Final Technical Report:
NRSP Project R7957

'Poverty Dimensions of Public Governance and Forest Management in Ghana'

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NATURAL RESOURCES SYSTEMS PROGRAMME

FINAL TECHNICAL REPORT

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'Poverty dimensions of public governance and forest management in Ghana'

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NRSP Production System

Forest-Agriculture Interface

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Abbreviations and Acronyms

AgGDP	Agricultural gross domestic product
CFC	Community Forestry Committee
CIDA	Canadian International Development Agency
CPP	Convention Peoples' Party (Ghana political party)
CPR	Common pool resources
CDR	Committee for the defence of the revolution
DA	District Assembly
DANIDA	Danish International Development Agency
DCE	District Chief Executive (presently, a political appointee)
DCD	District Coordinating Director (formerly, District Chief Coordinating Executive [DCCE] – a Civil Service appointee)
DESC	District Environmental Sub-committee
DFID	Department for International Development (UK)
EPA	Environmental Protection Agency (Ghana)
FAI	Forest-agriculture interface
GFC	Ghana Forestry Commission (replacing the Forestry Department [FD])
GNRC	Ghana National Reconstruction Corps
GTZ	*Deutsche Gesellschaft für technische Zusammenarbeit* (German Agency for Technical Cooperation)
IAS	Institute of African Studies (University of Ghana, Legon).
IITA	International Institute for Tropical Agriculture
NABFC	National Anti-Bushfire Committee
NDC	National Democratic Congress (Ghana political party)
NGO	Non-governmental organisation
NPK	Nitrogen-Phosphorus-Potassium (ie. abbreviation for a fertiliser containing a mixture of these three)
NPP	New Patriotic Party (Ghana political party)
NRSP	Natural Resource Systems Programme (DFID)
NTFP	Non-timber forest product
ODI	Overseas Development Institute (London).
OVI	Objectively-verifiable indicators
PDC	Peoples' Defence Committee
PNDC	Provisional National Defence Committee (former military regime).
PRA	Participatory rural appraisal (cf. GTZ's 'Programme of Rural Action')

1. Executive Summary

This is a scoping study to develop a research project on innovative strategies for natural resource management at the FAI in Ghana. This research stands to make a significant contribution to the realisation of the FAI Purpose, through improved understanding of the social and economic influences which have led to existing policies, and the decision-making processes which need to be taken into account in advancing environmental policy. The focus is socio-political, not technological. The first two of the Purpose-level OVIs have been achieved; the third is being addressed at a level appropriate to a scoping study.

Local government decentralisation is widely anticipated to improve environmental management by bringing decision making closer to the resource users, but there is little evidence from the Ghana case that this is actually occurring. Here, the dominant process has been to give new life to the principles of cultural and technological modernisation, which have guided policy formulation since Independence. This has been sustained in a number of ways. The quality of environmental information available to local decision-makers is poor, and this has allowed externally-generated narratives to dominate the policy process. Environmental discourse has been manipulated by certain groups to pursue their interests against those with competing claims over natural resources. In addition, external interventions often rest on questionable assumptions (for example, the search for technologies to increase returns to unit area where labour and capital, not land, are in fact be the limiting factors), and these have reinforced the centrist approach. Consultative processes, which appear exemplary in terms of their adherence to principles of multi-stakeholder participation, have tended, in the event, to exacerbate this bias. Finally, the fact that, in significant areas, authority over the environment has been withheld from the local level disenfranchises the democratic fora, and encourages the pursuit of environmental interests through emblematic means.

What needs to be done to re-orient environmental decision making? Five priority areas of research enquiry are identified. These concern:

1. The types of information system required for District Assemblies to better understand the social and economic processes which lead to alternative livelihood strategies, including the pressures of different forms of production on fallow lands.
2. The innovative institutional arrangements which are arising within localities, which may provide a vehicle to manage conflicts over natural resources.
3. The ways in which multiple stakeholder platforms and networks for rural producers might be encouraged, so as to facilitate a process of innovation, and encourage rural communities to act as agents of policy reform.

4. The means by which district and national policy managers can learn from developments outside of the existing national policy framework, and incorporate these processes into decision making in ways that broaden the potential for policy intervention by local-level producers.
5. The institutional linkages that need to be forged to facilitate a learning process, build consensus and integrate environmental decision making into the policy process.

The Scoping Study report makes proposals for these issues to be addressed in the substantive phase of research. A draft logframe for the proposed project is included.

2. Background

This project aims to contribute to the NRSP FAI Programme Goal (of developing planning strategies to sustain the livelihoods of poor people at the FAI) by, firstly, investigating in depth the various livelihood strategies of rural resource users, and then scoping out new institutional strategies for environmental management under administrative decentralisation. This is in a situation of considerable cultural and agricultural complexity, and in a policy framework which is still in process of development.

The social complexity of the forest-agriculture interface is a rather neglected factor in natural resource management in Ghana. Though the historically high levels of population mobility and land transactions, linked to short-term labour migration and long-term migrant settlement, have been well documented nationally, they have not been given priority in most of the recent policy-oriented studies of land use at the forest-agriculture interface. For a number of reasons, this represents a significant gap in the applied literature.

Firstly, farming systems in the forest-savanna ecotone are often complex and subject to significant variation on ecological, social and economic grounds. The supporting vegetation patterns in which these cropping systems emerged have themselves developed over long historical periods, strongly influenced by anthropogenic forces. Many income sources are natural resource based, and bring their practitioners into conflict with other users of the same resources (charcoal being an important current example). The social context is a complex one, however, on some occasions exacerbating divisions, on others encouraging cooperation. (This may occur, for example, where land is in relative surplus; those who control land may prefer to hire it out to temporary migrants, rather than to cede it to relatives on a long-term basis).

Secondly, this region has been much affected by successive government policies for agricultural modernisation, primarily through the development of large-scale mechanised state farms. Though the latter have generally failed, their influence is still felt in a number of ways. Where land was stumped to facilitate access by agricultural machinery, this has affected the cropping systems which it can subsequently support, their needs in terms of fertiliser application, and the labour required to exploit them. New road facilities have also increased market access, contributing to the emergence of one regional centre, Techiman, as the nation's major wholesale agricultural market. And the migrant labour which was initially brought in to clear the state farms, was subsequently released onto the local market, and this has biased farming systems and resource management arrangements in line with the increased labour availability.

Thirdly, the Government of Ghana has recently embarked on policies of local government administrative devolution and participatory forest management, which proceed from certain assumptions about the integrity of the rural community, but which are likely, in practice, to both reflect and influence its diversity and complexity.

Local government decentralisation, in its present manifestation, has its origins in the reforms first introduced in 1987 by the PNDC (military) regime, but since confirmed by successive civilian governments. While devolution is still far from complete, there is in process a progressive transfer of decision-making and legislative control to district-level authorities for many aspects of environmental management. The exceptions are those concerned with timber values (which remain under the control of the national Ghana Forestry Commission) and land allocation (which, in most areas, is the personal prerogative of the local chief, acting in the name of the traditional stool authorities). In an environment in which the strength and nature of claims over natural resources are heavily influenced by origins, ethnicity, age, gender, affinity and length of residence, this makes for the emergence of a complex arena of negotiation, in which competing parties with differential access to, and influence with, local legislators, seek to pursue their own interests in competition and cooperation with others. In so doing, they invoke various environmental and social principles. These in turn influence the subsequent evolution of institutions and policy.

Underpinning the study is a concern with the implications of decentralisation for the rural poor. A review of the literature suggests that the linkages between democratic decentralisation and

poverty reduction are uncertain, at both national and local levels. With respect to the latter there is, indeed, some evidence of an inverse relationship. There are a number of possible reasons for this. For instance, poor people may be marginalised by the high opportunity costs to them of political participation. For decentralisation to succeed also requires high levels of accountability of both elected representatives and bureaucrats to the citizenry at large. Rural populations are often, to varying degrees, heterogeneous and hierarchical. Such social complexity may well be inimical to the success of decentralisation policies. Periodic elections are unlikely, on their own, to create the kinds of public accountability which are central to democratic functioning. Accountability mechanisms may also act to strengthen the position of elites, defined by various social and class criteria. Where these elites are in an antagonistic relationship to the rural majority, the effect will be to further marginalise the position of the poor. For decentralisation to contribute to a redistribution of wealth within a locality is likely to require high levels of social organisation and political awareness on the part of the poor. Where there is a requirement for poor groups to challenge powerful local elites, then a strong party organisation is likely to be required. Decentralisation systems which disfavour such political articulation between centre and periphery are unlikely to favour radicalism. At the same time, other factors (such as the strength of patronage systems) may also act to limit the potential for loyalties to develop around economic interests rather than social identities.

These observations are pertinent to the case of Ghana, where party affiliations are prohibited in elections at district level and below, elites tend to be in an antagonistic relationship to the small farming class and the poor suffer from divided ethnic and other loyalties.

On all these grounds, there is good reason to argue that livelihood strategies will be crucially influenced by social identities and institutions, and that these will, in their turn, be reflected in political processes. Natural resource use at the FAI thus has important implications for governance, in that the ‘rules of the game’ are being developed largely in the local contexts of resource use, and under conditions in which national and global interests interact with local ones, though not necessarily in a pro-poor way.

These considerations all pointed to the need for empirical research, firstly on livelihood systems and decision-making, and secondly, on how environmental policy is being formulated in a situation of decentralisation to local government. The ultimate aim was to help adapt policies and

management models/practices to the emerging realities, while seeking to safeguard both the condition of natural resources in the FAI and the interests of the poor and vulnerable.

This proposal responded to a research topic identified in the NRSP FAI production system call. By its nature, socio-political research of this type is unlikely to result from direct demand from within the policy community, particularly on the part of the poor. Its value has to be judged by future benefits, rather than immediate demand.

3. Project Purpose

This was a scoping study whose purpose was defined by NRSP FAI LF Activity 1.2, *viz* *'Strategies for promoting new management approaches to increase the livelihood opportunities of poor people developed and implemented in Ghana, in the FAI target zones'*

This was to be achieved through a phased approach involving:

- Initial scoping study (the present contract)
- Full research study
- Validation of recommendations (in association with national and bilateral partners)
- Wider dissemination.

The following indicators of progress were identified for the scoping study:

1. Knowledge of institutions mediating policy (decentralised local government/ agriculture and forest-related institutions) updated, identifying gaps and key constraints.
2. Research topics on strategies of participatory management aimed at enhancing the livelihoods of the poor and marginal at the FAI investigated and elaborated with a view to informing future FAI calls on Ghana and elsewhere.
3. Uptake pathways for alternative policy and other innovations defined and assessed.

4. Outputs

This study is of a research scoping nature, and has three outputs:

1. Increased understanding of the social and institutional dimensions of natural resource management at the FAI in Ghana
2. Potential alternative strategies for developing and delivering appropriate participatory management approaches to benefit the poor identified
3. Increased awareness among NR researchers, policy-makers and development agencies of the types of changes which will be needed to ensure that current decentralisation and natural resource management policies contribute to poverty alleviation.

These outputs are reviewed in turn in this section of the report. It draws on the findings presented in the ff. annexes, to which the reader is referred for the detail of the argument, and the supporting data and references.

Annex 1: 'A brief history of agriculture in the transition zone of Brong Ahafo'
Annex 2: 'Cropping Systems'
Annex 3: 'Managing the Environment'
Annex 4: 'The Way Forward'

Annex 5 presents the draft logframe for the proposed follow-up project.

4.2 Output 1: *'Increased understanding of the social and institutional dimensions of natural resource management at the FAI in Ghana'*

Research results, with reference to Output One, consist of a more comprehensive understanding of the development of agriculture in the Brong Ahafo, the dominant cropping patterns, and the main environmental and institutional issues in natural resource management.

A complex picture emerges. This belies many of the assumptions that underpin current research, and challenges several of its principles.

Following the review, a forward research strategy is identified and discussed.

4.1.1 *Research study sites*

Farming systems in the transition zone are diverse. In order to comprehend this diversity, six settlements in three main administrative areas were selected for research. These were:

1. Wenchi District – the Ahenfie electoral area in the Nsawkaw Area Council, comprising part of Nsawkaw, Tanoso and Njau; also Subinso, Atuna, and Buoku electoral areas;
2. Kintampo District – Weila and Mansie
3. Techiman District – Kokoago

These settlements covered the main ecological areas of the transition zone. Their location in relation to the main forest ecotones is indicated in Map 1. In addition, a study of the functioning of the district assembly and its component unit committees was undertaken in one district, Wenchi. Figure 4.1 indicates the sites of the main settlements studied, and Table 4.1 summarises their major characteristics:

Figure 4.1 The Brong Ahafo Region

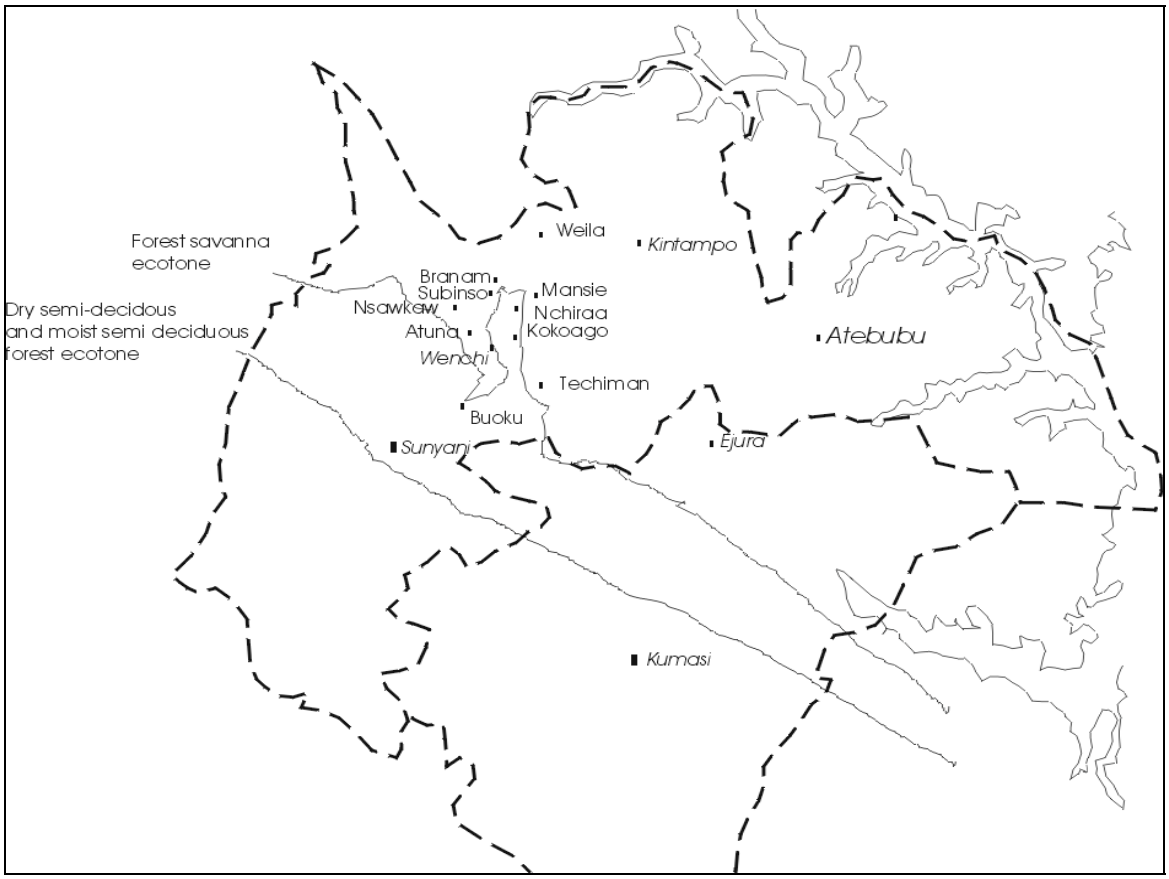

Table 4.1: Characteristics of Settlements, indicating main research themes

Settlement	*Ecological zone*	*Dominant Ethnic Group* (note: migrants of various origins – mostly from the Upper West – found in all settlements)	*Main research interests*
1. Subinso	Savanna-forest mosaic	Brong and Deg (Mo) landowners, with many migrants, mostly from the Upper West.	1. Former centre of agricultural modernisation; lands extensively cleared & stumped; soils now exhausted. 2. Farmers moving into cassava and groundnuts; crop diversification.
2. Atuna	Savanna-forest mosaic	Dagaaba migrants from Upper West Region	1. Fuelwood and charcoal as secondary income sources for migrant women. 2. These recently banned by chief (ref. party political conflict)
3. Buoku	Semi-deciduous forest fringe	Migrants from Dormaa – as cocoa farmers; Migrants from Upper West (originally cocoa labourers); Some indigenes from Wenchi	1. Settled by Dormaa migrants for cocoa in 1920s. 2. The only settlement with evidence of major land constraint. 3. Only settlement with sharecropping. 4. Also taungya, encroachment on forest reserve 5. Family lands mainly farmed by women.
4. Weila	Savanna-forest mosaic.	Nafana (Banda) immigrants (from colonial times), in Deg (Mo) area	1. Well within the parkland (yam) zone, and thus dependent on environment rich in small trees/coppices for staking. 2. Land still in significant surplus.

			3. Recent disputes over charcoal production, involving conflict between local youths and Sissala charcoal burners (now migrated elsewhere). 4. Crops: Yam and maize production. Conflicts between environmental management and livelihoods rights (yam/charcoal)
5. Mansie	Savanna-forest mosaic	Deg (Mo)	Ditto (per Weila)
6. Kokoago	Forest-savanna mosaic	Short distance migrants mainly from near Techiman, originally settled to farm cocoa.	1. Ex-cocoa lands, adjacent to defunct irrigation project and close to Wenchi State Farms, and more recent (now collapsed) GNRC mechanised farm. Local farmers have since moved onto stumped lands for maize cultivation. 2. Mechanized maize cultivation practiced by some farmers, with chemical inputs. 3. Local systems for intensive tomato cultivation. 4. Division of lands between men (grassland areas) and women (forest lands).

4.1.2 *The context of environmental decision-making in the Brong Ahafo*

The present study took as one of its preliminary objectives, the characterisation of the narratives which guide environmental decision-making in the Brong Ahafo region, particularly among the key decision makers at District Assembly and Unit Committee levels, and in the public support agencies.

Among the striking features of these narratives are their simplicity, uniformity, and largely external origins. Perceptions of environmental change within the region over the last two decades have become intertwined with received wisdom about small farmer practices (most of it of colonial origins) to give rise to a set of 'crisis narratives'. These accord well with recent international discourse about environmental decline in Africa. They stress such themes as:

- The destructiveness and non-sustainability of traditional agriculture, particularly swidden practices ('slash and burn').
- The destructive effects of bush fires; the alleged anthropogenic origins of the devastating bushfires which swept through Ghana and the West African sub-region in 1983, and the resulting need for major changes in small farmer practices.
- The impending crisis in agriculture which is being caused by rampant population growth, resulting in environmental problems (shortening fallows and land degradation) and food security decline, both of which imply the need for a rapid transformation in traditional agriculture, through intensification of land use.[1]

There is little to suggest that such crisis narratives have any substantive connection with the realities of farming in the Brong-Ahafo. They are not, indeed, evidence-based to any appreciable extent. Rather they are rooted in external perceptions and interests, and are sustained by a number of features of the local political environment. These include, most notably:

- The paucity of sources of information for environmental decision-making;
- The external dependence, both intellectually and in terms of resources, of the central extension services;
- The social complexity of the small farmer population, and the fact that conflicts over natural resources tend to be overlaid with important social dimensions;

1. Throughout this report, 'intensification' is used in the conventional sense, to refer to increases in the quantity of other factors, as compared to a relatively fixed area of land (see, for example, Ellis, 1988: 196).

- The local interests which can be served by mobilising such narratives within the legal and administrative frameworks provided by local government decentralisation, in pursuit of partisan interests.

Examples of the use of such narratives, in the form of situational analyses, are provided in Box 4.1. Additional evidence is given in Annex 3.3.2.

Box 4.1 Uses and abuses of environmental narratives – 1

Case Study One: Weila
Weila is a settlement in the northern parkland zone, inhabited mainly by Banda peoples who settled in this Mo area in historical times. This is a yam producing area. Land is in surplus and there is no shortage of small trees and coppices for staking out the growing yams.

A few years ago, a group of Sisala migrants came to the area, and were allocated charcoal-production rights for sale by the chief. This involved an annual payment to allow them access to specified areas to cut living trees for conversion into charcoal for sale in the urban areas (about 90 percent of urban dwellers in Ghana are estimated to use charcoal for their fuelwood need). The species in question (predominantly *Anogeissus leiocarpa*, *Terminalia glaucescens*, *Pterocarpus erinaceus* and *Lophira lanceolata*) were not ones of agricultural interest.

The chief's prerogative was much resented by the local youths. Acting on a policy initiative of Kintampo District Assembly, they forced through a bye-law to prevent the cutting of live trees to make charcoal, and to restrict charcoal production only to the transformation of dead wood. They cited the extreme destructiveness of the migrants' production methods as justification for their decision. Whether or not it was valid in these terms, it had differential effects on indigenes (ie. Mo and Banda) and migrants (Sisalas). Yam farmers have ready access to dead wood on their farms, while the migrants, as specialist charcoal producers, do not. Having learnt charcoal production methods by watching the migrants, the indigenes were now in a position to exploit this as a complementary income-generating activity. The Sisalas found it difficult to gain access to charcoal resources since they now had to compete with local youth and farmers who gained preferential access over migrants from their relatives. As a result of the difficulties they experienced in gaining access to charcoal resources, the increasing expense and social tensions, the Sisala charcoal-burners moved on to other areas where no live wood ban had been applied.

One of the effects of this case has been to increase the level of conflict between the chiefs/elders and the youths. The former were reluctant to control the charcoal burners as this brought them valuable revenues. The chief, who feels somewhat outwitted by the youths, is now trying to introduce controls over indigenes burning charcoal.

Case Study Two: Mansie
At Mansie a similar pattern obtains further down the line. The charcoal burners have gone, charcoal has become the main income of the youth, and the unit committee and chief are attempting to control and ban exploitation of charcoal by indigenes, though with little success. Many farmers, whose main interests are yam are concerned about the effect of increasing charcoal exploitation on yam farming. The main debates on these issues take the form of environment versus livelihood rights.

Two case studies – conclusion
Interesting questions arise, therefore, concerning the process of policy formulation and the scientific basis for it; the net effects on agricultural production and the environment, and on the livelihoods of the various groups involved. In neither case was there any evidence that policy making was evidence-based, except in the most impressionistic terms. Non-partisan environmental information is not available at these levels, and neither short-term nor long-term decision-making is premised upon it.

Arguably, the consequences of the new opportunities opened up by political decentralisation have been less concerned with the promotion of environmental standards than the pursuit of partisan interests. The evidence is that a 'grand narrative' has been commandeered by a particular group to promote its own interests – only to be subsequently manipulated by others to support their counter-claims.

The first purpose of this report is to survey natural resource use in the Brong Ahafo Region, and to characterise the actual bases of decision-making by small farmers, the ways in which they have adapted to changes in their environment, and the variations in experience between them.

4.1.3 *Agricultural policy and its effects on the Brong Ahafo Region*

Agriculture in the Brong Ahafo has a long history, dating back at least to the second millennium BC. The patterns of cultivation which have developed bear witness to the interplay between natural and managed environments, and confound a common perception of an essentially static traditional agriculture.

Over the centuries, there have been considerable shifts in climate and vegetation within the transition and forest zones, marked by retreats and advances of species associated with forest and savanna, as periods of desiccation alternated with relative humidity. By managing a wide array of crop species and micro-environments, farmers have developed techniques of risk and environmental management which secure their long term returns to labour.

A series of policy developments in the post-colonial period has had a profound influence on the character of agriculture in the Brong Ahafo. The main of these have been:

- Starting in the early 1960s, agricultural modernisation through the development of large-scale mechanised farming; this led to large-scale land clearance and tree stumping, tractorisation, and associated infrastructure development (particularly road building).
- Adoption, in the 1980s, of structural adjustment policies involving market liberalisation, and the removal of input subsidies, leading to the collapse of mechanised agriculture in most areas.

Though the state farms and associated enterprises failed, they have nevertheless had significant effects upon the rural economy. These effects have included:

- Increased demand for agricultural services and inputs;
- New opportunities for the business class to acquire large areas of land;
- Changes in soil structure and vegetation types (consequent on stumping and ploughing), creating a new dependence on inputs;
- Improved infrastructure (particularly roads);

- Increased availability of migrant labour, attracted to the region initially by work opportunities in the modern sector, as well as the opening up of communications and wholesale food markets.

This influx of migrants changed the balance between the factors of production, and opened up new possibilities to increase productivity through heavy investments of labour. Two investment patterns thus established themselves in the Brong Ahafo in the 1970s, '80s and '90s:

- Intensification through investment in mechanisation and subsidised inputs;
- Increased production through investment in hired labour, more extensive land clearance, and more intensive weeding.

The former was most pronounced close to the state farms, where support services were concentrated, the latter in more distant areas. With the removal of input subsidies, the demand for hired labour increased, as the high cost of inputs was compensated by switching to more labour-intensive systems.

With few exceptions, formal agricultural research has functioned to support these major policy developments, and has been conceived within their premises. Research has been predominantly structured by an approach in which growing land pressure is seen as the critical determinant of agricultural change, demanding the search for new technologies (variously mechanical, chemical and organic in their origins) to permit intensification. Even today, the systems research projects in the Brong Ahafo rest largely on the presumption that land shortage demands the development, as a matter of urgency, of technologies to increase returns to unit area.

Such assumptions largely ignore the more important trends in the Brong Ahafo, particularly the implications of the commodification of labour and the emergence of large labour markets in the agricultural sector. As will be discussed in the next section:

- Land remains in relative surplus in most areas
- The responses of farmers to pressures for agricultural change have been conditioned more by the availability of labour than shortages of land.

Thus:

- Where population densities are low, the available labour has been applied to increase the area under extensive cultivation;

- Where densities are higher, the additional labour has been applied to more intensive use of land (though not necessarily as a response to land shortage *per se*).

In neither case has viable agriculture developed in line with predictions.

4.1.4 *The Small Farmer in Policy Discourse*

One of the consequences of this failure has been an inability to develop the capacity to challenge the dominant environmental narratives. Thus, presumptions as to the cultural backwardness of the small farmer community continue to dominate the arenas of national policy making, and block a more creative engagement with a dynamic economy.

While the problems of 'modern agriculture' in Ghana should have promoted a more critical approach, recent environmental rhetoric has acted in a contrary direction, and the policies of cultural modernisation have only been reinforced. These environmental policies have, moreover, imbued the dominant narrative with an added moral dimension which has had the effects of both criminalizing established farming practices (such as bush burning), and elevating donor-friendly alternatives (for example, teak and cashew production) onto a morally superior environmental plane. Ironically, extensive tree plantations may well end up mirroring the land hoarding strategies of the mechanisation era, to the detriment of the small farmer majority. Like stumping and ploughing, tree plantations tend to be seen as a strategy to alienate land and secure it for the long term.

4.1.5 *Fallowing and Permanent Cultivation.*

Much of the rhetoric on agricultural modernisation contends that population growth creates pressures on fallowing systems because of its effects on land quality. Rising population pressure leads to shortened fallows, and this in turn leads to short cycles which prevent soils recycling sufficiently. This creates a downward spiral of impoverished soils with insufficient resting periods before cultivation.

Data collected for this study presents a more complex picture. Medium fallows of between 3-6 years prevail in the Brong Ahafo transition area, with 31 percent of farmers using longer fallows of over 7 years and 10 percent fallowing for over 10 years. While there is evidence of farmers responding to land shortage in certain areas by using shorter fallows (as at Buoku where 37 percent of plots are being fallowed for periods of between 1-2 years), adoption of intensive

farming methods and inputs at Kokoago has led to equally high rates of short fallows. Low land pressures are not necessarily associated with long fallows (for example, at Kokoago 39 percent of farmers use short fallows of 1-2 years and at Subinso 23 percent of farmers used 1-2 year fallows). In the settlements in the parkland zone where yam farming is of prime importance, short fallows are rare (only 5 percent of Nsawkaw , 10 percent of Weila and 14 percent of Mansie farm plots were previously fallowed for short periods of 1-2 years).

There also seems to be some evidence of matching crops to land and to fallow intervals on the land. This is reflected in the high percentages of monocrop cassava grown with short fallows and the high percentages of yam (usually intercropped with cassava) grown with medium-long fallows (see Figure 4.2 and Table 4.2). However, there is no direct correlation between cropping and fallow systems, since many farmers have sufficient land to allow for fallows of at least 3-6 years.

Factors other than soil restoration are also important in decisions as to length of fallows, including build up of pests and weeds in the soil. This is a critical influence on yam production methods, for example.

4.1.6 *Population and Land Tenure*

Land tenure regimes in the Brong Ahafo are conditioned by its comparatively low population densities. Two distinct regimes are evident, corresponding to the variable ecology:

1. *Family lands system:* In the high forest areas, considerable labour needs to be invested in land clearance. Once land has been cleared, there are pressures to maintain it, and a family land system is likely to develop. 'Intensification' of this type is not necessarily the result of land shortage as such, but rather reflects the impact of labour constraints on farmer decision making.
2. *Bush fallow system:* Woodland areas are not so difficult to clear of their woody biomass, though grasses can be problematic. The thinner organic matter of the parkland soils needs to be tilled and organic matter built up. Labour intensive mounding techniques have been developed. Such areas are prone to dry season bush fires, however, and under these conditions, a store of invested labour cannot be easily maintained within the cleared fallows. The major labour inputs are not in transforming woody vegetation, but in tilling the savanna soils. Farmers move freely from area to area within the lands where their settlement claims rights of ownership, clearing the most suitable regenerated land for their yam farms.

In recent years, new factors have come into play and these have resulted in a growing incidence of individual and family land.

- As land pressure builds up, with the influx of migrant farmers and migrant labourers, this leads to a consolidation of holdings under family tenure. While land is still in relative surplus, individuals tend to intensify on well-placed plots, in order to avoid having to travel far from the settlement to gain good land.
- Mechanised tilling requires heavy investment in preparation, and thus also increases interest in existing farm plots.
- Investment in woody perennials, such as cashew and teak, creates a two-fold interest in sedenterisation of farm holdings; most obviously, in terms of the plantation itself, but also because,

Figure 4.2 Fallow intervals

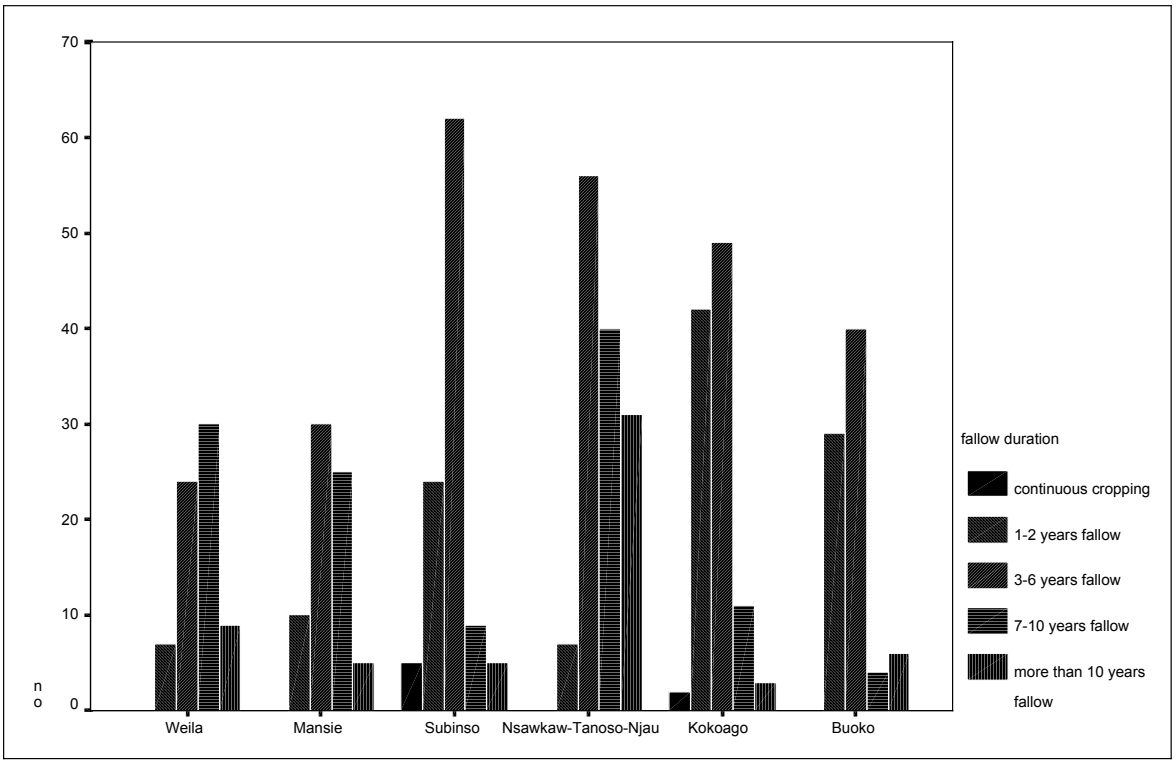

Table 4.2 Fallow intervals in cropping systems

Percentage of plots under different fallowing intervals in different cropping systems

Cropping system	Continuous Cropping	1-2 years fallow	3-6 years fallow	7-10 years fallow	over 10 years fallow	No. of farm Plots
Yam-cassava	1	12	36	36	15	113
Yam-maize	.	13	67	13	7	15
Yam-cassava-maize (%)	.	8	58	29	.	24
Maize-cassava	2	22	46	22	9	46
Sole maize	3	29	47	10	11	62
Sole groundnut	.	26	44	18	13	39
Cassava-groundnut	.	29	49	15	7	41
Sole cassava	.	42	42	12	4	26

by taking land out of the fallow system, it diminishes the available area and increases pressures to secure rights to farm land. Paradoxically, therefore, it is the introduction of new technologies which have created pressures for change in the tenure system in the Brong Ahafo, not the incompatibility of increasing population densities with traditional swidden systems.

4.1.7 ***Population and land tenure***

The low population densities of the Brong Ahafo are reflected in the land tenure systems. Only 2% of plots (n.816) were cultivated under share cropping arrangements. Sharecropping is concentrated in the semi-deciduous forest settlement of Buoku, where 11% of all farm plots are farmed in this way.

Land hiring and leasing are generally relatively rare; only 6% of farmers lease land, though this spreads across all ecological zones.

4.1.8 *Main circuits for land acquisition*

These include:

- *Family land* - land on which families claim rights through constant cultivation, including the right to pass land on by inheritance.
- *Rights of spouses* - usually due to women working on land made available by their husbands, on marriage.
- *Clearance rights over community land* - individual rights claimed through 'first clearance'; these may be converted into family land over time.
- *User rights* - rights temporarily ceded to another farmer for use, and acknowledged through some sort of token payment.
- *Rights given by chiefs* - usually to migrants, without existing rights; some prestation has to be made to the chief, as wall an annual payment, probably in cash and kind.
- *Hiring of land* – leasing of land for monetary rents; this becomes more attractive as land becomes scarcer - rights given by chiefs may well gradually be converted into leaseholds in such situations; the land may be hired for one year or more, depending on the cropping cycle;
- *Sharecropping* – also emerges with increasing scarcity of land, and is more common than leasing in the semi-deciduous forest areas; sharecropping arrangements in the Brong Ahafo are mostly of the *abunu* and *abusa* type (respectively, the landlord retaining a half or third of the production), possibly in the same farm or even (as applied to different crops) field.
- *Squatting* – is found on state farms and forest reserves.

The dominant forms of land access in the study areas are evident from Figure 4.3 and Table 4.3. From these it will be seen that:

a) About 50% of farmers gain access to land through family ties.
b) In the northern transition zone, farmers can also gain access to uncultivated community/stool land (20% have access to community land; see particularly Weila and Mansie).
c) Clearing uncultivated bush is also fairly common in Nsawkaw, less so in Subinso, though this may reflect the high proportion of migrants in the latter settlement.
d) Women often gain access to land through spouses or affines.
e) 14% of women in the sample gained land through their spouses or affines, though there is significant local variation in this, with the highest proportions in the land abundant northern settlements.
f) Women's dependence on their spouses is primarily a reflection of access to labour; women in the northern areas, lack access to sufficient labour for land clearance, and are forced to make

do with the abandoned yam farms of their husbands; this in turn leads them to plant crops which do well under such conditions, such as groundnuts. In secondary growth areas of the dry semi-deciduous forests, the labour constraint is less in evidence, and women find it easier to gain access to adequate labour for clearing, or alternately to do it themselves; forest soils respond well to minimum tillage, and thus are less demanding in terms of labour than parkland areas where mounds and ridges have to be made.

g) In situations of growing land scarcity but increasing commercial opportunities, young ambitious men may seek access to land through hiring, sharecropping and other non-family circuits. This is to avoid family obligations, and also to gain access to the best land available. With competition for hiring of prime lands, women have to make do with the less fertile small family plots. This may result in more individually based farming strategies among men.

h) Partly as a result of (f) above, men tend to farm larger acreages than women (more than double the average area, though with considerable local variation).

i) User rights are more common in the parkland environment, and frequently reflect relations between a migrant and an indigene. For example, in Subinso, 86% of those who gain access to land in this way are migrants; at Nsawkaw, the figure is 64%. This is particularly likely to occur where increasing scarcity of land encourages land owners to protect their own long-term rights through ensuring that surplus land is kept in cultivation by others. Migrants are often preferred in such situations, as their rights are only temporary.

j) As land becomes scarce, leasing tends to become more attractive to migrants; 17% of all migrants in the sample gained access to land through leasing, while none of the indigenes did so. Leasing is particularly likely to occur in settlements such as Kokoago (maize) and Subinso (maize, groundnuts), with a developed commercial sector.

k) Hiring is particularly likely on already stumped land, where landlords can charge a premium for labour already invested in land 'improvement'.

l) Land in areas such as Kokoago is frequently hired for long periods (eg. 3 years), to gain maximum returns from labour invested through intensive rotations (maize/tomatoes/cowpea).

m) Where land is in short supply, as in some high value forest locations, sharecropping displaces monetary rents and user rights. As in the case of Buoku, this is the preserve of migrants (12% of all plots are sharecropped, though never by indigenes).

n) Where land is becoming in seriously short supply - again as in Buoku - this tends to be reflected in the large number of farmers gaining access through taungya arrangements, or illegal encroachment into the forest reserve; there are, however, additional political factors in this case.

With the increasing commodification of agriculture and the influx of immigrants, all this may change. What were previously subsistence crops may become cash crops. As relative prices change, men may shift more into groundnut production, and thus displace their wives from last year's yam fields. Where migrant labour is abundant, the opportunities for women farmers may increase.

Vagaries in climate may have similar effects, perhaps breaking down the traditional division of labour, and encouraging crop diversification by men and/or women.

4.1.9 *Migrants and Chiefs*

The relatively low population density of the Brong Ahafo Region (particularly in the more northerly parklands), and the high labour costs which farming involves in such areas, result in relatively low rental values for land, and relatively easy access. The movement of migrant labour into this zone has been a prime factor in opening it up, and allowing local farmers to expand into commercial food crop cultivation.

Figure 4.3 Tenure arrangements in the Brong Ahafo transition zone

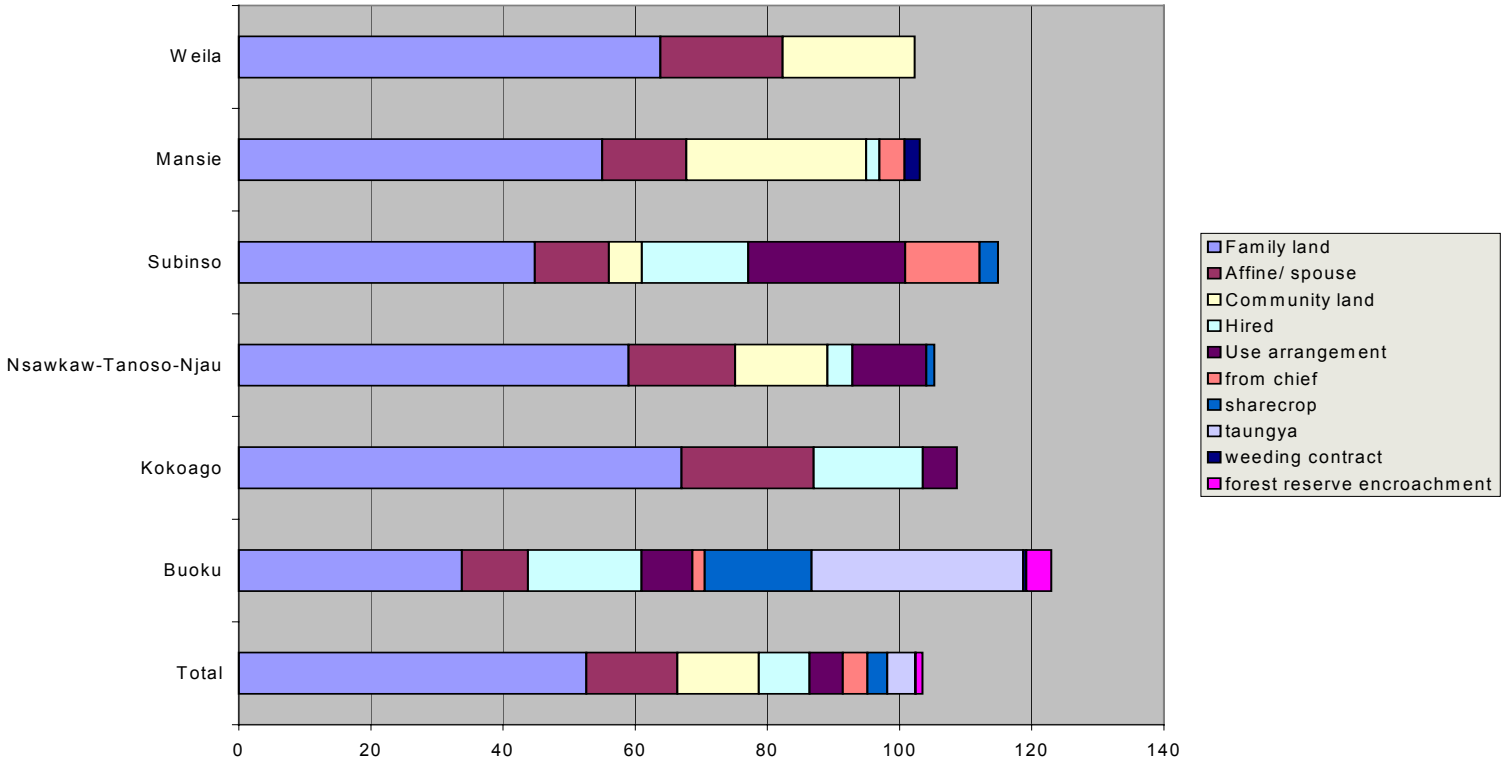

Table 4.3 Sources of men's and women's land

	Settlement						
	Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoku	**Total**
Male							
Family	71.4%	44.4%	42.2%	51.2%	52.9%	15.4%	46.2%
Community clearance rights	28.6%	48.1%	6.7%	16.3%			16.7%
Spouse or in-laws			2.2%	4.7%	5.9%	7.7%	3.2%
Use			13.3%	11.6%		3.8%	6.5%
From chief			13.3%			3.8%	3.8%
Hiring			6.7%	4.7%	23.5%	15.4%	7.0%
Sharecropping			2.2%			7.7%	1.6%
Taungya						11.5%	1.6%
forest reserve encroachment						3.8%	.5%
Family & use			4.4%		5.9%		1.6%
Family & hiring				2.3%	5.9%		1.1%
hire & use			8.9%				2.2%
Use & sharecrop						3.8%	.5%
Weeding contract		3.7%					.5%
Community and family		3.7%		4.7%			1.6%
Government agency and family land				2.3%	5.9%		1.1%
Family and purchased[2]				2.3%			.5%
Family and taungya						15.4%	2.2%
Taungya & sharecropping						7.7%	1.1%
Community and hire						3.8%	.5%
Women							
Family	50.0%	61.5%	31.4%	52.6%	58.3%	32.0%	46.9%
Community clearance rights	4.5%		2.9%	5.3%			2.8%
Spouse or in-laws	40.9%	26.9%	20.0%	24.6%	33.3%	12.0%	24.9%
Use			14.3%	10.5%			6.2%
from chief gift		7.7%	8.6%				2.8%
Hiring		3.8%	5.7%	1.8%		12.0%	4.0%
Sharecropping			2.9%	1.8%		8.0%	2.3%
Taungya						20.0%	2.8%
forest reserve encroachment						4.0%	.6%
Family & use			2.9%			4.0%	1.1%
Family & hiring			5.7%				1.1%
Hire & use			2.9%				.6%
in-laws & hire			2.9%				.6%
Community and family	4.5%			3.5%			1.7%
Family and in-laws					8.3%		.6%
use & taungya						4.0%	.6%
Taungya & sharecropping						4.0%	.6%

[2]The purchased land is a building plot purchased in town, subsequently used for farming

In many instances, the relationship has served the migrants well. However, the extensive (and large unchecked) 'traditional rights' of the chiefs do allow them to impose a relationship of clientage on their migrants, which can lead to some resentment.

4.1.10 *Natural Resource Tenure*

The 1962 Concessions Act vested all trees in Ghana in the Office of the President, to administer on behalf of the 'allodial authority' (the chiefs). This gives the Ghana Forestry Service control over all trees (particularly timber trees) whether in forest reserves or on farmers' fields. In the latter case, farmers have no right to any royalty payments, although royalties are paid to the chief, the stool and to the district authority.

While in the past, the timber industry was interested only in redwoods and the like, with export potential, increasing scarcity of timber trees and diversification of exports has increased its interest in what were hitherto unconsidered species. A formal ban on chainsaw production has further shifted access to timber away from farmers to the industry.

For these and other reasons, production for local livelihoods has increasingly focused on charcoal, using species without potential as timber. As will be later discussed, this has brought small producers into increasing conflict with chiefs and district authorities (to whom charcoal represents a potentially lucrative source of income), as well as the environmental lobby, for whom charcoal is a major emblem of environmental degradation, even 'desertification'.

4.1.11 *Supplementary livelihoods*

Around 46% of all men and 56% of women have supplementary off-farm incomes. In the case of men, these include natural-resource based (e.g. charcoal) and artisanal (e.g. tailoring) activities, and petty trading. For women the main income sources are petty trading (e.g. dressmaking), preparation of cooked foods, and (in the case of Dagaaba migrants), brewing of *pito* (sorghum beer). Table 4.4 gives a breakdown of off-farm income sources.

Charcoal production is the only developed source of natural-resource based off-farm income for men, although in some areas, it is largely produced by specialist (non-farming) Sisala migrants. This lack of developed crafts based on natural resource utilisation is at odds with a common

perception as to villagers' high dependence on the natural environment for off-farm income.3 It reflects a hostile policy

Table 4.4 Main off-farm incomes

Percentage of farmers engaged in off-farm activities	Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoku	*Total*
Men							
Off-farm incomes	43	50	51	48	39	46	46
Natural resource exploitation	18	43	11	10	6	4	15
Charcoal	11	39	4	5	.	.	9
Hunting	3.5	4	.	.	.	4	1.5
Herbalist	.	.	2	5	.	.	1.5
Carpenter	.	.	.	.	3	.	0.5
Pestle-carving	.	.	2	.	.	.	0.5
Mortar-carving	3.5	.	.	.	.	.	0.5
Hoe-handle making	.	.	2	.	.	.	0.5
Palm-wine tapping	.	.		.	0.3	.	0.5
Petty-trading	11	4	9	5	10	12	8
Artisan	10	.	20	16	16	.	11
Casual labourer	.	,	,	7	.	.	1.5
Women							
Off-farm incomes	54	57	80	40	59	56	56
Natural resource exploitation	.	12	3	2	.	.	3
Charcoal	.	12	3	2	.	.	3
Petty trading	41	19	37	19	32	32	31
Prepared food	14	15	23	7	23	8	14
Pito brewing	.	4	11	2	.	8	4

3 This may seem at odds with the findings of Wiggins *et al* (2001). However, direct comparisons are difficult to make, both because of the different bases of the assessments (individuals vs. employment rankings/days worked + income said to be obtained), and differences in the location of the settlements studied.

environment. The framework of natural resource tenure largely excludes villagers from ownership rights; the legislative system criminalizes their use of tree resources; and environmental policies are prone to equate off-farm natural resource based incomes and 'environmental degradation'. This is in marked contrast to the importance of forest resources in national exports, and underlines the marginalisation of the interests of the small farmer majority.

4.1.12 *Cropping Systems*

Cropping systems in the transition zone of Brong Ahafo are complex and diverse. In the survey of 6 different settlements and 818 farm plots, over 150 different cropping combinations were found. The dominant crops cultivated were: yam, cassava, maize groundnut, sorghum, plantain, cocoyam, bambara beans, cowpea, tomato, okro, pepper, and garden egg. Small quantities of rice are cultivated in valley bottoms. The dominant tree crop cultivated is cashew with some farmers also investing in teak plantations.

The main crops (indicating % farmers cultivating, and % farm plots, in each case) are:

- Cassava – in both major ecosystems (76/45)
- Yam – mainly in the parkland zone (71/36)
- Maize – both zones (60/35)
- Groundnut – mainly parkland, though increasingly in the semi-deciduous forest fringes also (48/24)

Groundnut is mainly a women's crop (70% women, cf. 29% men). Yam, cassava and maize are more likely to be men's crops.

Intercropping is more common than monocropping in the transition zone (62% cf. 38%). This is indicative of risk management strategies, primarily in relation to rainfall and pest attack.

Monocropping is dominant only in the Kokoago area, indicating the strong commercial orientation of farmers in this area. Monocropping tends to be associated with high input use, as is commonly the case with maize, though there are many exceptions (for example, groundnut monocropping is not associated with use of inputs).

The main crops are as indicated in Figure 4.4. Table 4.5 gives the distribution of crops in male and female plots, and Table 4.6, the dominant cropping systems.

Figure 4.4 Main crops grown in the Brong Ahafo transition zone

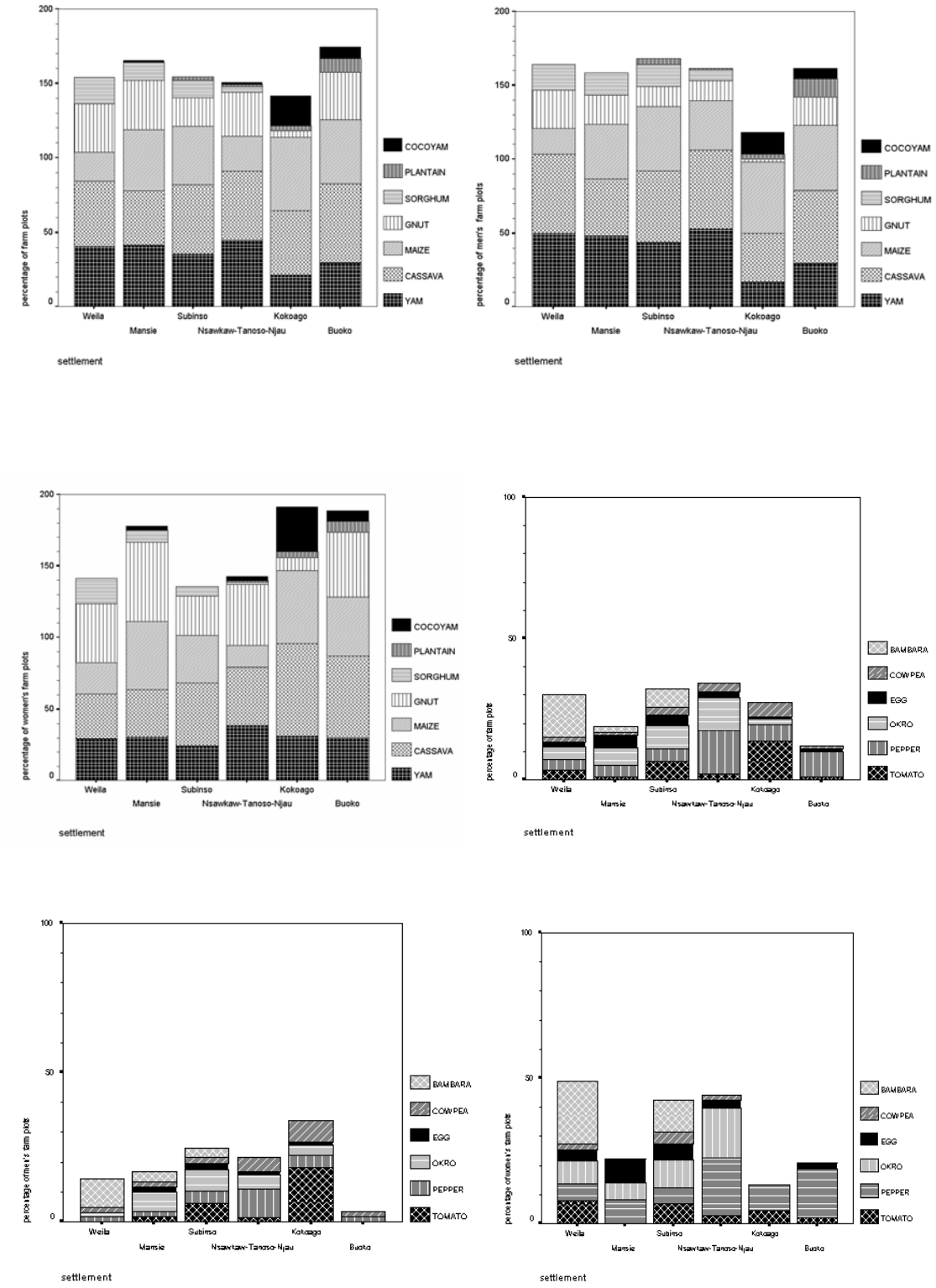

Table 4. 5 Distribution of crops in men's and women's farm plots

Crop	Sex of Cultivator of plots	Percentage of plots under different crops						
		Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	Total
Yam	Male	50	48	44	53	17	30	40
	Female	29	31	25	39	31	30	32
	All	41	42	36	45	22	30	36
Cassava	Male	53	38	48	53	33	49	45
	Female	31	33	44	41	66	57	44
	All	43	36	46	46	43	53	45
Maize	Male	18	37	44	34	48	44	38
	Female	22	47	33	15	51	41	31
	All	19	41	39	23	49	43	35
Groundnut	Male	26	20	13	13	2	19	14
	Female	41	56	27	42	9	45	37
	All	33	33	19	30	4	32	24
Sorghum	Male	18	15	15	7	0	0	9
	Female	18	8	7	2	0	0	5
	All	18	12	12	4	0	0	7
Rice	Male	0	0	1	4	0	0	1
	Female	0	0	0	8	0	0	3
	All	0	0	1	6	0	0	2
Bambara beans	Male	10	3	3	0	0	0	2
	Female	22	0	11	0	0	0	5
	All	15	2	6	0	0	0	4
Cowpea	Male	2	2	2	5	7	2	3
	Female	2	0	4	2	0	0	2
	all	2	1	3	3	5	1	3
Plantain	Male	0	0	4	1	3	12	3
	Female	0	0	0	1	4	8	2
	all	0	0	2	1	4	10	3
Cocoyam	Male	0	0	0	0	15	7	4

	Female	0	3	0	3	31	8	6
	All	0	1	0	2	20	7	5
Tomato	Male	0	2	6	1	19	0	6
	Female	8	0	7	3	4	2	4
Crop	Sex of Cultivator of plots	Percentage of plots under different crops						
		Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	Total
	All	3	1	6	2	14	1	5
Garden egg	Male	0	2	2	1	1	0	1
	Female	4	8	6	3	0	2	3
	All	2	4	3	2	1	1	2
Okro	Male	2	7	7	5	3	0	4
	Female	8	6	10	17	0	0	9
	All	4	6	8	11	2	0	6
Pepper	Male	2	2	4	10	4	2	4
	Female	6	8	6	20	9	7	12
	All	4	4	5	5	6	9	8
Cashew	Male	6	5	12	24	2	2	9
	Female	2	6	1	20	0	0	7
	all	4	5	8	22	1	1	8
Teak	Male	0	2	1	0	0	7	1
	Female	0	0	0	0	1	0	1
	all	0	1	1	1	0	5	1
no of men's farm plots		62	60	98	83	94	57	454
no of women's farms plots		51	36	73	106	45	53	364
Total no of farms plots		113	96	171	181	139	110	818

4.1.13 *Agricultural intensification*

Increased agricultural production can be achieved in a number of ways, including:

- Investment in high input agriculture on extensive land areas;
- Investment in high input agriculture in small areas of land in which the aim is to maximise the impact of limited investments in inputs;
- Extensive cultivation through investments in hired labour for clearing and weeding, expanding areas of land;
- Intensive cultivation using hired labour and intercropping which aims to maximise returns to labour in a small area;

Given the abundance of land, its low cost and the relative high price of inputs and labour, farmer strategies focus on maximising returns to investments in inputs and labour rather than land-economising technologies.

4.1.14 *Farming Strategies*

Within the Brong Ahafo transition zone five styles/underlying strategies of farming can be found, which reflect different degrees of intensification or commercialisation of agriculture and different ways to maintain or increase levels of production. These are:

- Extensive cultivation using land tilling and mounding technologies within a distinct bush fallowing system in which land is rested for three or more years. Yam is frequently the most important crop in this system, but is usually intercropped with a variety of other crops. Farmers are concerned with tree regeneration, and look for well-regenerated areas in which to make new farms.
- Extensive cultivation of monocrops such as maize or groundnuts, or a narrow range of intercrops, such as maize-cassava and groundnut-cassava, within shorter fallowing regimes. Farmers are less concerned with the regeneration of the tree cover, but manage soils without application of inorganic fertilisers.
- Extensive cultivation of monocrops (usually maize) using inorganic fertiliser on land which has been stumped and ploughed. Cultivation is on a permanent basis.
- Intensive cultivation on smaller land areas of vegetable crops using inorganic fertiliser. These frequently involve complex cropping sequences alternating minor season and major season cultivation, extending periods of cultivation and minimising fallows.
- Intensive cultivation of smaller areas, with complex multiple cropping sequences, which focus on risk management and matching crops to soils. These usually occur in areas which

were originally cultivated with inorganic fertilisers on lands which have been stumped and ploughed, and in which the soils are often exhausted.

These various styles of farming compete and interact with each other, transform the soil and environment, impact upon each other defining the space that each can occupy, and define the possible niche in the totality of cropping systems. While policies may attempt to favour one farming style, other farming styles may be able to effectively mobilise resources to challenge the agricultural systems which are officially supported by government and international policy prescriptions.

Table 4.6 Dominant cropping systems

Percentage of plots under cropping system	*Settlement*						**Total**
	Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	
yam-cassava	28.3	13.5	14.0	30.2	8.6	11.8	18.5
sole maize	2.7	16.7	11.1	7.9	20.9	14.5	12.0
maize-cassava	1.8	1.0	7.6	6.9	20.1	9.1	8.2
Groundnut	14.2	10.4	8.2	8.5	1.4	3.6	7.6
cassava-groundnut	3.5	6.3	3.5	6.9	2.2	20.0	6.6
other groundnut intercrops	14.2	13.5	7.0	9.0	.7	3.6	7.7
yam-cassava-maize	1.8	10.4	8.8		3.6	3.6	4.4
sole cassava	.9	2.1	8.8	.5	7.2	5.5	4.3
sole yam	4.4	5.2	3.5	2.6	4.3	5.5	4.0
No. of farm plots	113	96	171	189	139	110	818

The dominant crops vary from area to area in relation to such factors as:

- Ecology
- Agricultural infrastructure
- The market niches that farmers have learned to exploit
- Changing policy incentives and disincentives.

Agricultural infrastructure, market niche and policy incentives are closely interrelated, since infrastructure development is often the result of policy directives, and policy may create new market opportunities or distort existing market options. New developments within the regional

economy may also have unforeseen consequences on policy. (An example of this is the way the development of a modern agricultural infrastructure also encouraged migrations of networks of farmers and labourers into the region in the post-independence period. This in turn opened up new avenues of agricultural intensification based on hired labour, which had not existed before the creation of an infrastructure based on modern inputs, and new forms of commercial market production which did not exist before the creation of state farms and extension services.)

4.1.15 ***Adaptive strategies of farmers***

Over the years, farmers have adapted their farming systems in response to a number of factors. For example:

Ecological adaptation

Ecological adaptations include the matching of crops to specific micro-environments. Variations occur both by species and variety. With ecological modifications brought about by climatic changes and soil transformation under ploughing, different crops are modifying their ranges (a case in point being groundnuts, cultivation of which is extending southwards into grassy environments within dominant forest mosaics, as well as into degraded soils and soils impoverished by ploughing).

Impact of agricultural policy and infrastructure on farming practices

The development of a modern state agricultural sector and of a supporting agricultural infrastructure have had an important effect upon the farming systems in Brong Ahafo in both northern parkland and southern high forest fringe communities. However, such modern agricultural infrastructure has had variable, but often limited, impact on farming systems. Proximity to former state farms and other lands transformed by ploughing is influential, though these developments are not typical of high forest fringe area, where most farmers use no fertilisers and hire manual labour rather than invest in labour saving technologies such as tractor ploughs.

Table 4.7 shows the extent of usage of inputs and modern agricultural technologies on the various farm plots cultivated by farmers in the various settlements in the survey. Table 4.8 shows the proportion of farmers that use some fertiliser on any of their farm plots and table 4.9 shows the proportion of farmers who hire tractor services in the context of investments in hired labour. Large numbers of farmers throughout the survey area invest in hiring labour for weeding and

clearing, but outside of two settlements (Subinso and Kokoago), few farmers make investments in high input technologies.

Annex 2 presents detailed case studies of the four main study areas.

4.1.16 ***Fallow tree resources and agriculture***

In the environmental policy literature in Ghana, the Brong Ahafo region is frequently portrayed as a zone prone to desertification, in which savanna is advancing and forest retreating, largely as a result of human intervention and farming practices.

This literature makes no attempt to differentiate between the diverse environments within Brong Ahafo, and the different tree resources found there. Two basic types of tree formations exist in the area, each with its distinct tree species:

a) *dry semi-deciduous forest*

Dominates in the south of the transition zone, and also occurs in riverine areas as gallery forests and on the sites of old settlements. Mosaics of savanna grassland and parkland also exist in this zone, which may reflect relicts of earlier transformations of the environment, or which may relate to edaphic features. Tree species are often larger, taller, less numerous, more vulnerable to fire and other stresses and less able to regenerate from coppice and root shoots than those in savanna woodland.

b) savanna woodland

This is characteristic of the more northerly areas. Tree cover is interspersed with grasslands dominated by *Andropogon* spp. Gallery forests with typical semi-deciduous pioneer species occur in riverine areas. Tree species tend to be smaller, more numerous, robust, and drought-resistant, to be fire resistant and able to regenerate from coppice regrowth, root shoots and suckers.

In both areas, trees are valued by farmers in bush fallowing systems as playing important roles on-farm and farmers preserve some tree varieties on their farms (the preferred species are reviewed in Annex 2.6 of this report).

Table 4.7 Usage of inputs and mechanised technology on farm plots

High input usage	***Settlement***						
	Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	*Total*
Percentage of farm plots cultivated with inorganic fertiliser:							
Male plots	.	1.8	5.1	2.4	8.7	.	7.8
Female plots	2	.	9.6	.	8.9	.	3.3
All plots	0.9	1.1	7.0	1.0	3.3	0	5.8
Percentage of stumped farm plots:							
Men's plots	.	1.7	21.9	1.2	22.3	1.8	10.0
Women's plots	5.9	2.8	27.4	10.4	8.9		10.7
All plots	2.7	2.1	24.3	6.3	18.0	.9	10.3
Percentage of farm plots cleared with tractor:							
Men's plots	.	.	11.2	1.2	9.6	8.9	5.8
Women's plots	.	.	23.3	.9	2.2	.	5.2
All plots	.	.	16.4	1.1	7.2	4.6	5.5
No of male farm plots	62	55	98	83	94	57	449
No of female plots	51	36	73	106	45	53	364
No of farm plots	113	91	171	189	139	110	813

Table 4.8 Percentage of men and women using inorganic fertiliser

Percentage of farmers using inorganic fertilizer	*Settlement*						
	Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	*Total*
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Men	.	4	11	5	58	.	13
Women	.	.	11	.	18	.	3
All	.	2	11	2	41	.	9
no of men	28	28	45	44	31	26	202
no of women	22	26	35	57	22	25	187
Total respondents	50	54	80	101	53	51	389

Table 4.9 Investments in hired labour and tractor services

Sex of farmer	Hired labour and tractor services?	*Settlement*						
		Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	*Total*
		(%)	(%)	(%)	(%)	(%)	(%)	(%)
Male	Hired labour for clearing	64	57	40	57	64	58	58
	Hired tractor services	.	.	18	2	11	.	6
	Hired labour for weeding	68	46	53	55	88	69	60
Female	Hired labour for clearing	77	81	71	71	58	92	76
	Hired tractor services	.	.	26	2	8	.	6
	Hired labour for weeding	64	62	68	51	68	76	62
All	Hired labour for clearing	70	69	46	65	55	75	63
	Hired tractor services	.	.	22	2	10	0	6
	Hired labour for weeding	66	54	60	53	79	72	61
No. of men		28	28	45	44	31	26	202
No. of women		22	26	35	57	22	25	187
Total respondents		50	54	80	101	53	51	389

In the more northerly yam farming belts, tree resources are important for staking yams and yam farms are made in areas with large densities of small trees. However, to cultivate yams under the trees, the latter have to be induced to shed their leaf cover to enable the yam tendrils to gain adequate access to sunlight. This is achieved by making fires under the trees, by ringing their bark, or by lopping the branches. The trees often recover and put out new shoots. These unusual patterns of tree use give agriculture a distinctive character in the relevant areas, and have important implications both on-farm (for cultivation) and off-farm (for charcoal production).

In the semi-deciduous forest zone, the most commonly preserved trees tend to be pioneer species, which are often the most robust and fastest growing. While there are many important timber resources in this forest, farmers do not have rights to these trees or to royalties from their exploitation.

Interestingly, farmers within parkland environments tend to preserve more trees on-farm than in the semi-deciduous forest zone. This is not surprising given that parkland trees are usually smaller than high forest trees, and regenerate easier from coppice regrowth. Farmers in the forest fringe area reported more problems coping with changes in tree cover, particularly as regards tree regeneration, than those in the parkland, particularly after the 1983 bush fires. The new scenario in the forest fringes includes annual bush fires which destroy forest trees and prevent their regeneration, expansion of grassland and areas dominated by the weed *Chromolaena odorata* (‘Acheampong’), and increasing fuelwood shortage.

However, the picture is complex. For example, Buoku has a mixed forest and savanna aspect, with a high proportion of Borassus Palm (*Borassus aethiopum*). Informants at Buoku contend that the savanna grassland areas have existed as long as living memory, although they have expanded in recent times. In the past, forest and savanna coexisted in this area, although many of the timber trees were felled by concessionaires, mostly in the 1980s. Some savanna species – including Borassus palm – have expanded in area, due to the increasing incidence of bush fires, and have now become the dominant species in formerly forested areas. The occurrence of Borassus in the forest zone suggests that environmental change in the area has a long history.

Environmental change would appear to have been less in the parkland than semi-deciduous forest areas. When it comes to the nature of environmental change, farming populations in the parkland areas tend to be divided into two camps:

- One camp supports the doomsday narrative (serious decline, increasing population leading to over-cultivation, destruction of trees and imminent desertification);
- The other camp articulates a counter narrative, arguing that there may actually be more trees now than in the past (though perhaps of smaller girth), that the tree species are well adapted to fire, and that there is no fire crisis.

Within charcoal producing areas in the northern transition zone, debates about environmental degradation have become highly politicised, since there are complex struggles over the control of charcoal between competing resource users. These struggles are articulated and justified in terms of the destruction of the environment and of forests that result from charcoal production.

Charcoal production, and the conflicts which surround it, are considered in detail in the case study of 'Charcoal Management Issues' presented in Annex 3.3. This case study illustrates the ways in which resource conflicts are channelled into the decentralised political process. This in turn gives new life to the 'grand narratives' of environmental destruction - though it does not necessarily result in improved environmental management.4

Different farming systems also have different impacts on the regeneration of trees on fallow and farmland. For example:

- Yam farming depends upon the regeneration of trees for yam staking, and a process of promoting cutting, pruning and fire control and regeneration.
- High-input mechanised agriculture removes all the tree cover through stumping and attempts to maintain permanent cultivated plots that are free from trees to allow tractor ploughing.
- The expansion of maize cultivation within the semi-deciduous forest may also promote removal of tree cover.

At Kokoago, grasslands and stumped lands are considered prime lands for cultivation. This has gender implications. Women cannot afford investments in labour for maize production on grassland, and therefore have to farm the remaining secondary forest patches. This contrasts with the situation frequently found elsewhere in tropical Africa, where forest soils are retained by the men for their own use, and women are forced to farm on what are often less productive savanna soils.

4 This coincides with the findings of Wiggins *et al* who note that environmental rules which are accepted in principle are often freely broken when they conflict with economic imperatives (2001: 67).

4.1.17 ***Farmer adaptation and innovation***

Farming systems within the Brong Ahafo region are complex, dynamic and diverse. Underlying this complexity is the ability of farmers to adapt to new conditions which result from changes in the biophysical, market, and policy environments. While self-provisioning is still important for most farmers, all the farming systems investigated have cash crop sectors which focus on producing for a defined market niche in which the farmers in question have comparative advantage. These niches change with time. Thus:

- In the past, the presence in certain areas of state farms and other government agricultural projects led to the availability of cheap, subsidised inputs and government support services. This encouraged farmers to go for high input permanent production on stumped and cleared land. It was the low cost of inputs and services, not pressures of land, which led to the breakdown of bush fallowing in these areas.
- Elsewhere, with insecure access to inputs, farmers began to develop alternative modes of investing in agricultural intensification other than through state controlled inputs. The significant amounts of available migrant labour were used to expand the areas under crop production and to intensify weeding regimes. The expansion of yam cultivation in the parkland areas was brought about in this way.
- The crisis in high-input agriculture resulting from the implementation of Structural Adjustment policies led to a shift in food production to low-input areas, where productive soils are still available.
- In some of the maize-producing areas, a combination of discontinued input use, unproductive soils, unreliable climate and changes in relative market prices has led farmers to switch to other crops such as cassava and groundnuts. Risk is also mitigated by mixed cropping of a variety of crops able to respond to different conditions.
- In yet other maize-producing areas, farmers continue with this crop (though with reduced inputs), while diversifying into other intensive sectors, such as vegetables which offer higher returns.
- Yam remains the most important crop in the northern parklands, within a bush fallowing system; varietal selection may be matched to land availability (with less heavy feeders gaining prominence when fallows shorten), as well as climate, market demand and taste. Yam farming is also being intensified through mixed cropping, particularly rotations of yam with cassava followed by groundnut, or (as a risk mitigation strategy) sorghum and bambara beans.

- The ecotone between semi-deciduous forest and forest-savanna mosaics has seen considerable transformation of cropping systems in recent years, particularly since the 1983 bush fire. Cocoa (dominant in the 1960s) has since been replaced by maize and vegetables; maize is, however, also characteristic of the savanna mosaics which have long existed in the same area.

The processes resulting in the historical formation of the savanna mosaics and the present transformation of moist semi-deciduous forest into grassland-dominated areas are uncertain. It is not clear to what extent farming systems have altered the environment, and the extent to which a drier climate phase or even global climate change has impacted on the forest ecotone. More information is required on the similarities and differences in farming practices between former forest settlements in which cocoa was cultivated and which have now been transformed into maize, cassava and vegetable cropping areas, and the maize cropping areas in the savanna mosaic areas. Little is known either about the dynamics and long-term sustainability of maize cultivation within these two areas.

Farming systems in Brong Ahafo are also competitive, seeking to establish a production niche in which they have a comparative advantage (or less of a disadvantage) on the market. The need to stay competitive has been intensified by structural adjustment, removal of subsidies and competition with cheap imports of food crops. All this has led to erosion of prices. The incomes of urban people have also been depressed as a result of devaluation, unemployment, etc., and this has intensified the purchasing power constraint. When they fail to establish a comparative advantage, farmers respond by experimenting with new crops and shifting to new farming strategies.

4.1.18 *Agricultural research*

Surprisingly little research exists on the different niches that farmers occupy and the factors that define the boundaries between different farming systems. These factors tend to be overlooked by mainstream agricultural research when it lumps together different farming systems in all-embracing categories, juxtaposing ‘traditional agriculture’ with ‘agricultural modernisation’. Localised farming systems need to be understood in their relationship to regional systems and the ways in which they accommodate or adapt to features of agricultural modernisation.

Systems perspectives have dominated agricultural research, with population growth seen as the main motor for change. Such perspectives tend to regard bush fallowing as an outmoded system which needs to be replaced by more environmentally friendly technologies, such as:

- More intensive cultivation using inputs to limit the area under agricultural cultivation, to allow higher yields to be produced in smaller land areas, and enable larger areas to be preserved as forests, woodlands, and recreational areas;
- Use of green manures to promote better soil recycling, improved fallowing, shorter fallowing or permanent cultivation to enable more intensive and sustainable crop production in limited areas and allow for preservation of forest and woodland areas;
- Promotion of agroforestry systems to promote soil conservation, improved recycling of land and permanent cultivation in hedgerows systems such as alley cropping to enable more intensive and sustainable cropping from limited areas, preservation of trees and allow for preservation of more forests and woodlands.

The justification for the new technologies is often located in grand narratives of environmental crisis, requiring new interventions and new technologies. These narratives tend to encourage narrow commodity-focused programmes with only a limited acknowledgement of the wider setting.

Since research does not focus on the internal dynamics of farming systems, it tends to present the findings of commodity programmes as the solution to complex problems, with insufficient acknowledgement of their social-economic and political dimensions.

Little funding is available to support independent critical research. Such research as does occur tends to be conceived within the dominant paradigm. Thus, the major demonstration trials and government service recommendations concern crops in which research services have developed a comparative advantage. However, these do not necessarily coincide with crops grown by farmers nor support their dominant strategies. Two illustrative cases – *Mucuna* trials and the root and tuber programme – are reviewed in Annex 2.7.

4.1.19 ***Poverty and agricultural development***

Since the early 1980s complex adaptations and responses to policy processes have occurred in farming systems in Brong Ahafo. These are partly in response to neo-liberal economic policies. Prior to the adoption of structural adjustment agricultural services were concerned with input

delivery services and the provision of subsidised modern inputs to farmers including chemical fertilisers and mechanisation services. These services were skewed, focused on particular geographical areas and concentrated on larger farmers who often built up a relationship of clientship with government and agricultural services and rural banks dispensing soft loans. During the 1970s large mechanised farms appeared that focussed on food production. These commercial farmers often acquired large tracts of land that were stumped and put under permanent cultivation. With the removal of subsidies many of these large farms have collapsed, since the high price of inputs and of credit (bank interests rates have been around 30-40 percent in the 1990s to present times) are not reflected in farmgate food prices.

Commercial farmers have tended to move out of food production into export crops. In Brong Ahafo the main export crop that has been developed is cashew. The main constraints to cultivating cashew are the cost of the seedlings, the cost of labour to create the plantation, knowledge about cultivation techniques and markets, the cost of pesticides and access to pesticides, and ability to gain sufficient land for large-scale cultivation Cashew is a crop for middle and prospering farmers. Timber (mainly teak) plantations are another area in which large farmers are interested, since it secures land for the owner, minimises labour in the long term after the initial investment in clearing the plantation, and promises good returns. Major problems for investment in plantation are the risk of fire and the problems of discounting capital on a long-term investment. The commitment of the government to a timber plantation development project with loans for farmers and outgrower type relations with timber companies may make timber plantations more attractive to large farmers in the future. However, small farmers may have insufficient land available to participate in plantation schemes. This may lead to more rural poverty as land becomes increasingly scarce as large farmers expand areas of production in response to government incentives and loans, which small farmers are unable to access.

During the 1970s and 1980s there was some trickle of modern technologies in the vicinity of government agricultural projects, such as state farms. These farmers ploughed their land with tractors, invested in fertilisers since they were cheap. This was mainly used for maize cultivation. However, ploughing frequently destroyed the topsoils and farmers had to continue using fertilisers to produce adequate yields of maize. With free market prices for fertilisers these farmers found the price increase in fertilisers was not realised in the price for their crop, but that they could not get good yields of maize on their land without the use of fertilisers. In these areas there is frequently a decline in agricultural production, in which agriculture may be abandoned

and youth migrate in search of alternative livelihood opportunities. The size of food crop farms decline, groundnuts and cassava replace maize, and farmers develop risk minimising strategies on smaller areas of land. Maize production is taken up in other areas with better soils where bush fallowing is the dominant mode of farming. In these areas farmers find rising prices for maize an incentive to move into maize production and they can now produce maize more competitively than those areas formerly using inputs, which they displace. Thus the price of maize on the domestic market does not take into account the cost of inputs since sufficient maize can be produced without inputs.

However, introduction of maize into new areas also leads to problems for the poor. Richer farmers can invest in labour to clear and weed their farms and easily expand the area under cultivation leading to land scarcity for some. Frequently increased commercialisation of agriculture has a gender dimension. Within the Mo areas of the northern transition zone where yam is the major crop the traditional division of labour involved men clearing new plots of land from fallow and planting these under yam. Women helped in the weeding. When the yams were harvested women took over the plots and planted groundnuts. In contemporary times, this division of labour is breaking down. Instead of abandoning the old yam farm to their wives many men are now planting maize on them. Men have also intensified production by introducing multiple cropping in which they plant cassava in the yam mounds and continue cropping into a second year. Many men have also gone into groundnut cultivation since it has a good market price. Some men now divide their old farm into two portions allocating half to their wife (or wives) and retaining a half for their own use.

In other areas with variable farm ecologies, the main commercial crops are produced in particular niches, which are monopolised by the richer men. This may include areas near water sources for vegetable production, more fertile land, or areas that have formerly been stumped by state enterprises and projects, which are used for maize production, as at Kokoago. In some areas, the more fertile lands for commercial crop production are hired out. Poorer people farm on small areas of family land which may have a long history of cultivation and be less fertile, while those requiring large plots for commercial production hire the land. Land hiring in these areas ensures that the best land is retained for those with capital to invest in it. Those with capital also frequently prefer to hire land for commercial crop production rather than use family land, to avoid a drain on their capital from the social demands of their extended families. For instance, at Buoku, large maize farms are usually made on hired or sharecropped land, while those using

family land tend to grow intercrops of a variety of food crops of which groundnuts is perhaps the most important crop and the others are largely grown for self-provisioning. Groundnuts are important since they can be grown on small areas of land with short fallowing systems. Here, the most significant category of family land-users are women, who lack the capital to make heavy investments in agriculture.

The increasing commodification of agriculture adversely affects women with less available capital to invest in agriculture, who find themselves farming on more marginal land. The increasing commodification of agriculture also results in more individual farming in which hired labour becomes important to supplement the labour of the farmer. This can result in women becoming more dependent upon expending capital on hired labour and gaining less help from their husbands and male relatives. However, this also enables richer women with capital to farm in their own right, to gain access to their own independent land and to hire labour to expand the area they can cultivate and intensify production.

The increasing vagaries of climate, in recent years, has also increased the risk of farming. As a result of this poorer farmers without surplus capital may tend to minimise risk by engaging less in commercial "niche" crop production, growing hardier crops, such as groundnuts, cassava, sorghum, bambara bean, and by engaging in multiple cropping systems. The farms of small cultivators may contract, as they invest less of their income in the risk of agricultural production and develop alternative livelihood options to supplement agricultural production. This is particularly prevalent among youth who do not have capital to farm on a large scale. As a result of this many male youth go into charcoal production to gain "quick" money. Many women also combine small scale farming with petty trading.

Among the poorer sections of agrarian settlements in Brong Ahafo are migrants from the Upper West and Upper East regions of Ghana. Many youth migrate seasonally, working as casual farm labourers, gaining some capital with which to return to their home towns to develop their own farming. Isolated settlements of migrant farmers can often be found situated far away from feeder roads only accessible through remote paths. Farmers in these settlements may often have fragile rights in the land they are farming. While rents may not be expensive, they may have to perform some services for the chief from whom they got the land. However, migrants are socially differentiated and there are many rich migrants farming in Brong Ahafo, who may have made large investments in agriculture and may have access to large networks of migrant labourers. In

the northern transition zone where land does not attract high rents, and can be easily gained since population densities are low, lack of rights in land is not a serious barrier for migrants with capital. Ability to invest in labour is often the major constraint in agricultural production in this zone. In the semi-deciduous forest areas of southern Brong Ahafo, land is scarcer and sharecropping arrangements become dominant in land transactions. In these areas availability of land may be more a constraint for migrants, particularly in the cocoa growing areas.

Agricultural development policies have tended to favour richer farmers and provide few options for small farmers. While soft loans and subsidised inputs for large farmers have not been in force in recent years, attempts to develop cashew and timber plantation projects favour those with land, and those with the capital and influence to gain land and hire labour or tractor services in clearing the land. The expansion of the plantation sector is likely to create land pressures for food crop farmers. The focus of agriculture on monocropping and row planting tends to favour farmers growing commercial crops, and not those engaging in mutiple cropping as a risk reducing strategy or attempt to maximise investments in scarce labour. This category includes a large number of women, who are unable to secure prime land for commercial crops and who have insufficient land to higher the necessary labour to make large commercial farms. Farmers who are able to develop monocropping extensively by investing in labour and expanding areas of acreage are those that tend to benefit from monocropping technologies, although their profits are variable according to the vagaries of climate. Farmers without sufficient capital to take risks of expanded production tend to focus on growing hardier crops and a range of crops on smaller farm plots. Small and middle farmers who used to use inputs and ploughed their lands are among the losers. They are unable to use inputs successfully now, but have difficulty in cultivating their lands without inputs. Their plight has not been addressed by agricultural services. The agricultural services tend to work within a framework of the need to transform agriculture in relation to population pressures rather than the impact and failings of previous policy frameworks. Growing concerns with post harvest technology and storage tend to favour large farmers who can afford to store crops over months and not small farmers who must sell a large proportion immediately after harvest to meet debts, social responsibilities and to hire labour for clearing the next season's farm plot.

4.1.20 ***Managing the environment under decentralisation***

Environmental management has acquired a high profile in Ghana at all levels, including the districts. Districts have responded to pressures to implement policies and create environmental institutions, committees and bye-laws.

In the Brong Ahafo, this is evident in a number of ways, including the creation of new bye-laws and procedures – for example, to regulate:

- the use of fire on farm and in the bush;
- charcoal production;
- hunting;

It has also led to the creation of new institutions to manage the environment, including:

- District environmental sub-committees
- Fire volunteers or 'Fire Mobisquads'

However, these institutions and decision-making processes are often ill-served by the available information systems. Environmental policy tends to be informed by the same grand narratives earlier discussed, which draw on received wisdom about the environment not on the actual conditions on the ground. This in turn encourages a top-down approach in which rural producers are cajoled to change their ways. Unsurprisingly, the latter tend to feel alienated from policy frameworks, and distrustful of policy processes.

4.1.21 ***Structures of decentralised environmental policy***

The framework for the current structure of decentralisation in Ghana was established by PNDC Law 207 of 1988. This enacted a new structure of devolved local government, within a three-tier structure of Regional coordinating Councils, District Assemblies and Town or Area Councils and Unit Committees.

The Local Government Act of 1994 (Act 462), the National Development Planning Commission Act of 1994 and the National Development Planning (System) Act of 1994 establish the framework for development planning.

Annex 3 of this report reviews the implications of these structures and procedures in detail. Below, we consider only their major implications for the practices of environmental management in the districts.

As regards decentralised environmental management, the regional branches of the Environmental Protection Agency are mandated to coordinate environmental planning in the districts and integrate them with national environmental plans and international commitments. Its responsibilities include:

- Initiating environmental awareness campaigns;
- Advising the District Assemblies on enacting environmental bye-laws;
- Helping to establish District and Area Council Environmental Committees.
- Coordination of Anti Bushfire Campaigns and work with the Fire Service to mobilise community level Fire Volunteer Squads.

At the District Assembly level, the intention is for environmental issues to be discussed at Assembly meetings. The Environmental Committee should then take up issues identified by the deliberation of Assembly members based on the experiences of their electorates. The Environmental Committees should recommend bye-laws to be discussed and ratified by the full Assembly.

Within the settlements, the Unit Committees and the Area Councils are responsible for implementing bye-laws, and collecting revenues from licences, permits for natural resource extraction and revenues from crops and other produce leaving the district. They are to initiate projects for the protection and enhancement of the environment. The Area Council planning process requires meetings between the Unit Committees and the community.

In practice these procedures are undermined by several factors, which are at odds with the spirit of the legislation (*viz.* establishment of democratic environmental decentralisation administered by elected representatives who are accountable to an electorate who participate in local level planning).

These factors include:

- The fact that the *Ghana Forestry Service* has been able to resist decentralisation, on the grounds that timber resources are national assets which need to be managed centrally, on behalf of the nation;
- The relative independence of the *fire volunteers* from the authority of the Environmental Committees;

- The roles of the *chiefs* in natural resource management, specifically their claims to ultimate ownership of land, as the allodial authority, and their rights to establish customary bye-laws independently of the District Assemblies;
- Chiefs are also being increasingly empowered by the central government to enact environmental bye-laws (for example, to control bushfires), and to punish transgressors;
- The fact that the District Chief Executives are appointed by central government and seen as representing the development policy interests of the government to the District rather than as the spokesperson for dominant interests within the district. The DCEs are accountable to the central government rather than to the district electorate over environmental policy matters (among others). Presently, reforms are being considered which will make the DCE an elected representative;

As a result of all these factors, it is difficult within the prevailing structures of district administration for Assembly members or Unit Committees to question environmental policy or to seek to adapt it to the needs of their constituencies. Environmental policy tends to be conveyed to the districts as a set of prescriptions which Assembly Members and Unit Committees are require to implement.

There are few avenues through which Assembly Members and Unit Committees can get access to dispassionate information on the environment. Most information is disseminated to the districts in a prescriptive form. There are no provisions for Assembly Members and Unit Committees to set up consultative community fora with their constituents, to examine environmental problems and devise suitable solutions (for example, concerning bushfires).

Given these constraints, the options open to Assembly Members and Unit Committees are extremely limited. Effectively, there are only three. They can either:

- Act as spokespersons for government environmental policy, advocating the relentless implementation of bye-laws (at the risk of unpopularity and future electoral failure);

OR:

- Ignore environmental policy or implement it only half-heartedly;

OR:

- Take advantage of the considerable confusion (as well as the conflicting responsibilities of different authorities and lack of accountability to community organisations) to engage in rent-seeking behaviour for personal benefit.

These three are not mutually exclusive, however, and all may be implemented simultaneously to a greater or lesser degree.

Given the close integration of the local elites with the national elites, the preferred option is often the first option, the implementation of punitive bye-laws, drawing on the narratives of anthropogenic destruction which dominate national environmental discourse. Since these rhetorical narratives usually allocate some form of blame, they can be picked up by powerful groups to further their interests. They then become projected into the local political arena as an 'environmental crisis', thereby justifying the introduction of bye-laws. These are likely to be accepted by local people only where they do not contradict their own economic interests.[5] Where they do, then the consequence is likely to be social conflict. Thus, the dominance of crisis narratives within government agencies concerned with natural resource management, encourages confrontational environmental committees to come into being that do not reflect the state of natural resources at the local level nor the interests in natural resources. Had the environmental committees worked through other more negotiated frameworks which embraced various perspectives on natural resources or assets, they might well have been able to establish platforms through which various group interests in the community could work and negotiate and engage in constructive dialogue.

Thus, the net outcomes are likely to be that environmental policies:

- Are poorly implemented;
- Are given low priority;
- Lack empirical justification;
- Create a culture of blame;
- Are open to manipulation and politicization (this is particularly evident in conflicts over charcoal management)

4.1.22 *An interim assessment of environmental decision-making*

In summary, the existing approaches to environmental management in the district tend to be singularly ill-adapted to the interests of the small producers, particularly the poor. Environmental policy is, to an excessive degree, external in its derivation, top-down in its orientation, and

5 This point is developed further by Wiggins *et al* (2001).

punitive in its presumptions. The opportunities which decentralisation of local government presents for a more responsive and constructive approach have not yet been realised.

This study seeks to develop an alternative approach. The premise adopted here is that natural resource management is concerned with complex relationships between people and resources, which often interact in unforeseen ways, producing unexpected outcomes.

In such a complex context, effective production of information and knowledge requires:

- The creation of inclusive frameworks which bring together the understanding and perspectives of a range of natural resource users;
- The creation of democratic platforms for learning and decision-making
- The creation of information systems which rely on a two-way flow of information.

On the one hand, policy-makers need to be able to gain empirical data on conditions within the district. On the other, natural resource users need to gain new tools to help them:

- Understand their environment
- Apply the principles on which they are agreed to the management of their specific situation;
- Articulate their problems in policy fora, to policy makers, and other resource users.

The implications of this are considered further under Output 2, and a project proposal is developed in Annexes 4 & 5 to take the agenda forward.

4.2 Output 2: '*Potential alternative or developing and delivering appropriate participatory management approaches to benefit the poor identified'*

4.2.1 *The Way Forward*

It is the argument of this report that research on agriculture and natural resource management in the Brong Ahafo is not responding well to the needs of the farming community. New ways need to be found of identifying the constraints upon farm practices, and responding to them in line with farmer interests.

New approaches are required to improve decision-making in natural resource management at all levels from local-level producers up to national-level administrators.

Hitherto, most agricultural research has ended up expanding the areas of influence of a state or policy sector through the distribution of new technologies and building up of a clientele of faithful supporters. The arguments here presented are opposed to this type of approach. Rather, institutional innovations are required which:

a) Promote feedback on the environment and production systems from various localities;
b) Lead to the creation of information systems which regularly update themselves and which policy makers can use to learn about the conditions which various categories of people experience in their daily life.

These information systems should facilitate debate at the various policy levels to foster more informed and appropriate policy options. The interface between administrative organs and perceptions of different people within the localities, and the learning processes that emerge from the interface at both these levels, is what will ultimately determine if a sustainable development process can be implemented.

Policies need to be informed by the experiences of citizens, and citizens need to understand the avenues through which they can create demands for appropriate policies.

The proposed project (see Annex 4 & 5) seeks to promote such a perspective on policy development.

4.2.2 *Taking Account of Complexity*

Given the complexity of social arrangements, micro-environments and change, sustainable production systems cannot be conjured up on experimental stations and transformed to the localities as technological prescriptions in a top-down fashion.

The premise for a better policy process is the setting up new information systems which are:

- Inclusive
- Involve a consultative process with a wide range of interest groups within the rural areas
- Bind policy-makers to downward accountability.

These information systems need to collect empirical data on the different interest and livelihood groups and their natural resource base, and the economic potential of the various localities. They also need to reflect the perceptions and interests of the various groups within the localities.

4.2.3 *Engaging with Decentralisation*

The *institutional mechanism* for the validation of policy prescriptions must ultimately be the democratic process.

Whatever its limitations, the process of decentralisation in Ghana offers the only avenue through which rural dwellers come into contact with development administration and can have any say in development planning.

The shortcomings of the system are not necessarily the product of decentralisation. The contradictions tend to come, rather, from the higher echelons of administration:

- From ministries, departments and regional co-ordinating bodies who issue top-down directives and expect the districts to comply;
- From government agencies who expect districts to implement government policy without a debate on the appropriate needs of the districts;
- From departments which think they are too important to decentralise.

More positively, the legal framework for decentralisation provides ample scope for:

- Accountability
- Civil society participation in development planning
- Communities to develop their own development plans.

It requires District departments to collaborate in developing District sector plans which are ratified by an Assembly with a majority of members. It requires Unit Committees and Area Councils with an elected majority to initiate development plans which have been discussed with the communities. Strengthening these linkages has the potential of building upon civil society participation and making District Assemblies more accountable to a rural electorate.

4.2.4 *Other Interventions*

The major focus of the programme is in building information systems from the local level up and facilitating dialogue between the local level and other development management institutions. However, a critical element will be in building linkages between the local level Area Councils/Unit Committees and the District Assemblies, Regional Coordinating councils, government agencies and operational NGOs, and generating interest in the programme.

While there are constraints within the current framework of natural resource management, there is the potential of building synergic linkages with existing projects and programmes in the field of decentralisation, and also with some recent policy concerns and new directions. Several donor projects now focus on strengthening the district planning process, attempting to enhance planning procedures by facilitating more inclusive consultation, more transparent procedures governing allocation of resources and improved responsiveness to civil society groups. Examples include (see Annex 4.2):

- the *DFID District Support Programme*, which works at the level of the district administration coordinating the planning processes and programmes of various departments and integrating their activities and potentials. The DFID programme has been built into the district Offices of the Ministry of Food and Agriculture. The proposed project can complement these initiatives, by building a local demand for service delivery and information which can further enhance the desire to build more efficient, transparent and responsive decentralised development services.

- *CARE*, which is developing a programme of community support for sustainable development in the Wenchi district. There is the potential to build linkages in which the project contributes to the methodology that CARE uses and the information base on which it develops interventions;

- The *Ghana Forest Service* is concerned with developing a 'Ghana Forest Forum' and exploring an institutional framework based around decentralisation in which civil society organisations, farmers and forest users can make greater input into forestry policy deliberations, to act as a counter lever against policy distortions, against the dominant interests of industry and create demands for reforms in rights to forest resources and downstream benefit flows;

- The *Ministry of Lands and Forests* is concerned to introduce greater decentralisation of land and forest resource administration, and introducing more transparent systems of administration with accountability to civil society groups;

- Several donors are supporting programmes for promoting decentralisation, and more transparent policy planning processes based on improved collection of data, analysis and management of data, and dialogue between local level planning processes and district administration planning. This group includes GTZ, Danida and a DFID-funded Khanya-led community-based planning project working on a pilot basis in the Ashanti region (as well as in Uganda, India and elsewhere).

The proposed research is complementary to these projects. Indeed, it could be argued that it is a necessary prerequisite for them to be effective. (For example, GTZ seeks to work through community fora. However, without the evidence of research which can identify social processes and their implications for development initiatives, the social representation of a community forum remains unknown.)

The Ghana Poverty Reduction Strategy (GPRS)

This national document is still in draft (the most recent version is dated February, 2002). It is of particular interest to the project in respect of two dimensions:

a) Its commitment to reinforcing and extending *the process of local government decentralisation.*

Thus:

> "In terms of governance at the national level the need is for a vigorous and progressive deepening of decentralisation and the devolution of power. A combination of the latter with permanent mechanisms for a symbiotic relationship between communities, NGOs, civil society organisations, private business and the public sector and between levels of

> government will strengthen national government and nation-building through dialogue and consensus." (2002: 28)

Though the resourcing of the programme remains uncertain, the GPRS acknowledges that a number of steps need to be taken to make local government more effective, including the creation of a national Local Government Service, to staff the district-level bureaucracy, review of the Local Government Bill to reinforce local autonomy, and strengthening of the local revenue base.[6]

b) The orientation of the GPRS with respect to *natural resource policy*.

The draft document is particularly weak in this respect. For instance, the GPRS advocates strengthening of the environmental legislative framework in much the same way as is now being done by district assemblies- an approach subjected to criticism in this report. Thus the GPRS states:

> "In order to improve the environment and natural resource management, existing laws and regulations relating to the protection of resource utilisation must be implemented. The Bush Fire Law will be reviewed, strengthened and enforced. Programmes such as community fire fighting volunteers must be strengthened with allocations from district assembly common funds by districts." (p78).

This favours the kinds of punitive policing attitudes to environmental management of which this report is particularly sceptical.

The GPRS' overall strategy for the agricultural sector is also questionable as a means to reduce poverty: For example:

> "Government will need to play a supportive role in achieving the transformation of the agricultural sector from its subsistence orientation to a commercially attractive, viable, and dynamic activity. This is vital for the achievement of sustained equitable growth. However, agricultural transformation will not be achieved without a corresponding transformation of the attitudes of individuals to work in general and commercial farming in particular. It requires a transformation from a culture of subsistence to a culture of business focused on profit and accumulation. Pivotal to the process of change in the rural environment is the reform of traditional land administration systems. Under present conditions land as an asset is excluded from the national economy and its value denied to the farmer. It is not tradable. Legal title to land within the concept of communality is an essential prerequisite to attracting entrepreneurship into farming and the promotion of agricultural industry. Without legal title

6 Notably, however, the main means by which strengthening of the local revenue base is to be achieved appears to be through the encouragement to Districts to "develop innovative revenue and funding sources for which training will be provided" (p.125) – which at first site does little to address the fundamental imbalances in the revenue base. Notably, also, the traditional authorities are seen as a part of the decentralisation process, not – as many would view them – as an impediment to it. (p.124)

> to land there can be no transformation. Effective management of the transformation demands an integrated cross-sectoral approach and dynamic government support (p.27).

While this is a somewhat piebald position (the meaning of the phrase "legal title to land within the concept of communality" is particularly ambiguous[7]), the main vision would appear to be one of transformation of the agricultural structure by agribusiness (integrating farmers through credit lines, with the potential which this introduces for land appropriation from the small farmer sector, etc.). Issues of fine-tuning agricultural research to the needs of the rural poor and improving feedback links are not addressed. Elsewhere the GPRS discusses the creation of agribusiness linkages between small farmers and large companies and the extension of credit lines through these arrangements. However, it does not address the mechanisms to be put in place to ensure that the interests of the rural poor are met by this process and that agribusiness does not become an avenue to promote the interests of richer strata of farmers or a means of dispossessing the poor and tying them to schemes which are not in their best interest. Again, the present report is highly sceptical of policy initiatives of this type – in that they could well favour a class switch which is unlikely to be either environmentally or socially sound.[8]

In summary, the GPRS is a key reference document for the proposed research, and may well have implications for it, both positive and negative. It will be important for the project to maintain working relationships with the GPRS national team, and to keep an eye on future iterations of the document.

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7 This seems to be a mere restatement of top-down trickle down theory through progressive commercial-oriented farmers.

8 While credit, marketing and storage clearly are important issues, they were beyond the scope of this study which essentially deals with the forest/agricultural interface. At present few farmers receive credit and most of them make independent investments within their farm. While the GPRS and some researchers are enthusiastic about extending credit, this has to be looked at critically, particularly given the patterns of credit disbursement in the 1970s and their linkages to outgrower schemes. This will be particularly important in the proposed study of the plantation sector (see Annex 4).

Storage is also a complex issue given that the dominant crop yam, has complex and technically exacting storage systems which do not easily fit into the traditional/modern dichotomy of agricultural modernisation. The failure of several recent attempts by donor-funded projects to improve yam storage in West Africa would warn against the attempt to broaden the proposed project to include this theme.

There are also highly complex issues involved in marketing. For instance, an analysis of markets must look at the infrastructure of existing markets and physical market places and the regional integration of market centres with transporting networks and marketer networks. This would seem to be a whole long-term study. Thus, the present report limits itself to the impact of market pressures on changing cropping systems and varieties from the farm perspective.

4.2.5 *Entry Points for research*

In the conventional participatory approach, researchers have tended to focus on developing more flexible and process-oriented modes of planning using participatory research tools. The main role of the researcher is independent facilitation. The researcher brings the expertise of knowing how to facilitate a process of negotiation, to help identify problems and solutions, which the community then agrees and implements collectively. This is problematic to the extent that the barriers to effective participation may lie not in the absence of independent perspectives but in scarcity or conflict over resources.

By contrast, the potential entry point into the community advocated here is for research to act as a provider of information. Collecting and disseminating information in this way would have four objectives:

- To gain a better understanding of the social groups within the communities, their livelihoods, their policy perspectives and their interests;
- Provide information to these groups to facilitate the development of bridging ties through which they can articulate broader group interests;
- To provide them with information which would facilitate their ability to develop strategic linkages with other groups and place their demands to policy-makers.
- To examine the potential of local-level participation in research processes, so that local groups can generate their own research, process their own data and information, and be able to update information systems and utilise them for placing their demands in the policy process.

This entry point creates a different role for the researcher than the PRA process. The researcher no longer plays the role of the facilitator. The outcome is no longer to bind the whole community to a community plan of action in accord with policy processes.

In this scenario, the role of the researcher is rather to provide information and support information-generating processes. The outputs of research become information systems that facilitate communications between policy processes and natural resource users, and enhance feedback and accountability.

4.2.6 *The Role of Information*

At present, information systems within the districts are weak.

There are no institutionalised processes for generating a knowledge base on the needs of localities and the different interest groups that reside in them.

This has a number of consequences:

- It becomes difficult for District administrations to develop District profiles
- It also becomes difficult for Assembly Members and Unit Committees to present their needs beyond the parochial concerns of their own villages.
- The Districts are unable to place their needs and demands to higher up administrative organs.
- The Districts become subservient to top-down national prescriptions imposed by Regional Co-ordinating Councils (which are frequently based on minimal and fragmentary national-level data substantiating a framework that is essentially built on received wisdom, not local evidence).

To develop policy processes that are more inclusive and respond to the needs of rural dwellers, the following steps are required:

1. District level information systems need to be created;
2. There is need to process and update this information in ways which will enable the concerns of various localities to be reflected in planning procedures;
3. This requires the two-way communication of information between localities and their Unit Committees and the district administration.
4. Unit Committees and Area Councils need to be able to collate basic information on such issues as:
   - their settlements,
   - the characteristics of the population in the settlement,
   - the different livelihood groups within their settlements,
   - the policy interests of different groups,
   - the natural resource base and natural resource conflicts,
   - the incidences of bush fires, etc.
5. Unit Committees and Area Councils need to be able to feed this information to District Assemblies and also request information on trends within the districts.

6. This information should also be available to the District Assembly members and the sub-committees, and should inform their deliberations.
7. It should then contribute to the formulation of a district profile which informs the planning process and is also conveyed to Regional Coordinating Councils.
8. These information systems need to be built from the community level upwards to achieve responsiveness to changing conditions and the interests of people.

4.2.7 The Proposed Project

Improving the quality of the information systems at the local level, and improving the communication linkages between District administration, District Assembly, unit Committees and farmer/natural resource user groups are thus critical to environmental democracy, and central to the aims of the proposed project.

The dual role which the project can make is to generate and disseminate research findings of value to local resource users, and to thereby reinforce the incipient structures for environmental management which exist to serve their needs.

Tasks

The major tasks of the project proposed here should be to:

a) Identify and work with the interest groups at different levels in the system of decentralisation from the localities with their Unit Committees through the District administration up to the regional level.
b) Identify their information needs and the major constraints which limit their ability to collect, process and communicate information.
c) Strengthen and facilitate their information-generating and communicating processes
d) Utilise the capacities of the research team to generate information which can in turn be used at the local and district levels (this would include access to research services findings, national databases, remote sensing information, geographical information systems, etc.)
e) Strengthen the institutional context for environmental decision-making at local and District levels
f) Bring all of [a-d] together to improve the quality of environmental action within decentralised government.

The role of networks

Natural resource issues are not constrained by the settlements in which people live. The economic activities of different producers are integrated into a regional economy, in which a wide range of producers contrive to define the niche which one particular set of producers can occupy. Many of the problems in natural resources management which occur in a particular situation are typical of a much wider zone, with variations in the processes of adaptation, conflicts, negotiation of conflicts, and institutional innovations.

One means of giving natural resource users greater access to information is to develop *regional networks* which would bring farmers together to examine particular problems in natural resource management, different perspectives on the problem and different approaches to the resolution of the programme. This could include situations involving conflicts between different natural resource users that are replicated in a number of localities, such as between charcoal burners and (yam) farmers, where reflections on the different histories of conflict and negotiation, could promote social learning.

It could also involve situations in which different natural resource users have worked out a set of different adaptive responses to similar problems, or where the adaptive response in one area has consequences for other natural resource users in other areas.

This component of the programme will involve:

- A series of exchange visits involving farmer and other resource users;
- Workshops which seek to draw lessons from various experiences;
- Visits to research organisations and government services to exchange experiences.
- Other innovative means (for example, rural radio, and television) to help share and disseminate ideas, and by so doing, to give back authority to the rural producers, and enhance their voices in decision-making processes.

The objective of this networking would be to bridge experience between natural resource users, to enable them to address problems requiring collective actions and to enable them to draw up a framework of reference which enables them to engage in dialogue with policy makers.

The final output of this component would be workshops between policy makers and rural producers in which the networks of natural resource users place their demands and projects to the policy makers.

The types of themes to be addressed (which will need to be identified by participating networks of farmers) could include issues such as the following:

- Yam, charcoal and tree regeneration: Is there a problem? What are the solutions to good relations between charcoal burners and farmers?
- Maize production with inputs, plus bush fallowing and management of the soil.
- Changes in yam producing technologies.
- Bush fire management: the farmers' perspectives in different areas.
- Vegetable production technologies and stream conservation
- Plantation development and its impact on landholdings and the poor.

This could culminate in *'weeks of action'* in the districts, which would attempt to raise the profile of natural resource users in the rural areas. Here again, the media (local, regional and national) would have important roles to play.

Resource foci

The Project should cover the management of natural resources control of which has been largely or entirely devolved to the district level (eg. agricultural products, of the types discussed above, tree plantation development, and farm-based products such as charcoal).[9]

The Brong Ahafo is likely to be the focus of a major externally-funded plantations programme in the coming years. This is not uncontroversial. On the evidence to date, the programme may well favour exactly the sorts of entrepreneurial approaches to resource capture and land development which have already blighted post-independence agricultural modernization in the region, largely to the detriment of the small producer. Information and institutions are again the key. If the small farmer community is to derive benefit from the scheme, it is essential that its members – and their elected representatives – are well-informed about it, and are able to influence its implementation. Developing an effective interface between local producers, elected representatives (Unit Committees and District Assemblies), and officials of the devolved and non-devolved public

services (agriculture and forestry) is essential to both these tasks.

Project Outputs

In summary, the project outputs will focus on improvements in three areas of intervention:

1. *Quality of information* available at district level
2. *Networking* between farmers
3. *Articulation of the needs and problems* of rural producers with the democratic organs of local and regional government.

The project outputs are presented in the draft Phase Two Logframe (see Annex 5).

9 Note that only recent tree plantations would be considered here. Management of long-established plantations of the Forestry Department/GFC has not been decentralised to DA level.

4.3 Output 3: *'Increased awareness among NR researchers, policy-makers and development agencies of the types of changes which will be needed to ensure that current decentralisation and natural resource management policies contribute to poverty alleviation'*

The original intention was for awareness-raising activities to be undertaken before the submission of the present report.

However, in view of the scoping character of the present study, the Team Leaders felt that it would be inappropriate to present the findings formally to their partners without being able to give them some indication of the likely follow-up from the funding agency. The decentralisation process in Ghana is not yet well-advanced, and there are a number of sensitivities arising out of this research which can only be effectively addressed in the context of an action-research programme.

Formal awareness-raising activities have therefore been withheld until the report is submitted. They will be conditioned to some degree by the likely follow-up from the funding agency.

Three sets of activities are envisaged:

a) Discussion of findings with resource users, in local informal settings.

This element of the programme will proceed in April-May. The field research team has by now established good rapport with a range of resource users and decision-makers, at District and locality levels. It is envisaged that the field team will return to its study sites, in sequence, to discuss the findings in informal settings with the various groups with whom they have been working over the last year. These discussions will take place largely in vernacular languages and in a manner appropriate to the needs of the stakeholders involved. Thus, formal workshops will be avoided, and the accent placed on carefully targeted meetings to maximise the participation of the relevant categories.[10]

b) Formal presentation of findings at a national policy-makers workshop or workshops

10 Note (6/02): These meetings have now been undertaken, and the research report is being drafted. The feedback was extremely well-received by the villagers.

This element is likely to take place later in the year, ideally when some fairly firm indications can be given of the likely follow-up envisaged by the NRSP. It will involve the two research leaders (Ghana and UK), and a range of partners. A formal one-day workshop in Accra was originally envisaged, to present to, and review findings with, key national makers (senior Ministry staff, academics, parliamentarians, international partners active in the Brong Ahafo region and/or in other aspects decentralised development, etc.). However, the research team now favours an approach tailored more to the interests of particular constituencies, with a view to strengthening the voice of each. This would help diminish the risk of suppressing certain opinions in the interest of consensus, where diversity of opinions may be of greater value to the project design.

The following series of three separate workshops is now proposed (6/02):

- *Workshop One:* National government agencies including Ministry of Local Government, Environmental Protection Agency, Ministry of Lands and Forests, Forestry Commission, Ministry of Food and Agriculture, etc. and agencies which are central to coordinating the GPRS.
- *Workshop Two:* Donor supported initiatives in decentralised management and natural resource management and NGOs;
- *Workshop Three:* District Authorities including representatives from district administration, Environmental Committees, decentralised departments, Assembly Members Area Councils and Unit Committees, sand other local level environmental management including Fire Volunteers and Chiefs.

c) Dissemination activities:

Three sets of dissemination activities will be undertaken:

- Those involving national and local radio, NGO fora, etc.
- Policy-oriented publications suitable for work in progress such as the *ODI Natural Resource Perspectives* and *ODI Working Paper* series, and web-postings, on the ODI Forest Policy and Environment Group Website, of the annexes to this report.
- Academic research seminar presentations and publications.

The first of these will need to be handled with particular care, given the ease with which environmental messages can be 'hijacked' by particular interests, to convey messages which may be quite at odds with those intended. But there are a number of innovative possibilities, all of which may help to assert the ownership and authority of the small farmer community over their own development processes.

4.3 Comparison between planned and actual outputs

The present study has achieved the outputs laid down in the logframe, at a level appropriate to its conception as a scoping study. The only qualifications are:

- The revised schedule for Output 3, as discussed immediately above (Para 4.3).
- The presentation of a single research proposal rather than three separate research topics (per OVI 1.1/1.2).

The original intention – to provide three alternative research options – proved to be out of keeping with the socio-political, rather than technical, bias of the research findings. The complex nature of these findings demands a process-oriented approach in the next phase, drawing on new information and new understandings to build up consensus for change in environmental decision-making, rather than the pursuit of single-theme research ideas. Thus, different options for change will be accommodated within this learning-process orientation, depending on the interests of the parties to the action research, and do not need to be specified in advance.

OVI 2.1 (local capacity to carry forward the research) is reflected in the formation of a competent team of research assistants, enjoying the confidence of the Ghana Research Leader, which is available to form the nucleus of any future field research grouping. The results of the District Assembly surveys are in the process of being written up by one member of this field research team as an M.Phil thesis, to be presented at the University of Ghana.

5. Research Activities

5.1 Research Methodology

In broad terms, two methodological approaches can be used in a study of this type:

- A case study approach
- A statistical approach

The former is appropriate where one wishes to investigate new relationships and/or develop new understandings. The latter is more favoured where the aim is to test a specific hypothesis or a model. The present study is of the former type, and thus a case study approach has been used.

A statistical approach would be doubly contentious in the context of the present research. Since the data was predominantly about farmer perceptions, it contains a lot of 'noise'. Such data is better sorted out into classes rather than as averages. Because of this, there has been no attempt to carry out analysis of regression. Economic researchers often ask farmers to give their acreages, and on the basis of their perceptions come out with ordered data indicating averages.[11] This is further analysed through regression analysis. In a situation such as the present, this approach would be fundamentally misleading. Farmers often do not know the acreage or yields of their farms but are pressured into responding in particular ways, whether or not these are appropriate to their circumstances. Data on large holdings is likely to be particularly inaccurate, given the tendency to exaggerate.

This justifies the preference in the present study for the sorting of responses into data classes and bands by frequency, rather than by statistics derived from the mean. If such statistics had been required then this would have to have been done by measuring out field plots, take measures of farmers yields at harvest time, keep weekly figures of labour time spent in the field and weekly budgets of farm expenditure. This would have been far beyond the allocation of time and funding for this scooping study.

11 A case in point – to the extent that it is evidence-based – may be the draft Ghana Poverty Reduction Strategy ('GPRS', February 2002). This asserts that "the average farm size is small (less than 1.2 ha). Hired labour is hardly used by this group. The average food crop farmer has limited contact with the product market and is unlikely to use fertiliser, insecticides, high yielding seed varieties or irrigation-based techniques of production". These "facts" are not corroborated by our report which found high use of labour by all farmers, and complex situations in other input usage related to historical policy and ecological factors, and market integration.

The statistics used here were simple descriptive measures of percentages for different clusters. A case study approach was used to explore production relationships in different settlements , with different ecologies, different production systems and different histories of integration into markets and policy frameworks. The approach was not based on the search for 'typical' conditions but rather contrasting conditions and different cases. The primary concern was with understanding *variability*. Therefore only the most limited significance should be attached to averages and related statistics. Qualitative research consisted of informal case studies of experiences of particular farmers and individuals, and explanations of the differences between settlements by farmers. The findings of the quantitative data were taken back to settlements and discussed with groups of farmers for explanation.

The aim was to gain samples of youth, women, men, indigenes and migrants, which would enable different experiences to be collated rather than gain 'representative sample' of village populations. 'Migrants' proved particularly problematic, since this is a highly differentiated category, which includes local as well as long distance migrants. [12]

The research has not been in a position to disaggregate different groups according to various standards of social differentiation. The current fashion of differentiating rural populations into 'the poor', 'very poor' and 'non-poor' has not been followed, as the data decomposes in different ways. Arguably, however, such an approach would do little to advance understanding of processes of social differentiation, particularly in a context such as this where labour markets are complex, both socially and occupationally, and subject to life cycle influences. Migrant labour in West Africa is highly differentiated and often constituted by mobile labour networks. Within these networks, labour contractors and migrant farm owners form an upper echelon of successful migrants who then move into petty trading, transport etc., while the lower echelon is made up of recent migrants who are usually youths taking up their first labour contracts. While differences did appear in the present study as regards male and female farming strategies, there was no clear trend for migrants or specific groups of migrants originating from particular areas. Thus, the report is not able to specify particular social groupings of 'the poor', though it does show processes and pressures which bring about social differentiation. This helps us understand different farming strategies and pressures on farmers in the Brong Ahafo. The approach can then

12 Problems were also caused by the unwillingness to identify young adult and adolescent men as farm workers (they were seen as too young to be so classed). This has been identified as an issue for further deliberation in the full study.

be built up to give a more detailed analysis of the processes of social differentiation. This may prove more helpful than starting from a static set of categories of 'non- poor', 'poor' and 'very poor'.

5.1.1 *Choice of study areas*

To understand the complex institutional arrangements that exist for the control and administration of resources in the transitional zone of Ghana, a number of case studies were developed in distinct ecotones in the Brong Ahafo. These cases were selected to reflect contrasting situations rather then to be representative of typical Brong Ahafo conditions. They sought to contrast:

- different systems of production based on natural resources in different environments;
- different types of adaptations to environments;
- multiple land rights and processes of conflicts and resolutions that occurred in different land use systems.
- Different livelihoods strategies.

One important criterion for research was to compare natural resource management in the northern savanna-forest mosaics with that in the southern fringes of semi-deciduous dry forest. The northern savanna forests are characterised by large areas of parkland in which small robust trees dominate interspersed with grasslands dominated by *Andropogon* sp. Gallery forests with typical semi-deciduous pioneer species occur in riverine areas. The semi-deciduous forest fringe is, very broadly, characterised by high forest tree species, although the canopy is frequently open and many herbaceous and grassy species dominate the forest floor. The semi-deciduous forest has been largely disturbed by farming, invasion of weed species, and fire, and frequently only tall emergents survive with an under-storey dominated by *Chromolaena odorata*.

A second important criterion defining the selection of settlements was the need to examine the impact of agricultural policies on farming practices and the landscapes in these two areas. This resulted in the selection of settlements which were situated near state farms or state agricultural delivery services and settlements which lay beyond the main zone of influence in extension services. This enabled an investigation of the impact of input usage on the environment and the impact of changing policy frameworks to agricultural subsidisation on farming practice.

5.1.2 ***Study sites***

- In the northern transitional parkland environment *Subinso*, situated 2 km from the Branam State farms, was selected to represent a settlement which lay within the heart of agricultural input delivery systems.
- *Mansie* and *Weila* were selected to represent settlements which lay beyond the influence of agricultural input and mechanisation services.
- In the semi-deciduous forest fringe, *Kokoago* was selected to represent a settlement in the vicinity of state agricultural services.
- *Buoku* represented a settlement with low dependence on state agricultural input delivery systems. Buoku also represented a settlement in the immediate vicinity of a forest reserve.

Additional study sites were also selected in the transitional parkland, in the area of Nsawkaw (Nsawkaw town, and the neighbouring villages of Tanoso and Njau, and Atuna, a settlement of Dagau migrants 12 kms. from the road). These sites (and also, in part, Weila) were selected because of their interest in relation to charcoal production, as will be discussed below.

5.1.3 ***Charcoal as a case study of multiple land use conflicts***

To understand the complex institutional arrangement which govern multiple land uses the study focussed on charcoal production. During the period of research, charcoal production had become an important policy issue in the area. Some district administrations in Brong Ahafo were attempting to ban charcoal production and others were attempting to regulate production.

Conflicts over charcoal production between different interest groups in various settlements were common. These groups included migrant Sisala charcoal burners, youth with interests in charcoal burning, and chiefs and elders attempting to control the charcoal trade. Different settlements were chosen to reflect variations of conflicts and negotiation. At Mansie, migrant charcoal burners had been encouraged to leave the settlement a few years back and local youth were now in control of charcoal burning, but in conflict with elders. At Weila, migrant charcoal burners had recently left the settlement as a result of regulations introduced by chiefs and elders and youth were attempting to establish control over charcoal. At Nsawkaw, charcoal was still being produced by migrant Sisalas, but there had been conflicts between charcoal burners and farmers over rights over trees, and conflicts between chiefs and district assembly members and unit committees over rights to regulate charcoal. As a result of this interest in the management of charcoal, northern

parkland communities, in which charcoal production is focussed, are more represented in this study than semi-deciduous forest communities.

Research focussed on developing an individually administered questionnaire which examined farming practices and strategies, livelihood options, use of other natural resources, perceptions of the physical environment and of policy processes. These interviews sought to gain representation for different groups of farmers including migrants, women and youth (see table 5.1). In addition a number of informal group interviews were initiated, particularly to explore resource conflicts, as in the case of groups of migrant charcoal burners and youth, but also to solicit women's perceptions. Select interviews were also held with small groups of farmer after the survey had been analysed to solicit feedback and insights of some of the findings. Informal group discussions were also held with farmers at Atuna, situated off the road behind Jensoso, a small settlement of about 500 migrant Dagaabas who had acquired land from the chief of Jensoso. At the large town of Nsawkaw the area under investigation was not the whole settlement but the area under the jurisdiction of one Assembly Member, which included part of the town and the two outlying villages of Tanoso and Njau. This enabled the political dynamics of the relationships between different levels of administrative personnel to be observed and their ramification in some of the processes of conflict and negotiation in natural resource management, particularly around charcoal.

5.1.4 *Assembly Members Survey*

A second survey of 35 Assembly Members and 55 Unit Committees was also carried out in the Wenchi district to solicit information on the processes of rural administration and perceptions of the role of natural resource management in district administration. Interviews were also held with key personnel in the district and regional administrations. The results of this are in the process of being written up as the M.Phil thesis of Eric Sam-Quartey, a member of the research team.

5.1.5 *Land cover change sub-project*

During the course of the research, an additional land cover change sub-project was agreed with NRSP management, and supplementary funding provided. This study was launched in February 2002, and will report in April or May. It is examining the dynamics of land-use change in the northern transitional zone and the extent to which the land cover has been transformed by human intervention. The study is being undertaken by the Remote Censing Unit in the Department of

Geography, University of Ghana, Legon, under the direction of the Ghana Project Director, Dr. KS Amanor.

Subject to a positive assessment of its findings, the experience developed in this sub-project would commend it for inclusion in the full research study to follow the scoping phase of the research.

5.1.6 *Other aspects of research management*

Two workshops were held by the research team – a one-day inception workshop in Oxford (attended by the UK and Ghana project leaders, the UK economist and a representative of the NRSP) and a 2-day mid-term field workshop, at Dodowa in Ghana (attended by all three senior members of the research team, and the four research assistants). The inception workshop was preceded by a preparatory meeting in London.

The original plan to involve key stakeholders and informants in an initial workshop in Ghana was dropped, following indications that excessive use of workshops in other programmes was already leading to low participation and disappointing results. Individual interviews and small group meetings were anyway felt likely to produce a richer set of responses given the innovative (and somewhat sensitive) nature of this research.

Table 5.1 Profile of the survey area

Population characteristics	Settlement						
	Weila	Mansie	Subinso	Nsawkaw-Tanoso-Njau	Kokoago	Buoko	**Total**
Men	56	52	56	44	58	51	52
Women	44	48	44	56	42	49	48
Migrants	14	15	68	20	91	77	45
Northern migrants	.	2	39	10	6	26	15
Akan migrants from Central and Ashanti Regions	.	.	1	.	6	10	2
Volta Region migrants	.	.	1	.	2	6	1
Migrants from within Brong Ahafo	14	13	28	10	77	32	27
Youth under 35	34	41	39	38	40	53	40
Under 45	66	56	64	58	70	71	63
Ethnic composition	Nafaana who migrated into Deg (Mo) area before the 20th century	Deg (Mo)	Brong and Deg with large number of migrants from Upper West Region	Brong with Migrant Dagaaba farmers from Upper West and community of Sisala charcoal burners	Short distance-migrants mainly from around Techiman who came to farm cocoa	Mainly migrants from Dormaa, and Upper West	
Ecology	Savanna-forest parkland				semi-deciduous forest		
Size of sample	50	54	80	101	53	51	389
Approximate population	1100	1800	3000	5500	600	1000	

6. Environmental Assessment

6.1 What significant environmental impacts resulted from the research activities (both positive and negative)?

- This is a scoping study, which sought to develop new knowledge about the environment and its exploitation, and thus its impacts are yet to be felt.

6.2 What will be the potentially significant environmental impacts (both positive and negative) of widespread dissemination and application of research findings?

- The full study which is proposed should improve the quality of environmental management in the Brong Ahafo in a number of ways:
  - By improving the quality of environmental information available to decision-makers (including through the use of new technologies, such as remote censing);
  - By bringing environmental decision making more firmly within the democratic process;
  - By reducing conflicts between resource users, and opening up democratic channels for their resolution;
  - By giving more voice to the poor and marginal (including poor women and migrants);
  - By better adapting natural resource research to actual on-farm constraints;
  - By improving the information base on controversial aspects of natural resource policy (such as tree plantation development).

To the extent that there are potential negative impacts, these relate largely to the danger of stimulating inappropriate responses from local authorities, which seek to give proof of their environmental concerns. The long-term aim of the project, however, is to give environmental decision-making a more rational basis, and hence to counter such 'gesture politics'.

6.3 Has there been evidence during the project's life of what is described in Section 6.2 and how were these impacts detected and monitored?

- Not yet (this was a scoping study). The future environmental impacts of the proposed follow-up study will be monitored by such indicators as use of, and demand for, improved information to support environmental decision-making; information sharing within farmer networks; increased dialogue between policy-makers and resource users; reduced conflict over natural resources and increased channelling of conflicts into the democratic process; broadened participation in environmental decision-making at locality (Unit Committee, Area Council), District Assembly and Regional levels.

6.4 What follow up action, if any, is recommended?

N/A

7. Contribution of Outputs

As a scoping study, this project's Outputs are to be judged against the objectives of the follow-up research-action programme outlined above.

In summary, the Purpose-level OVIs have been achieved at levels appropriate to a scoping study. The present research report provides a strong empirical foundation on which to build the proposed programme. This should be concerned with improving the quality of management of all natural resources in the Brong Ahafo, not merely those currently managed under CPR. As will be evident from Section 4.1.8, above (see also Annexes 1 & 2), common pool regimes do not exhaust the resource management possibilities in this region, and are anyway subject to transformation into various forms of privately-managed resources, where demographic and other forces encourage this.

The Project Proposal, derived from this Scoping Study seeks to overcome the following weaknesses in the policy environment:

- Natural resource policy in the Brong Ahafo is unable to generate benefits for poor people because the knowledge on which it is based is largely externally-derived, and lacks a foundation in local realities and circumstances; policy development is thus prone to draw upon crisis narratives which stigmatise local producers and alienate them from policy processes;
- The new opportunities which have been offered for District Assemblies to develop their own policies and legislation have similarly suffered from the non-availability of empirical evidence (for example, on the availability of the resource, and the impact of production techniques and strategies on its condition); this has rendered the District level prone to a political form of decision-making, detached from the broader contexts of resource utilisation.

Thus, the Goal of the Natural Resources Systems Programme (NRSP) - to generate benefits for poor people by the application of new knowledge to natural resource (NR) systems – is a valid one in the present circumstances. The evidence of the scoping study supports the judgement that lack of knowledge is a constraint upon environmental decision-making, and thereby impacts negatively on livelihoods.

The present report sets out in detail:

1. the resource constraints which condition the livelihoods of small farmers in the Brong Ahafo, and the decision-making processes through which they respond to these constraints, differentiating the responses of different classes of resource user (poor and rich men and women, indigenes and migrants);
2. the capacities and limitations of the existing institutions mediating natural resource policy at the district level;

Purpose-level OVI-1 has thus been met *("Knowledge of institutions mediating policy [decentralised local government/agriculture and forest-related institutions] updated, identifying gaps and key constraints"*).

A strategy has been defined to re-orient rural policy to the interests of the small farmers, in line with OVI-2 *("Research topics on strategies of participatory management aimed at enhancing the livelihoods of the poor and marginal at the FAI investigated and elaborated with a view to informing future FAI calls on Ghana and elsewhere"*). This is based on a critique of existing research strategies, their economic assumptions, and their technology-transfer orientation. Their tendency to subordinate participatory principles to external goals is likewise problematized. While the details of the proposed strategy are specific to the context of the Brong Ahafo, the principles on which it is founded are of wider relevance, and pertinent to conditions elsewhere in Ghana and beyond.

The strategy here presented acknowledges the social complexity of natural resource systems at the FAI in the Brong Ahafo, and the ease with which the interests of the poor and marginal (particularly women, and different classes of indigenes and migrants) can be marginalised within the policy process. The way forward must therefore involve a process of dialogue and negotiation, rather than technological prescription. A sceptical attitude is also required as regards the discourses which dominate the environmental fora at local, district and national levels, which are easily captured by those with power in society. Evidence needs to be placed in appropriate forms before all the resource users, to allow them to make their own demands on policy-makers. Supporting the development of institutions of local origin and under local ownership will be critical to this endeavour.

The District administration is an important node to create information systems. The District level is important since this represents one of the most important meeting grounds between administration and civil society, in which large numbers of actors involved in District administration and policy making are directly accountable to an electorate, and the electorate is mandated to participate in development planning and the formulation of development plans. This is the only forum at the local level with the legitimacy to arbitrate between resource claims, and reconcile competing interests. The producer institutions need therefore to be articulated with this level of democratic government, so as to establish their own voice in the policy process in a way which supports the functioning of democracy. OVI-3 (*"Uptake pathways for alternative policy and other innovations defined and assessed"*) relates to this interface between livelihoods and the democratic process.

Several donor programmes are working within the districts to improve the planning process, to make it more accountable and transparent, to integrate democratic formulation of plans at the local level with a more transparent process of allocation of funds to development projects within the district planning units (e.g GTZ). Other programmes encourage networking among district personnel to integrate planning capacities of different agencies and lead to enhanced environmental planning (eg. DFID). The argument has been put forward that these initiatives would stand to benefit significantly from the development of the farmer platforms here proposed to help them achieve their stated goals.

Thus, the project aims to build upon these district-level initiatives, extending participatory district planning to natural resources management and creating an information system and multi-stakeholder fora which will influence the collection and analysis of data. The objective is to build a system of natural resource administration that is responsive to the needs of communities and different resource user interests.

8. Publications and Other Communication Materials

This was a one-year scoping study. The main intention was to design a full research project from which, *inter alia*, a series of research-action publications could be derived.

The immediate aim is to prepare *Working Papers* (ODI and IAS, Ghana), and an *ODI Natural Resource Perspectives* policy review. The four scientific annexes (attached) provide, however, a firm foundation for a more substantive study, of book length, and this will be included among the outputs of the full research project.

Outputs to date include:

- the four main annexes to this report
  - A Brief history of agriculture in the transition zone of Brong Ahafo
  - Cropping systems
  - Managing the environment
  - The way forward

- The internal reports:
  - Notes on Natural Resource Management Programme in the Transitional Zone of Ghana - by Kojo Amanor (11/2001)
  - 'Economic perspectives on land use, poverty and environmental issues in Ghana's forest transition zone (Brong Ahafo Region) - by Michael Richards (12/2001);

9. References Cited in the Report, sections 1-7

References are cited in the Annexes. A full bibliography is provided in Annex 4.

10.Project Logframe

The logframe for this scoping study is provided next. A draft logframe for the proposed follow-up project is given in Annex 5.

CN00/057: 'Poverty dimensions of public governance and forest management in Ghana' – Project Logframe

Narrative Summary	*OVI*	MOV	Risks & Assumptions
Goal: [NRSP FAI LF Output 1] Planning strategies to sustain livelihoods of poor people dependent on forest adjacent to cropland developed and promoted	[NRSP FAILF Output 1/OVI] By 2002, new approaches to the management of common pool resources and forest biodiversity validated in two target areas, incl. Ghana FAI. By 2003, these approaches incorporated into participatory management strategies to maintain forest integrity and adopted by target institutions in two targeted countries.	[NRSP FAI LF Output 1/MoV] Reviews by Programme Manager. Reports of research team and collaborating/target institutions. Appropriate dissemination outputs. Local, national and international statistical data.	[NRSP FAI LF Output 1/R&I] Enabling environment exists. Budgets and programmes of target instns. are sufficient & well managed. Target beneficiaries adopt and use strategies
Purpose: [NRSP FAI LF 1.2] Strategies for promoting new CPR management approaches to increase the livelihood opportunities of poor people developed and implemented in Ghana, in the FAI target zones. To be achieved through a phased approach involving: ▪ Initial scoping study (present commissioned research) ▪ Full research study ▪ Validation of recommendations (in association with national and bilateral partners) ▪ Wider dissemination	[NRSP FAI LF 1.2.1.b] By end of project: Knowledge of institutions mediating policy (decentralised local govt./ agriculture and forest-related institutions) updated, identifying gaps and key constraints. Research topics on strategies of participatory management aimed at enhancing the livelihoods of the poor and marginal at the FAI investigated and elaborated with a view to informing future FAI calls on Ghana and elsewhere. Uptake pathways for alternative policy and other innovations defined and assessed	[NRSP FAI LF 1.2.1.b] NRSP research call (that uses findings of the project) Project FTR NRSP Annual Report	Incoming GoG retains commitment to 'Vision 2020' goals of broad participation, & proves open to policy innovation, & assimilation of research findings. Policy-makers are otherwise amenable to acknowledging evidence of research studies in developing policy. NRSP remains in a position to fund the full-scale research intended to follow this scoping study

Outputs:	**OVIs:**	**MoV:**	**PAER**
1 Increased understanding of the social and institutional dimensions of natural resource management at the FAI in Ghana.	1.1 By end of the research Study, at least 3 research topi identified to take forward this research agenda, covering the areas of concern (social & instl/ policy/environmenta 1.2 In each case: - elaboration of research hypotheses; - definition of a proposed research methodology (-ies); - identification of the key social and economic factors which are driving institutional and land use change; - refinement of a range of proposed indicators for assessing the social dimensions of land use; - Identification of possible sites for the full study, illustrating the interplay between ecological variation and social institutions on the livelihoods of the poor.	Project reports 1.1 Review papers which scope out the main policy issues and challenges;	1.1 High levels of situation specificity in environment, leading to low relevance of chosen study sites to wider picture in Ghana; 1.2 Obstacles to progress of decentralisation in study area, restricting access to relevant information and limiting applicability of findings;
2. Potential alternative strategies for developing and delivering appropriate participatory management approaches to benefit the poor identified.	2.1 NR researchers and policy makers engage with research agenda at workshop, and contribute to strategy formulation, identifying strengths and weaknesses of alternatives;	2.1 Proceedings of Workshops, and participant assessments	2.1 Unconducive policy environment in Ghana and/or UK
3. Increased awareness among NR researchers, policy- makers and development agencies of the types of changes which will be needed to ensure that current decentralisation and natural resource management policies contribute to poverty alleviation.	3.1 Local capacity to carry forward the full research study, as evidenced by co-ownership of research proposals and publications; 3.2 Sensitisation of key public agencies in Ghana to research findings, through stakeholder workshops and focus group meetings; 3.3 Preliminary dissemination of research findings and ideas through the written media, national and local radio, NGO fora, etc. 3.4 Interest in, and demand for, project outputs among relevant publics, as evidenced by demand for project staff to present findings and participate in national and local planning.	3.1 Contributions of partners to research report to NRSP, and to publications; at least one article for Ghanaian publication; research papers by research assistants. 3.2 Press cuttings and reports, briefings & external presentations; 3.3 Invitations to Project staff from external sources (in GoG, NGOs and elsewhere) to contribute to further policy development & public awareness.	

Activities:	**Milestones:**	**Budget:**	**Risks & Assumptions**
1. Set-up visit to Ghana by research leader 2. Initial methodology development workshop held (UK); 3. Literature Review prepared; 4. Research team formed and trained; 5. Inventory of stakeholders; 6. Institutional review of forest management at the FAI in Ghana; 7. Pilot sites selected; 8. Field research undertaken; 9. Economic scoping study undertaken,and findings fed into overall research study; 10. Supplementary field visits; 11. Stakeholder review meetings; 12. End of project workshop (Ghana); 13. Report and review paper drafted/ redrafted; 14. NRSP Report prepared; 15. ODI seminar to present findings.	1. Set-up visit in M1; 2. Initial methodology workshop M1; 3. Ghana field team selected by end M2; briefed and trained by end M3; 4. Institutional review by end M4; 5. Literature review by end M3; 6. Inventory of interested stakeholders by end M4; 7. Pilot study sites selected by end M4; 8. Case study research in period M4-M9; 9. Economic incentives scoping study by end M6; 10. Supplementary field visits undertaken by end M9; 11. Stakeholder workshops, M10; 12. End of project workshop, M11; 13. Publications, M12 & subsequently; 14. Report to NRSP, M12; revisions M13; 15. UK presentation of findings M13;	a) UK staff costs £24,225 b) Overseas staff costs £19,850 c) Overheads £20,600 d) Capital Equipment £1,500 e) O/seas Travel £17,000 f) Miscellaneous £6,400 ***Totals:*** FY 2001-2: £19,610 FY 2002-3: £69,965	1. Lack of cooperation at field level from local authorities, etc. 2. Policy makers and other decision makers have time available to meet researchers and participate in workshops, and are not suffering from workshop overload.
		Pre-condition:	Capable personnel are identified for the research assistant posts

11.Keywords

Ghana; natural resource policy; resource conflicts; local government decentralisation; migrants.

12. Annexes

Scientific Annexes:

Annex 1: 'A brief history of agriculture in the transition zone of Brong Ahafo'

Annex 2: 'Cropping Systems'

Annex 3: 'Managing the Environment'

Annex 4: 'The Way Forward'

Annex 5: Draft logframe for the proposed follow-up project.

Administrative annexes:

Annex 6: Final project inventory.