should be protected from the sun in these groves.

A further lesson from Yiworgu is that close institutional ties between traditional and modern institutions are likely to enhance the prospects of NRM.

4 BUND CONSTRUCTION FOR RICE PRODUCTION, NORTHERN REGION

4.1 SUMMARY DESCRIPTION

A donor-funded project constructed bunds on farmers' fields to conserve water and increase their rice production. Since the end of the project, many farmers have built more bunds. Despite problems with credit, land rights and declining soil fertility, bund construction and water conservation are widely seen as profitable.

Figure 7: A Farmer-built Bund, Kanfeiyili



4.2 BACKGROUND

4.2.1 LOCATION OF THE CASE

The Lowland Rice Development Project (LRDP) and the subsequent Food Security and Rice Producers Organisation Project have worked with rice producers and processors in over 50 communities in the Tamale area of Northern Region, Ghana (approximately 9° 25' N, 0° 50' W). Our brief field visits focused on the Jana and Kanfeiyili areas near Tamale town.

4.2.2 ENVIRONMENTAL AND GEOGRAPHIC SETTING

This area experiences a dry season from about October to April, during which temperatures often reach 40°C during the day. March is the hottest month, with a mean temperature of 31.4°C. The rainy season normally lasts from May to September, and total mean annual rainfall for Tamale is 1,033 mm. But the distribution of rain within the season is erratic, and there is substantial variation from year to year. Much of the precipitation takes the form of heavy storms that cause intensive runoff during short periods.

The topography of the area, at an altitude of approximately 100-200 m above sea level, is relatively flat, comprising a series of broad, very gently sloping valleys. There are a variety of mostly poor soils in the area, although some in the valley bottoms are suitable for rice production. Either because of comparatively intensive use over recent decades or because of poor inherent characteristics, however, most of these soils are now characterised by low fertility. Fertiliser application is usually necessary in order to achieve a marketable surplus over and above subsistence needs. Overall, environmental suitability for rice production varies significantly from one valley to the next.

The Tamale area is part of the Guinea savanna ecological zone, and lies within one of the three desertification hazard areas identified in Ghana. This zone consists of grasslands interspersed with mostly fire-resistant trees. Tree cover in most parts of the area has been reduced by human activity.

The rice producers of the area live in nucleated settlements that are scattered across the gentle landscape. Most are accessible by vehicle, although the condition of the roads is poor. Many are within 50 km of the rapidly growing urban market of Tamale, but reaching the town can take several hours because of the limited availability of public transport.

4.2.3 LIVELIHOODS, SOCIAL AND ECONOMIC ASPECTS

Agriculture is the predominant livelihood strategy for people in this area. The crops grown include Guinea corn, maize, yams and soy beans. The first two of these are grown mainly for domestic consumption. The latter two are also marketed. Rice is almost entirely a cash crop; it is not a traditional staple. Livestock (cattle, sheep and goats) are owned mainly for subsistence purposes.

There are hardly any employment opportunities in the rural communities, and there is little social infrastructure apart from some primary clinics and health posts. Some communities, however, including the ones we visited, are close enough to Tamale (or other centres like Savelugu) to be able to use some of their facilities.

Although desertification is not visibly severe in these areas, poverty is. People suffer a very low standard of living and are often unable to clothe or feed themselves adequately.

Both the incidence and the depth of poverty are greater in rural savanna than in any other part of Ghana, even though pockets of poverty also exist in the forest zone, coastal belt and in the large urban centres... Gender is also an important dimension of poverty, especially in Northern Ghana, where sharp distinctions exist between the income earning roles of men and women. Women also bear a disproportionate share of the burden of being poor – they are obliged to spend a great deal of time not only working in family enterprises, but also nurturing and rearing children, and performing other household tasks, such as cooking and fetching water and firewood.

Faculty of Agriculture, University for Development Studies and ODI, 1999: 2.

Figure 8: Members of Rice Growers Co-operative, Jana



Communities are governed through the dual structure that is common in northern Ghana: a chief is responsible for most aspects of leadership and administration, but the *tindana* or earth priest has mystic and cultural responsibility for natural resources. Women and men have different rights and roles with regard to natural resource use and management. The *magazja* or women's leader has an important place in local authority structures. Islam, Christianity and indigenous belief systems coexist in the spiritual life of these communities. Polygamy is common, but any marriage requires that the man be able to dispose of significant resources and is therefore a real economic challenge for him and his family.

4.2.4 RESOURCES USED OR MANAGED

This case study focuses on the management of water and arable land for the purposes of rice production.

4.2.5 AUTHORITY TO USE OR ALLOCATE RESOURCES

This has proved to be a complex issue. As elsewhere in northern Ghana, land ownership is communal. The land is administered by the chiefs of the area, who allocate long-term use rights to local families. In some cases, these families in turn have multi-annual tenancy arrangements with other local people who actually farm the land from season to season. When land improvements such as bunding for rice production take place, it is essential to establish who holds what rights to the land in question.

Figure 9: A Farmer-built Bund, Jana



4.2.6 FUNDING, ORGANISATION

The Lowland Rice Development Project (LRDP) was funded by the Agence Française de Développement (AFD - French Development Agency) and operated in Northern Region from 1999 to 2003. It had a budget of € 2.67m, of which € 2.29m was financed by AFD and the remainder by the Ministry of Agriculture and Food (MOFA). It worked in collaboration with MOFA and the Agricultural Development Bank. The LRDP ended in 2003, but in 2002 a Food Security and Rice Producers Organisation Project (FSRPOP) was launched to tackle some of the organisational shortcomings of the rice farmers' co-operatives. Funded by the French Ministry of Foreign Affairs, this project will end in June 2006. It is implemented in close collaboration with MOFA, and in particular with the Ministry's Farmer Based Organizations section. Much of the advisory work with farmers' co-operatives is carried out by a local NGO, the Community Action Programme for Sustainable Agriculture and Rural Development (CAPSARD). Other project activities include a functional literacy campaign for co-operative members, and a rice quality channel programme.

Meanwhile, many farmers have built new bunds since project support for this activity ended. They work almost entirely with their own resources, although some extension support is still available from MOFA.

4.3 DETAILED DESCRIPTION

4.3.1 GOAL OF ACTIVITY

The primary goal has been to increase farmer income by increasing rice yields. These increases are achieved by the construction of bunds that trap runoff and partially inundate rice fields.

4.3.2 INITIAL OBJECTIVE/IDEA/PROBLEM TO BE SOLVED

Although rice was an established crop in the Northern Region, yields were low. There is substantial surface runoff during the rainy season, and bunds that capture this runoff can significantly increase yields of this predominantly cash crop, particularly if the practice is combined with increased fertiliser use. The central idea was therefore to alleviate farmer poverty by using bunds to make better use of high surface runoff.

4.3.3 DESCRIPTION OF ACTIVITY/EXPERIENCE

In the early years of its operation the LRDP focused narrowly on the technical goals of building bunds in fields and thus increasing yields and farmer incomes. Bunds were constructed with motor graders, and field boundaries were realigned to conform to them. In the Jana area that we visited, some 16 acres (6.5 ha) were bunded in 1999, with one acre of bunded land allocated to each farmer. The following year, bunds were constructed on over 100 acres (40 ha.) of additional land. The original 16 farmers each received one extra acre, while the remaining land was allocated in units of one hectare per farmer. In total, the LRDP created bunds on some 1,151 ha of land, benefiting over 2,400 farmers in 58 communities in the valleys of Zuwari, Kulda Yarong and Sillum (GRET, 2002: 13 and FSRPOP, 2005: 3). The project introduced two new more palatable and higher yielding rice varieties, 'Tox' and 'GR 18', that are now widely planted.

The project also facilitated credit arrangements with the Agricultural Development Bank, enabling participating rice farmers to get seasonal credit to pay for tractor ploughing and fertiliser. Farmers were organised into rice growers' groups to assist in credit, input supply and marketing arrangements.

Most of the participating rice farmers are men. A few women cultivate bunded rice fields in their own right. Women's main involvement, however, is as processors of the rice. They have been trained in parboiling methods and are thus able to produce a high quality rice for the market. (Rice is not a staple food in these rural areas. Almost all the produce is marketed in the towns.) Some women process their husbands' rice production. Mostly, however, women process rice that they buy locally. Unlike the male rice growers, these female rice processors received little assistance with credit and describe the lack of seasonal operating finance as a significant constraint.

Although project resources for the construction of bunds with graders are no longer available, and despite the hard labour involved when machinery cannot be used, many farmers in Northern Region are now making bunds themselves, either with hoes or with ox-drawn implements. There is widespread enthusiasm about the way in which these bunds can increase rice yields and farmer income – provided that the farmer has the operating capital with which to buy fertiliser and pay for tractor ploughing. (Ox ploughing of rice fields is an alternative, but farmers told us that it did not achieve the same yields as tractor ploughing.)

Some rice farmers we met at Kanfeiyili had made bunds with hoes after initially benefiting from LRDP construction of bunds for them with graders. They explained that LRDP had not been careful enough about the allocation of the land on which it built bunds, and had not consulted the chiefs properly or researched existing land rights adequately. Later it transpired that people with stronger claims to the bunded land – the true 'owners' - could come and reclaim the land, with the support of the chief. The rice farmers who had been using this land had no choice but to vacate it. Determined to continue the profitable rice production, they then went to land that was undisputedly theirs and built bunds on it by hand. In some cases they were able to do this in places where dams and other bunds that LRDP had built nearby would direct water towards their fields.

Figure 10: Rice in the Co-operative store, Jana



A recent study, so far only reported in draft, investigated rice production in all 58 communities formerly supported by LRDP (FSRPOP, 2005). In these areas it measured a total of 1,963 ha under rice, of which 43% had been bunded. On 59% of this latter area, the bunds had been built with heavy equipment by the LRDP. On the remaining 41% of the bunded area, the work had been done by farmers using hand equipment (FSRPOP, 2005: 3, 11). However, it is possible that some respondents to this survey understated the amount of land bunded by the project and exaggerated the area they had bunded themselves, because they might not have fully repaid loans they had taken out on land bunded by the project. “Further studies are needed to check the existence, history and efficiency of these [farmer-built] bunds before we can state that LRDP bunded technology spread, but it is an encouraging result” (FSRPOP, 2005: 3). Some 40% of the farmer-built bunds, the tentative data suggest, have been built by farmers on whose land the LRDP had previously built bunds, while the other 60% were built by farmers who had not participated in the LRDP. If further study confirms these data, the implication is that LRDP participants either extended their rice producing area by further bunding, or lost access to the land the project had treated, probably due to problems over land rights, and had to re-establish the technology on other land. It also means that the bunding technology was adopted by many non-LRDP farmers.

4.4 RESULTS

4.4.1 LIVELIHOOD OUTCOMES

Farmers who are using bunds to retain water on their rice fields report yields that on average are 2.5 times higher than previously. This has significantly increased their incomes. Farmers at Jana told us that most of them have bicycles now. Some have been able to roof their houses with corrugated iron or use cement to build new houses. Some have been able to marry first or additional wives. Their households have food all the

year round, being able to buy what they need with revenues from rice sales. They are also able to pay school fees for their children.

Figure 11: Parboiled Rice, Jana



However, natural conditions and other factors have caused wide variation in the yields achieved. Some 14% of farmers supported by LRDP were found not to have produced enough rice to repay their loans (GRET, 2002: 13). Furthermore, although survey data are not yet adequate for firm conclusions to be reached, there are indications that yields from farmer-bundled land may be lower —although, meanwhile, project-constructed bunds have deteriorated over the years since they were built, and the differential between yields from the two types of bunded field may now be insignificant in some areas. The final evaluation of the LRDP, which was assessing income and livelihood outcomes for people whose land had been bunded by the project, concluded that

labour productivity in the intensified system is below that of traditionally grown extensive rice insofar as the traditional growing methods are reduced to a minimum (broadcast sowing after ploughing by tractor, reduced weeding, harvesting). And yet, there does not generally seem to have been a switch from extensive to intensive rice farming. Rather, the tendency is for the latter to complement the former (as indeed is the case with other crops). This makes it difficult to assess the global impact of the project on production systems and on families' income derived from agriculture.

According to the investigations and estimates made by the evaluation/monitoring team on a sample of 40 farmers, it nonetheless emerges that the economic impact has been very positive for those farmers who were not previously able to grow rice extensively or who had only small surface areas at their disposal due to lack of land or initial capital. The impact is less marked in the case of those who already possessed large areas for mechanised extensive rice production prior to the project, but the project has helped to limit fluctuations in production and hence inter-annual risks. Overall, three quarters of the farmers surveyed reported a significant increase in their income (to the extent of an extra 1.5 million cedis), while for the poorest 25% monetary

income increased threefold. In the case of these families, it would seem that the project has had a lever effect on production as a whole. (This may partly be explained by the “diverting” of fertiliser towards other crops such as maize and groundnuts, and by the reinvestment of part of the revenue from rice in other crops.) These data are corroborated by the keen interest shown by the populations for the continuation of the project, and by a variety of little signs indicating that it has helped to raise living standards and to generate small investments (cycles, roofing, etc.) in these very poor villages.

GRET, 2002: 13.

4.4.2 NATURAL RESOURCE AND ENVIRONMENTAL OUTCOMES

Many rice farmers report that the fertility of their bunded fields is declining. The whole venture is uneconomic if fertiliser is not used. Ghana reportedly has a long tradition of heavy fertiliser use, the result of generous subsidies provided under earlier economic policies.

LRDP and FSRPOP experience underlines the variability in natural potential for intensive, bunded rice production in Northern Region. “There are great differences among the different valleys, which have different characteristics in terms of land pressure, soil quality, water flows. It underlines that this intensive rice cropping system is not adapted to every situation” (FSRPOP, 2005: 4).

Women’s parboiling of the rice uses substantial amounts of firewood, which they buy from suppliers in their local areas.

4.4.3 GOVERNANCE OUTCOMES

In many cases, original LRDP demarcation and allocation of the bunded fields led to disputes and conflict, as mentioned above. Only when chiefs are fully involved and land rights very carefully adjudicated beforehand can these difficulties be overcome.

The rice farmers’ co-operatives have proved to be a major institutional challenge. Substantial training and advisory inputs have proved necessary. This support continues under the auspices of the FSRPOP and the Farmer Based Organization section of MOFA.

4.4.4 UNEXPECTED OUTCOMES

This whole experience has been one of unexpected outcomes. The LRDP was originally a highly conventional, technically-driven intervention that focused on quantitative targets of hectares of land to be treated and kilogrammes of rice to be produced. It did not expect, although others might easily have predicted, the problems with land rights, credit systems and institutions that threatened the sustainability of its achievements.

The unexpected outcome that warrants the presentation of this case study is the way in which farmers have adopted and extended the bunding technology. The concept was not completely new in the area; some bunding already took place. However, the extent to which farmers would decide to spread the method to additional land had not been predicted. It indicates the strength of the economic incentives offered by the local rice market, which motivates farmers to undertake the heavy physical labour involved in constructing bunds without earth moving machinery.

Figure 12: Women Rice Processors, Jana



4.4.5 LESSONS LEARNED

The lessons learned from this experience are typical of many rural development interventions.

First, farmers have been quick to respond to market opportunities, and are ready to invest large amounts of hard labour in the construction of the bunds that make such a response possible.

Secondly, water conservation in these conditions can make a major difference to rice yields.

Thirdly, however, there are important environmental constraints. The two identified during this brief visit were declining soil fertility as rice is grown for several successive years on the same land, and the availability of fuel wood for the processing that adds so much value to the product.

As is so often the case, the complexity and implications of land tenure were underestimated. This cost the project and the people substantial amounts of money and goodwill.

Typically, too, the project initially underestimated the socio-economic and institutional challenges of building efficient and equitable producer co-operatives and linking them with the efficient operation of credit systems and agencies. The smooth delivery and repayment of seasonal credit to and by rice producers have not yet been fully achieved although FSRPOP is making good progress in that direction.

5 BUSH FIRE CONTROL AND RESERVE AREAS, UPPER WEST REGION

5.1 SUMMARY DESCRIPTION

Many communities in Upper West Region have taken steps to bring bush fires under control. Some have also set aside reserved areas where little or no resource harvesting is permitted. Some of these reserves are particularly valued for their medicinal plant resources. In some cases these and other trees and shrubs have been planted in reserve areas. Community Environmental Management Committees (CEMCs) have been established to co-ordinate bush fire control and resource management. These activities have had positive outcomes for livelihoods, the natural environment and local governance.

Figure 13: Zumaperi Reserve



5.2 BACKGROUND

5.2.1 LOCATION OF THE CASE

The Environmental Protection Agency (EPA) is working with 48 CEMCs so far. We visited those at Zumaperi (just SE of Nandom, approximately 10° 50' N, 3° 15' W); Goziiri (just NW of Nandom, approximately 10° 55' N, 3° 10' W); and Dupari (NE of Bulenga, approximately 9° 58' N, 2° 12' W).

5.2.2 ENVIRONMENTAL AND GEOGRAPHIC SETTING

Much of Upper West Region consists of rolling topography. It lies within the Guinea Savanna vegetation zone, combining grassland with deciduous tree cover at altitudes between 100 and 600 metres above sea level. Much of the tree cover has been degraded. About 6% of the Region is under permanent vegetative cover, “which is far below the recommended 20% of the total land area of each Region” (Nkegbe, 2005: 1).

Rainfall is highly variable from year to year but averages 1,023 mm p.a. at Wa, falling mainly between April and September. Mean temperatures at Wa are highest in March (30.7° C) and lowest in August (25.4° C) (Faculty of Agriculture, University for Development Studies and ODI, 1999: 57-58).

The threat of desertification in the Upper West region is evident in the following:

- *Reduced vegetal cover*
- *Reduced crop yield and recurrent crop failures*
- *Degraded land – prevalence of barren land in all eight districts of the Region...*
- *Siltation of reservoirs (dams and dugouts)*
- *Labour out migration (seasonal migration of the youth of the Upper West Region)*
- *Low income and high level of poverty.*

Nkegbe, 2005: 1.

5.2.3 LIVELIHOODS, SOCIAL AND ECONOMIC ASPECTS

Livelihoods in Upper West Region depend heavily on crop and livestock production. The main crops are sorghum, millet, maize, rice, groundnuts, cowpeas, beans and yams. However, yields and incomes are generally low and poverty is severe. Many households undertake seasonal labour migration to southern Ghana. The population lives in scattered village settlements. Although official data are not available, two of the communities we visited reported populations of about 800 people each. Overall, Upper West Region is one of the least densely populated areas of Ghana, with a population density in 2000 of 65 per sq. km.

Communities are institutionally complex but appear comparatively stable in governance terms. They are headed by chiefs, but important fields of authority are headed by the *tindana*, or earth priest, a cultural figure responsible for land resources and their associated spiritual values, and by the *magazia* or women’s leader. Religious leaders (Moslem imams and Christian priests) also play important roles. The formal government sector has very little presence outside the district and regional capitals

5.2.4 RESOURCES USED OR MANAGED

This case study concerns the use and management of the full spectrum of plant resources in uncultivated areas. Some of these areas are set aside as reserves; others are general bush land that is subject to less strict management regimes.

5.2.5 AUTHORITY TO USE OR ALLOCATE RESOURCES

Authority for natural resource use or management in these areas is derived from the chief and the *tindana*, who have jointly sanctioned the operations of Community Environmental Management Committees. When necessary, local chiefs can appeal to more senior chiefs in the hierarchy of traditional authority. Statute law and government agencies have little effective authority in the allocation, use or management of natural resources in these areas.

5.2.6 FUNDING, ORGANISATION

The work described in this case study is largely self-funded by local communities, with little external support. At one of the sites visited, Goziiri, the Nandom Agricultural Project of the Catholic Church has been promoting enhanced natural resource management since the 1980s, calling on the community to combat bush fires and to plant trees. Throughout Upper West Region, the Environmental Protection Agency facilitates the formation of CEMCs and advises them on NRM, but it has minimal resources for this work. Recently, as executing agency for some components of the GEF-funded Northern Savanna Biodiversity Conservation Project, it has been able to provide small-scale funding to some communities, for example to establish tree nurseries.

5.3 DETAILED DESCRIPTION

5.3.1 GOAL OF ACTIVITY

The twin goals of these activities have been to control bush fires and to protect natural (primarily plant) resources in defined reserve areas.

5.3.2 INITIAL OBJECTIVE/IDEA/PROBLEM TO BE SOLVED

...the annual total conflagration of the North coupled with the current state of overpopulation and soil degradation has done irreparable damage to the environment and is seriously affecting the quality of life here in Ghana.

Kirby, 1999: 115.

For almost a century, bush fires and the land degradation they cause have been recognised as a serious threat to the natural environment in northern Ghana. There is an extensive literature on the issue and many projects have tackled it (EPA, 2005b: 13, 20). Explaining the role of fire in maintaining the distinction between ‘house’ and ‘bush’, Kirby describes the complex cultural roots of bush burning in Ghana, and outlines the many efforts that have been made to combat it since colonial times. People set fire to the bush for many reasons. These include the clearance of land for farming; to scare up game for hunting; to chase away reptiles; to create firebreaks to protect homesteads; to create fresh grazing; and occasional vandalism or arson. Unintentional causes of bush fire include fires used for cooking food in farm lands or for smoking bushmeat; cigarette smoking; charcoal burning; and the carrying of fire from one place to another. Repeated burning of the bush reduces wildlife, medicinal and other plant biodiversity over extensive areas, reduces grazing and browsing for local livestock (causing them to wander further afield and increasing the risk of theft), promotes soil erosion and reduces soil fertility because of the reduced amount of organic matter decomposing on the ground. It also encourages snakes to move towards residential areas.

Figure 14: Three Boys were Punished for Setting this Fire Near Goziiri to Help Them Collect Honey



The adverse effects of bush fires are part of a broader process of land degradation due to reduced plant cover and biodiversity. Other causes of this degradation are accelerating removal of woody biomass for fuel and charcoal burning, and rising rates of medicinal plant exploitation and thatching grass collection.

These forms of land degradation have a direct negative impact on local livelihoods, which depend heavily on crop and livestock production and on the extraction of fuel, building and medicinal resources from the local environment.

5.3.3 DESCRIPTION OF ACTIVITY/EXPERIENCE

Three processes have been central to this region's experience: measures to combat bush fires; the establishment of reserve areas; and the creation of Community Environmental Management Committees. The sequence of events has varied from place to place. At Dupari, for example, the first step was to create a reserve (now measuring 502 acres or 203 ha). Measures to combat bush fire, and the establishment of a CEMC with the support of EPA, followed. At Goziiri, encouraged by the Nandom Agricultural Project of the Catholic Church, the chief first proposed a ban on bush fires soon after he came to power about 18 years ago. More recently, a reserve area has been set aside and a CEMC was created. At Zumaperi, a prominent local herbalist took a leading role in the establishment of a reserve area where medicinal plants could be protected and reintroduced. The area has other biodiversity functions as well, however, and is managed by a CEMC which is not chaired by the herbalist but by another local resident. It is one of two reserves created by Zumaperi, totalling about 160 ha.

Figure 15: Dupari Reserve

While many communities began with bush fire bans and/or reserves in the 1990s, EPA has only been promoting CEMCs actively since 2000. Now, interest in the three processes is spreading quickly. Some communities consult neighbours who have already taken such steps and then start them themselves. EPA catches up with them later and supports their work. In other cases, EPA launches the process by extension activities.

All the measures outlined are forms of natural resource management that depend on the authority of the local chief and the perceived legitimacy of the CEMC that is set up with his blessing. Care is taken to ensure that CEMCs are locally representative, including people from the different social and geographical sections of the community. A minimum number of women members is specified, and the *magazija* or women's leader is usually a member, along with the *tindana* or earth priest and sometimes a youth representative. The total size of CEMCs ranges from nine to 15 members.

Again with the authority of the chief, the CEMC lays down regulations or byelaws to control natural resource use and punish abuses such as the setting of fires or the unauthorised felling of trees, burning of charcoal or harvesting of plant products. Failing to act to extinguish a fire is also an offence, regardless of who started it. These regulations typically differentiate between reserve and other areas. In the reserves, little or no resource extraction is permitted, although grazing is often allowed and the collection of medicinal plants is undertaken by authorised herbalists. Outside the reserves, more resource use is allowed, but many activities such as tree felling and charcoal burning still require official permission. Charcoal burning, as a women's activity, is controlled by the *magazija*. There is little direct protection of wildlife in the byelaws, which focus on the protection of plant resources. The assumption tends to be that, if the natural vegetation is in good condition, wildlife resources will be enhanced. The Dupari community expressed interest in stocking their area with grasscutters, which would supply meat for local consumption and for marketing.

Figure 16: Chief (left) and Elder at Dupari



Sometimes the byelaws are written down. In many cases they are oral. Their enforcement depends on the authority of the local chief, supported in cases of appeal by the Paramount Chief. Local chiefs' authority, and the authority of the CEMCs as mandated by the chiefs, appears to be strong, as does the support from the Paramount Chief. If a chief punishes a natural resource offender who comes from elsewhere and is not one of his subjects, the offender reportedly has little chance of denying the authority of the chief to punish him. Any appeal to the Paramount Chief is likely to lead to an increased sentence, according to the chief at Goziiri. Cash fines are sometimes imposed on offenders, but given the general shortage of money punishments often take the form of labour on NRM activities such as the clearance of fire breaks or the transplanting of tree seedlings. Three boys caught setting a fire at Goziiri just before our visit (Figure 14) were sentenced to collect three truck loads of stones.

Firebreak clearance around reserve areas is a major task for many of these communities. At least once a year the CEMC mobilises people to do the necessary work.

Communities that control bush fires in their own areas often have problems with fires coming in from neighbouring areas. They therefore approach these communities and try to persuade them to impose bans as well. Often, though certainly not always, they succeed, and the enhanced NRM practices gradually spread outwards.

Although bush fire control, reserve management and resource protection are all supervised by the senior leadership of participating communities, youth are often strongly involved as well. Indeed, they are often the ones who go out to combat bush fires, which is arduous work that often has to be done at night.

EPA has very limited resources to support these NRM activities. Its input consists mainly of facilitation and advice. It has been able to supply Wellington boots and cutlasses on a very small scale to some communities, to help them combat fires and clear firebreaks. It can currently fund small-scale infrastructure such as tree nurseries, with support from the GEF-funded Northern Savanna Biodiversity Conservation Project. As

noted, EPA's role is sometimes to encourage and support existing community initiatives, and sometimes to spread the word to new communities and stimulate them to take similar action. Gradually, bush fire control and natural resource protection are becoming prominent parts of local culture.

Figure 17: Herbalist in Reserve at Zumaperi



5.4 RESULTS

5.4.1 LIVELIHOOD OUTCOMES

As one local development worker put it, the natural environment is key to livelihoods in Upper West Region. Enhancement of the natural environment enhances local livelihoods. People we interviewed in the three communities described various ways in which such improvements are taking place. Thatching grass, shea nuts, dawadawa (*parkya biglobosa*, locust tree) pods and many other plant resources are more readily available than they used to be. Better availability of medicinal plants makes it easier for herbalists and traditional healers to play their major role in local health care. Livestock are in better condition and graze closer to the villages, where the risk of theft is reduced. Some areas report less slash-and-burn cultivation and improved soil fertility because increased amounts of organic material are being returned to the soil. This increased fertility is reflected in higher yields and in longer cropping cycles and reduced frequency of bush clearance for new farms. A number of informants mentioned the fact that thicker grass and bush provide an enjoyable habitat for snakes that no longer find it necessary to seek shelter in people's homesteads.

Throughout northern Ghana, the cutting and selling of firewood is a major livelihood strategy. Understandably, many people – especially the women who depend most heavily on this -strategy – are not happy about the restrictions on such activity.

More positively, the reserve areas are seen by some as zones where people can take pleasure in the wealth of their natural environment, and particularly in the wildlife that is becoming more abundant there.

5.4.2 NATURAL RESOURCE AND ENVIRONMENTAL OUTCOMES

In general, CEMCs in Upper West Region are succeeding in reducing the frequency of bush fires, combating land degradation and increasing plant biomass and biodiversity in their areas. The thicker grass and woodland in reserve areas governed by CEMCs are plain to see. As noted above, local people also report enhanced soil fertility in cultivated areas, and rehabilitation of land that had been degraded by wind and water erosion. When land is fallowed, it recovers its fertility more quickly.

We asked in all the three communities we visited whether groundwater resources have been enhanced, but there seems to be no consistent evidence that this has happened yet. Water shortages remain a major hardship in many communities. The chief of Dupari also pointed out that the time women take collecting water from remote or low yielding sources is time they could be spending more productively on other activities, including natural resource management.

At Dupari, people reported that wildlife are returning to the area now that their reserve is in place.

There is an obvious risk that the long standing grass and dense vegetation of reserve areas will burn much more intensely if fire does reach such areas in the dry season. People we interviewed acknowledged this risk but said that it was heavily outweighed by the benefits that this extra biomass and biodiversity bring.

5.4.3 GOVERNANCE OUTCOMES

In addition to CEMCs, various other sectoral committees exist in the communities of Upper West Region for functions like water supply and education. We have not investigated the role or impact of these other bodies. But in the three communities that we visited it was clear that the governance outcomes of these campaigns to combat bush fires and protect plant resources have been positive. There is a stronger community spirit, enhanced general conformance to local laws and more unity as a result of the empowerment that this successful NRM has achieved. Communities that have pioneered these approaches clearly take pride and pleasure in explaining their achievements to outsiders and in advising other communities how they can take similar action. While EPA plays a valuable facilitating role, it is clear that enhanced natural resource management is one way in which people are taking direct action, using their own institutional resources to enhance their own governance.

5.4.4 UNEXPECTED OUTCOMES

The only unexpected outcome reported by these three communities was the return of wildlife to reserve areas.

5.4.5 LESSONS LEARNED

The main lesson from this experience in Upper West Region is that, despite their dire poverty, rural people there still have the institutional resources, the commitment and the ability to enhance their natural resource management and thus to achieve significant improvements in their livelihoods. This can be achieved without heavy external funding. With only modest resources, EPA has been able to play a valuable advisory and facilitating role. However, there is no doubt that it would be able to extend and intensify this role with a more adequate operating budget and that the provision of adequate basic infrastructure to communities – especially water supplies – would make their natural resource management significantly more effective.

Figure 18: Firebreaks Around Reserves Require Regular Clearing



It is striking that, in these communities, traditional institutions retain their authority and can achieve effective governance of natural resources. The balance of roles and the mutual recognition of responsibilities by different sections of communities (such as women, youth, religious leaders, chiefs and herbalists) seem to work well in this regard. What is particularly important for the success of these NRM ventures is that the authority of local regulation is not challenged. There is no alternative power or regulatory structure besides the chiefs, whose hierarchy provides effective support from higher to lower levels. Formal government and legal channels seem to be little used in this successful NRM.

6 SOIL AND WATER CONSERVATION IN BONGO DISTRICT, UPPER EAST REGION

6.1 SUMMARY DESCRIPTION

Building on indigenous knowledge and techniques, an NGO is promoting soil and water conservation techniques such as composting and contour bunds in a heavily degraded area. The extension approach involves the formation and support of farmer groups over a seven year cycle.

Figure 19: Stone Terraces, Apuwongo, Bongo District



6.2 BACKGROUND

6.2.1 LOCATION OF THE CASE

This case study focuses on work in the Beo Tankoo area of Bongo District, Upper East Region, approximately 10° 50' N, 0° 47' W. Field visits were made to the Dua and Apuwongo communities in this area.

6.2.2 ENVIRONMENTAL AND GEOGRAPHIC SETTING

The topography of the area is relatively flat, with occasional rocky outcrops, at an altitude of about 200m above sea level. Although technically in the Guinea Savanna ecological zone, the landscape borders on the Sudan savanna zone and has very little vegetation cover. Viewed at the end of the dry season, the area seems to epitomise the hazards of desertification. Most trees have been removed and grass cover is sparse. There is serious vulnerability to water and wind erosion.

Actual soil fertility is determined as much by the exceptional concentrations of population allied with a low-input farming system. Throughout most of Upper East Region... there are virtually no elements of the system that encourage the return of nutrients to the soil... in the dry season [livestock] are taken away from the area to avoid damage to crops and the manure is effectively lost. Most trees, even leguminous ones, have been removed from the farms in order to increase cropping area. Firewood is so short that the stems of cereals are removed from the farms and used to cook food, thus not returning their organic matter. The elimination of almost all types of ground cover leaves the area prone to wind erosion.

Blench, 1999: 25.

There is a single rainy season from April to September, during which most precipitation falls in brief, intense storms that can flood fields and cause significant erosion. Bongo District has an average of 70 rain days and 600 – 1,400 mm of rainfall per year. Mean temperatures at nearby Navrongo range from 27.0° C in December to 32.1° C in April.

The most severe constraint to traditional agriculture in the Interior Savanna Zone... of Ghana are the dry spells, which sometimes lead to drought conditions. Dry spells occur during the cropping season, resulting in the depletion of soil moisture, and rendering the soil less able to support traditional rainfed agriculture. Even when the rainfall is considered adequate, the individual rainfall events are extremely variable...

Faculty of Agriculture, University for Development Studies and ODI, 1999: 1.

Although many of the Bongo soils are inherently fertile and have good water holding capacity, their productivity has been degraded by intensive use. The area's soils are now characterised by low fertility, low water holding capacity and susceptibility to sheet erosion. During the dry season, many rivers and streams dry up, vegetation withers, livestock suffer severe weight losses and as many as 70% of households send at least one member to seek employment in southern Ghana for up to six months. In a participatory needs assessment carried out in 2003, people in the Dua area described many forms of environmental degradation, including declining soil fertility, erratic and light rainfall, poor vegetation cover, soil erosion and the disappearance of wildlife (Amoah, 2003).

6.2.3 LIVELIHOODS, SOCIAL AND ECONOMIC ASPECTS

The Upper East Region of Ghana has a much higher population density than Northern or Upper West Regions (Blench, 1999: 29). In 2000 it was 106 per sq. km. Bongo District as a whole had an estimated population of 77,885 in 2000 and a population density of 183 people per sq. km. This relatively high mean figure for the district masks the fact that some relatively fertile valleys have been abandoned by much of their population due to black fly infestation that causes onchocerciasis (river blindness). Rocky outcrops elsewhere also increase the density of settlement and agricultural land uses on the remaining areas.

The population of Dua was estimated to be 4,318 in 2004. No figures are available for Apuwongo.

Figure 20: Village Landscape, Dua, Beo Tankoo



The dearth of economic opportunities in the area is represented by the sex ratio in a 2003 random sample of the Beo Tankoo area (Kannae, 2003), in which 58% of the population was female. (53% of the population of Bongo District were estimated to be female in 2000.) Agriculture is the dominant livelihood strategy, with 96% of this sample describing their occupation as farming. Seasonal labour migration is a prominent livelihood strategy: “In general, the out-migration of the populace aged between 15 years and 35 years and of both sexes to the southern part of the country for non-existent jobs or menial jobs is remarkable from December to February each year” (Bongo District Assembly, nd: 17). Unlike many people in northern Ghana, the people of Beo Tankoo cannot resort to charcoal burning as a livelihood strategy because of the deforestation of their area.

The area’s predominantly agricultural livelihoods depend on a combination of crop and livestock production. The principal cereals, grown largely for domestic consumption, are sorghum, millet, rice and maize. Blench (1999: 36) writes that “the dominance of millet in such a high rainfall area [as Upper East Region] is striking as millet is usually associated with subdesertic regions.” Of the legumes, groundnuts, cowpeas and Bambara beans are grown in almost equal proportions for home consumption and sale, whereas soya beans are produced almost entirely for the market. Tomatoes are another heavily marketed crop. Sweet potatoes and frafra potatoes are also grown. Sheep, goats and cattle are raised throughout the area, although only 45% of the 2003 sample owned sheep and 40% had cattle. Goats were owned by 73% of the sample households.

Despite the dependence on agriculture, local arable land holdings are very small. The average holding in Bongo District is 1.9 ha. Almost two thirds of households consider their arable holdings to be too small (Bongo District Assembly, nd: 40; Kannae, 2003: 16). The 2003 sample survey found that 92% of respondents felt their farm production was too low. The main reason they gave for this was poor soil, which was quoted by 59% of respondents. Drought and limited land were referred to by 13% and 12% of the respondents respectively (Kannae, 2003: 18).

6.2.4 RESOURCES USED OR MANAGED

This case study focuses on households' arable land, which is used and managed in the broader framework of the communities' management of their natural resource base.

Though land in the district is communally owned, some portions remain under the custody of the Tindanas [earth priests] who were the original custodians of the land. Land ownership is vested in the lineage and no one can dispossess a landholder or his family. In general, land is regarded as sacred. Land use rights are passed patrilineally. In some cases land allocation may be shared between the Tindana who is the religious head and the community.

Women get access to land only through allocations made to them by their husbands. However, this is done after considerations that there would be no shortage of farm land during the farming season when the woman is cropping her own farm. Widows with sons are usually permitted to keep land their husbands possessed and farm it until their sons are old enough to farm. In such cases the land passes automatically to their children.

Bongo District Assembly, nd: 40.

6.2.5 AUTHORITY TO USE OR ALLOCATE RESOURCES

As farmers carry out the activities reviewed here on their own land, they normally have direct personal or family authority to undertake them, within the framework of resource tenure rights described above.

6.2.6 FUNDING, ORGANISATION

The activities reviewed are promoted through the extension programmes of TRAX, an NGO that has been operating in Ghana with British support since 1989. TRAX currently works in Northern and Upper East Regions, and is based in Bolgatanga. It receives funding of about US\$ 125,000 per year from the British government (DFID) and a British lottery organisation. Its budget for operations in the Beo Tankoo area is about US\$ 5,500 per year.

TRAX works in a limited number of areas. In each, it begins by facilitating community needs assessments and the formation of resource user groups. Extension support is provided through these groups. The organisation expects to work with a community and its constituent groups through a development cycle of seven years, after which they are 'weaned off' and TRAX withdraws. So far it has withdrawn from 38 communities in this way. It currently works with 124 groups in 39 communities. These groups comprise a total of 2,419 members (1,423 women (59%) and 996 men (41%). There are 26 groups in the five communities of the Beo Tankoo area, totalling 667 members (417 women and 250 men). Within Beo Tankoo, Dua and Apuwongo each have seven groups.

6.3 DETAILED DESCRIPTION

6.3.1 GOAL OF ACTIVITY

The goals of the activities that TRAX supports vary from place to place, depending on what each community identifies as its priorities. They generally focus on combating poverty through low external input sustainable agriculture (LEISA) techniques, among which soil and water conservation (SWC) practices tend to be prominent. Sometimes communities identify priorities that are outside the scope of TRAX, in which case the organisation puts them in touch with other agencies that may be able to help.

Figure 21: Taking Crop Residues to a Compost Pit, Dua



6.3.2 INITIAL OBJECTIVE/IDEA/PROBLEM TO BE SOLVED

In a needs assessment conducted at Dua in 2003, women ranked the lack of water as their most serious problem, followed by poor soils, and, tied in third place, constraints on income generating activities (IGAs) and the lack of grain milling services. Men ranked water shortages as the worst problem, followed by poor soils and, in equal third place, lack of access to credit and to grain mills. “Both women and men were of the view that the problem of poor soil fertility could be addressed by themselves with little outside assistance. However, they both agreed that the problem of water, corn mill, accessible road, credit/IGA and livestock diseases will require external support to address. They further indicated that the problem of poor soil fertility will require a longer time to address after interventions if compared to other problems” (Amoah, 2003:8).

6.3.3 DESCRIPTION OF ACTIVITY/EXPERIENCE

As elsewhere in northern Ghana, farmers in the Beo Tankoo area have traditionally practised a range of SWC activities. The collection and redistribution of manure around fields is an indigenous practice, for example. So is the construction of stone lines and terraces, which have a threefold purpose. They retard runoff, promoting the infiltration of water into cultivated areas and reducing erosion. They hold back soil particles being carried by runoff, retaining and sometimes enhancing soil fertility. Finally, their construction removes stones from cultivated areas, making them easier to work and more productive.

Figure 22: Ayuri Akologo in his Compost Pit, Dua



In the case study areas that we visited, TRAX extension staff are promoting the adoption and enhancement of these techniques, through the farmer groups described above. Compost pits at least two metres deep are dug near homesteads. Farmers and their families collect manure and crop residues from their lands and from further afield, layering these materials in the pits and eventually redistributing the compost onto the cultivated areas. Extension staff train farmers to survey contour lines across their fields, and the farmers then build stone lines for the purposes outlined above. Sometimes these lines complement lines and terraces that had already been constructed using indigenous techniques.

TRAX was unable to supply monitoring data for its 2004 programme year, which ended in March 2005. In its programme years 2001-2003, it facilitated the construction of 15,885 metres of stone lines in the Beo Tankoo area. Over the same period, 150 compost pits were constructed in the area.

Figure 23: A New Stone Line, Dua



Compost pit and stone line construction are both heavy tasks, and farmer groups normally work together to complete them on each member's land. However, one major drain on the area's labour resources is the collection of water, which can occupy several hours per day for the women and girls in a household. TRAX therefore secured donor resources for the construction of a limited number of boreholes and hand pumps in the area, in the hope of making more labour available for agricultural and SWC activities.

6.4 RESULTS

6.4.1 LIVELIHOOD OUTCOMES

A mid term review of TRAX LEISA activities in June 2003 (not confined to the Beo Tankoo area) found "evidence of increased soil fertility in the form of increased yields, crop appearances and accumulation of fertile soils behind constructed bunds". It reported yield increases of more than 50%, except in 2002 when there was a serious drought (Bancie, 2003: 4). One farmer told the 2003 review that crop residue management had increased his yield from two to six bags of maize per acre. Group discussions that year suggested that the hunger gap had reduced on average by five months to about two and a half months (*ibid.*: 7). However, household surveys carried out by the mid term review in Beo Tankoo and the Namongo area "revealed that about 28 and 23 per cent of households' status in the two areas respectively, are dropping and only 8 per cent in the Beo Tankoo area indicated that their status was going up. Possible reasons... for this could be macro economic factors like a general increase in cost of living due to fuel price increases with no corresponding increase in agriculture commodity prices at the time of the evaluation" (*ibid.*: 6-7).

Figure 24: Stone Lines Promoted by TRAX, Apuwongo



The construction of stone bunds is labour intensive and the availability of stones for the purpose varies from place to place. In some areas that we visited, bunds could be readily constructed in the process of clearing stones from cultivated areas. Elsewhere, farmers must sometimes travel long distances to collect stones, rendering the approach much less feasible given that mechanised means of transport are unavailable.

During our brief visit to Dua, one farmer reported significant (but not quantified) increases in his food production since he adopted the crop residue management practices recommended by TRAX and built a compost pit three years ago. He is now able to feed his family all year round. Although adopting these SWC techniques has increased his workload, he is keen to continue and intensify them, using donkeys to carry water and crop residues from neighbouring areas. Other farmers who have built stone bunds told us that these structures retain soil fertility and promote the infiltration of moisture. However, in many cases the structures are too recent for significant livelihood benefits to have been achieved yet.

In the limited areas for which TRAX has been able to improve water supplies, an additional livelihood benefit has been the saving of women's and girls' time. Some of that time has presumably been devoted to SWC and other economically productive activities, although there are no monitoring data to prove this.

6.4.2 NATURAL RESOURCE AND ENVIRONMENTAL OUTCOMES

The environmental outcomes of these SWC interventions are realised on a micro scale within farmers' fields. There, soil structure, moisture content and fertility are enhanced, leading to the production increases identified above. Rock bunds improve infiltration without creating waterlogging during heavy storms. Earth bunds are constructed by farmers who want to maximise water retention for rice production.

Figure 25: A Better Crop from a Composted Field



6.4.3 GOVERNANCE OUTCOMES

Because these interventions are focused on the SWC practices of individual farmers, their governance outcomes are limited. However, the joint activities of participants in the various groups have an empowering effect as these farmers provide labour for each other's bund and compost pit construction work.

6.4.4 UNEXPECTED OUTCOMES

No unexpected outcomes were recorded.

6.4.5 LESSONS LEARNED

TRAX and participating farmers in Upper East Region are learning a lesson that has been widespread in the Sahel over recent decades. Simple techniques to enhance soil organic matter and moisture content and to arrest soil erosion, often rooted in indigenous practice, can significantly enhance yields and the livelihoods of rural households, with only modest external investment. By combining indigenous knowledge and commitment with some external ideas and facilitation, people in these conditions are making real progress in combating desertification.

7 TREE PLANTING AT YAMERIGA, UPPER EAST REGION

7.1 SUMMARY DESCRIPTION

A community women's group has planted a woodlot and a teak plantation, and established two nurseries. It is now preparing a mango plantation and another nursery, for which a well has been dug and a pump provided. Although there have been few direct economic benefits so far, the group is strongly committed to the environmental future of the community and now anticipates significant income from mango sales to a processing company. Men have now been invited to join the group and are giving leadership that local culture made it difficult for the women to provide on their own.

Figure 26: The Yameriga Group Make a Fence for the New Mango Plantation



7.2 BACKGROUND

7.2.1 LOCATION OF THE CASE

Yameriga is in the new Talensi-Nabdam district SE of Bolgatanga in Upper East Region, approximately 10° 40' N, 0° 47' W. It comprises the three communities of Yourgu, Shea and Gbane.

7.2.2 ENVIRONMENTAL AND GEOGRAPHIC SETTING

The terrain of the area is generally flat, but the Tongo Hills are nearby to the south. Yameriga is in the Guinea Savanna ecological zone, with limited numbers of deciduous trees scattered across the grassland. Tree cover has been reduced by relatively dense human settlement and agricultural land use, although some shea and dawadawa (locust) trees remain and the community still has a small sacred grove. There are no significant wildlife resources.

It is estimated that 70% of the total land area is arable, of which 50% is actually cultivated and 20% is not used. There are a variety of soils in the area, but they are all degraded and infertile. They contain little organic matter, due partly to the rapid rate of decomposition caused by the high temperatures. Mean temperatures at nearby Navrongo range from 27.0° C in December to 32.1° C in April. Mean annual rainfall in the Yameriga area is about 1,000 mm, with precipitation occurring mainly between April and September. The amount and timing of the rainfall varies significantly from year to year, however.

7.2.3 LIVELIHOODS, SOCIAL AND ECONOMIC ASPECTS

The Yameriga area has a population of about 1,870 in 105 households. The Talensi form the dominant ethnic group. Livelihoods depend heavily on crop and livestock production. The principal cereals grown are early and late millet, rice, sorghum, maize and *kaapala*. The main legumes are soya beans, beans, *Bambara* groundnuts and groundnuts. Sweet potatoes, *fracra* potatoes and a variety of vegetables are also produced. Baobab leaves are also used as vegetables, especially in the hunger season. There are annual harvests of shea nuts and *dawadawa* pods. Overall, the most important crop is late millet, followed by soya beans, maize, rice, groundnuts, beans, early millet and sorghum.

Cattle, goats, sheep, pigs and poultry are all raised for subsistence purposes and limited marketing. The cattle, goats and sheep graze on the open range, although there is some supplementary feeding of crop residues.

Many households send at least one member to work in southern Ghana during the dry season. Whereas some communities in Upper East Region have resources like weaving grasses that they can use to earn income during that period, those at Yameriga do not. There is some shea butter processing, however, and some collection and sale of medicinal plants and herbal remedies.

The people of Yameriga live in deep poverty. Their nutritional and health status is poor. Malaria is the commonest disease. HIV/AIDS is now widespread, but statistics on its incidence are not available.

7.2.4 RESOURCES USED OR MANAGED

This case study focuses on two small areas of trees that have been planted by the participating women, and a new mango plantation currently being established. The first area, a teak plantation, covers about 1 ha. The second, a woodlot of several species (not visited), covers about 0.5 ha. The third comprises an allocated area of about 4 ha, of which only 1 ha is currently being fenced and developed.

Figure 27: The Yameriga Group's First Nursery



7.2.5 AUTHORITY TO USE OR ALLOCATE RESOURCES

All three of the areas used and managed by the group were allocated to them by the chief, with whom the group's leader has good relations. The largest and most significant allocation of land, that made recently for the mango plantation, was excised from the farming land of the chief's extended family. Those using it were allocated new land elsewhere and told to establish their farms there.

So far, the group has not used any of the wood or timber from its woodlot and teak plantation, except for the use of poles from the woodlot in fencing the new mango plantation. Those two areas are considered group property. But the mango plantation will be divided among the extended families of those who have worked in the group since its inception in 1996. Each user family will be responsible for the care of its section of the plantation and will be entitled to sell and profit from the produce.

7.2.6 FUNDING, ORGANISATION

This was an autonomous initiative by a local woman who launched the group in 1996. She secured the support of the Forestry Department for the provision of planting material and technical advice. The Department has also undertaken to buy seedlings from the community's first nursery for use in its afforestation programmes. The Environmental Protection Agency (EPA) began to provide training and facilitation in 2001. Through the Northern Savanna Biodiversity Conservation Project (NSBCP) it has funded the construction of a well and the provision of a pump and water tank at the new nursery adjacent to the mango plantation. Total NSBCP funding to the group has been about US\$ 9,000. EPA has also facilitated contacts with the Integrated Tamale Fruit Company, which is providing the mango seedlings and has guaranteed to buy fruit from the plantation.

When EPA became involved, it advised the group to include youth, and later men, in its membership. It also facilitated the establishment of a Management Committee of ten members, of whom seven are women.

Leadership and decision-making in the group were sometimes difficult, we were informed, when it comprised only women. Management of such an organisation entirely by women was culturally unfamiliar and consensus and compliance were not always easy to achieve. The incorporation of some senior men in the group has reportedly solved these problems, creating better unity and direction.

Figure 28: The Yameriga Group's Second Nursery



7.3 DETAILED DESCRIPTION

7.3.1 GOAL OF ACTIVITY

The primary goal of this activity has been to enhance the livelihoods of participating women and their households. Combating land degradation and enhancing the natural resource base in the area were secondary goals.

7.3.2 INITIAL OBJECTIVE/IDEA/PROBLEM TO BE SOLVED

Returning to Yameriga in 1996 to seek treatment from a herbalist for a long-term illness of her son (perhaps because of the reputation of the nearby Tongo Hills as a centre for herbal remedies), Mary Azumah was struck by the poverty of the area and the lack of economic opportunities that local women suffered during the dry season. Unlike people in some other parts of Upper East Region, they lacked local materials for basket weaving, for example. She therefore sought ways for the women of Yameriga to be more economically active, and was encouraged to promote tree planting by a local chief who had already started a woodlot.

Rather than starting with a clear project idea, the Yameriga women's group has developed its targets and strategies organically, as it gained experience and identified new opportunities. The group now has about 80 members, of whom about three quarters are women. When EPA began to support the group, it advised it to approach the senior male leadership of the community and to invite some of these respected men to become members. As noted above, this has made decision making and management easier.

7.3.3 DESCRIPTION OF ACTIVITY/EXPERIENCE

With the assistance of the *magaɔɔ* or women's leader of Yameriga, Mrs Azumah began by encouraging some 20 local women to form a tree planting group. This group obtained about 1 ha of land for a teak plantation. The Forestry Department provided seedlings and advice for the establishment of this plantation. The trees there have grown well but have not yet been used. Later, the group secured a small area of land for the establishment of a nursery, for which the Forestry Department again provided advice and planting material of various species. The Department buys seedlings from the nursery for its afforestation programmes in Upper East Region. The chief provided a further allocation of about 0.5 ha for a second small woodlot of mixed trees, which the women have also planted but not yet harvested.

Most recently, the group has secured a further 4 ha from the chief and has arranged to plant this with mangos. Seedlings are being provided by the Integrated Tamale Fruit Company, which has also undertaken to buy the fruit in due course. As noted above, NSBCP funding has been used to establish a nursery, well and pump at the new site. The new water supply is used for domestic purposes as well as for the nursery.

In addition to the plantings at the three group sites, members have been given small numbers of seedlings of various fruit and timber species to plant around their homes.

The group has stimulated the formation of an environmental club at the Yameriga primary school.

7.4 RESULTS

7.4.1 LIVELIHOOD OUTCOMES

These activities have made little difference to participants' incomes so far. Indeed, the labour on the various woodlots has required a significant sacrifice of time and effort, and there are complaints that members are often hungry at the end of a day's unpaid work for the group. Although the opportunity cost of these inputs has usually been low, some member families decided to forgo the seasonal migration to work in southern Ghana that is common in this area from November to May. Participants take a long term view of the livelihood benefits that their group's work can achieve, and their commitment has been renewed by the new activity and infrastructure focused on the mango plantation.

Figure 29: Water Supply at the New Nursery



For one woman at our meeting, one long term livelihood goal of this group's activities would be households that could afford not to marry off their daughters at or soon after puberty. Weeping, she described how her husband had insisted on withdrawing their 15 year old daughter from school to be married, thus bringing some resources into the household.

Households do already report some benefits, in terms of fruit and shade, from their home plantings.

The water supply established at the new nursery is quoted as a major improvement to the livelihoods of some local women.

Group members see further economic opportunities in the possible establishment of a nursery for the medicinal plants that are in such demand in the Tongo Hills area.

7.4.2 NATURAL RESOURCE AND ENVIRONMENTAL OUTCOMES

The environmental outcomes of this activity are on a very small scale and are largely restricted to the few hectares on which the group has established woodlots and plantations. However, the Yameriga experience offers an inspiring example to neighbouring communities of what can be done to increase economically valuable biomass with minimal resources in an unpromising natural environment.

7.4.3 GOVERNANCE OUTCOMES

This appears to be a highly empowered and confident group. One member told us that tree growing has really brought the members closer together. They know each other and support each other much better than they did before. They have begun to give advice and support to other groups in the district that are trying to do similar things, such as the ones at Zor and Shega.

It is clear that the group owes its success so far to support from a sympathetic chief, who was committed to tree planting and environmental rehabilitation. A further important aspect of the group's governance experience is the initial management difficulties that were reportedly encountered when all members were women, and the improved cohesion and direction that were achieved after some senior men were invited to play a role. While it might be seen in some quarters as politically incorrect to suggest that women cannot manage a group venture like this without men, the women at Yameriga clearly offered us this conclusion. One commonly quoted criterion for successful common property resource management is that the most powerful elements in local society should be involved and committed to the process. Incorporating the senior men in this way has helped the Yameriga group to satisfy this requirement. Significantly, local youth are also recognised as a legitimate interest group that now participates as well.

7.4.4 UNEXPECTED OUTCOMES

One thing has led to another for the women of Yameriga, and each new development has been largely unexpected and welcome for this impoverished community. What the group certainly did not expect was that their efforts would make them well known in Upper East Region and beyond – a reputation that they welcome because it may help them to attract more development resources.

7.4.5 LESSONS LEARNED

The experience of the Yameriga women's tree planting group shows how, with some inspired leadership, and minimal external support, people in northern Ghana can overcome extreme poverty to create new economic opportunities by enhancing their natural environment. The group's achievements are only on a small scale so far, but they show that real progress is possible.

8 SOME KEY ISSUES

8.1 INTRODUCTION

As a short series of case studies, this report cannot offer an authoritative or comprehensive analysis of efforts to combat desertification in Ghana. But we can conclude with a series of brief comments on some key issues that arise from these five cases.

8.2 LAND TENURE

One of the ‘wealth’ principles of the ‘nature, wealth and power’ framework that guides NRM analysis in the FRAME programme (sections 1.3, 1.4 above) is to

assure that resource managers have – and perceive themselves to have – secure access to the means of production and the benefits of their NRM investments.

One of the ‘action recommendations’ stemming from this principle is:

Plan for how changing production requirements interact with land tenure systems.

USAID, 2002: 15.

In four of the case studies reviewed here, it is clear that this principle is in place. Communities, groups and individual farmers clearly have full rights to the landscapes, resources, reserves, woodlots, plantations and fields they are managing. They are confident of their rights and there is no dispute about how the benefits accruing from their enhanced management of natural resources will be distributed. In the case of bund construction for rice production, however, land tenure conflicts have been a serious issue (sections 4.3.3, 4.4.3) because the Lowland Rice Development Project did not take enough care to reconcile the hierarchy of local resource rights with the enhanced water management that bund construction achieved. In fact, insecure tenure of the land that the LRDP had banded for them is one reason why some farmers have gone on to band other land, which they are sure is theirs, without external help.

8.3 INSTITUTIONS, CULTURE AND EMPOWERMENT

Four of the ‘power’ or governance principles recommended in USAID’s ‘nature, wealth and power’ approach to NRM are:

- *strengthen procedural rights for poor people;*
- *improve rural representation and amplify rural voices in public decisions that affect their lives and well being;*
- *distribute environmental authority and functions to institutions best positioned to exercise them;*
- *transfer environmental powers to authorities representative of and accountable to local populations.*

USAID, 2002: 25.

These conditions are largely satisfied in the case studies reviewed here. Local traditional authority structures seem still to have effective authority over natural resource management in their areas, and to be broadly representative of community interests in interaction with outside authorities such as the EPA. Partly because government agencies have such limited resources, the principle of subsidiarity recommended above is really the only option in northern Ghana. Local institutions have to do most of the work. The continuing integrity of traditional authority structures (compared, at least, with some southern African societies) means that

effective environmental powers (as opposed to those that may exist in theory in national statutes) do reside with authorities that are representative of and accountable to local populations. Chiefs play a strong and apparently effective role in all the case studies that we visited, although confusion seems to have arisen over land rights and allocation in some areas where bunding of rice fields took place in the Northern Region (section 4.4.3). Elsewhere, the authority of chiefs has been critical to effective management of natural resources that is helping communities to combat desertification. It is also important that local chiefs are backed up by the authority of more senior chiefs in cases where their jurisdiction or court verdicts are challenged by natural resource offenders (section 5.3.3).

These traditional authorities are now interacting with modern Community Environmental Management Committees in many of the places visited during this review. Although we could not investigate the CEMCs in detail, the model seems to be a popular one - notably in Upper West Region, where some communities that have heard about the idea approach the EPA, or neighbours who already have a CEMC, to find out how they can establish such an institution themselves. Superficial observation suggests that in rural Ghana, as in many other parts of Africa, there may be something of a 'committee disease' as each Ministry, agency or project persuades communities to create a sectoral committee for education, health, water supply, agriculture or whatever its mandate may be. CEMCs are certainly not the only committees in most communities, and the risk of 'committee fatigue' may need to be allowed for. Nevertheless, these case studies suggest that communities in northern Ghana are capable of achieving synergy between their indigenous environmental management institutions and the modern committees that are currently being introduced.

The apparently effective institutional framework that exists in the case study communities owes much to the cultural status of natural resources and environmental protection in northern Ghana. *Tindanas* or earth priests are key elements of the local authority system. Sacred groves like that at Yiworgu (chapter 1) are common features in the landscape, and play an important role in reinforcing rural people's moral commitment to nature. The concept of cultural, ethical or spiritual motives in NRM does not fit explicitly into the 'nature, wealth and power' framework. In fact, however, the power of the spirits and the cultural or mystic meanings of nature may be the strongest element in local governance frameworks. Failure to incorporate these motives in NRM initiatives will probably prevent such initiatives from making any significant progress. Conversely, the fact that *tindanas* are regularly consulted in the kinds of initiatives described in our case studies helps to explain why progress is being made in these efforts to combat desertification. When, as at Yiworgu, the cultural identity of the people is explicitly linked to the environmental integrity of an area of natural resources, there is clearly a good foundation for conservation action.

The comparatively healthy governance conditions that these case studies enjoy are reflected in the strong sense of empowerment that we encountered among the resource users and community institutions – CEMCs, farmers' groups and tree planting groups – that we met. The progress that these local institutions have made gives a tangible boost to morale among communities that live in deep poverty. Despite the hardships they face, these communities are proving to themselves and the outside world that they can organise themselves, enhance their NRM and enhance their livelihoods. This feeling of empowerment that this generates often spreads into other areas of governance and social endeavour, strengthening communities' sense that they can move forward despite the dearth of local or external resources.

8.4 GENDER

USAID's 'nature, wealth and power' framework notes that

The participation and empowerment of women has proved to be key in successful natural resource management in Africa. The return on investment in women's groups is high.

USAID, 2002: 10.

Traditional gender roles are well entrenched in the communities covered by these case studies. Women's work loads are sometimes increased when, for example, tree nurseries are established or seedlings are planted out and women are expected to water them. Women may also suffer most economically when environmental

restrictions are placed on activities like charcoal burning that are of particular importance to their livelihoods. In the case of the soil and water conservation techniques being promoted in Upper East Region (chapter 1), women are expected to substitute one form of heavy labour for another when improved water supplies give them more time to work on the construction of rock lines – although the net impact on their work loads is likely to be beneficial. In the rice growing areas of Northern Region reviewed in chapter 1, women have an active role in the processing and marketing of the product, but are discriminated against by lending institutions. This makes it difficult for them to buy unprocessed rice from the men who grow it, and threatens the viability of their enterprises.

However, it is clear that local governance allows a role and a voice for women, and the *magazja* or women's leader is often cited as one of the key traditional authorities who is consulted in, and shares decision-making over, natural resource management. EPA ensures that CEMCs include a number of women representatives. The agency was enthusiastic in its support for the women's tree planting group that we reviewed in Upper East Region (chapter 1). It then took what in western eyes would seem a politically incorrect approach – which may be culturally realistic in local terms – by encouraging the women to co-opt men into the group and into its leadership. This reportedly enhanced management and decision making in the group and has built community ownership of, and commitment to, the group's activities (which had already been strongly endorsed by the chief). As we noted in section 7.4.3, although these measures might seem inappropriate from some gender perspectives, they have at least strengthened the initiative in common property resource management terms by ensuring that the most powerful local interests are involved in it.

8.5 ECONOMIC INCENTIVES

Among the 'wealth' principles recommended in USAID's 'nature, wealth and power framework' are the following:

- *strengthen markets and make market incentives a more important part of NRM strategies...*
- *create a framework in which people can make better NRM choices in their own self-interest.*

USAID, 2002: 15.

The case studies we have reviewed in northern Ghana all offer economic incentives to local resource users as a motivation for enhanced natural resource management. Some, like the water management achieved by bunding rice fields (chapter 1) and the soil and water conservation and crop residue management promoted in Upper East Region (chapter 1) offer short term gain. Some only promise longer term benefits. The women's group at Yameriga (chapter 1) is remarkable in the length of time it has been prepared to work for no direct reward, trusting only in the prospect of future revenues. In several cases, a number of general livelihood benefits – such as enhanced medicinal herb availability, or better local grazing for livestock meaning better animal condition and reduced stock theft - have been linked to the promise of new cash cropping possibilities – extra rice income from bunded fields, and income in many communities from the marketing of mango trees that are being planted in association with many bush conservation programmes.

Many of these examples show the important contribution that the private sector and efficiently functioning markets can make to effective NRM in the fight against desertification. A number of communities in Northern and Upper East Regions, as we have noted, have linked their resource conservation efforts to mango planting, in arrangements with the Integrated Tamale Fruit Company. Water and soil conservation by rice farmers is largely driven by the profits they perceive in the urban rice markets of Ghana.

However, it is important not to view enhanced natural resource management only in these terms of economic instrumentalism. As we have emphasised above (section 8.3), Ghanaians, like many other people around the world, also have cultural, ethical and mystic reasons to care for nature. Despite their poverty, they find it possible to care for nature for nature's sake, as well as for the extra production and income that conservation can achieve.

8.6 LABOUR AVAILABILITY

Many of the enhanced NRM techniques described in these case studies demand substantial labour inputs by resource users. The various reserves at places like Yiworgu (chapter 1) and Zumaperi (chapter 1) require the clearing and then regular maintenance of firebreaks. Bund construction for rice production (chapter 1) is heavy physical labour, as is the building of compost pits and stone lines (chapter 1). It is a mark of how strongly people perceive the various incentives to combat desertification that they are willing to provide the amount of labour required. The heavy work involved in most of these initiatives should also serve as a reminder that planning of any anti-desertification measure needs to consider how much labour will be required, and whether that labour is likely to be forthcoming. It should also remind planners and resource users to consider the gender implications of these labour requirements.

8.7 THE ROLE OF FACILITATION

Most of these case studies are remarkable for how little they have depended on outside resources. Most were either local initiatives that subsequently came to the attention of external agencies, or were project interventions that built on indigenous knowledge and techniques. Despite the comparative self-reliance of resource users in northern Ghana as they combat desertification – which bodes well for the sustainability of these activities – the case studies also show how much external facilitation can help. Through modest technical inputs and the provision of advice, encouragement and occasional arbitration, agencies like EPA, TRAX and CAPSARD significantly enhance the work of resource users and their local institutions. Often what matters more than any transfer of materials, equipment or money is the simple extension presence of experienced and supportive staff who can help rural people talk through their problems, resolve disagreements and identify solutions. Often, too, these extension staff can help resource users and their leaders negotiate with outside agencies like credit institutions, marketing organisations and other government departments. Large cash injections through donor funded projects would not necessarily enhance the self-reliant progress that rural Ghanaians are making in the fight against desertification. But it is essential that extension agencies like those described in these case studies have adequate operating resources to maintain – or preferably intensify – their field presence.

8.8 PUBLICITY AND COMMUNICATIONS

Agencies like EPA can provide other relatively low-cost services to communities combating desertification. First, they can promote knowledge of desertification issues and potential ways to address them, through public awareness programmes such as the regular radio broadcasts that EPA makes in Upper West Region. Secondly, they can help communities to communicate their experiences in natural resource management to each other and the wider world. Bringing resource users and their local institutions into contact with each other has proved to be a highly effective mode of extension, and is responsible for much of the rapid spread of bush fire control initiatives, for example. Furthermore, publicising communities' NRM achievements can attract outside resources that will help these communities in their work, in addition to the empowering effect that such publicity usually has. Several of the case study groups we visited during this exercise reported the pride and satisfaction they have felt as their achievements came to be known further afield, and the welcome attention this publicity has attracted for them from senior leadership in their Regions as well as from development agencies. The oxygen of publicity (to borrow a British political phrase) is always an effective stimulus to enhanced natural resource management.

8.9 MONITORING AND EVALUATION

This brief exercise is a modest attempt to document a small sample of the many initiatives being taken across northern Ghana to combat desertification. Instead of being a single event commissioned for the specific purpose of presentation at a UNCCD meeting, this kind of work ought to be a regular, routine process of monitoring the nation's work and progress. In reviewing these five case studies, we could only find limited documentation about what has been done (with the exception of the Lowland Rice Development Project and its successor, the FSRPOP). Monitoring and evaluation are weaknesses of most development and NRM work

everywhere, but that is no reason for Ghana not to do better in this regard. As we have just pointed out, communicating successful experience is a highly effective way to stimulate more of it. It is essential to learn from problems, too.

We recommend that the EPA, in consultation with CILSS and the UNCCD Secretariat, seek the resources for a thorough and systematic programme to monitor Ghanaian resource users' efforts to combat desertification. There are two, not mutually exclusive, ways in which this could be done. First, detailed, regular observation and analysis (which might include the use of GIS and remote sensing tools) could be undertaken of a limited number of cases, possibly including the ones reviewed here. This careful longitudinal analysis of achievements and challenges should be planned to last at least a decade and should aim to develop an in-depth understanding of how best to progress in tackling desertification problems. The findings of this monitoring and evaluation should be circulated widely so that as many communities and environmental and development agencies as possible can learn from the experience of the case studies. The second approach would develop a simple fact-finding methodology, covering a limited number of key variables, that could be applied by extension staff to a much larger number of cases of community and resource user action against desertification. This kind of information would be processed by a central monitoring and evaluation unit in the EPA to offer a regular aggregate picture of national experience with different types of intervention, measuring variables like person days of labour and Cedis expended per hectare treated with different techniques and comparing them with benefit variables like percentage change in reported yields, or numbers of bush fire outbreaks per year.

Both these suggested M&E approaches would need careful initial design and would themselves have to be reviewed periodically. Both would depend largely on data collection by resource users, their local institutions, and field staff of EPA and other selected agencies. Both would require dedicated external funding, but this funding would be on a comparatively small scale. This modest external support would yield major benefits, however. Case studies like the ones reported here can only be anecdotal. Much more can usefully be done to build up a systematic national picture of progress against desertification in Ghana.

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