

THE UNIVERSITY OF HULL

**Sustainable Livelihoods of Forest Fringe Communities: Forests, Trees
and Household Livelihood Strategies in Southern Ghana**

being a Thesis submitted for the Degree of Doctor of Philosophy

in the University of Hull

by

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ABSTRACT

Forests play fundamental roles in supporting rural livelihoods in Ghana. They form an integral part of the rural economy, providing subsistence goods and services as well as items of trade. Non-timber forest products (NTFPs) contribute in many ways to improving diets, combating hunger and increasing incomes for rural households in Ghana. Indeed, wild plants and animals have traditionally been the major insurance of many rural households against food and livelihood insecurity. Yet past forestry development efforts have primarily focused on timber, and on building the forest capital, without paying equal attention to how these particular assets combine with others to sustain livelihoods, especially for the poor. This oversight has resulted in gaps in our understanding of the contribution of forest products to sustainable livelihoods.

This study focuses primarily on the role of forest products (especially NTFPs) in rural livelihoods, the institutional issues that mediate local people's access to forest products, the impact of forest degradation and decline on rural livelihoods, and the forms of adaptation to forest resources decline. By combining qualitative and quantitative processes of enquiry (rapid rural appraisal, household questionnaire survey, key informant interviews, household case studies, literature search and direct detailed observations), the extent and manner in which forest-based resources form part of livelihood structures of forest and near-forest dwellers was examined in three forest fringe communities in the Wassa Amenfi District of southern Ghana.

The results of this study reveal that NTFPs provide critical resources across southern Ghana, fulfilling nutritional, medicinal, cultural and financial needs, especially during periods of seasonal hardship and emergencies. Virtually all households consume a wide variety of forest foods, and forest-based activities provide one of the most common income-earning options for households throughout the study area. The contribution of forests and forest products to rural livelihoods is also manifested in the spiritual, cultural and traditional values placed on them. Forest products feature in many cultural ceremonies such as marriages, funerals, initiations, the installation of chiefs and the celebration of births.

In spite of the important contribution of forest resources to rural livelihoods, current statutes in Ghana do not recognise indigenous rights to NTFPs in forest reserve areas. All products within forest reserves, including timber and NTFPs are vested in the government. Local people must obtain permits to harvest products from forest reserves. Similarly, all naturally occurring timber trees - whether on private or on communal land, or even on private farms - 'belong' to the government. It is an offence for an individual or community to cut or sell timber or merchantable tree species without permission from the Forestry Department (FD). Local people resent this form of exclusion and see the permit system as too expensive and complicated. This policy of exclusion discourages any sense of stewardship or responsibility towards forest resources. It alienates, and is a strong disincentive to local management of forests and timber resources. Because of this, people harvest NTFPs profligately and often destroy valuable timber species on their farms before concessionaires can gain access to them.

The potential of forest products to continue to support rural livelihoods in Ghana can only be realised by an increase in the stream of forest benefits to local people. This will require security of access to forest resources, local incentives to protect the forest and its timber resources, and the involvement of local communities in forest management. These are critical issues if local communities are to use the forest resources in their localities sustainably. Because local communities are primary users of forest products, and create rules that significantly affect forest condition, their inclusion in forestry management schemes is essential.

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LIST OF ACRONYMS

BCTF	: Bushmeat Crisis Task Force
CFM	: Collaborative Forest Management
CFMU	: Collaborative Forest Management Unit
DRC	: Democratic Republic of the Congo
FC	: Forestry Commission of Ghana
FD	: Forestry Department of Ghana
FORIG	: Forestry Research Institute of Ghana
FPID	: Forest Products Inspection Division
FSD	: Forest Service Division of Ghana
GDP	: Gross Domestic Product
HF	: High Forest
HFZ	: High Forest Zone
ISSER	: Institute of Statistical, Social and Economic Research, Ghana
ITTO	: International Tropical Timber Organisation
MLF	: Ministry of Lands and Forestry
MOFA	: Ministry of Food and Agriculture
NTFPs	: Non-timber Forest Products
PRA	: Participatory Rural Appraisal
RRA	: Rapid Rural Appraisal
TEDD	: Timber Export Development Division
WADA	: Wasa Amenfi District Assembly
WCED	: World Commission on Environment and Development

CHAPTER 1

INTRODUCTION

1.1. Introduction

In less developed countries, particularly those in Africa, livelihood insecurity remains a major problem. Poverty, famine and malnutrition are serious, perennial problems that these nations have to grapple with. Poverty in the developing world is more a rural than an urban phenomenon, and in the poorest developing countries, 65-80% of the population still live in rural areas (Shepherd *et al.*, 1999). Rural people in these countries, especially the poor, thus employ a diversity of means to help meet basic needs: food crop production; forest and tree product gathering, consumption, processing and sale; cash crop production; and income-earning enterprises both on and off the farm. Often, the poorer the household, the more diverse the sources of its livelihood, as the needs for the year must be made up from various off-farm as well as on-farm natural resources, and often from migrant labouring as well (Shepherd *et al.*, 1999).

Within this matrix of opportunities, poor rural people are very much dependent on land and other natural resources for their livelihood. They have traditionally depended upon forests and trees for the collection of livelihood goods such as food, fruit, fuelwood, fodder and fibres (Chambers *et al.*, 1989). Forests contribute to the livelihood and household food security of forest dwellers through the provision, both of direct food and of income, which may be used to purchase food (Falconer and Arnold, 1991). In addition, forests support agricultural production through their effect on soil productivity and the supply of fodder for livestock (Pimentel *et al.*, 1997). Forests and forest products are therefore key resources for poor people.

As an introduction to the thesis, this chapter provides a background to the study and clarifies the research problem. The concepts that informed and guided the study are also discussed. After situating the study within the broader concept of sustainable rural

livelihoods, the study objectives are presented. The last part of the chapter briefly introduces the chapter-by-chapter organisation of the thesis.

1.2. Background and conceptual considerations

Forest resources - particularly non-timber forest products (NTFPs)¹ - are an important element of poorer households' livelihood systems through their contribution to food security, employment and the spiritual and cultural well-being of people. Many fruits, flowers, mushrooms, leaves, etc. are collected for subsistence food preparations. Poorer people also hunt wild animals and those who practice traditional medicine also collect medicinal plants from the forest. NTFPs and processed goods derived from them also provide an important part of the family income throughout the year, especially in poorer communities, and depending on other employment opportunities, NTFPs can provide an economic activity to fill seasonal gaps in other works.

Indeed, many studies (e.g. Arnold *et. al.*, 1994; Townson, 1995; Connelly, 1985; Fisseha, 1987; Ogle and Grivetti, 1985; Malaisse and Parent, 1985) show that forests and trees form a very important component of the livelihood system of rural people and particularly those living in forest margins. The decline of these important resources through deforestation and forest degradation therefore has important implications for the sustainable livelihoods of the rural poor.

Estimates of the number of people who depend on forests vary widely. However, available information suggests that forests contribute greatly to the livelihoods of rural people in developing countries. The FAO estimates that about 2.6 billion people, or 62% of the total population in developing countries obtain a large proportion of their food from forests and related vegetation (FAO, 1992b). Pimentel *et al.*, (1997) also report that over 300 million people in the developing world derive part or their entire livelihood from forests. The World Bank has recently estimated that one-quarter of the world's poor depend directly or indirectly on forests for their livelihoods (World Bank,

¹The study is based on the following definition of NTFPs: "all the biological material (other than industrial round wood and derived sawn timber, wood chips, wood-based panel and pulp) that may be extracted from natural ecosystems, managed plantations, etc. and be utilised within the household, be marketed, or have social, cultural or religious significance" (Wickens, 1991). Examples are animals of different species, mushrooms, fruits, roots, barks, leaves, non-industrial wood used for diverse purposes, seeds, flowers, leaf litter, resins, gums, honey, fibres, canes, medicines, chewstick, etc. (Asibey and Beeko, 1989)

2000, cited in Warner, 2000). Thus the importance of forests and of NTFPs to the quality of life of poor rural people in developing countries is now common knowledge.

In Ghana, forests form an integral part of the rural economy, providing subsistence goods and services as well as items of trade. Indeed, wild plants and animals have traditionally been the major insurance of many rural households against food and livelihood insecurity (Boakye-Boaten, 1974; Irvine, 1952). Despite these 'markers', the role of forests in household livelihood security has largely been ignored. Indeed, the livelihood effects of forests and trees have not been a concern of forest managers, and policy-makers have only recently recognised the important role they play in the livelihood security of the rural poor.

The Ghanaian Forestry Department (FD) has focused its management systems on timber and timber products, while important NTFPs which support rural livelihoods have been neglected and are regarded as 'minor' forest products. As Francois (Ghana's Chief Conservator of Forests) observed:

"Somewhere down the course of history, timber and timber products assumed such major importance in human affairs that they appeared to be the only significant output of the forests. They dominated in national and international trade statistics, were promoted rigorously in all sorts of media, adapted rapidly to the changing tastes of urban consumption, and generally basked in an exaggerated measure of self-importance" (Francois, 1992).

Consequently, in Ghana there has been no concerted effort towards the planning and management of forests to ensure sustainable availability and supply of NTFPs. In fact, the perspective of rural livelihoods has had low priority in mainstream forest management and forestry politics, and NTFPs have not received anything like the attention given to timber. Indeed, poor forest dwellers, the landless and marginalised farmers are the most dependent on forest resources for their livelihoods. These are the groups with the strongest potential reasons for protecting the resource, given sufficient support and incentives. Yet, these people, whose livelihoods depend on forest products, are regarded more as a danger and nuisance than as collaborating managers of the forests. For most rural populations, however, the neglect of NTFPs and the exclusion of people from forest management are illegitimate and ill-founded. For the many rural communities who come face to face with the harrowing experience of ill health, hunger

and other forms of deprivation, the reality is the enormous contribution of NTFPs (in all their varied forms) to all aspects of their lives.

Most earlier studies have therefore focused on timber and timber products, and on describing forest products and changes to the forests, rather than on how these products form part of livelihood structures of rural people and what happens to the people as forest resources become less available (see for example Hawthorne and Abu-Juam, 1995; Abbiw, 1989, 1990; Asibey, 1986; Irvine, 1952, 1961). This study therefore focuses primarily on the role of forest products (especially NTFPs) in the livelihoods of local people, the institutional issues that mediate local people's access to forest products, the impact of forest degradation and decline on rural livelihoods, and the forms of adaptation to forest resources decline.

In the section that follows the concepts that informed and guided the study are reviewed and discussed. This then leads into a discussion about the research focus and framework.

1.2.1. The concept of sustainable rural livelihoods

The concept of 'Sustainable Rural Livelihoods' relates to a wide set of issues and is increasingly central to the debate about rural development, poverty reduction and environmental management (Scoones, 1998). It was first put forward in the report of an Advisory Panel of the World Commission on Environment and Development (Chambers and Conway, 1992). In calling for a new analysis, the commission proposed sustainable livelihood security as an integrating concept, and made it central to its report. The definition was as follows:

"Livelihood is defined as adequate stocks and flows of food and cash to meet basic needs. Security refers to secure ownership of, or access to, resources and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. Sustainable refers to the maintenance or enhancement of resource productivity on a long-term basis. A household may be enabled to gain sustainable livelihood security in many ways - through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires of activities" (WCED, 1987, in Chambers and Conway, 1992: 7).

Thus, the idea of sustainable livelihoods emerged as an approach to maintaining or enhancing resource productivity, the secure ownership of and access to assets, resources and income-earning activities as well as ensuring adequate stocks and flows of food and cash to meet basic needs. Clearly, food security is an important component of this framework.

The definition of sustainable livelihoods has undergone modifications since it was first introduced. For example, in modifying the WCED Panel definition, Chambers and Conway (1992) put forward the following working definition of sustainable livelihoods:

"A livelihood comprises the capabilities, assets (stores, resources, claims and access)² and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term" (Chambers and Conway, 1992: 7).

Drawing on Chambers and Conway (1992), Scoones (1998) also defines sustainable livelihoods as follows:

"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base" (Scoones, 1998: 5; see also Carney, 1998).

From the above definitions, three fundamental attributes of a livelihood can be identified, namely:

- the possession of human capabilities (such as education, skills, health, psychological orientation, etc.);
- access to tangible and intangible assets (such as land, forests, etc.); and
- the existence of economic activities.

² According to Chambers and Conway (1992), stores and resources are tangible assets commanded by a household. Stores include food stocks, stores of value such as gold, jewellery and woven textiles, and cash savings. Resources include land, water, trees, and livestock; and farm equipment, tools, and domestic utensils. Claims and access are intangible assets of a household. Claims are demands and appeals which can be made for material, moral or other practical support or access. The support may take many forms, such as food, implements, loans, gifts, or work. Access is the opportunity in practice to use a resource, store or service or to obtain information, material, technology, employment, food or income.

In particular, the asset dimension is critical to an appreciation of the concept. Assets, in this context, are resources and stores (tangible assets), and claims and access (intangible assets), which a person or household commands and can use towards a livelihood (Chambers and Conway, 1992). Out of these tangible and intangible assets people construct and contrive a living, using physical labour, skills, knowledge, and creativity.

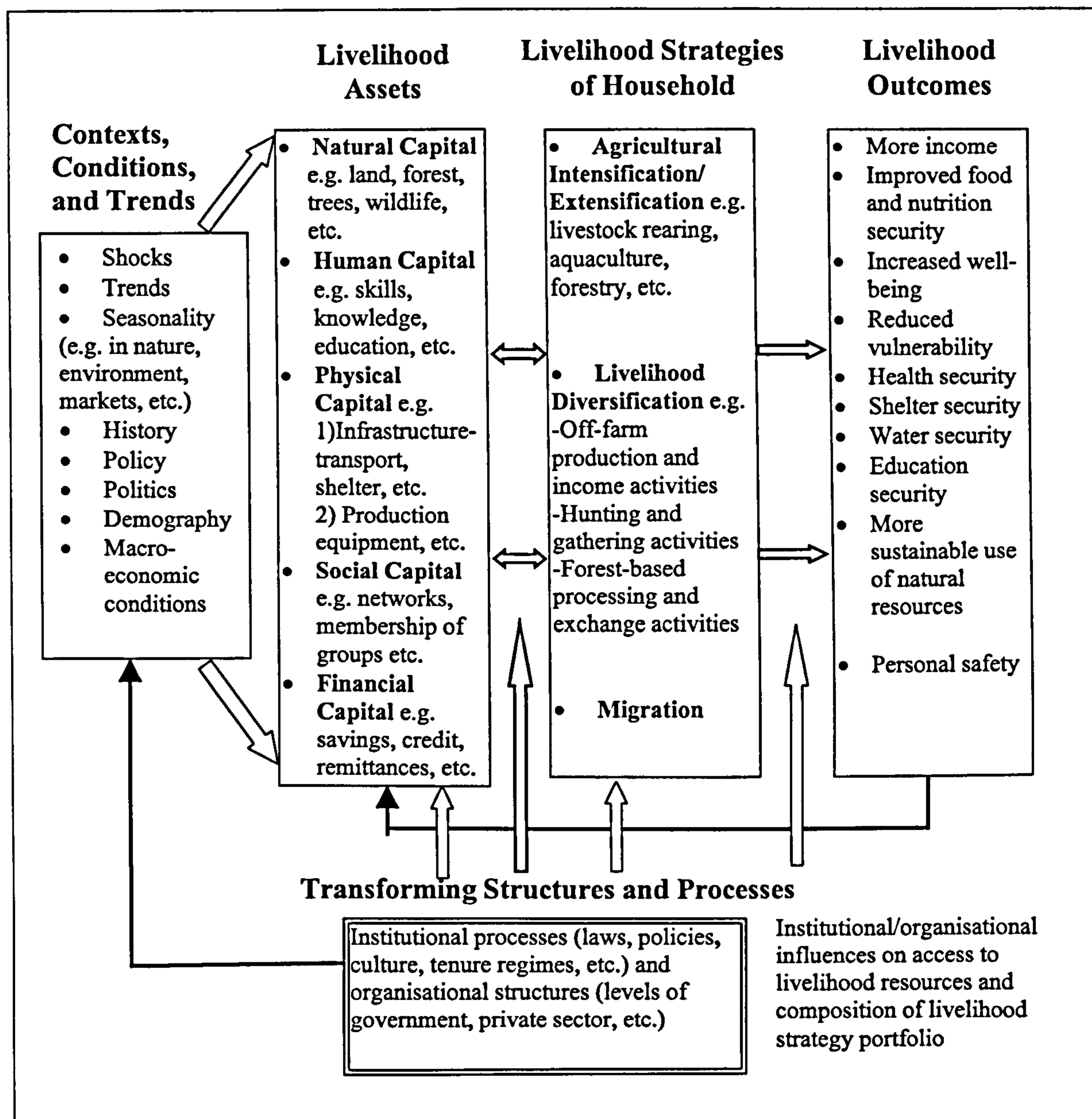
The sustainable livelihood approach allows a wide range of influences to be brought into a single frame of analysis. Situated in particular *contexts* and *settings* (historical, environmental, policy, etc.), particular assets or forms of *capital* are accessed by households, and used to construct *livelihood strategies*, which result in *livelihood outcomes*. The role of *institutions and organisations*, which determine in large part the access of households to resources and strategies, is critical (see Figure 1.1).

1.2.2. A framework of sustainable rural livelihoods

The sustainable rural livelihoods framework (Figure 1.1) has a number of basic elements: livelihood assets, livelihood strategies, livelihood outcomes, and institutional processes and organisational structures. Of particular interest in the framework are the institutional processes and organisational structures, which mediate the ability to carry out such strategies and achieve such outcomes.

The assumption is that people pursue a range of livelihood outcomes (more income, food security, health security, reduced vulnerability, etc.) through different activities, by drawing on a range of assets. The activities they adopt and the way they reinvest in asset-building are driven in part by their own preferences and priorities. However, they are also influenced by the types of vulnerability, including shocks (such as drought), overall trends (in, for instance, resource stocks), and seasonal variations (Farrington *et al.*, 1999). Options are also determined by the structures (such as the roles of government or of the private sector) and processes (such as institutional, policy and cultural factors) which people face. In aggregate, these conditions determine rural people's access to assets and livelihood opportunities, and the way in which these can be converted into outcomes. Thus, poverty and the opportunities to escape from it depend on all of the above (Farrington *et al.*, 1999).

Figure 1.1. A framework for sustainable rural livelihoods



Source: Adapted from Scoones (1998) and Carney *et al.* (1999)

Livelihood assets

The ability to pursue different livelihood strategies is dependent on the basic material and social, tangible and intangible, assets that people have in their possession. The framework identifies five types of capital assets³ which people can build up and/or draw upon. These are:

³ This is not an exhaustive list, other forms of 'capital' can be identified. For instance, the broader political conditions (including the relationship between the state and civil society) which allow or constrain the pursuit of different livelihood strategies may be termed 'political capital'. Similarly, the embedded historical and cultural setting within which livelihoods are pursued may be captured by the notion of 'symbolic capital' (Scoones, 1998).

- natural capital - the natural resource stocks (soil, forests, trees, water, air, genetic resources, etc.) and environmental services (hydrological cycle, pollution sinks, etc.) from which resource flows and services useful for livelihoods are derived;
- human capital - the skills, knowledge, ability to labour and good health and physical capability important for the successful pursuit of different livelihood strategies;
- financial capital - the capital base (cash, credit/debt, savings, remittances, etc.) which are essential for the pursuit of any livelihood strategy;
- physical capital - other economic assets including basic infrastructure such as transport and shelter, production equipment and technologies which are also essential in livelihood strategies; and
- social capital - the social resources (networks, social claims, social relations, affiliations, associations, etc.) upon which people draw when pursuing different livelihood strategies requiring co-ordinated actions (Scoones, 1998; Farrington *et al.*, 1999).

In economic terms, such livelihood assets or resources may be seen as the 'capital' base from which different productive streams are derived and from which livelihoods are constructed (Scoones, 1998). These assets constitute livelihood building blocks. To a limited extent they can be substituted for each other. Thus, the poor may draw on social capital such as family or neighbourhood security mechanisms at times when financial capital is in short supply (Farrington *et al.*, 1999).

Livelihood strategies and outcomes

In a rural context, households may construct four main categories of livelihood strategies:

- *Livelihood (agricultural) intensification*, where the value of output per hectare of land or per animal is increased by the application of more labour, capital or technology;
- *Livelihood (agricultural) extensification*, where more land or more animals are brought into production at the same levels of labour, capital or technology. For example, in rural Ghana most subsistence farmers bring more land into cultivation every year due to lack of farm inputs, especially fertilizer;
- *Livelihood diversification*, where households diversify their economic activities away from reliance on the primary enterprise (livestock or cropping), typically seeking a wider range of on- and off-farm sources of income, e.g. forest product

gathering, processing, consumption and sale, petty trading, formal employment, etc; and

- *Migration*, where people move away from their initial source of livelihood, and seek a living (either temporarily or permanently) in another livelihood system (Scoones, 1998; Carney, 1998; Mearns and Dulamday, 2000).

Broadly, these are seen to cover the range of options open to rural people. More commonly, rural people pursue multiple strategies, together or in sequence. They may, for instance, depend on their own farming, on selling their labour locally, on gathering and processing forest products, on hunting, or on migration, all within the same year⁴. Outcomes will not be simply monetary, or even tangible in all cases. They may include, for instance, a sense of being empowered to make wider, or clearer, choices (Farrington *et al.*, 1999). Generic types of livelihood outcomes are given in the right hand box of Figure 1.1.

*Transforming structures and processes*⁵

Within the sustainable livelihood framework, certain social structures (the roles of government, private sector, and other organisations) and processes (laws, policies, institutions, culture, etc) mediate the complex and highly differentiated process of achieving a sustainable livelihood. These structures and processes influence rural peoples' access to resources and livelihood strategies, and the way in which these can be converted into outcomes⁶ (Farrington *et al.*, 1999). Institutional arrangements, understood in the very broad sense as 'regulations', including the rules and norms, which govern individual and group behaviour, play a critical role in sustainable livelihoods since they determine the access of individuals and households to livelihood resources (capitals). Institutions range from customary and local rule systems, determining for example how local people use forest resources on a day to day basis, to formal laws and administrative procedures governing the use of state forest reserves (Mearns and Dulamday, 2000).

⁴ Livelihood strategies may involve the use of a range of other tactics. For instance, people may stint, hoard, protect, deplete, claim, borrow, share, steal and so on (see Chambers and Conway, 1992: 15).

⁵ 'Transforming structures and processes within the livelihoods framework are the institutions, organisations, policies and legislation that shape livelihoods... They operate at all levels, from the household to the international arena, and in all spheres, from the most private to the most public' (DFID, 1999). Transforming structures and processes are now being renamed 'Policies, institutions and processes' within the DFID framework.

⁶ For example, see Ahmed and Lipton (1997) for a discussion of impact of structural adjustment on sustainable rural livelihoods in sub-Saharan Africa.

For example, in a sustainable rural livelihoods study carried out in two villages in Mali, Brock and Coulibaly (1999) reported that informal institutions are of great importance in determining how people gain access to the resources needed for a reasonable livelihood. They noted that many of these institutions are informal structures linked to kinship and neighbourhood. According to them, 'the large extended household...is the central institution through which people gain security, pool resources, and share risk' (Brock and Coulibaly, 1999). Customary institutions are also important for managing day to day access to farmland, water and grazing in Mali. In terms of formal law, all Malian citizens have the right to settle and farm whenever they want. However, in practice, strong vestiges of customary law prevail, with village councils and traditional land chiefs maintaining control over who can farm, water or graze their animals (Brock and Coulibaly, 1999). They maintain that in terms of day-to-day management, the government clearly cannot exercise its formal rights to allocate land and reconcile conflicting claims and, as a result, local structures remain important.

Sustainability is a key quality of successful livelihoods. Sustainability means both the ability of the livelihood system to deal with and recover from shocks and stresses, by means of coping (short term, reversible responses) or by adaptation (a longer term change in livelihood strategy), and also the ability of the livelihood system and the natural resources on which it depends to maintain or enhance productivity over time.

1.2.3. Rural livelihood diversity in developing countries

Rural people in developing countries, notably in sub-Saharan Africa, do not gain a full living simply from farming or herding. They normally practice 'livelihood diversification', undertaking a wide variety of activities to boost security and raise living standards (Bryceson, 2000; Ellis, 1999). Rural livelihood diversification is thus 'the process by which rural households construct a diverse portfolio of activities and social support capabilities for survival and in order to improve their standard of living' (Ellis, 1999: 2).

The tendency for rural households to engage in multiple occupations is often noted, but few attempts have been made to link this behaviour in a systematic way to rural poverty reduction policies. In the past it has often been assumed that farm output growth would

create plentiful non-farm income earning opportunities in the rural economy via linkage effects. However, this assumption is no longer tenable. It is becoming increasingly evident that for many poor rural families, farming on its own is unable to provide a sufficient means of survival (Ellis, 1999).

Rural livelihoods thus encompass several activities. These can include cultivation, herding, hunting, gathering, reciprocal or wage labour, trading and hawking, artisanal work such as weaving and carving, processing, fetching and carrying and the like. These activities variously provide food, cash, and other goods to satisfy a wide variety of human needs. Some of these outputs are consumed immediately; others go into short or long-term stores, to be consumed later or to be invested in other assets (Chambers and Conway, 1992).

While in many developed countries the concept of a single wage earner in a career job is largely unquestioned, for most families in developing countries the situation is markedly different. Livelihood structures are complex, usually revolving around the incomes, skills and services of all members of the family in an effort to reduce the risks associated with living near subsistence. A family may survive by sending its children to sell goods on the street, while the father engages in basketry and the mother earns a small income through forest product gathering activities. Again, a subsistence farmer may become a wage labourer in the off-season or during drought and could later revert to farming when it is time to plough the field (Hoon *et al.*, 1997).

Empirical evidence from a variety of different locations suggests that rural households indeed engage in multiple activities and rely on diversified livelihood portfolios. In sub-Saharan Africa, a range of 30-50 per cent reliance on non-farm income sources is common while in southern Africa, the range is 80-90 per cent (Ellis, 1999). Similarly, in south Asia, approximately 60 per cent of rural household income is from non-farm sources (Ellis, 1999).

For example, in a study of livelihood activities in a number of sub-Saharan African Countries (Ethiopia, Malawi, Nigeria, Tanzania, Zimbabwe, South Africa and Congo-Brazzaville), Bryceson (2000) reports that the vast majority of rural households in these countries have one or more non-agricultural income sources. These include handicraft activities, petty trading, labour migration, beer brewing, forest and tree product

gathering and sale, and remittances. Brock and Coulibaly (1999) also report that livelihood diversification is an important household strategy in Zaradougou, Mali. They note that, although cotton and cereal production are the major source of income for most households in the region, other livelihood activities are also important. These include migrating to Côte d'Ivoire to establish coffee and cocoa plantations, gathering activities (e.g. sheanut and honey collection), the harvesting and selling of firewood, small stock rearing and poultry keeping. Cultivation of fruits and dry-season vegetables are also important sources of income for several households in the region (Brock and Coulibaly, 1999).

1.3. Research focus and framework

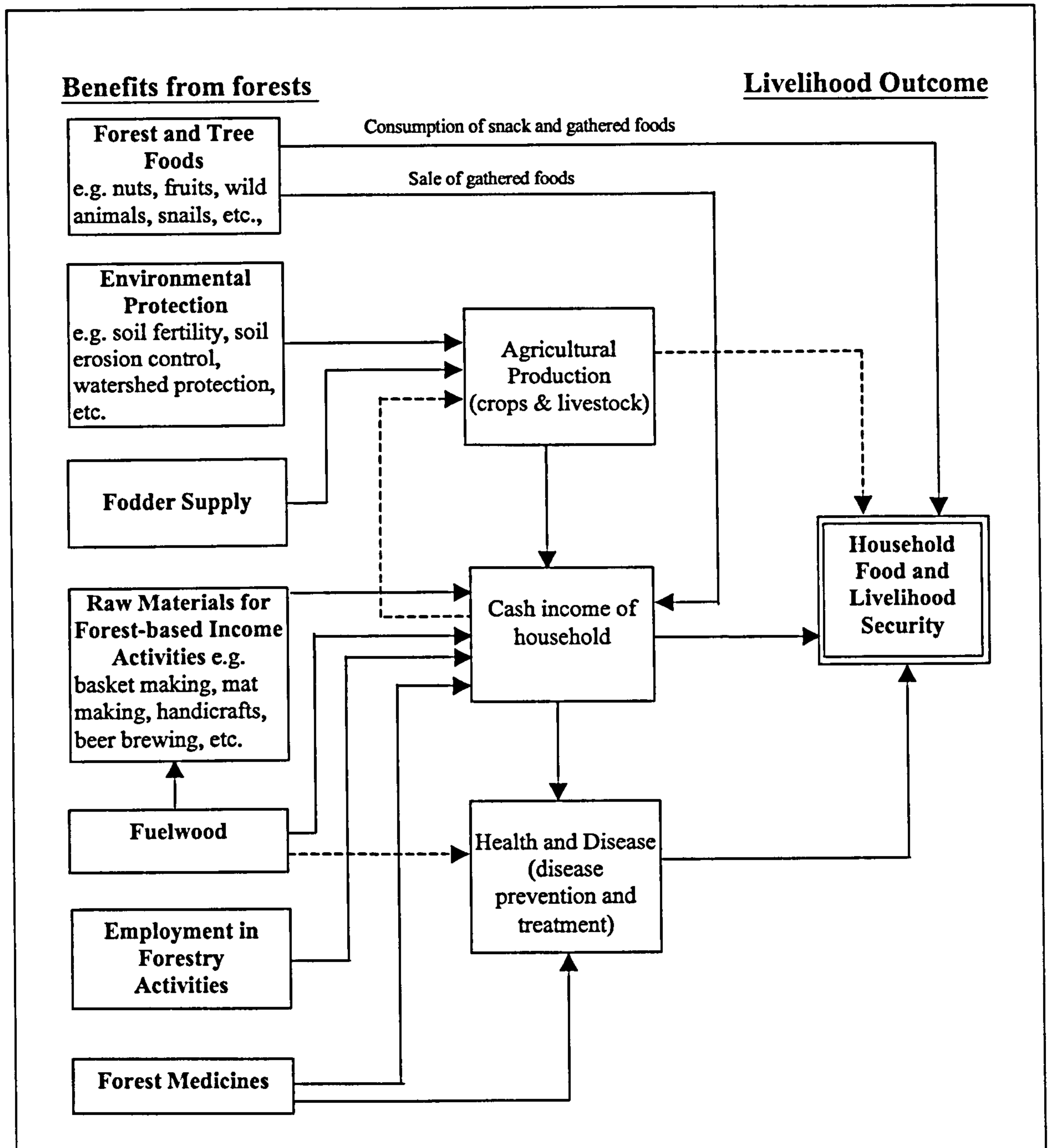
Livelihood security is therefore the outcome of complex interactions among natural resource management and political, social, and economic factors. As an important element within this matrix, forests support the livelihoods of rural people in several ways: by providing recurrent subsistence needs - of fodder, fuel, food, fibre, and many NTFPs; as sources of income, especially in otherwise less productive seasons; as capital stocks or savings banks to be cut and cashed to meet contingencies; and by maintaining the favourable and stable conditions needed for sustained agricultural productivity (in terms of preventing soil erosion, enhancing soil fertility and maintaining soil moisture⁷) (Pimentel *et al.*, 1997; Falconer and Arnold, 1991; Falconer, 1990a,b, 1992; Chambers and Leach, 1987).

Figure 1.2 highlights some of the important links between forests and rural livelihoods. The boxes on the far left represent forest products and benefits from forests. Moving to the right, the linkages between forest outputs and household livelihood security are highlighted. Products such as forest foods, fodder and the environmental functions of forests contribute to the quantities of food available to the household. In addition to these products, fuelwood and raw materials for forest-based income activities, as well as employment in forestry activities contribute to household income. Finally, forest products such as fuelwood and medicines may have an impact on people's health and

⁷ Farmers in Ghana and most other African countries are still heavily dependent on rain-fed agriculture. In Ghana, total area under irrigation as at 1994 was 10,500 hectares, 0.04% of the country's total land area (MOFA, 1997).

thus contribute to household livelihoods (Arnold and Falconer, 1988; Falconer, 1990b; Falconer and Arnold, 1991; FAO, 1989).

Figure 1.2. Research framework: links between forests and household livelihoods



Source: Adapted from Arnold and Falconer, 1988; Falconer, 1990b

The focus of this study is to investigate the various activities by which local people living in the forests and the forest margins of Ghana make and sustain their livelihoods. Involving many complex and interacting factors, the sustainable livelihoods of forest dwellers in Ghana can be explored from various perspectives and dimensions. Thus the

study is mainly concerned with the importance of forest resources, especially NTFPs, to rural livelihoods. Particular attention is given to local people's dependency on forest resources for food and income, the forest resources being considered as livelihood assets and household food security and income as livelihood outcomes.

In looking at the role of forest resources in securing livelihoods for forest dwellers in southern Ghana, the study is concerned not only with the contribution of forest as a source of food, employment and income, but also with the role of forest resources in traditional practices - that is, their influence on the physical, spiritual and cultural well-being of people.

Within the forest sector, key constraints to improving forest-based livelihoods lie in the institutional environment and, in particular, in the relationship between the Forestry Department (FD) and the forest users. These organisational structures and institutional processes are also examined. In addition, local institutions that influence people's access to forest resources are explored.

Finally, for rural livelihoods to be sustainable, the resources and systems on which these livelihoods depend should themselves be managed sustainably. Hence the study also looks at the sustainable management of forest resources - as perceived by the local people.

The next section outlines what the study sets out to achieve, given the research problem, the conceptual framework and the research focus that have been presented.

1.4. Research aims and objectives

The research problem, conceptual framework and the literature survey form a launching pad for investigating the contribution of forest resources to the livelihoods of rural dwellers in southern Ghana. The aims and significance of the study were therefore twofold:

1. To determine the extent and manner in which forest-based resources form part of livelihood structures of forest and near-forest dwellers in southern Ghana.

This is undertaken to include an investigation of how forest-based activities contribute to household income and the extent of the local people's dependency on the forest resources for food security, as part of wider livelihood activities.

2. To identify the impact of local people's dependency on the forest resources and the extent of adaptation to forest resource decline.

Ghana has been richly endowed with forest resources, which are vital for the country's development. Unfortunately, exploitation of these resources to satisfy socio-economic needs has resulted in deforestation and destruction of wildlife habitats, as well as resource depletion and degradation. Estimates indicate that at the beginning of 1900, the natural forest estate of Ghana covered around 8m ha, or one-third of the country's area (Trum-Barima, 1981). However, by 1950, the natural forest estate had reduced to 4.2m ha and in 1980 it was estimated at 1.9m ha (Ebregt, 1995). Ghana's Forestry Department's recent assessment revealed that there is very little intact forest left outside forest reserves, wildlife reserves and traditionally protected areas of Ghana, which currently stand at 1.8m ha (Adu and Owusu, 1996). The extent to which local people adapt to this decline therefore has an important implication for the livelihoods of these people.

To address comprehensively these issues, specific objectives of the study are:

1. To explore the links between forestry and household livelihood security in the Ghanaian context and to determine the current direct and indirect role of forest and tree products in household food security.
2. To document the range of forest products that forest dwellers collect from the forest (including those that have been used in the past), their collection patterns, and their relative importance for the livelihoods of local people.
3. To describe the dynamics of local use of forest resources for household food and livelihood security.
4. To identify important social, cultural and institutional processes as well as organisational structures affecting local people's access to, dependency on, and management of forest resources.
5. To investigate the impact of decreasing forest resources on the local people, especially the poor and their coping and adaptive strategies.
6. To identify ways of managing the forest resources (especially NTFPs) sustainably, and which policies should be put in place to ensure that the forests are conserved while they continue to supply benefits to the local people of Ghana.

1.5. Base assumptions

The above objectives were pursued from a broad base of assumptions, which were carefully interrogated. The essence of adopting such a working framework was to help focus and underpin the investigations, while at the same time providing wide scope for analyses. The operation was, however, executed under conditions of flexibility in order to allow the emergence of new issues. Below are the assumptions that grounded the investigations:

- That where rural people lack access to adequate natural resources to ensure food and livelihood security, those resources which are available are bound to be overstretched. For forestry, this means that among other major factors, sustainable livelihoods are crucial to the survival of forests and must therefore be central in forestry planning.
- That a much larger percentage of food comes from forests and trees than has been assumed. Forest food plays a central role in providing diverse nutrients and they are often critical during seasonal periods of agricultural food shortage.
- That the income from the household collecting and small scale processing of forest and tree products is extremely important to the rural poor (especially women from poor families), for whom the income from forest products is used to purchase foods as well as inputs for agricultural production.
- That as natural forests recede or degrade there is sometimes a transition in land use, and as agriculture expands into these areas, farmers increasingly protect, plant, and manage trees on their land in order to provide selected outputs.

The next section lays out the structure of the rest of the thesis and provides a brief outline of each of the chapters.

1.6. Structure of the thesis

The thesis is organised into nine main chapters. Chapter 2 reviews literature on the importance of forests and forest products in supporting rural livelihoods. The chapter focuses primarily on forests as a source of food, employment and income. It concludes that forest products play a crucial role in the livelihoods and well-being of people living in or close to forest environments and that forest foods, employment and income are

commonly important parts of rural strategies that tide households over the seasonal gap between harvests and other emergencies. Chapter 3 focuses on Ghana and its forestry sector, setting the scene for the study by providing the background to forests and forestry practice in Ghana. It traces the history of forest reservation and conservation as well as the development of forest policy and legislation in the country. The final section of the chapter discusses the contribution of forestry to the Ghanaian economy. Chapter 4 provides a background to the study area and discusses the strategy and the various methods employed for data collection and analysis. Key methodological issues that guided the investigation are also reviewed and discussed.

Chapters 5, 6, 7 and 8 present the results of the study as well as interpretations and discussions of these results. In particular, chapter 5 focuses on land tenure, land holdings, and agricultural production in the study area, since these factors partly shape and influence the way rural people use and depend on forest resources for their livelihoods. The chapter begins with a discussion of the social structure, household characteristics, and ethnic composition of the sample. In chapter 6, subsistence uses of forest products are examined. The discussion centres on the range of livelihood goods that people obtain from forests, their collection patterns as well as the contribution they make to rural livelihoods. The changing patterns of household use and consumption of forest foods are also explored. The chapter closes with a discussion about the cultural and traditional values of forests and forest products.

Chapter 7 focuses primarily on forest-based income-earning activities and their contribution to household livelihoods. It explores the range of livelihood diversification activities undertaken by households. The discussion then narrows down to forest-based income activities, the patterns of engagement in these activities and their relative importance to household livelihoods. A typology of forest-dependent households is given in the chapter. The final section considers the constraints local people face in engaging in forest-based activities. Chapter 8 examines institutional configurations and state-people relations around forests. In particular, it discusses forest and tree tenure and use rights and how these shape people's attitudes towards the resource. The chapter also explores the changing patterns of the availability of forest products, the impact of this change on local people, and the forms and extent of adaptation to it. In addition, farmer tree planting and management as well as local people's perceptions of collaborative forest management are considered in this chapter.

Finally, in chapter 9, the main findings of the study are summarised and their implications for the management of forest resources considered. The chapter presents recommendations and suggestions for further research and highlight areas of limitation in the study.

CHAPTER 2

FOREST PRODUCTS AND THEIR IMPORTANCE TO LIVELIHOODS

2.1. Introduction

In recent years there has been increasing interest in environmental and developmental circles in both tropical forests as an important ecosystem, and in the well-being of people who live in or near them. The importance of forests and of non-timber forest products (NTFPs) to the quality of life and even survival of very large numbers of poor rural people in tropical developing countries now seems indisputable (Pérez and Arnold, 1996). Trees and forests contribute in many ways to improving diets, combating hunger and increasing incomes in local communities and rural households in developing countries. Thus, food security, income, employment, energy sources and overall well being of rural people in these countries are linked to the forests (Shand, 1997).

This chapter reviews relevant literature on the contribution of forests (particularly NTFPs) to rural livelihoods. Much attention has been given to NTFPs as a source of food, employment and income. There are considerable difficulties in the literature in identifying which NTFP supplies come from forests, as distinct from the farm bush, bush fallow and other tree formations and stocks outside forests. Emphasis is therefore placed on the use of such products rather than on where they come from. Nonetheless, the forest connection has been 'lifted' wherever possible. The review seeks both to build on the strengths of relevant studies and to bring together the disparate information on the importance of forest resources to rural livelihoods in developing countries, particularly Africa.

2.2. Forest products and rural livelihoods

Forests and trees provide a wide range of benefits in the form of goods and services that arise from direct and indirect use. These may be tradable goods, such as fuelwood and

other NTFPs, and those that cannot be traded, the latter mainly being services such as regular supply of clean water or the conservation of soil fertility (Arnold and Bird, 1999). For millions of people living in forest environments, the forest forms such a dominant part of their physical, material, economic and spiritual lives that its importance goes beyond the mere description of individual products or services that the forest provides. As well as providing a wealth of material outputs of subsistence or commercial value, the forest is no less than the basis for whole livelihood systems based on hunting and gathering, and of rotational agriculture that depend on the ability of bush fallow to revive the productivity of the land. The forest thus constitutes an integral part of the habitat and of the social and cultural structure of those living within it (Byron and Arnold, 1997). The main features of forest output and livelihood relationships are outlined in Table 2.1.

Table 2.1. Forest outputs and rural livelihoods

Livelihood inputs	Characteristics
Subsistence goods	Supplement/complement inputs of fuel, food, medicinal plant products, etc., from the farm system; often important in filling seasonal and other food gaps; forest foods enhance palatability of staple diets, and provide vitamins and proteins.
Farm inputs	On-farm trees provide shade, windbreaks and contour vegetation; trees/forests also provide low cost soil nutrient recycling and mulch. Arboreal fodder and forage, fibre baskets for storing agricultural products, wooden ploughs and other farm implements, etc.
Income	Many products characterised by easy access to the resource, and low capital and skill entry thresholds; mainly low return activities, producing for local markets, engaged in part-time by rural households, often to fill particular income gaps or needs (though they can be major sources of employment and income for forest dwelling populations); overwhelmingly very small, usually household based, enterprises (with heavy involvement of women, as entrepreneurs as well as employees). Some forest products provide the basis for more full-time and higher return activities; usually associated with higher skill and capital entry thresholds, and urban as well as rural markets. Some low input gathering activities involve raw materials for industrial processes and external markets.
Reduced vulnerability	Can be important in diversifying the farm household economy - e.g. providing counter-seasonal sources of food, fodder and income. Also important in providing a reserve that can be used for subsistence and income generation in times of hardship (crop failure, drought, shortage of wage employment, etc.); or to meet special needs (school fees, weddings, etc.).

Source: Adapted from Arnold and Bird, 1999

Although hundreds of millions of people worldwide are dependent on forests in one way or another, the nature of this dependence varies. The number of people wholly

dependent upon forests for their livelihoods is only a small proportion of the total (though even these probably comprise several million people). Rather, dependence on forests is almost always complementary to agriculture, livestock herding, trading or wage labouring (Byron and Arnold, 1997).

The total contribution of forests and trees to rural livelihoods is difficult to quantify. A significant proportion of forest products are consumed by those who collect them, with the amount collected varying according to seasonality, access and options (or alternatives) (Warner, 2000).

While the strongest role for forestry lies in the rural context, a substantial proportion of urban households in developing countries continue to draw on the plant and animal products of forests to meet some part of their basic needs, such as construction materials, energy, nutrition and medicine. The importance of forests to the urban poor is demonstrated by evidence that an increase in urban poverty temporarily increases demand for low cost forest products which normally would have been substituted in urban markets (Arnold and Bird, 1999).

Among off-farm resources, NTFPs play fundamental roles in livelihood support, yet past forestry development efforts have primarily focused on timber, and on building the forest capital, without paying equal attention to how these particular assets combine with others to sustain livelihoods, especially for the poor. This oversight has resulted in gaps in our understanding of the contribution of forest products to sustainable livelihoods (DFID, 1999, in Warner, 2000). In order to understand the relationship of rural people to their forests, knowledge of the nature and dynamics of their particular uses of forest products is important.

2.3. Forest food resources in the food system of forest dwellers in developing countries

There are vast numbers of foods garnered from forests. In many rural societies, foods from forests, such as fruits, nuts, leaves, gums, sap, stems, seeds, honey, mushrooms, roots, tubers and bushmeat¹ are an important, sometimes essential, part of the diet. This

¹ The term "Bushmeat" (which originated from West Africa, e.g. see Ntiamoa-Baidu, 1997) is used in this work to refer to meat of wild animals hunted or collected for food.

is particularly true at certain times of the year when agricultural food is scarce, or when the workloads of those whose role it is to feed the family - usually women - are heavier than usual (FAO, 1992a).

Many studies (e.g. Campbell, 1986; Gura, 1986; Malaisse and Parent, 1985; Arnold *et al.* 1985; Connell, 1977;) have documented edible forest products gathered by forest dwellers and non-forest dwellers alike. A literature survey completed by Becker (1986) revealed 800 edible plant species in the arid and semi-arid Sahelian belt of Africa. Grivetti (1976) reported that the Tswana (agro-pastoralists) regularly used 126 plant species and approximately 100 animal species as food sources. In Nigeria, Okafor (1980) reported over 150 species of edible woody plants. Similarly, in Ghana, Irvine (1952) recorded over 100 species of wild plants exploited for their leaves and another 200 wild species valued for their fruits.

For most rural people, foods derived from forests - or from forest trees they maintain in their farming system - add variety to diets, and improve palatability. The quantities of forest foods consumed may not be great in comparison to the main food staples, but they often form an essential part of otherwise bland and nutritionally poor diets. Forest and farm tree food products are also widely used as snack foods between meals, eaten while working in fields or while herding (Arnold, 1992). For example, Amadi (1993) reports that the Korup forest in Cameroon is an important source of food and other household items for people living in and around it. She notes that fruits such as monkey cola (*Cola lepidota* and *Cola pachycarpa*) and nuts such as *Coula edulis* are regularly collected and consumed as snacks to stave off hunger by women and children on day-long trips to gather other NTFPs. She adds that green leaf vegetables such as *Heinsia crinita* and *Gnetum* sp., condiments such as *Afrostryrax lepidophyllus* and soup thickeners such as *Ricinodendron heudelotii* are all regularly used cooking ingredients. In addition to these supplementary roles, forest foods are extensively used to help meet dietary shortfalls during particular seasons of the year, thus helping to bridge "hunger periods", when stored food supplies are dwindling and the next harvest is not yet available (Arnold, 1992). The third main role of forest foods in the overall nutritional system is in emergency periods such as floods, droughts, famines and wars. In famine periods, energy rich foods such as roots, tubers, rhizomes and nuts can provide an important buffer (Falconer and Arnold 1991).

Most studies on forest food resources focus on describing what is consumed or edible (e.g. Becker 1986; Malaisse and Parent, 1985; Gura, 1986; Burkhill, 1985; Irvine, 1961). Few studies focus on the frequency with which they are used, the nutritional value they impart, and how local people value such foods (Falconer, 1990a). Nonetheless, available information demonstrates that, in many cases, the nutritional quality of forest foods is comparable and, in some cases, superior to domesticated varieties. For example, Caldwell and Enoch (1972) found that, on average, wild leaf vegetables have higher riboflavin content (0.4 - 1.2 mg/100g edible portion) than eggs, milk, and fish. Similarly, Becker (1983) found that the seed of the chanar tree (*Geoffroea decorticans*) has a chemical 'score' similar to that of groundnuts (peanuts) and millet.

It is difficult to estimate accurately the total amount of food people in developing countries obtain from the forest because of the dearth of information. Again the amount of forest food obtained per person and hectare varies widely between countries and between regions within countries (Pimentel *et al.*, 1997). However, estimates indicate that the world's forests directly or indirectly supply food to an estimated 200-300 million people annually (Gleick, 1993; Prasad and Bhatnagar, 1993; Arnold, 1994). The FAO also reports that about 62% of the total population in developing countries live in rural regions and directly obtain most of their food from their local environment (FAO, 1992b). Many harvest and use wood and non-timber products for a wide variety of purposes that enhance their livelihood, and help them purchase food and other vital necessities. These people not only collect wild plant roots, leaves, fruits, and nuts from trees, shrubs, and other plants, but also hunt wild animals, fish, and insects (Hladik *et al.*, 1993).

2.3.1. Household consumption of plant foods collected from forests and fallows

Rural people living in forest environments collect and consume a wide range of forest foods, such as leaves, seeds, nuts, fruits, roots and tubers, sap, gum, honey, and mushrooms. Some of these are simply gathered and eaten raw, while others go through complex processing before they are made edible (Falconer and Arnold 1991).

A considerable number of historic and present day botanical studies document the multitude of plant food resources found in the forests of Africa (e.g. Irvine, 1961;

Walker and Sillans, 1961; Burkhill, 1985). For example, Okigbo (1983) reports that more than 1500 species of wild plants are (or have been) consumed by different African peoples. The author distinguishes between those wild species consumed regularly (e.g. *Gnetum* sp.) and those used only in times of scarcity (e.g. *Vitex doniana*).

Similarly, Grivetti *et al.* (1987) synthesised the literature on the uses and nutritional values of wild plant food resources throughout Africa and concluded that wild plants are an essential component of many African diets, especially in periods of seasonal food shortage. They suggested that by maintaining and increasing current use of locally available wild foods the economic and nutritional situation of rural Africans might improve. In Zimbabwe, Bradley (1992) reports that whilst households in the communal areas depend heavily on the market for food, part of their subsistence needs are provided by products from indigenous woodland and trees in fields. A range of products are harvested: termites, 'mopane' worms and other invertebrates, honey, a variety of fruits, wild leaf vegetables, mushrooms, small animals (and occasionally larger mammals) and fish from the rivers. Some of these are available on a seasonal basis, and there are regional variations, depending on environmental parameters and ecosystem type.

In a study on the uses of edible wild plants in Swaziland, Ogle and Grivetti (1985) examined the cultural, ecological, and nutritional aspects of wild plant use. They found that more than 220 wild plant species were commonly consumed by the 394 people interviewed over three ecological zones. Ninety two per cent of respondents reported purchasing food regularly and all of them reported using wild foods. Thirty nine per cent estimated that wild plants contributed a greater share to the annual diet than domesticated cultivars. Only 37% reported greater annual consumption of domesticated plants, thus confirming the importance of forests and associated vegetation in the food economy of certain regions. Pélé and Berre (1967), cited by Falconer (1990a) provide considerable descriptive information on the uses of forest foods in southern Cameroon. They describe the different ways in which forest foods are consumed: as snacks (e.g. *Detarium senegalense*), as meat substitutes, as staple main dishes (e.g. fruits of *Pachylobus edulis*), for their oil (e.g. nuts of *Mimusops djave*), in sauces (e.g. leaves of *Vernonia amygdalina*) and as condiments (e.g. the bark of *Scorodoploeus zenkeri* is used to add a garlic-like flavouring). They add that plants gathered from forest and bush areas are valued most at times when other food sources fail (e.g. during the dry season).

Fruits

Forest fruits are an important source of food and income in most developing countries. For example, in a study to examine the degree of dependency on forests and trees for food security in Nanguruwe and Mbambakofi villages in the Mtwara region of Tanzania, Missano *et al.* (1994) discovered over 30 different kinds of forest fruits eaten by the villagers. The fruits were considered important both for consumption and as a source of extra income. They maintained that these fruits are much appreciated as snacks in the busy agricultural season when people are in the forest, or walking through on the way to the fields for planting or weeding. Similarly, Bradley (1990) reports that indigenous wild fruits are very important as a source of food in the communal areas of Zimbabwe. Fruits are collected and consumed directly and are only sold on a small and localised scale. He notes that there is a conscious and well-respected practice of preserving fruit trees even as the indigenous woodland is severely modified or removed.

In a similar study on the use of wild fruits in Zimbabwe, Campbell (1986) found that, though there were many fruit species, three species (*Diospyros mespiliformis*, *Stychnos cocculoides* and *Azanza garckeana*) were the most frequently consumed and also the most highly prized. He found that while the communal land area was heavily populated and had suffered severe deforestation, the prevalence (density) and use of the three favoured fruit species had not been affected by deforestation. Fruit trees had not been cleared, but had been incorporated into the farms. He noted that primary school children are the major collectors of wild fruits, with adult women being the second major collection group. According to him, local tenurial arrangements and access rights are factors affecting gathering activities.

Seeds

Seeds are also consumed widely in Africa. For example, in most parts of the Sahelian region of Africa, the seeds of *Parkia* sp. form an important part of the diet. Campbell-Platt (1980) found that fermented parkia seeds (known in Ghana as dawadawa) is the most important ingredient of the side dishes, soups and stews, made to accompany porridges in northern and western Africa. His study revealed that fermented *Parkia* is used 90 out of 100 days by the Cabris of northern Togo, 60 out of 100 days by the Mobas of northern Togo, 50% of all meals in Ghana's Upper Region and 10% of all meals in the Northern region of Ghana.



The seeds of the forest tree *Irvingia gabonensis* are also commonly consumed throughout West Africa, especially in southern Nigeria. They are used in sauces and soups, giving them a desirable glutinous consistency (Falconer, 1990a). A study of forest fruit trees in Nigeria found that annual consumption of *Irvingia* seeds in the southern regions of Nigeria ranged from 3.2 to 14.13 kg/year/household. Consumption was found to be greatest in rural areas, but there was a growing demand for the seeds in urban centres as well (Department of Forest Resources Management, 1986, in Falconer, 1990a). Oyakhilome (1985) also estimated that *Irvingia* seeds are used in one-third of all soup preparations in Nigeria's southern regions.

Leaves

Green leafy vegetables are also one of the most widely consumed forest foods in Africa. Frequently, they are used as the base for soups, stews, and relishes, which accompany carbohydrate staples such as rice or maize. This combination is important because in addition to increasing the nutritional value, these wild leafy vegetables add flavour to otherwise bland staple diets thereby encouraging greater food consumption (Falconer and Arnold 1991). For example, in a study in Swaziland, Ogle and Grivetti (1985) found that wild leaf vegetables are the most frequently used wild plants. More than 50% of the adults reported consuming wild leaves frequently (more than twice weekly). Wild leaves were found to be the main accompaniment to the maize staple for the 39% of the meals studied. Forty-six per cent of the respondents reported buying wild vegetables regularly at the local market, while only 25% reported selling them. The study concluded that the dietary use of wild plants is not minor.

In a similar study of wild leaf plants in Lushoto, Tanzania, Fleuret (1979) found that vegetable relishes are an essential element of the Shamba people's diet. She found that wild leaves are used in 32% of all meals consumed and that they are the most common ingredient (used 81% of the time compared with 17% for cash crop vegetables) for the traditional side dish. She also found that introduced cultivated vegetables are not replacing wild leaf relishes because people prefer the taste of wild leaves and they are traditionally important. In addition, wild leaves are valued because they are cheap and accessible. Another interesting point discussed in the study is that wild leaves, meat and fish are viewed as consumptive substitutes for one another, whereas cultivated vegetables are viewed as cash crops.

Mushrooms

Mushrooms gathered from forests and related vegetation are often eaten as meat substitutes and for flavouring in many cultures and are good sources of protein and minerals (FAO, 1992a). Mushrooms are often only available for short seasons; however, in some cultures mushroom gathering becomes a major activity during this period. For example, in a study to examine the nutritive value of some Ghanaian mushrooms (*Termitomyces* sp. and *Volvoreillea* sp.), Asedam (1982) reported that mushrooms are highly valued foods but are only available in the early rainy season. He added that they are good sources of minerals and protein.

In a similar study in Upper Shaba, Democratic Republic of Congo (DRC), Parent (1977) found that mushrooms (especially *Cantharellus* sp.) were frequently gathered and consumed in the region. He estimated that, during the rainy season, at least 20 tons of mushrooms are consumed by the approximately 700,000 inhabitants of the region. According to him, mushrooms are gathered by women and children, who frequently spend up to two or three hours a day gathering them in the rainy season. Although the mushrooms are mostly consumed in the household, they also serve as a source of income to several households. Another study in Nanguruwe and Mbambakofi villages in the Mtwara region of Tanzania also found that mushrooms are valuable sources of relish consumed with cassava. The authors identified 17 different varieties of mushrooms consumed by people in the area. They concluded that mushrooms add to food diversity and variation of the otherwise monotonous diets (Missano *et al.* 1994).

Honey

Honeybees occur in many forest ecosystems and the honey they produce is a highly valued forest product. Trees play an important role in honey production as they collectively (because of different flowering times) provide year-round nectar for bees. Honey is a highly valued food almost everywhere for its high-energy content: 100g of honey contain more than 280 calories of energy (FAO 1992a: 13; Sen-Gupta 1980). Both honey and brood (bee larvae) are important sources of food for many people in Africa. For example, Ntenga and Mugongo (1991) reported that a mixture of honey and sorghum is an emergency food in parts of southern Tanzania because it can be stored for a longer time.

In some parts of Africa, honey is of particular importance as an ingredient for honey beer, which is used in the exchange economy in many places. For example, Clauss (1991) reported that honey beer is often regarded as a 'local currency' amongst smallholder farmers in north-western Zambia, where it is used for the payment of services like field cultivation. Ntenga and Mugongo (1991) also mention the importance of honey beer for the Barabaig of Tanzania in paying for services and in traditional ceremonies. In the Zambezi district of Zambia, Clauss (1991) reports that honey is of sufficient value to be traded for cattle.

Forests and trees have always played an important role in the well-being and livelihood of the people of Ghana. The vast majority of the people, especially those living in rural areas, rely directly on forests and trees for food, medicine, low-cost building materials, fuelwood, craft materials and income (Falconer, 1992; Townson, 1995). Apart from the subsistence, economic and environmental uses, forests play an important role in the spiritual and cultural values of the indigenous people of Ghana. For them, the forest resource is a matter of survival: its use and availability, an indispensable buffer against famine, poverty, drought, and environmental change (Ntiemoa-Baidu, 1997).

Unlike many other parts of the world, where knowledge about forest resources is held by geographically distinct indigenous groupings, in Ghana such knowledge is found in virtually all rural households and in many urban households too. Earlier works indicate that forest resources form an important part of livelihood structures in many rural communities in Ghana (e.g. Osei-Owusu, 1981; Dei 1989; Asamoah 1985; Abbiw, 1989; Falconer, 1990a, 1992; Ntiemoa-Baidu 1992; Townson, 1995). Forest foods such as leaves, fruits, nuts, seeds, roots and tubers, mushroom, snails, and bushmeat form an important component of the rural subsistence economy as well as many urban areas of Ghana. Abbiw (1989), for example, describes 62 edible forest fruit species (17 of which are marketed), 60 species used as salt substitutes, 100 species used for their leaves, and 19 species whose roots are consumed in Ghana.

In a similar study in the Asante-Akim district of Ghana, Osei-Owusu (1981) noted that 28 forest food plants were commonly gathered and consumed. The majority were eaten in the "bush" as snacks (e.g. the fruit of *Lecaniodiscus cupanioides*, *Myrianthus arboreus*, *Napoleonaea leonensis* and *Dacryodes klaineana*), or added to soups and sauces for flavouring (e.g. the ground stem of *Albizia zygia*, the leaves of *Bombax*

buonopozense, and the fruits of *Ficus capensis* and *Tetrapleura tetraptera*). He also noted that some plants were used in unique ways; for example, the stem of the liana, *Byttneria catalpifolia* was found to provide a source of drinking water. In another study in a forest community called Ayirebi in Ghana, Dei (1989) estimated that 9% of their food is obtained by hunting and gathering.

The diverse ways in which a single forest species may be used is well illustrated in an example from Ho in Ghana. In this community, *Ceiba pentandra's* fibrous fruits are used in medicines, for pillow making and is commercially sold to help plug holes in canoes. Its seed oil is taken against rheumatism, used as a fire-lighter and is sold commercially for soap making. The leaves are consumed in soups and also provide goat fodder. Its bark and stem are used in the preparation of a medicinal mouthwash and the roots are used in the treatment of leprosy. Its ash provides good mulch and a favoured mushroom grows at its base. It is also valued as a bee fodder tree (for honey production). Finally, it is a sacred tree; its leaves and bark are believed to expel evil spirits (Asamoah 1985).

2.3.2. Household consumption of wild animal foods (bushmeat) from forests

Bushmeat, including mammals, rodents, reptiles, birds, snails, and insects from forests provides a stable food source for many forest dwellers in developing countries. Bushmeat was one of the main sources of food and virtually the sole source of animal protein for people in pre-historic times. But modernisation and agricultural development over millennia has drastically reduced people's dependence on bushmeat as a source of food in many parts of the world (Ntiamoa-Baidu, 1997). In Africa and many developing countries, however, bushmeat continues to contribute substantially to the total animal protein supply in both rural and urban households (see Table 2.2).

Virtually all species of wild animals are acceptable as a food resource to some group of people in Africa. Species, which may be shunned by one group of people, are a delicacy to another. The species that are eaten vary from antelopes to monkeys, rodents, reptiles, and a whole range of invertebrate species including snails, termites and beetles. The range of species eaten and the relative importance of the different species vary from locality to locality depending mainly on the species available for exploitation in each region and also on hunting restrictions enforced in each country (Ntiamoa-Baidu, 1997).

Table 2.2. Wildlife as a source of protein food in selected African Countries

Country	Use of bushmeat as a food resource/source
Ghana	All species of wild animals are accepted as food resource. Asibey (1977) estimated that 70% of Ghanaians eat bushmeat, and wild animals constitute the main source of animal protein for rural communities. Over 90% of people interviewed in a recent survey said they would eat bushmeat if it were available (Tutu <i>et. al.</i> , 1996).
Cameroon	Bushmeat is an important part of the diet of many urban and rural people, providing an estimated 70-80% of animal protein consumed in the southern areas (Ajayi, 1979). Bushmeat constitutes 8.8% of the estimated 33.1kg of meat consumed per person per year (Gartlan, 1987).
Liberia	Popular species exploited as bushmeat are antelopes and various species of monkey (Verschuren, 1983). Estimates in the 1970s indicated that bushmeat contributed between 60 and 90% of the animal protein consumed (Ajayi, 1979; Sale, 1981). A more recent survey estimated that three-quarters of the country's meat production comes from wild animals. Subsistence hunting yielded 105 tonnes of meat valued at US \$ 42 million (Anstey, 1991).
Nigeria	Bushmeat is popular in both urban and rural areas and provides 20% of animal protein in southern Nigeria. The most commonly consumed species are small animals, including squirrels, grasscutters, giant rats, brush-tailed porcupines, and bats (Ajayi, 1979; Martin 1983; Anadu, 1987). An estimated total of 1,320,000 metric tonnes of bushmeat was hunted by farmers in three ecological zones within a six month period (Adeola and Decker 1987).
Sierra Leone	Bushmeat was once a staple food in many Sierra Leonean diets. Despite the increasing scarcity of wildlife throughout the country, bushmeat is available in most rural and urban markets and 55% of all households regularly consume bushmeat (Smith 1979; Teleki and Baldwin, 1981).
Tanzania	Game meat is a source of cheap protein for rural as well as urban populations and is of vital importance particularly for people living around parks and reserves (Chihongo, 1992).
Democratic Republic of Congo	72% of the population in the town of Bukavu consume bushmeat regularly and the annual bushmeat consumption in the town was estimated at 400 tons in 1987 (Keita, 1993). Hunter-gatherers living in the forest areas obtain all their animal protein from the forest and up to 200 animal species ranging from large and medium sized animals to birds, reptiles and insects are exploited for food (Ichikawa, 1993).
Zimbabwe	In addition to large mammals, which are hunted illegally, rodents and birds are used extensively in all small scale farming areas. Honey and insects are collected and eaten by almost all households. Important edible insects include termites, caterpillars and some grasshoppers (McGregor, 1991; Wilson, 1990).
Malawi	In all regions of Malawi wild animals such as caterpillars, termites, game and honey are exploited for food (Nyirenda, 1993).
South Africa	For rural communities living in the vicinity of forests, natural woodlands, and fallow areas, wild animals often play a significant role in local diets. Hunting of large game animals is legally forbidden but various species including genets, field mice, rock hyrax, porcupines, bush pigs, and hares are hunted for food. Monkeys are particularly relished by the Zulus. Reptiles and amphibians such as lizards, leguaans (<i>Varanus</i> sp.), tortoises, snakes and frogs are regarded as delicacies (Maliehe, 1993).

Source: Adapted from Ntiamoa-Baidu, 1997.

In countries such as Botswana and DRC, much of the meat consumed is bushmeat and in the majority of West African states, bushmeat is the preferred meat and has a higher retail value than domestic meat in urban markets (Ntiamoa-Baidu, 1997). In addition to being a highly preferred food item in many areas of Africa, wild animal foods are life-saving reserves in times of food shortage and hunger; the importance of caterpillars, beetles and termites as key sources of food in times of famine is particularly well documented for communities in the Central African sub-region (see for example Wilson, 1990; McGregor, 1991; Takeda and Sato, 1993).

Hart and Hart (1986) indicate that the Mbuti (hunter-gatherers) of eastern DRC harvest about 370kg of wild game per person per year in the rainforests. Similarly, a study of the diet of Kwango-Kwilu villages in DRC showed that the main source of protein was forest game, freshwater fish and insects, especially caterpillars and grasshoppers which were particularly abundant in the period of food shortage (December-January) (Kukwikila *et al.*, 1993). Among the Congolese Ntomba people, the first meat introduced to a baby is fat and liver from hoofed game species such as the blue duiker (*Cephalophus monticola*) and bushpig (*Potamochoerus porcus*). These are introduced when the baby is between 4 and 9 months, with caterpillars being introduced from 12 to 14 months of age (Pagezy, 1993). A survey conducted in 1987 in Bukavu, DRC also found that 72% of the population in the town consumed bushmeat regularly and the yearly bushmeat consumption of the town was estimated at 400 tons (Keita, 1993).

In West Africa, the utilisation of forest game and their products is well documented (see Ajayi, 1979; Asibey, 1977, 1978, 1986; Martin, 1983; Ntiamoa-Baidu, 1987). In this region bushmeat is eaten by all classes of people and it is preferred to domestic meat (Asibey, 1986). For example, bushmeat consumption in Côte d'Ivoire was estimated at 83,000 tons in 1990, valued at US\$ 117,000,000 (Feer, 1993). Similarly, it is estimated that three-quarters of Liberia's meat production comes from forest game, with subsistence hunting yielding as much as 105,000 tons of meat annually (Anstey, 1991, in Ntiamoa-Baidu, 1997). In another study on the utilisation of bushmeat by farmers in three ecological regions (rainforest, deciduous forest and savannah) in Nigeria, Adeola and Decker (1987) estimated that a total of 1,264,000 metric tons of bushmeat were harvested per month by the approximately 2.6million farmers during the rainy season. This was made up of 568,000 metric tons from the forest regions and 696,000 metric tons from the savannah region.

Gathered animals (as opposed to hunted species) such as snails, turtles, termites, caterpillars and other insects also contribute significantly to the West African diet (Falconer, 1990a). They are especially valued for the flavouring and diversity they add to the diet but their consumption is only occasionally recorded, even in nutrition studies (Annegers 1973). According to Falconer (1990a) snails are the most popular and widely consumed forest animals throughout the West African forest zone. They command high market prices in Nigeria (Martin 1983) and Ghana (Asibey 1986).

Studies on volume of forest game production in Africa tend to be restricted to small areas. The limitation of such data is that they neither capture the actual volume of bushmeat exploited nor cover the entire range of species taken (Ntiamoa-Baidu, 1997). Forest animal species such as rodents, snails and insects, which are often consumed by the hunter and his family, hardly appear in the markets and therefore do not appear in the statistics. As Prescott-Allen and Prescott-Allen (1982) put it, 'when a hunter sells his catch to a neighbour or pops it into the family pot, he rarely tells a statistician'.

Despite the lack of precise estimates on forest game production and consumption, the literature suggests that forest game is one of the most valued and preferred animal protein items in both rural and urban diets in Ghana and many parts of Africa. For example, many studies in Ghana have shown that over 90% of people in both urban and rural areas would eat bushmeat if it was available and for approximately 40-70% of them, bushmeat is the preferred meat (Falconer, 1992; Ntiamoa-Baidu 1992). The popularity of bushmeat was confirmed by the results of a survey of the meat preference of customers visiting chop bars (traditional restaurants) in Accra, where they had a choice of various types of meat and fish dishes. Sixty five per cent of the 374 visitors to the chop bars selected bushmeat dishes (Tutu *et. al.*, 1993).

Important as forest game is in the diets of Ghanaians, several authors have noted that forest animal resources are declining. For example, Redford (1992) notes that the number of some wild game in forests is declining because of over-hunting. Falconer (1990a) also notes that the availability of game meat has declined in most parts of West Africa because of dramatic changes in the rural wildlife habitat and over-hunting.

2.4. Income from forest-based activities

In addition to providing rural people with a source of food, forests also contribute to household livelihood security through the generation of income and employment from the sale and exchange of gathered and processed forest products such as leaves, fruits, mushrooms, snails, fuelwood, rattan, bamboo fibres, pestles, mortar, baskets, mats, etc. (FAO, 1992a). For rural people, especially those with little or no land of their own, forests may provide the main source of cash income. This income does not come solely from wood harvesting. Non-wood forest resources can often generate greater, more sustainable incomes than can be gained from the same land when used for agriculture or

logging (Pimentel *et al.*, 1997). The income obtained from the sale of forest products enhances the ability of rural people to purchase food. Alternatively, it may be invested in agricultural assets such as livestock or seeds to secure future food supplies (Browder, 1990a,b).

In recent years, there has been increasing interest in the contribution of forests and NTFPs as a source of local rural employment and income. This stems from arguments that the contribution is important in terms of both rural livelihoods and sustainable forest management (Arnold and Townson, 1998). Studies on non-farm rural employment and income as a whole has shown that small-scale production and trading activities in forest products constitute one of the largest parts of rural non-farm enterprise employment (Liedholm and Mead, 1993, in Arnold and Townson, 1998). Such findings and assumptions have been an important factor in moves to give much higher priority in forest management to meeting local needs, and to increasing local involvement in (and responsibility for) forest conservation and management. This trend has been reinforced by arguments that, as much local forest use comprises non-timber forest products, it is likely to be less ecologically destructive than timber harvesting, and therefore offers a sounder basis for sustainable forest management (Arnold and Townson, 1998).

Forest product activities constitute one of the most important sources of income for local people in Africa (see Table 2.3). For example, in a survey of six countries in southern and eastern Africa (Botswana, Kenya, Lesotho, Malawi, Swaziland and Zimbabwe) Arnold *et al.* (1994) reported that an estimated 763,000 persons were employed in small-scale production or trading in four types of forest product activity: grass, cane and bamboo products (42 per cent); woodworking (27 per cent); other wood products (11 per cent); and forest products trade (20 per cent). In the period covered by the surveys, it was noted that the net number of new forest product enterprises was increasing. Similarly, a socio-economic survey of all villages inside the Korup National Park in Cameroon, and most of the villages situated within 4 km of its boundary, showed that the most important enterprises in terms of their contribution to the village economy are hunting and the collection and processing of NTFPs (Devitt, 1988, in Amadi, 1993). Amadi (1993) notes that condiments such as *Irvingia* sp. (bush mango), *Ricinodendron heudelotii* and *Afrostryax lepidophyllus* (country onion) account for 25-

50% of overall village incomes, and these activities are of particular importance to women living in the Korup Forest.

Table 2.3. Estimates of employment in forest-based gathering and processing activities in selected African countries

Country	Estimated number of people employed in forest-based activities
Tunisia	The minor forest products trade provides 270,000 days employment a year (Saadallah, 1978).
Côte d'Ivoire	Estimated 65,000 people are involved in rattan cane basketry part-time while 1,500 are involved full-time (Kaye, 1987).
Zambia	96,000 households earn income from handicraft production (Marks and Robins, 1984). 25,000 people are involved in the fuelwood trade. There are more than 52,000 forest-based small-scale processing enterprises, which employ 137,400 people (Fisseha, 1987).
Sierra Leone	18,000 people are employed in forest-based small-scale enterprises (Fisseha, 1987). 60% of the farm households in the Bo region process palm fruits and kernels for sale (Engel <i>et al.</i> , 1985).
Cameroon	Palm wine production provides income for an estimated 20,000 people in the Bos-Wouri region (an estimated 600 tonnes/month of palm wine enter commerce) (Moby-Etia, 1982). 50,000 people are involved in charcoal production (Peskin <i>et al.</i> , 1992). 3,600 people are involved in raphia and rattan processing in the southwestern region (Shiembo, 1986).
Senegal	An estimated 700,000 litres of palm wine enter commerce a year (Forest Service, 1982).
Southern Ghana	About 258,000 people obtain part of their income from NTFP activities (Townson, 1995).

Source: Adapted from Pimentel *et al.*, 1997; Arnold and Falconer, 1988; Arnold, 1994; Falconer and Arnold, 1991.

The size of NTFP markets can be quite substantial both at the local and international levels, providing income for the actors directly involved and for the government. For example, in Cameroon, the size of the market for kola nuts (*Cola acuminata*) is estimated at 20,400 tons per year (Nkongmeneck, 1985, in Ndoye *et al.*, 1997), and in Nigeria, it is estimated that 78,880 tons of *Irvingia* sp. are marketed per year (Department of Forest Resources Management, 1986, in Falconer 1990a).

The recorded exports of Kola nuts from Cameroon to Nigeria and the Central African Republic in 1992 was estimated at 448 tons, while the exports of *Gnetum africanum* (a leafy vegetable gathered from the forest) from Cameroon to Nigeria amounted to 428 tons (AEERD 1993, in Ndoye *et al.*, 1997). At the international level, it is estimated that the annual trade of NTFPs amounts to US\$ 11 billion (Iqbal 1995, in Ndoye *et al.*, 1997).

In Ghana, income-generating activities based on forest products contribute significantly to both rural and urban livelihoods (see Table 2.4). For example, a Forest Resource Management Project jointly funded by the Government of Ghana and the UK Overseas Development Administration revealed that, in the daily urban market in Kumasi (the biggest in Ghana), 700 people were involved in NTFP trade on a full-time basis and more than 90% of the traders were women (Ogden 1996). The study reported that an estimated 160 tons of bushmeat were sold in the market per year with an annual value of US \$ 209,000 while the value of the cane trade was estimated at US \$6,730 per month. According to Ogden (1996), in two of the villages studied (Kwapanin and Essamang) NTFPs constituted the main source of income.

Table 2.4. Commonly traded forest products in Ashanti and Western Region markets, Ghana

1. Foods: Snails Bushmeat Fruits Seeds Mushrooms	5. Cola nut 6. Charcoal 7. Medicines: Leaves Bark Seeds and nuts Animal products Prepared tonics	9. Household goods: Sponge Mortars Spoons and utensils Wooden trays Grinders Mats Baskets
2. Spices: Cloves Nutmeg	8. Wrapping leaves: <i>Marantaceae</i> leaves Other food wrappers	10. Tool handles 11. Rubber balls
3. Chewsticks*		
4. Chewing sponge*		

*These are sticks made from stems, barks, or roots of several different plant species, which are chewed to clean and freshen teeth. The most commonly used species include *Garcinia afzelia*.

Source: Based on Falconer 1991, in Arnold 1994.

A similar study in Kumasi, in the Ashanti region of Ghana, identified on average 650 traders selling forest products in the main market during the period of the survey, with an average of 70 traders bringing supplies into the city daily. The Kumasi market serves as a hub for trade throughout the region, drawing goods into a central point and redistributing them to other markets. It was found that 68% of the 232 people interviewed in villages in the region obtained part of their income from forest-based activities (Falconer 1991, in Arnold 1994). In another study on NTFP-based income activities in southern Ghana, Townson (1995) estimated that approximately 258,000 people (representing 10% of the total population) in the areas within 10 km of forest reserves obtain income from NTFP activities. Over 200,000 households (representing

38% of the total households in the area) had at least one member of the household obtaining income from NTFP-based activities.

Forest-based income activities are not limited to Africa, they are important elsewhere. For example, in the Brazilian Amazon, it is estimated that 1.5 million people derive part of their income from extractive products (FAO, 1994). According to Zhong *et al* (1995), 700,000 people work in the bamboo sector in China and, in India, it is estimated that 50 million tribal people depend on NTFPs for part of their income (Poffenberger, 1996). In Sri Lanka, Gunatilake *et al* (1993) estimate that the average family income from NTFPs is \$253 per year. Similarly, Godoy *et al.* (1993) report that the people of Iquitos, Peru, harvest about \$15 per hectare per year in NTFPs.

While forest-based income activities vary from region to region depending on markets, the local people, their alternative means of employment and the resources of the different ecosystems in which they live, there are some characteristics which are common to many forest-based income earning activities. In general forest-based gathering and processing enterprises are characterised by small size (household level), they are rural based, labour intensive, accessible to the poorer sectors of society, involve low capital costs and they provide direct benefits to the local economy (Falconer and Arnold 1991). The degree to which different forest products are gathered and marketed depends on the need for cash, the accessibility of markets, the quantities of the product that are available as well as the time available for their collection and sale (Arnold, 1994).

2.4.1. Income from gathering enterprises

It is clear then that the gathering and selling of forest products is an important economic activity for many rural people in developing countries. While forest dwellers rely to a large extent on forest products, the forest product gathering and processing industries are not only limited to this population. Forest products gathering activities are less visible because of their intermittent and often transitory nature and therefore they are less easily identified and recorded. Hence information on overall magnitudes and patterns of enterprise activity of the kind that censuses and surveys have produced for processing activities are not available for gathering activities (Arnold, 1994).

Nonetheless, available literature suggests that forest-based gathering activities are one of the most important economic activities in many parts of Africa. A wide range of forest products, such as fruits, vegetables, mushrooms, snails, fuelwood, etc. are gathered and sold almost universally in markets throughout the West African region. While most people, and especially farmers, participate in these activities seasonally, or on a part-time basis, these activities provide employment for many rural and urban people and hence an important source of cash income, as there are often fewer alternative means of income generation in these areas (Falconer, 1990a).

For example, in a survey of 28 markets in the humid forest zone of Cameroon, Ndoye *et al.* (1997) reported that the sale of four NTFPs - *Irvingia gabonensis*, *Cola acuminata*, *Ricinodendron heudelotii* and *Dacryodes edulis* - amounted to 417.1 tons with a value of CFA 175,742,300. Similarly, in a study of Nigerian household use of indigenous farm and wild trees, including the trade and market potential of these tree food products, Okafor (1981) examined the seasonal availability and comparative market prices of 39 wild and 18 cultivated plant species over a three year period at five market sites. He found that the prices of the wild tree products were considerably higher than those of the cultivated species. Okafor concluded that these high prices were a reflection of the popularity and the level of demand for wild food products as well as an indication of their relative scarcity and availability at strategic times in the year when conventional foods are unavailable. Gartlan (1987) also reports that the fruits and seeds of *Irvingia gabonensis* are commonly gathered and marketed in the Korup region of southwestern Cameroon. These are often gathered, dried and sold to Nigerian traders or taken to Nigerian markets, where one bucket fetches approximately CFA 10,000.

Forest products gathering and trading activities are not solely confined to Africa, they are important elsewhere. For example, in Iquitos, Peru, a study of forest product markets identified approximately 5,000 vendors of various forest products in the city in 1986, with the number having grown by nearly a quarter over the previous year. In 14 villages surveyed in the region, nearly all households gathered and sold some forest products, most selling to trading intermediaries in the villages. The main products traded included fruits, leaves, and palm hearts; bags, baskets, and other handicrafts; thatch and other building materials; meat and skins; charcoal and fuelwood; and medicinal plants (Padoch 1988, 1990).

In a similar study in northeastern Brazil, May *et al.* (1985) reported that an estimated 450,000 households rely on cash earned from the sale of gathered and oil-processed kernels of the babassu palm (*Orbignya phalerata*). The majority of farmers in the area are landless (tenant farmers) and babassu palm kernel collection is one of the few ways they supplement their cash income. Babassu palm kernel collection and sale in the area corresponds with the slack period in agriculture, as well as the period of most severe cash needs. Both men and women are involved in the collection of babassu fruits/kernels, though it is primarily the women who extract oil from the kernels. The palm also provides many other products including thatch, baskets, charcoal and food (May *et al.* 1985).

In another study conducted in a lowland village in the Philippines, Siebert and Belsky (1985) discovered that all village households collected forest products for supplementary and emergency income. More than half of the households in the village depended on rattan collection and timber wage-labour as a primary source of livelihood. Siebert and Belsky (1985) concluded that the labour intensive nature and decentralised trade structure of rattan and other non-timber product gathering activities provide more benefits to local economies compared with the timber industry.

2.4.2. Income from processing enterprises

The processing of forest and farm tree products provides an essential source of off-farm income for many rural households. Like gathering activities, NTFP processing is often a part-time activity, which is combined with agricultural and other tasks (Falconer, 1990a).

A wide range of forest and tree products undergo simple processing at the household or small-scale rural enterprise level generating products which are often of great local importance. These products include food, charcoal, household equipment, farming tools, transportation equipment, vehicle parts, wooden or cane/rattan furniture, and other products of wood, baskets, mats, and other products of canes, reeds, vines, grasses, and similar materials. These products serve predominantly rural households and agricultural markets (Arnold, 1994). Another group of products is cultural artefacts or handicrafts (especially decorative ones) which usually go largely to urban markets, to tourists and sometimes even to export destinations (FAO 1987).

For example, a study which summarises data from six countries on the nature, magnitude and contribution of forest-based small-scale enterprises to rural income and employment found that the majority of enterprises produce furniture, agricultural implements, vehicle parts, baskets, mats, and other products of cane, reeds and vines. The study noted that small-scale forest-based processing enterprises serve predominantly rural households and agricultural markets, and are usually their principal source of supply. Handicraft production, however, generally served urban and occasionally export markets (Fisseha, 1987). Table 2.5 summarises the main types of processing activities in the six countries.

Table 2.5. Composition of the small-scale forest-based manufacturing enterprise group in selected countries

Forest-based small-scale enterprise types ¹	% of total number of enterprises					
	Jamaica	Honduras	Zambia	Egypt	Sierra Leone	Bangladesh
Saw-milling/pitsawing	0.8	3.2	5.6	-	0.1	0.9
Carpentry/furniture	23.1	71.4	14.3	23.8	66.8	27.2
Wood carving/bamboo/ cane	12.5	0.2	11.9	-	5.9	11.6
Basket/mat/hat making	63.5	10.6	60.3	70.4	23.8	32.4
Other ²	0.1	14.6	7.9	5.8	3.4	27.9

1. Many forest-based small-scale enterprises do not specialise in the production of one item; so classification sometimes depends on the most dominant or important activity.

2. The "other" category includes activities such as broom making in Honduras, fuelwood in Zambia, agricultural tools in Egypt, and container making and agricultural tools in Bangladesh.

Source: Fisseha (1987).

Small forest-based processing enterprises are generally characterised by very small size, heavy reliance on entrepreneurs and members of their families for labour, technological simplicity of operations, low capital intensity, limited industrial and managerial skills, seasonality of activities (especially for the smallest ones) and rural location bias (Arnold 1994) (see Table 2.6).

Table 2.6. Characteristics of small forest-based manufacturing enterprises in selected countries

	Jamaica	Honduras	Zambia	Egypt	Sierra Leone	Bangladesh
<u>Share of total small enterprises</u>						
Value added (%)	47	16	-	18	23	18
Value of production (%)	49	14	-	19	27	-
<u>Employment</u>						
Total employment ('000)	10.2	-	137.4	-	18	-
Family members (%)	82	51	86	89	41	73
Women employed (%)	30	6	12	31	-	21
Women owners (%)	32	10	12	65	-	3
<u>Size of enterprise</u>						
Workers per enterprise (No.)	2.2	2.2	1.7	1.9	1.8	3.8
One-person operations (%)	58	59	69	69	-	36
Home-based (%)	52	72	81	76	-	-
Average investment (US \$)	3030	1055	-	-	431	255
<u>Rural location</u>						
Enterprises (%)	88	100	96	80	99	97
Employment (%)	79	100	95	65	96	-
<u>Economic contribution</u>						
Rate of return on investment (%)	33	42	-	28	32	54
Net return to family labour (US \$)	2494	1221	-	495	371	30.8
Return to family labour as % of prevailing wage	164	156	-	118	159	161

Source: Derived from Fisseha (1987), cited in Arnold (1994).

For Africa as a whole forest-based processing has been estimated as the second largest rural industry (Page and Steel 1984). In the West African region, common activities include palm oil processing and other forest food processing, alcohol distilling, fish smoking, raphia and rattan basketry, woodworking, cane furniture production, charcoal production, cloth dyeing and soap production (Falconer, 1990a). However, as Falconer notes, there are no comprehensive regional studies which focus on forest-based processing enterprises, or even on processing activities at the country or regional level. What is available are case-specific studies which identify different types of forest-based processing activities and discuss the local-level importance of these enterprises.

Palm oil processing (the extraction of edible oil from palm fruits) provides a very important source of income to a great number of women in West Africa. For example, in a study in the Bo region of Sierra Leone, Engel *et al.* (1985) found that 93% of the rural households were involved in palm oil processing. In this region, palm fruits are always collected from the wild, mostly in fallow areas. While men are responsible for the harvesting of the palm fruits, women are responsible for processing and trading the

oil. The researchers found that 60% of the female producers sell the palm oil they produce. Cashman (1987) also found that palm oil processing was one of the most lucrative activities for women in southeastern Nigeria. Cashman compared a range of income earning activities: cola nut, fruit, vegetable, meat and fish sales, palm oil, maize, and locust bean processing, and soap making. She found that palm oil processing and the sale of cola nuts were the most profitable activities. However, the initial investment required for cola trading was comparatively high, and the labour required in palm oil processing was great.

Rattan, cane and raphia processing are also important forest-based activities, which contribute substantially to rural incomes. Baskets, mats, crop dryers (e.g. mat for cocoa drying), traps and furniture are all typically made from palm products and are widely used in rural households throughout West Africa. For example, in southwestern Cameroon, Shiembo (1986) estimated that some 3,600 people were involved, at least part-time, in small-scale raphia and rattan weaving. He found that raphia and rattan products were more expensive due to raw material shortages. Similarly, in a study of cane weaving enterprises in Kumasi, Ghana, Darko (1981) found that men dominated weaving activities while women dominated the trade of raw cane and fabricated cane products. He noted that irregularity in the supply of rattan and raphia, which are the main inputs, was the greatest problem producers faced.

The production and marketing of palm wine² and palm alcohol³ is another important income earning activity in West Africa. In Nigeria, Panayotou and Ashton (1992) report that palm wine is a lucrative forest product and the gross revenue per palm tree per day for wine ranges from \$0.26 to \$1.99. They note that the income from palm wine production is as much as \$17 per day per worker. Palm wine production is also a big business in the Bas-Mungo and Bas-Wouri areas of southern Cameroon. In this region, approximately three quarters of the men in villages produce palm wine, and palm wine production provides a living for an estimated 20,000 people. An estimated 6,000 tonnes of palm wine enter commerce from this region each month and a small producer earns between CFA 20,000 and 35,000 a month (Moby-Etia, 1982, in Falconer 1990a).

² Palm wine is the fermented sap of either the raphia palm (*Raphia hookeri*) or the oil palm (*Elaeis guineensis*).

³ Palm alcohol is processed from palm wine through distillation. In Ghana palm alcohol is generally called "akpeteshie".

2.4.3. Income from hunting and bushmeat marketing

Hunting and marketing of bushmeat provide employment and income to a large number of rural people. In the past, most hunters in Africa hunted for the family pot but today the majority are market hunters. A high proportion of hunters in the region would choose to sell their quarry and purchase cheaper forms of protein to feed their families, so that the money left over can be used for other basic family needs (Ntiamoa-Baidu 1997). The general trend in the past was for smaller species to be consumed locally while larger animals were sold. However, this trend is changing as a result of a combination of factors including increased demand, scarcity and the need for cash (Ntiamoa-Baidu, 1997). Hence, species like pangolins, reptiles and rodents, which were in the past consumed by the hunters' household or even only by children, now find their way into the market.

In Africa today, there are very few people whose occupation is solely hunting. Most hunters work full-time on other jobs such as farming and only hunt on a part-time basis. However, the money earned from hunting provides an important and substantial source of supplementary income for many hunters and/or farmers (see Asibey 1977). For example, in Nigeria, Asibey (1987) asserts that hunting provides a good source of income. He estimates that the sale of 4 grasscutters (*Thryonomys swinderianus*) and 3 duikers (*Cephalophus monticola*) a month would place a hunter in the lower middle income group (\$130-660/year). Infield (1988) also indicates that the sale of bushmeat constitutes up to half the household income in rural Cameroon and is one of the main occupations of young men living in the Korup forest. He reports that the annual income from hunting and trapping in villages around the Korup National Park amounts to approximately CFA 425,000 per hunter and accounts for 56% of the total village income.

The Kola Pygmies of southern Cameroon provide an example of total dependence on wildlife for cash income. The Pygmies' main occupation is hunting and they obtain as much income from the sale of their quarry as cocoa farmers in the area (Ntiamoa-Baidu, 1997). The money derived from hunting is used to procure food, alcoholic beverages and manufactured items. The Pygmies also exchange bushmeat for carbohydrate food from their neighbours (Wilkie 1989, in Ntiamoa-Baidu, 1997).

In Ghana, hunting is a profitable occupation and lucrative bushmeat markets exist in most major cities. In a study of the economics of living with wildlife in Ghana, hunters supplying meat to the Atwemonom⁴ market in Kumasi were interviewed for information on their activities (Tutu *et al.* 1993). All indicated that they were part-time hunters and their main occupations were farming, driving or artisanal. The hunters spent from a few hours daily to up to 11 hours at weekends hunting. They operated individually, hunting with guns or trapping with snares. Animals commonly caught were Maxwell duikers, bushbucks, black duikers, royal antelopes and grasscutters, and the average income from hunting was 9,850.00 cedis (¢)⁵ per week (Table 2.7). Tutu *et al.* (1993) noted that this amount was up to 40% more than the salaries of government employees in grades equivalent to the full time jobs of the hunters interviewed.

Table 2.7. Average catch and income of hunters supplying meat to the Atwemonom market in Kumasi, Ghana.

	Average	Range
Age of hunter	33.75	23 - 70
Number of hunts per week	2.08	1 - 7
Length of hunting trip (hrs)	4.42	1 - 11
Time spent hunting each week (hrs)	8.69	1 - 35
Average catch per hunt	1.29	1 - 4
Income per week from hunting (cedis, ¢)	9,850	1,500 - 27,000
Selling price of animals caught (cedis, ¢)		
Maxwell duiker	4,075	1,600 - 5,000
Black duiker	9,167	8,500 - 10,000
Grasscutter (Cane rat)	2,750	1,500 - 4,000
Royal antelope	2,750	1,500 - 4,000
Bushbuck	16,220	9,000 - 27,000
Others	1,924	700 - 3,000

Source: Tutu *et al.* (1993).

Apart from the direct income derived from bushmeat by hunters, hunting also provides employment and income to a network of people including helpers, carriers, and a chain of traders. For many women in Ghana, for instance, the bushmeat trade is the main source of livelihood (Ntiamoa-Baidu, 1987). There are a number of bushmeat market centres in Ghana, notably the Kantamanto market in Accra and the Atwemonom market

⁴ Atwemonom is one of the three main bushmeat market centres in Kumasi, Ghana. The other two are Kejetia and the Central market. The name "Atwemonom" (*Atwe* = plural for duiker; *mono* = fresh) means a place for fresh duiker meat in the Akan language.

⁵ In 1993, US \$1 was equivalent to approximately ¢700.

in Kumasi. The bushmeat trade in these markets is highly organised, providing the main source of income to a chain of bushmeat traders (mainly women) involving wholesalers and retailers (Falconer, 1992; Tutu *et al.*, 1993). In Atwemonom market, for instance, traders whose mothers, grandmothers and great grandmothers had been bushmeat traders can be found.

The bushmeat market in Ghana has been studied for varying periods since the 1970s. Ntiamoa-Baidu (1997) reports that between 1971 and 1986, a yearly average of 68,797kg (range=19,750-105,003kg) of fresh bushmeat carcasses from 10 to 25 different wild animal species was recorded in the Kantamanto market. Similarly, in a study on volume of fresh and smoked bushmeat coming into bushmeat markets in Kumasi, a total of 13,884.6 kg of bushmeat valued at ₵9,251,759.00 were recorded over a 27-day period in 1991. This comprised 3,682 animal carcasses belonging to 31 species (Falconer, 1992).

In 1993, an attempt was made to obtain a more complete picture of the volume of bushmeat passing through the Atwemonom market in Kumasi. Observers were stationed at the market from dawn to dusk everyday over a one-week period in March to record the species, weights, and purchase and retail prices of every animal coming to the market. A total of 534 carcasses weighing approximately 5,525kg were recorded (see Table 2.8). The profit margin of the bushmeat traders ranged from 30 to 250% depending on the species and size of animal involved (Ntiamoa-Baidu, 1997). According to Ntiamoa-Baidu (1997), a comparison of these findings with the results of earlier studies showed that:

- species composition and volume of individual species marketed varies from year to year;
- the price per head of all species has increased several fold;
- there is no indication of decrease in the sizes of animals being hunted; and
- there has been very little change in the overall level of exploitation.

These findings suggest that although the population of most wild animal species is believed to be declining in Ghana, hunters continue to put more effort into hunting to maintain supply levels and satisfy the growing demand for bushmeat.

Table 2.8. Bushmeat trade in Atwemonom market, Kumasi, Ghana (over a one week period, March 1993)

Species	Total No.	Total Wt.(kg)	Purchase Price (¢)	Retail Price (¢)
Grasscutter (Cane rat)	140	588	476,822	747,703
Maxwell's duiker	118	869	537,100	745,000
Bushbuck	66	2,636	1,038,500	861,000
Brush-tailed porcupine	61	193	138,900	252,000
Black duiker	59	1,097	600,000	588,500
Royal antelope	42	96	67,628	130,524
Giant rat	23	24	12,200	17,000
Francolin	14	7	5,900	13,000
Mona monkey	2	5	3,500	6,500
Forest genets	1	2	1,000	2,000
Tree pangolin	2	2	1,500	-
Dwarf mongoose	3	3	1,200	-
African civet	1	-	5,500	-
Pel's flying squirrel	2	3	1,500	-
Total	534	5,525	2,891,250	3,363,227

Source: Ntiamoa-Baidu (1997)

The Ghana bushmeat trade illustrates the multiplier effect of income from hunting and other forest-based activities. The trade provides the main source of livelihood for the traders and their families and several of the traders operate as family groups with one woman as the head, assisted by her children and grand children.

2.4.4. The use of NTFPs in traditional medicine and the market for medicinal products

Forests provide the essential ingredients for traditional medications still used in many parts of the developing world. For most people, natural products represent the only source of medicine. Wild animal and plant species thus form the basis of traditional medicines and the primary ingredients used by traditional healers in Africa and other parts of the developing world. The practice of traditional medicine is widespread in Africa and market stalls selling plants and animal parts for medicines are common in both rural and urban markets throughout Africa. Roots, bark, leaves, flowers, fruits, and seeds are all used and animal parts include the meat, hair, skin, tail, bones, teeth, fat, glands and faeces (Ntiamoa-Baidu, 1997).

Many forest plant species are believed to have medicinal and curative properties. For example, the bark of the tree *Khaya senegalensis* is used for the treatment of intestinal problems in tropical Africa and, in Cameroon, *Prunus africana* is exploited commercially for medicinal purposes because its bark contains compounds used in the treatment of prostatitis (Nurse *et al.*, 1995). In some places in Kenya, the bark of *Acacia* is used to treat malaria, and its ash to cure milk and give it good taste (Pretty, 2002). In many cases one plant species is used for treating a variety of ailments. For example, in the forest zone of Côte d'Ivoire, *Cassia occidentalis* is used in 11 medicinal recipes. Decoctions of its leaves and roots are used as a diuretic, a laxative, a tonic and abortifacient, as well as in treatments for asthma, cataracts and jaundice (Ake-Assi, 1984 in Falconer, 1990a). Similarly, in one village in Ghana, Amponsah (1980) found that all villagers regularly used traditional plant medicines. He identified 105 commonly used medicinal plant species, noting that most were used to treat more than one ailment and that there were generally several treatments for the same disease.

Wild animals are also believed to have medicinal and curative properties. For example, Maliehe (1993) lists the scrub hare (*Lepus saxatilis*), cape hare (*L. capensis*), porcupine (*Hystrix africae australis*), the polecat (*Ictonyx striatus*) and the pangolin (*Manis temminckii*) as animals whose body parts are used in traditional medicine in South Africa. Similarly, in Ghana, Ntiamoa-Baidu (1992) reported that the parts of 26 species of wild animals are commonly used in traditional medicines among communities living around forest national parks in southwestern Ghana (see Appendix 1).

The sale of traditional medicines contributes significantly to household incomes in many parts of Africa and both men and women are involved in this activity. In an assessment of resource use in the Oku Mountain region of Cameroon, Macleod (1987) noted that *Prunus africana* bark collection provided an important source of off-farm income for local residents. The bark is sought after by several large pharmaceutical companies who use it to produce drugs for prostate gland treatments. Macleod estimated that one-third of the people from the region supplement their income through the sale of *Prunus africana* bark. In a similar study in the Western and Ashanti Regions of southern Ghana, Falconer (1992) reported that 29% of the 165 households interviewed collected plant medicines for sale. Falconer noted that the collection of the fruits of *Piper guineensis* is an important source of income for many people (especially women) in the region and the returns from this activity could range between ₦1,000 and 16,000

(£1.80 - £29) per week. For most people, the collection and sale of plant medicines is a part-time activity, and in none of the households interviewed was gathering of medicinal plants a major source of income. However, it provides an important supplementary income for poorer households at particular times of the year.

Although the effectiveness of most traditional medicines has not been scientifically studied and proven, and their potency in many cases may be questionable, many of those who use traditional medicines out of preference or out of necessity believe in their effectiveness and will probably continue to use them for a long time to come. By relying on these cheaper or free forms of medicines, money which would otherwise be spent on medical bills becomes available for purchasing food or other essential household items.

2.4.5. Fuelwood harvesting, consumption and marketing

Wood, in the form of firewood or charcoal, is the most common fuel in developing countries and is primarily used for cooking and heating. In many areas of the developing world the felling of trees and shrubs for energy purposes is thought to be a growing cause of environmental damage because the supplies can no longer meet the demand in an ecologically sound way.

According to Hall (1994), three-quarters of the energy in sub-Saharan Africa is derived from biomass in the form of fuelwood (firewood), charcoal, crop and wood residues, and dung. Nearly all households use bio-energy in some form, and in rural areas, dependence is overwhelming. He notes that a number of African countries such as Rwanda, Tanzania, and Uganda depend on biomass for over 90% of their total energy supply. Peskin *et al.* (1992) also reports that various kinds of plant biomass provide up to 90% of the energy needs of the rural poor in developing countries. In Ghana, for example, fuelwood constitutes about 70% of the total energy consumption (de Graaf and Parren, 1995). According to them fuelwood consumption in West Africa (Ghana, Côte d'Ivoire and Liberia) is estimated to be twelve times the volume of timber logs harvested from the forest.

The exploitation of forest resources for fuelwood provides an important source of income for many people in Africa, especially women. Fuelwood is characteristically

traded between rural and urban areas, although some wood is purchased in rural areas suffering from severe deforestation or by rural processing enterprises requiring large quantities of fuelwood. Generally, there is open market access, many buyers and sellers, few if any government price interventions, and high transportation costs in relation to the value of the fuelwood (Falconer and Arnold, 1991).

For example, in a detailed study of the production, marketing and household use of fuelwood in three rural and urban areas of Sierra Leone, Kamara (1986) found that the rural fuelwood market is located primarily in villages near roads leading to towns. Most traders sell fuelwood part-time in order to supplement their household income. The majority of fuelwood collectors and sellers are women, in both rural and urban areas, although rural men provide about 20% of the marketed fuelwood. The income earned from fuelwood collection plays an important role in the agricultural cycle. It provides the first cash income from land cleared for rice production. Subsequently, fuelwood collection for the market is concentrated during the off-peak agriculture period, providing cash income in a period when food supplies are generally at their lowest (Kamara 1986).

In a similar study of fuelwood exploitation and consumption in a village near Accra in Ghana, Ocansey (1985) found that the fuelwood trade to Accra and other urban centres is an extremely important economic activity for the villagers, especially during the fishing season when the demand for fuelwood increases due to fish-smoking activities. He noted that, on average, 50.94m³ of wood leaves rural communities every day and, on average, 1.37m³ of fuelwood is consumed per person annually. Farm and fallow lands were the main sources of fuelwood, although fuelwood collection from natural woodlands, public plantations and private woodlots was also significant.

In most developing countries, especially in Africa, fuelwood collection requires a substantial amount of time and effort due partly to the decline in supply and an ever-increasing number of people who depend on fuelwood as their main source of energy. For example, in Ghana and Mozambique, families spend from 1.5 to 5 hours each day collecting biomass to use as fuel (Peskin *et al.*, 1992).

2.4.6. Importance of forest-based enterprises and income for rural households

Forest-based enterprises are especially important for the rural poor (many of whom are women), as frequently they must rely on off-farm employment opportunities and available forest resources to help meet their household needs. One of the greatest advantages of small forest-based enterprises (when compared with larger enterprises) is that benefits accrue directly to the local rural households, often providing crucial sources of cash income (Falconer and Arnold, 1991).

In many cases a significant percentage of a household's income is generated through forest-based activities. For example, in a study in rural Sierra Leone, Engel *et al.* (1985) found that 18.6% of farmers considered non-farm enterprises (including processing activities, fuelwood collection, hunting, fishing, palm wine tapping, craft and construction) their most important activity in terms of labour input and benefits for the household. A further 14% considered them as the second most important activity after farming.

Although in many rural communities the absolute numbers of those involved in small-scale forest-based enterprises may not be high in relation to the entire rural population, they form a large share of those employed outside agriculture. For example, the estimated 90,000 persons employed in informal forest-based processing in the rural areas of Zambia in 1985 accounted for one third of all rural manufacturing employment in the country (Fisseha and Milimo, 1986). And of the 51,000 persons found to be employed in craft activities in Rufiji District in neighbouring Tanzania, more than 70% were engaged in forest-based activities (Arnold, 1994).

Forest-based work is only part of a diversity of activities employed by rural households for income generation. The close integration of forest-based activities with other household work makes it difficult to separate out income from forest-based activities, and even more difficult to define how they contribute to rural household livelihoods (Arnold, 1994). Nonetheless, the literature suggests that in many areas they provide supplementary, seasonal and emergency income to rural households. Income earning activities based on marketable forest products may be seasonal or year-round, or may be occasional when supplementary cash income is needed. In many rural communities where poor farmers cannot raise enough to be self-sufficient in food, and are forced to

earn cash for food purchases, income from forest-based activities may supplement the household budget. For example, in a village in the Philippines, Siebert and Belsky (1985) report that poor farmers rely on year-round rattan gathering as a major source of supplementary income.

Forest products are sometimes marketed to meet seasonal cash needs. Sale is a predominantly seasonal activity, which is at its height during the agricultural slack periods, when less time is required for farming activities and the need for cash is high. Some activities are seasonal because the product or raw material can only be gathered at certain times of the year (e.g. mushrooms or snails), while others are constrained by the seasonality of other activities (e.g. agricultural production), or seasonally induced cash needs (e.g. school fees) (Arnold 1994). For example, in Sierra Leone, the collection of fuelwood for the market closely mirrors the work requirements for agriculture. During the slack months, fuelwood collection increases (Kamara, 1986).

The third role of forest-based activities, as a source of income that people can fall back on in times of crop failure or shortfall, or in order to cope with some other form of emergency, can be very important. A large sum may be urgently needed at certain times- for medical treatment, a funeral, rebuilding a house or hut or replacing lost or damaged capital equipment. Forest-based income is important in all these emergency situations. In Ghana, for example, it has been reported that the greatest function that forests serve to those living near them is as a buffer: both environmentally and economically. They provide products and opportunities for income earning at times when other options fail (Falconer 1991).

2.5. Conclusion

This chapter has shown that forest resources play a crucial role in the livelihoods and well being of people living in or close to forest environments. In many rural communities, forests provide food (especially during emergency periods) and a range of other NTFPs, such as medicines, firewood, building materials, etc., which are important for the survival of the household. Forests are also important sources of income in many rural households. Thus, both directly and indirectly, forests and trees are closely linked to the livelihoods of rural people.

Forest foods, employment and income are commonly important parts of rural strategies that tide households over the seasonal gap between harvests, and enable them to cope with drought or other emergencies which reduce supplies of staple foods or cash crops. The counter-seasonal nature of many forest-based activities also helps even out the peaks and troughs in demands on farm household labour.

In general, poorer households are more dependent on forest-based resources for their livelihoods. However, there can also be different levels of dependency within a household. For women, the sale of forest products can be the most significant cash earner. Women may concentrate on mat and basket making, which can be performed in or near the home, and thus allow them to combine these income-earning activities with other household tasks.

A decline or deterioration in forest resources, or reduced access to the forest, are therefore likely to affect different people in different ways. Subsistence users of forest products, who depend on the forest for meeting basic needs, are likely to perceive change differently from hunters and gatherers and others who depend on harvest from the forests for employment and income.

In the next chapter, the discussion focuses on Ghana and its forestry sector. The chapter sets the scene for the study by providing the background to forests and forestry practice in Ghana. It traces the history of forest reservation and conservation as well as the historical development of forest policy and forestry legislation in the country.

CHAPTER 3

FORESTS AND FORESTRY PRACTICE IN GHANA

3.1. Introduction

Ghana has been richly endowed with forest resources which are vital for the country's development and future prosperity. Forestry is a major contributor to Ghana's GDP (see section 3.9) and also fulfils important social and ecological needs. Timber from the tropical high forests has traditionally ranked third as a foreign exchange earner, while fuelwood, bushmeat, medicinal plants and other natural products have continued to contribute significantly to the welfare of most Ghanaians. Ghana's attempts to manage her forest resource sustainably have varied over time in recognition of the environmental, economic and social changes that have occurred in the country.

Forestry practice in Ghana dates back to 1909 when a Forestry Department was established to manage the forest estate, which was in the process of being established through reservation. The demarcation and reservation of the forest estate was largely completed by 1939 and a Forest Policy was adopted in 1948. However, the policy mainly emphasised the sustained supply of timber for the wood industry and promoted the exploitation and eventual demise of unreserved forests. In 1994, the need for specific government guidance and control of forestry activities in Ghana became necessary due to changes that had occurred in the nature of Ghana's forests since the adoption of the 1948 Forest Policy. A New Forest and Wildlife Policy was therefore promulgated in 1994 to help protect and develop the remaining forests of Ghana.

This chapter focuses on the historical development of forestry practice in Ghana. It begins with a discussion of the geographical conditions in the country, highlighting the major aspects that might have a direct and/or significant bearing on the natural environment and the economy. The chapter examines the history of forest conservation and reservation in Ghana and provides a historical overview of the country's forest policy. It also examines the country's permanent forest estate (reserved forests) and the

extent of forest loss and closes with a discussion of the contribution of forestry to the economy of Ghana.

3.2. Ghana: a geographical perspective

3.2.1. Location and size

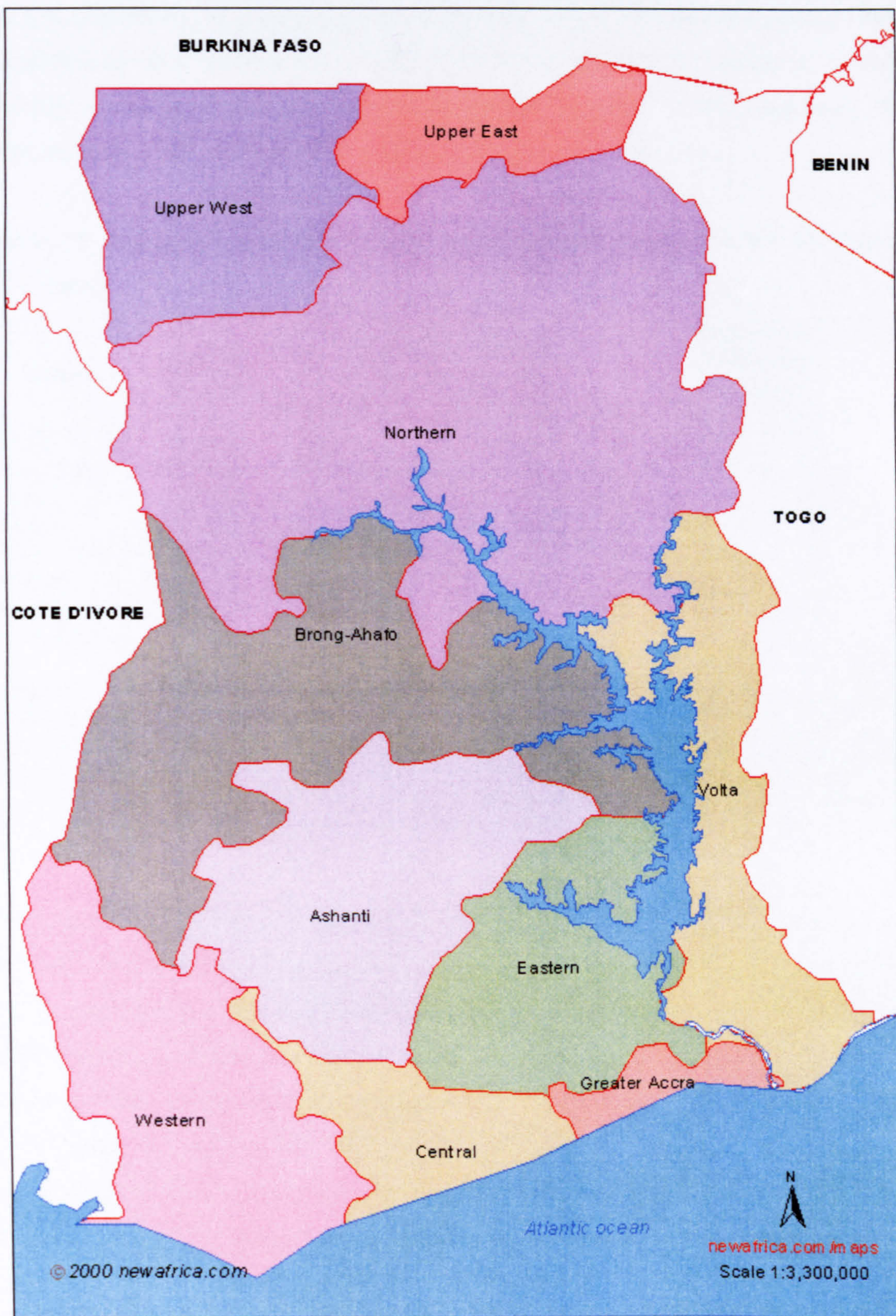
Ghana is situated in the centre of the countries along the Gulf of Guinea in West Africa. It shares borders with the three French-speaking nations - Côte d'Ivoire to the west, Togo to the east, and Burkina Faso (formerly Upper Volta) to the north. In the south, it is bordered by the Atlantic Ocean (the Gulf of Guinea) (see Figure 3.1). The seacoast is 554 km long. The country has a rough rectangular area of 238,537 km², about the size of the United Kingdom, and lies between latitudes 4° 44' and 11° 11' North and longitudes 01° 12' and 03° 11' West. The Greenwich Meridian, which passes through London, also traverses the eastern part of Ghana at Tema. From South to North, the country stretches about 850 km (Rimmer, 1992).

Administratively, Ghana is divided into ten regions as follows (capital cities/towns in brackets): Ashanti (Kumasi), Brong Ahafo (Sunyani), Central (Cape Coast), Eastern (Koforidua), Greater Accra (Accra), Northern (Tamale), Upper East (Bolgatanga), Upper West (Wa), Volta (Ho) and Western (Sekondi-Takoradi) (Figure 3.1).

3.2.2. Population

Ghana is one of the most populous countries in West Africa. The population has been increasing since the country achieved political independence in 1957. Ghana's first post-independence census in 1960 counted 6.7 million inhabitants. In 1970, the national census registered 8.5 million people, about 27% increase. The official census in 1984 recorded a figure of 12.3 million, almost double the 1960 figure (Ghana Statistical Service, 1991). The year 2000 population and housing census recorded a little over 18.4 million people, with a population density of 77 persons per square kilometre. This represents an increase of 49.7% over the 1984 population (Ghana Statistical Service, 2000).

Figure 3.1. Map of Ghana showing administrative regions



Source: <http://www.ghanaweb.smarthosting.com/img/pics/59387424.gif>

In Ghana, localities of 5,000 persons and above have been classified as urban since 1960. On this basis, the 1960 urban population totalled 1,551,174 persons, or 23.1% of the total population. This increased to 28% in 1970, and to 32% in 1984 (Berry, 1994). According to Ghana's Ministry of Agriculture's estimate, the percentage of Ghana's population residing in rural areas in 1996 was 68% (MOFA, 1997), indicating that urban residency still remained 32% of the population (see Table 3.1).

Table 3.1. Ghana's population density and rural-urban distribution by region, 1970-2000

Region	Area (sq. km)	Population Density (Persons/sq. km)					Population Distribution (1996) (%)	
		1970	1984	1990	1996	2000	Rural	Urban
Ashanti	24,389	61	86	104	122	131	68	32
Brong-Ahafo	39,557	19	31	37	46	46	73	27
Central	9,826	91	116	140	155	161	71	29
Eastern	19,323	63	87	105	122	109	72	28
Greater Accra	3,245	278	441	534	678	897	17	83
Northern	70,384	10	17	20	26	26	75	25
Upper East	8,842	61	87	106	125	104	87	13
Upper West	18,476	17	24	29	33	31	89	11
Volta	20,570	46	59	71	79	78	80	20
Western	23,921	32	48	59	71	77	77	23
Ghana (Total)	238,533	36	52	62	72	77	68	32

Source: Based on information from Ghana Statistical Service (1991) *Quarterly Digest of Statistics*, Accra, December 1991, Tables 94, 95 and 96; Ministry of Food and Agriculture (MOFA) (1991, 1997) *Agriculture in Ghana: Facts and Figures*, Policy Planning, Monitoring and Evaluation Department (PPME), Accra, Ghana, Table 3.1; and Ghana Statistical Service (2000) 2000 Population and housing census, Table 3.

Urban areas in Ghana have customarily been supplied with more amenities than rural locations. Consequently, Kumasi, Accra, and many towns within the southern economic belt attract more people than the savannah regions of the north. Only Tamale in the north has been an exception. The growth of urban population notwithstanding, Ghana continues to be a nation of rural communities. The 1984 enumeration showed that six of the country's ten regions had rural populations of 5% or more above the national average of 68%. These figures are not very different from the 1970s when about 72% of the nation's population were living in rural areas (Berry, 1994).

3.2.3. Topography

Ghana is characterised in general by low physical relief. About one-third of the country is less than 150m above sea level, and half is between 150m and 300m. Most of the

remaining area lie between 300m and 600m in altitude. Indeed, much of the country is gently undulating with some marked escarpments, but no great heights. The highest elevation, Mountain Afadjato in the Akwapim-Togo Ranges, rises only 880m above sea level (Prah, 1994).

Nonetheless, there are five distinct topographical regions. The Low Plains stretch across the southern part of the country. To their north lie three regions - the Ashanti Uplands, the Akwapim-Togo Ranges, and the Volta Basin. The fifth region, the High Plains, occupies the northern and northwestern sector of the country (Berry, 1994). The Low Plains comprise the four sub-regions of the coastal savannah, the Volta Delta, the Accra Plains, and the Akan Lowlands. Almost flat and featureless, the Accra Plains descend gradually to the Gulf of Guinea from a height of about 150m. The topography east of the city of Accra is marked by a succession of ridges and spoon-shaped valleys (Berry, 1994).

The Akwapim-Togo Ranges in the eastern part of the country consist of a generally rugged complex of folded strata, with many prominent heights composed of volcanic rock. The ranges begin west of Accra and continue in a north-easterly direction, finally crossing the frontier into Togo. In their south-eastern part, the ranges are bisected by a deep, narrow gorge cut by the Volta River. The head of this gorge is the site of the Akosombo Dam, which impounds the river to form Lake Volta. The average elevation in this section is about 450m, and the valleys are generally deep and relatively narrow. Occupying the central part of Ghana, the Volta Basin covers about 45 percent of the nation's total land surface. Its northern section, which lies above the upper part of Lake Volta, rises to a height of 150 to 215m above sea level. To the south and the south-west, the basin is less than 300m. The general terrain in the northern and northwestern part of Ghana (the High Plains) outside the Volta Basin consists of a dissected plateau, which averages between 150 and 300m in elevation (Berry, 1994).

3.2.4. Climatic conditions

Ghana has a tropical climate, characterised most of the year by high temperatures, constant breezes and sunshine. The country's warm and humid climate has an annual mean temperature of between 26°C and 29°C. Variations in the principal elements of temperature, rainfall, and humidity that govern the climate are influenced by the

movement and interaction of the dry tropical continental air mass, or the harmattan, which blows from the northeast across the Sahara, and the opposing tropical maritime or moist equatorial air mass. Annual rainfall in the extreme southwest is 2000mm or more; on the outer perimeter of the forest zone it is about 1,400mm, and in the northern savannahs, 1,000-1,500mm. The coastal savannah known as the Accra plains has the lowest precipitation, around 750mm (Rimmer, 1992).

Climatic conditions across the country are not uniform. The Kwahu Plateau, which marks the northernmost extent of the forest area, also serves as an important climatic divide. To its north, two distinct seasons occur. The harmattan season, with its dry, hot days and relatively cool nights from November to late March, is followed by a wet period that reaches its peak in late August or September. To the south and southwest of the Kwahu Plateau, where the annual mean rainfall from north to south ranges from 1,250mm to 2,150mm, four separate seasons occur. Heavy rains fall from about April through late June. After a relatively short dry period in August, another rainy season begins in September and lasts through November, before the longer harmattan season sets in to complete the cycle (Berry, 1994).

The extent of drought and rainfall varies across the country. To the south of the Kwahu Plateau, the heaviest rains occur in the Axim area in the southwest corner of the country. Farther to the north, Kumasi receives an average annual rainfall of about 1,400mm, while Tamale in the drier northern savannah receives rainfall of 1,000mm per year. From Takoradi eastward to the Accra Plains, including the lower Volta region, rainfall averages only 750mm to 1,000mm a year.

Temperatures are usually high at all times of the year throughout the country. At higher elevations temperatures are more comfortable. In the far north, temperature highs of 31°C are common. The southern part of the country is characterised by generally humid conditions. This is particularly so during the night, when 95 to 100% humidity is possible. Humid conditions also prevail in the northern section of the country during the rainy season. During the harmattan season, however, humidity drops as low as 25% in the north (Prah, 1994; Berry, 1994).

3.2.5. Vegetation

Based on physiognomy, the natural vegetation of Ghana can be broadly classified into four main types (Taylor, 1960, in Prah, 1994), which are closely related to the climate, namely:

- Savannah woodland
- Tropical high forest
- Coastal scrub and grassland
- Maritime vegetation

The savannah woodland is situated mainly in the northern part of the country, to the north of the high forest. This formation is typically composed of short-statured, many-branched trees, often less than 15m high, which are frequently widely spaced and do not usually form a closed canopy. The ground flora is composed of a more or less continuous layer of grass. Most of this area lies within the unimodal rainfall zone where peak rainfall occurs in August-September. Although the precipitation is seldom less than 1000mm per year, and may reach 1270mm, the intense dry season from December to April has a limiting effect on the vegetation. During this period, the midday relative humidity is extremely low and the soil becomes very hard. At the beginning of the rainy season, much of the rain runs off the hard-baked soil. The actual rainfall, therefore, is not a true indication of the availability of water for plants (Prah, 1994).

The high forest lies in the southern part of the country, with plentiful rainfall, without prolonged dry periods, and with high relative humidity and temperatures. The forest is multi-layered with three ill-defined strata, excluding shrub and herb layers. The herbaceous layer - or ground layer - is sparse. The shrub layer, comprising woody plants up to about 1.8m is variable in density. In old forests, shrubs may often be absent; however, in others, it may be so plentiful as to make the forest impenetrable.

As mentioned above, the trees usually form three storeys. There is a closed lower canopy in which the trees are typically heavy-crowned and do not reach a height greater than 18m. Above this is the upper storey, also with a closed canopy. The trees stand nearly 40m high and typically have tall straight stems, with the majority having small crowns. Lastly, there are the emergents which may reach a height of up to 60m; they do not form a closed canopy. Among the emergents are found many of the species important to Ghana's timber trade. Entwined throughout the stands are thick-stemmed

lianas and creepers, these being more evident in young secondary forests. There is an abundance of epiphytes, both herbaceous and woody. Seedlings, saplings and poles of tree species belonging to the upper storeys are found throughout the lower storeys. The forest is thus a heterogeneous collection of uneven-aged trees (Prah, 1994).

The coastal scrub and grassland is characterised by underdeveloped trees and shrubs. It extends along the coast and gives way to grass where the drainage is poor. Unlike the coastal scrub and grassland, the maritime vegetation is classed as a single formation. It occurs as a strip along the coast, broken in places by rocky, rising land. The vegetation is conditioned by maritime influences with many of the plants capable of living where the water table is high and the soil water brackish (Prah, 1994).

3.3. The forests of Ghana and forest vegetation zones

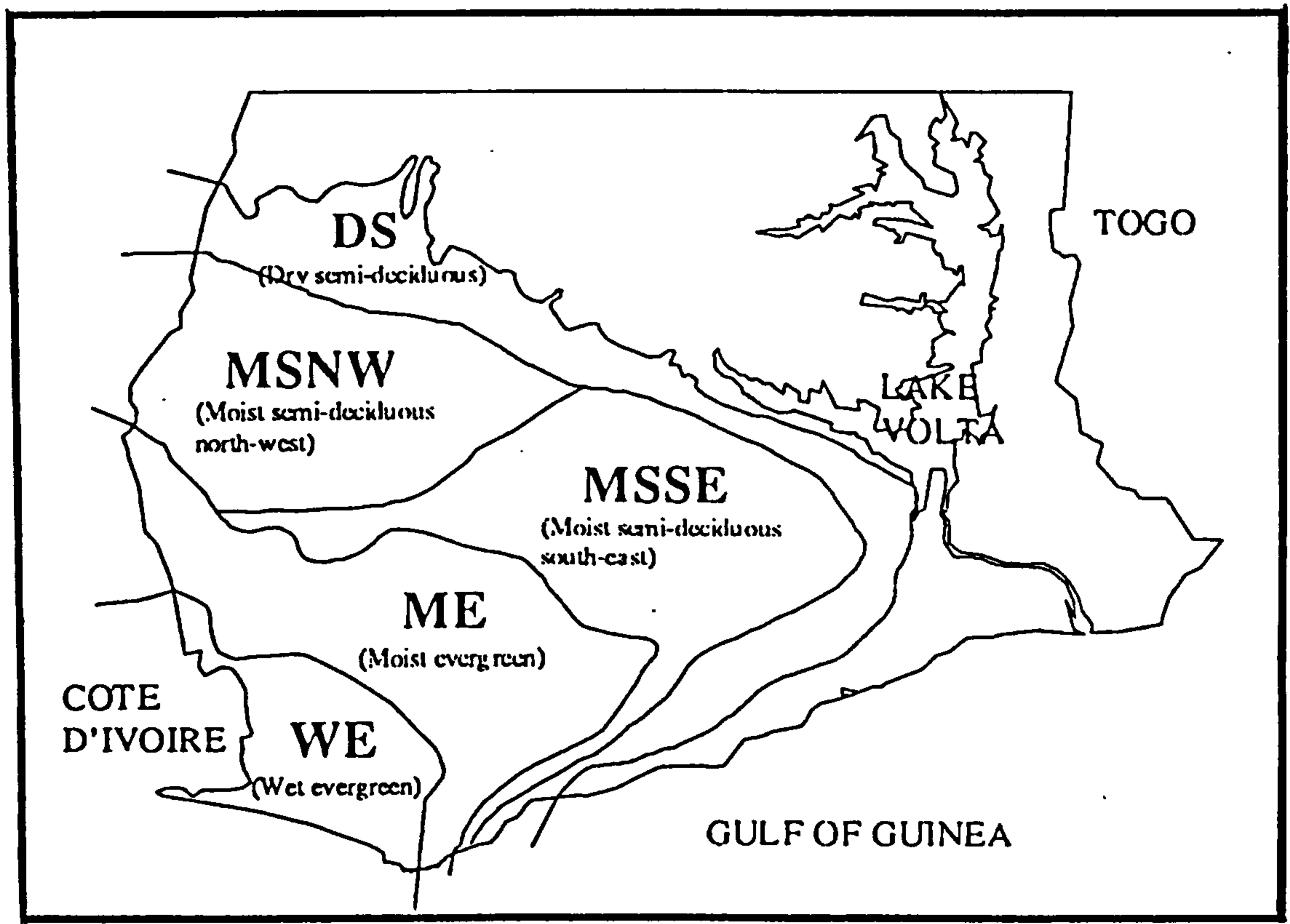
The tropical high forests of Ghana cover about a third of its land area, or 82,000km². The forests are part of the Guineo-Congolean phytogeographical region, their flora and fauna having strong affinity with those of Côte d'Ivoire, Liberia and Sierra Leone, and lesser affinity with the Nigerian forests, from which they are separated by the arid "Dahomey gap" (Prah, 1994). The high forest zone (HFZ) is divided into 5 ecological types¹, each with distinct associations of plant species and corresponding rainfall and soil conditions. These are (1) the Wet Evergreen (WE); (2) the Moist Evergreen (ME); (3) the Moist Semi-deciduous, north-west (MSNW); (4) the Moist Semi-deciduous, south-east (MSSE); and (5) the Dry Semi-deciduous (DS) zones (see Figure 3.2) (Townson, 1995: 3; see also Hall and Swaine, 1981). There is however no distinct line of demarcation between these zones, as one association imperceptibly merges into another. The general pattern is of wetter forest in the south and west turning to increasingly drier forest zones towards the north and east (Prah, 1994).

The WE zone has the highest proportion of its land area under forest reserves. It is also here that much of the remaining off-reserve forest is found, and where fallow land is more abundant (when compared to the other zones). Much of the timber within and outside reserves is under concession. Clearance of forest for small-scale mining is also an important problem. The principal commercial crops of these areas are cocoa, palm,

¹ The areas classified as Upland Evergreen by Hall and Swaine (1981) are incorporated into the MSSE and MSNW zones.

rubber, cassava and, in the southern-most areas towards the coast, coconut. Principal food crops are rice, plantain, cassava and vegetables. Many of the communities living in the WE zone are amongst the most isolated in the forest zone. They are often far away from major towns and poorly served by infrastructure, with accessibility being a major problem especially during the rainy season (Townson, 1995)

Figure 3.2. Map of southern Ghana showing the five principal forest vegetation zones



Source: Townson (1995)

The ME zone has a significant proportion of its area under forest reserves and has some remaining patches of off-reserve forest. Like the WE zone, much of the timber within and outside reserves is under concession. Clearance of forest for small-scale mining is also an important problem here. The most important cash crop in this zone is cocoa, although in many of the more eastern areas, oil palm plantations are beginning to be established. Cassava, Plantain, rice and maize are the principal food crops. Although in some areas access by road is difficult, the problems of accessibility are generally not as great as in the WE zone.

In the MSSE zone, forest reserves cover only a small part of the land area. Many of the forest reserves are seriously degraded, especially by fire in the drier areas towards the north-east. Most of the off-reserve forest in this zone has been cleared. Large and small-scale oil palm plantations occupy a significant proportion of the cultivated land, although cocoa and kola are also important cash crops. Cassava, plantain, maize, rice and vegetables are the important food crops. Much of the MSSE is easily accessible by road (Townson, 1995).

The MSNW has a large area of forest reserve although several of the reserves have been heavily exploited in the past and some areas have off-reserve forest patches. Cocoa is the principal commercial crop and cassava, plantain, maize and cocoyam are the main food crops. Available land for cultivation is becoming scarce in several areas. The road infrastructure in the MSNW is generally good.

The DS zone has a fairly large area under forest reserve, but a large proportion of this has been seriously degraded by past logging activities and more recently by fires. Very little off-reserve forest remains. Cocoa, oil palm and maize are the principal cash crops and food crops include plantain, cassava, maize and groundnut. Most roads in the DS are good and access by them is little affected by the rains (Townson, 1995).

3.4. History of forest reservation and conservation

Colonial rule of the Gold Coast colony began in 1874 and the impact of the colonial period on forest reservation and conservation in southern Ghana has been profound and enduring. One of the first priorities of the Gold Coast (now Ghana) administration was to secure for European firms access to the mineral and timber wealth of the colony and to the means of production of exportable cash crops (Smith, 1999). At the time, the colonialist's favoured method of gaining control of land and natural resources was for the state to appropriate all wastelands as Crown or Public Lands². Proposals for enacting such legislation were prepared, debated and in each case abandoned at the last minute due to local opposition.

² The Crown Lands ordinance to vest all 'waste' and forest lands and minerals in the colonial government was proposed in 1895. The Lands Ordinance to create Public Lands was put forward in 1897.

Finally, in 1900 a Concessions Ordinance³ was drafted in consultation with lawyers from the Gold Coast Aborigines Rights Protection Society in London. The 1900 Concessions Act sought primarily to ensure security of title for concession holders and to protect the landowners from unscrupulous prospectors and to check indiscriminate alienation of large tracts of land by Chiefs and the attendant depletion of forest resources (Amankwa, 1989).

Following the ordinance, all references to Public Lands were dropped, and the right of the Chiefs to grant concessions in timber and mineral lands was recognised. Colonial policy on land tenure changed dramatically during the next decade. While in the 1890's the customary system of land tenure was seen as an obstacle to progress, twenty years later, it was seen as an ideal.

As early as 1868, reports of a potential threat to imperial cash crop production in the British Empire, due to the indiscriminate felling of tropical forests, began to circulate. Gradually, the British Colonial Office began to respond to the intense lobbying and alarmist reports from renowned botanists (such as J.D. Hooker, the then director of Kew Gardens, London). With time, the need for a universal tropical forest conservation strategy based on state reservation of forest lands, carefully situated to avert the possibility of desiccation and climate change, became accepted (Smith, 1999).

In the Gold Coast colony, a treatise on forestry published in 1887 formed the basis of the first externally sponsored or official conservationist policy⁴. The author, Alfred Moloney (later Governor of Lagos Colony), believed that the dry and treeless Accra Plains were early evidence of the threat to cash crop production in the humid zone from indiscriminate felling of forests. Citing examples from other colonies, he called for forest conservation. As Moloney stated:

³ The Concessions Ordinance of 1900 was an amended version of the failed Gold Coast Lands Bill of 1897, except that reference to Public Lands had been dropped. The Ordinance was a mark of the Government's determination to exercise some control over the utilisation of land and forest resources. The right of natives to grant concessions in mineral and timber lands which belonged to them remained unhampered and was recognised by the Bill, however, all concession leases had to be submitted to a judicial tribunal of the supreme court for validation. While the primary aim of the Bill was to ensure security of title for concession holders, it sought at the same time to protect the land owners from fraud at the hands of unscrupulous prospectors and to check the indiscriminate alienation of lands by chiefs and consequently the depletion of forest lands and forest resources (Amankwa, 1989).

⁴ Indigenous or informal conservation practices such as maintenance of tree cover along river banks and on the site of abandoned settlements were already in existence (Smith, 1999).

'How different it would have been had there been some system of forest conservancy...When we have a good thing we should treat it kindly' (Moloney, 1887, cited in Grove, 1997).

In 1908 the Government invited H. N. Thompson, a British Forestry Officer and the then Conservator of Forests in Southern Nigeria, to report on methods of forest conservation in the Gold Coast. Thompson's report to the Governor of the Gold Coast recommended that, owing to the increased pace of cocoa expansion and the over-exploitation of forests for timber, it was imperative that a portion of the forests be reserved and a Department of Forests established and charged with responsibility for protecting and managing the resource (Prah, 1994).

Following this report, a Forestry Department (FD) was indeed established in 1909 with the aim of encouraging the reservation of 20-25% of the land area of the Gold Coast primarily for environmental reasons. The forest reserves would be "suitably located throughout the region to ensure adequate water supply from lakes and rivers, to prevent soil erosion, to protect crops from winds, to ensure a supply of timber and to maintain the rainfall and relative humidity necessary for the cultivation of cocoa, oil palm, kola and other economic crops" (Gold Coast Government Press, 1911)⁵.

The FD was tasked with selecting and establishing the system of primary protective forest reserves. In doing so, the new Department was acutely aware that it would have no direct control over land; the chiefs would have to be persuaded to set aside some of their land as permanent forest under local bye-laws. Thus, Native Authorities⁶ themselves were encouraged to pass bye-laws to create forest reserves. However, despite an extensive propaganda⁷ exercise and assurances that the forest reserves would always be the property of their native owners, the general suspicion remained that forest conservation must be an elaborate land-grabbing scheme by a landless government. The reaction of the Chiefs to reservation was 'violent and sustained' (Collins, 1961).

⁵ The Gold Coast Legislative Council Debates (1911) on the Forest Bill.

⁶ Native Authorities were a system of local government centred on a paramount chief and a traditional council. The Native Authorities were a key plank of indirect rule and were created by the Native Authorities Ordinance No. 18 of 1927 [CAP 111].

⁷ The reasons given to the Chiefs for reservation during the propaganda exercise included: (a) maintenance of the relative humidity of air and soil essential for agriculture especially cocoa (b) increased rainfall and constant supply of water in springs (c) supplies of timber for domestic use and export (d) prevention of soil erosion on hills (e) protection of crops from winds (f) a more equitable temperature.

In 1927, progress on forest reservation was deemed too slow and so a Forest Ordinance (CAP 157) was passed to allow compulsory constitution of forest reserves. An agreement was eventually reached with the Chiefs that no more than 6,000 square miles of the total land area of southern Ghana would be permanently reserved for forestry. With this agreement, reserves were defined in all major hills and watersheds. Furthermore, barrier⁸ and shelterbelt⁹ reserves were established to hold back fires, and to maintain local rainfall and humidity levels respectively. Title to the reserves, whether created under Native Authority by-laws or the Ordinance remained with the owner. As the Chief Conservator of Forests promised an audience of influential Chiefs in 1923:

"Do not be afraid that because you are asked to designate certain areas forest reserves that the Government will at any time take possession of them. The forests will always be the property of their native owners" (Mcleod, Chief Conservator of Forests, 1923)¹⁰.

In order to reassure the Chiefs that ownership was not being transferred by default and to provide an additional revenue stream for the Native Authorities, the landowners were granted extensive rights in forest reserves, including royalties on every tree felled, receipts from fines, the right to set royalty rates and to grant timber concessions. Stool¹¹ ownership of any trees planted in the reserves by the FD was guaranteed. In addition, an annual bounty of one pound per square mile for reserved land that was not generating timber revenues was also paid to the owners by the Government. Admitted farms were permitted to remain, customary rights of access to harvest forest produce were maintained and sacred sites were identified and respected (Smith, 1999).

In the case of forest reserves established under the Forest Ordinance (popularly known as Government reserves), the reserves were to be managed by the Government for the benefit of the owner or owners. The FD was permitted to retain a portion of the owner's royalties to help pay for forest reserve improvement. The Ordinance stated that this sum should never exceed one third of the royalties and that accounts of this expenditure would be made by the Chief Conservator of Forests to the owners. The majority of the

⁸ The barrier reserves fringe the savannah zone.

⁹ Shelterbelts are corridor strips, 1-2 km wide, stretching Northwest to Southeast.

¹⁰ Mcleod, N. C. (1923) 'Address Delivered at Cape Coast on 9th April 1923 on the subject of "Forests" to the Chiefs of Central Province and the Executive Committee of the Aboriginal Rights Protection Society'. Gold Coast Government Press, Accra.

¹¹ A 'stool' refers to a particular land-owning group represented by a 'stool' chief. It also refers to a community governance or administrative structure similar to dynasties (Kasanga *et al.*, 1996).

forest reserves were however created as By-law reserves (known as Chiefs reserves)¹² and were administered by the Native Authorities under the direction of the FD (Smith, 1999).

By 1939, the FD had succeeded, under the most trying conditions, in establishing an extensive system of forest reserves covering some 1.6m ha of the high forest (Ghartey, 1990, cited in Prah, 1994) or almost 21% of the land area of southern Ghana (Smith, 1999). These reserves constitute the permanent forest estate of the country and it is from them that the bulk of the nation's timber is produced.

3.5. Forest legislation

Since 1927 when the Forest Ordinance was promulgated, a range of legislation has been introduced to reserve forest, to protect trees and timber lands, and to regulate exploitation and trade in timber and non-timber forest products (NTFPs). For example, the Concessions Act, 1962 (Act 124), which significantly modified the Forest Ordinance, provides that all timber resources, together with all land declared to be forest reserves or subject to timber concessions, are vested in the state in trust for the communities concerned. The power to grant timber concessions is vested in the Minister for Lands and Forestry.

The Forest Protection Decree, 1974, prohibits a whole range of activities within reserves and imposes criminal sanctions for any violation. These violations include felling, uprooting, tapping or injuring any tree or timber; making a farm or erecting a building; obstructing any river, stream, canal or creek; hunting or shooting any game or wildlife; fishing, poisoning water or setting traps or snares; and collecting, processing, conveying or removing any forest produce (Cirelli, 1996).

The Trees and Timber Decree, 1974, as amended by the Trees and Timber (Amendment) Act, 1994, makes provision for controlling the cutting and removal of trees and timber. The Chief Conservator of Forests is empowered by this Decree to allot

¹² The 1926 Forestry Conference stressed that the bylaw reserves were to be managed by the traditional owners under the direction of Forest Officers: 'The Forest Officer's duties are advisory only and not administrative in any Chief's reserve. He must use every endeavour to get his advice accepted and acted on, but he must never usurp the Omanhene's (paramount chief) administrative power and duty' (Smith, 1999).

"locality marks" to every area of Ghana, and keep a record of such marks. Any person wishing to cut timber for export must first obtain a registered property mark from the Chief Conservator of Forests. Procedures for registration and marking and related offences are spelled out. The 1994 Amendment introduces an export levy on specified species of processed or unprocessed timber (Cirelli, 1996).

Indeed, various pieces of legislation are in place to protect Ghana's forest resources (see Cirelli, 1996). In order to facilitate their enforcement, provision is made under some of the laws for the FD to effect them at the operational level. These laws have, in principle, contributed to the protection of the forest resource which exists today. However, the laws that accompanied reservation have more or less alienated the rights of communities and villagers living near the reserves.

In the first years of reservation, communal rights to hunting and the collection of NTFPs for domestic purposes were conferred on nearby communities. However, these rights were never reviewed in the light of the changing needs of local communities (CFMU, 1998). Thus, the rights were later seen to be abused, as forest products became increasingly commercialised, with 'outsiders' apparently benefiting most. Today, communal rights to forest products promulgated at the time of reservation have largely been eroded. Access to forest products is now restricted by permits, levies and fines imposed by the FD (Prah, 1994; Obiaw, 1994). Anybody who enters a forest reserve to gather or collect NTFPs is required to seek permission from the FD irrespective of whether they are exploiting for domestic use or commercial use and whether or not they are land owning communities of the particular reserve.

Generally, legislation has turned landowners into passive and marginalised recipients of insignificant and irregular shares of revenue, with no decision-making role in any aspect of forest management.

3.6. Forest policy in Ghana: a historical overview

Forest reservation and its supporting legislation preceded the formal adoption of a forest policy in Ghana. This was regrettable since the absence of a clear, consistent and properly formulated guide did not auger well for the future of the forest resource (Prah,

1994). It was not until after the Second World War that the first forest policy was adopted.

During the Second World War, colonial governments across British West Africa were instructed to maximise rubber and timber production¹³ in support of the war effort. By 1945, new export markets for the previously little known West African woods, particularly 'wawa' (*Triplochiton scleroxylon*) had been established. A colossal demand for timber to rebuild Europe had also been created, whilst at home the growing purchasing power of Ghanaians was increasing the internal demand for mill-sawn lumber (Smith, 1999).

Not surprisingly, with the onset of peace there was massive interest by European merchant firms in the establishment of sawmills in the Gold Coast (now Ghana). One such company was Unilever whose subsidiary, the United African Company, acquired extensive 50 year and 99 year concession leases in the Western Region of Ghana in 1947 and established a major processing operation called Africa Timber and Plywood (Ghana) Limited (AT&P) at a town called Samreboi. The company intended to eventually produce 100,000 tons of logs per annum.

The post-war expansion of the timber industry was colossal¹⁴. In just ten years, from 1945 to 1955, lumber production moved out of the ambit of the local pit-sawing gangs into the hands of large, primarily foreign-owned milling concerns. Exports of mill-sawn lumber increased thirty-fold from 250,000 ft³ in 1946 to 7,400,000 ft³ in 1956 (Smith, 1999).

As the European interest in timber production grew the Gold Coast FD began to develop forest reserve management systems that would foster the rational development of this new industry. A Gold Coast Forest Policy was therefore formulated in 1946 and was adopted by the Government-in-Council in 1948. It consisted of 8 clauses as summarised below:

¹³ The Forestry Department was instructed to purchase forest products, including great quantities of timber, furniture, firewood, charcoal, rubber, gums, beeswax, etc. In 1945 the Department exported 3.5 million cubic feet of round logs (Smith, 1999).

¹⁴ In 1949 the Government enacted the Trees and Timber Ordinance to regulate and control the timber trade through the issuance of property marks to concession holders and permits for felling of trees. The Ordinance was intended to help regulate the operations of the legions of local and foreign timber concerns being established.

1. The creation of permanent forest resources by the reservation of suitably situated areas of forest or land desirable and suitable for afforestation, to sustain the indirect and direct benefits necessary for the welfare of the people of the Gold Coast (Ghana).
2. The management of permanent forest resources by methods that will achieve maximum productivity and value on the basis of a sustained yield.
3. Research into all branches of scientific forestry, with special early emphasis on ecology and silviculture, in order to achieve the aims of clause 2.
4. The development of Local Administration Forestry and the education of the Local Authorities and people to a better understanding of the necessity for, and the value of, their forests.
5. The progressive utilisation, without replacement, of the remainder of the forest resources not dedicated to permanent forestry.
6. The training of forestry staff and personnel.
7. The provision of technical advice.
8. Co-operation with all other interests in schemes for the prevention of soil erosion and in the development of plans for optimum land usage (Francois, 1989).

Although the ownership of land did not alter at the time of reservation, and the reserve settlement agreements at the time of reservation did recognise customary rights to forest products, the 1948 forest policy did not make any reference to indigenous people's rights to forest resources on their own land. While it provided for educating local people on the values of the forest, it failed to provide for their participation in management. Thus, the traditional landowners have no right of access to forest products in reserve areas and the major significance of forest resources/products to village communities is often barely recognised by forest managers (Obiaw, 1994).

The 1948 forest policy was also handicapped by the fact that the measures required to implement the objectives were not explicitly made a part of the policy; neither was there any firm commitment from the government to provide the resources required for such implementation (Francois, 1989).

The policy also failed to recognise the ecological importance of the forest in terms of genetic biodiversity and wildlife. Sadly, it also encouraged the maximum utilisation or conversion to agricultural use of the areas not dedicated to permanent forestry and, in

the process, accelerated deforestation. It mainly emphasised the sustained supply of timber for the wood industry and promoted the exploitation and eventual demise of unreserved forests. Finally, the policy was made inadequate due to the lack of a formal land use policy (Prah, 1994).

The policy could not stop the unsustainable exploitation of timber from Ghana's forests. Thus, between the Second World War and 1989, Ghana overexploited her industrial timber, to the extent that some species such as 'odum' (*Chlorophora excelsa*) are threatened, if not already endangered (Smith, 1999).

In recognition of the inadequacies of the 1948 policy, a new Forest and Wildlife Policy was promulgated in 1994 to help protect and develop the remaining forests of Ghana. The policy includes a review of past policies in the light of new perceptions and sets out a comprehensive list of immediate strategies to be employed towards optimal achievement of the stated policy objectives. The overall aim of the policy is the "conservation and sustainable development of the nation's forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society" (MLF, 1999). It consists of five key objectives and associated strategies, summarised as follows:

- Management and enhancement of Ghana's permanent estate of forest and wildlife resources;
- Promotion of viable and efficient forest-based industries, particularly in secondary and tertiary processing;
- Promotion of public awareness and involvement of rural people in forestry and wildlife conservation;
- Promotion of research-based and technology-led forestry and wildlife management, utilisation and development; and
- Development of effective capability at national, regional and district levels for sustainable management of forest and wildlife resources (MLF, 1999).

The guiding principles of the 1994 Policy are based on national convictions and global concerns. The Policy embodies Ghana's aspiration to become "a middle-income country with an agenda that emphasises a nation-wide self-reliance, secured within a cultural ethos of Ghanaian values, and buoyed by a decentralised and constitutional democracy,

an open and liberal market economy and equitable economic development by the year 2020" (Ghana's Vision 2020, in MLF, 1999).

Although the government and the FD assert that the 1994 Policy marks a turning point in the affairs of the forestry sector, and that it reflects the realities and development aspirations of Ghana today, the Policy does not seem very different from the 1948 Policy with regards to indigenous rights to forest resources. While the Policy makes provision for involving local communities in forest conservation, it does not guarantee them access rights. Both the 1948 and the 1994 Forest Policies have failed to recognise indigenous people's rights to forest resources and, consequently, local people have no right to forest products except with a permit from the FD. They are seen more as a danger and nuisance than as owners and collaborative managers of forest resources.

3.7. The permanent forest estate and the extent of deforestation

Forest reserves represent the nation's permanent forest estate from which the bulk of the nation's timber is produced. Overall, it is the reserved forests that have engaged the attention of Ghanaian foresters for sustained yield management. As stated above, in spite of the initial slow progress in forest reservation, about 1.6m ha of the high forest had been properly constituted as reserves by 1939. To date, about 214 forest reserves covering about 1.8m ha of the high forest have been demarcated, surveyed and duly constituted under the forest ordinance (Ghartey, 1990, in Prah, 1994) (see Table 3.2 & Figure 3.3).

The forest reserves were initially established in all major hills and watersheds and were explicitly defined to meet local needs for forest products, to maintain a suitable local climate for agriculture and to safeguard water supplies (Foggie, 1962, in Prah 1994). However, as reservation progressed, it became necessary (for management purposes) to demarcate the reserved forest into Production, Protection and Research areas, referred to as 'working circles'. Currently, of the 1.8m ha of reserved high forest, 1.37m ha or 76% are low-lying and constitute the Production Working Circle. The Protection Working Circle constitutes 0.40m ha or 23%, while the rest, about 0.02m ha forms the National Parks for wildlife conservation and management (Prah, 1994).

Table 3.2. Ghana - Basic forest statistics

Total land area	22,754,000 ha
Total forest area	9,022,000 ha (1995), of which:
Natural forest area	8,969,000 ha
Protected areas (IUCN categories I-IV)	4.8% of total land area
Forest reserve area in the high forest zone (HFZ)	1,634,100ha
Off-reserve forests in the HFZ	300,000 - 400,000 ha (1995)
Average annual change in forest cover, 1980-95	-1.3%
Change in forest cover last century	-7m ha
Fairhead and Leach estimate (1998)	-3.9m ha
Average roundwood production (1993-5)	25,990,000m ³ (+59% since 1983-5)
Average sawnwood production (1993-5)	727,000m ³ (+141% since 1983-5)
Average net trade in roundwood (1993-5) (i.e. imports/exports)	447,000m ³ (+413% since 1983-5)
[The HFZ generates about US \$14.1m in public revenues from forestry (est. 2% of total fiscal revenue) of which about one quarter is transferred to local authorities]	
Forestry industry structure:	
Number of enterprises	411
Total employment	100,000 (MLF, 1997/9)

Source: Adapted from Brown (1999)

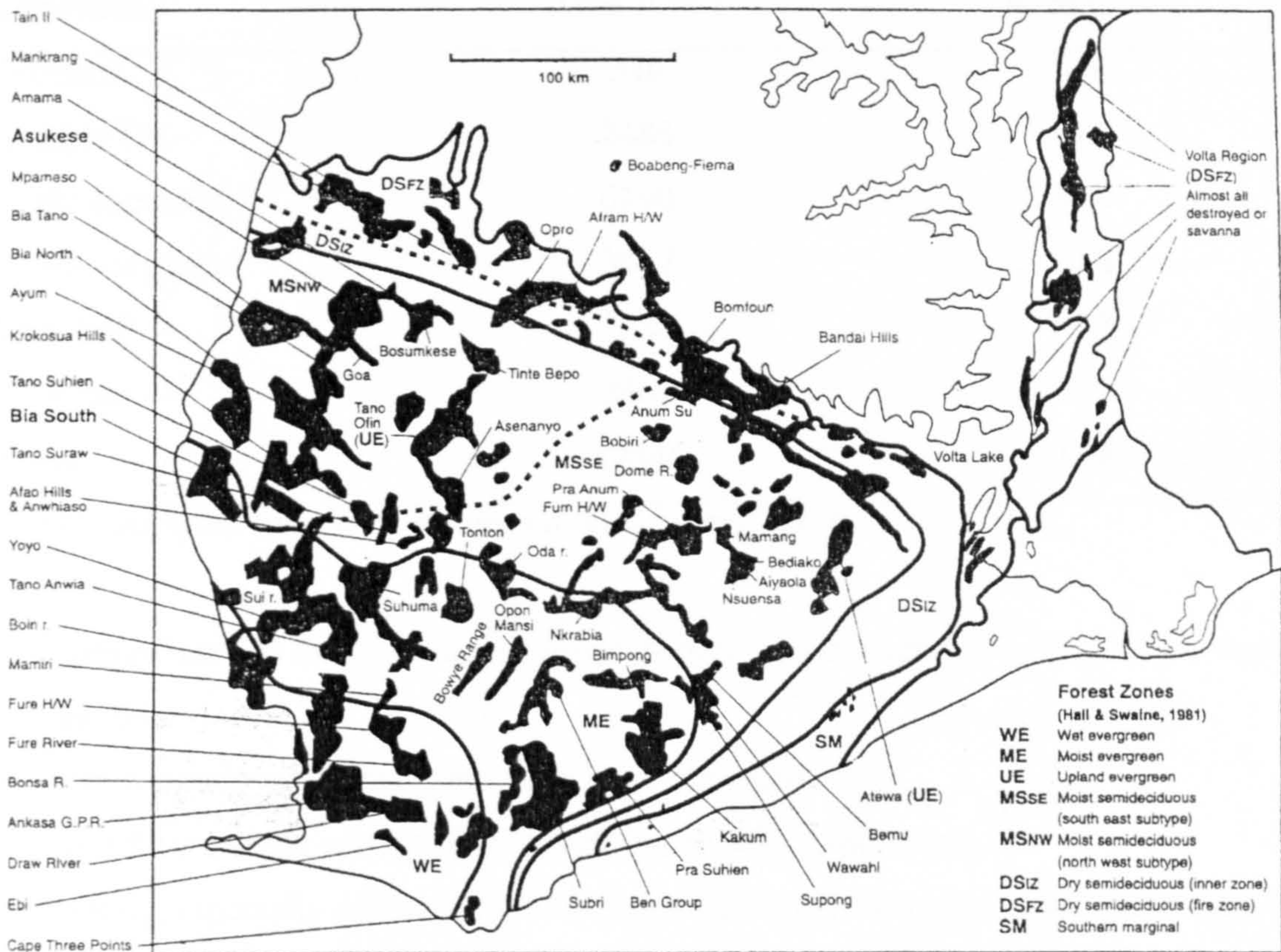
In a regional context, the Western Region is the area with the greatest concentration of forest reserves, followed by the Ashanti Region and then the Brong-Ahafo Region (see Table 3.3).

Table 3.3. Area of forest reserves by region

Region	Forest reserve area (sq. miles)	% of total forest reserve cover
Western Region	2884	40
Ashanti Region	1515	21
Brong-Ahafo Region	1196	17
Eastern Region	677	10
Central Region	578	8
Volta Region	277	4
Total	7130	100

Source: Ghana Forestry Department, cited in Brown (1999)

Figure 3.3. Map showing the entire system of forest reserves in southern Ghana



Source: Hawthorne and Abu-Juam, 1995

Although the permanent forest estate of Ghana is largely found in reserve areas, there are a few remaining areas of intact closed canopy forest outside reserves. However, information on the extent of coverage is ambiguous; estimates vary from 3,740km² (Nsenkyire, 1992) to 2,700km² (World Bank, 1987) to 1,000km² (IUCN, 1992) (cited in Prah, 1994).

In a recent study of Ghana's forest composition and botany, Hawthorne and Abu-Juam (1995) found considerable degradation in the HFZ and reported that only about half of the nation's 1.8m ha of forest reserves is in reasonable condition. They noted that about 14% of the reserves have no significant forest left and that there is virtually no significant area of forest outside the reserves (see Table 3.4). Ghana's Forestry Department's estimate is that there is not much intact forest currently left outside the forest reserves, wildlife reserves and traditionally protected areas of Ghana (Adu and Owusu, 1996).

Table 3.4. The condition of Ghana's forest reserves

Condition	Area (km²)	% of total
Excellent	346	1.9
Good to OK	2485	14.0
Partly degraded	6190	34.9
Mostly degraded	3697	20.8
Very bad	2626	14.8
No forest	2401	13.5
Total	17745	100

Source: Adapted from Hawthorne and Abu-Juam (1995)

The immediate and direct causes of forest decline and degradation in Ghana are various and include:

- conversion to agriculture, especially shifting cultivation;
- wild fires and the uncontrolled use of fire in land preparation;
- mining, especially recent proliferation of small scale, surface mining operations;
- commercial logging, responsible for forest degradation and indirectly for accelerated deforestation through providing access roads to hitherto unopened areas;
- fuelwood gathering, particularly the firing and cutting of living trees for commercial fuelwood and charcoal production; and
- urban growth, including the lateral expansion of urban settlements swallowing up the peri-urban forests and prime agricultural lands (Britwum, 1989; Adu and Owusu, 1996; Hawthorne and Abu-Juam, 1995; Mery, 1996).

Beyond the immediate causes are a complex of interacting social, economic, cultural and political factors, which aggravate most of the immediate causes and make the solution of the deforestation problem more difficult. These factors include:

- uncertain forest property rights;
- high population growth rates which accentuate the effects of most of the immediate causes;
- lack of technologies for sustainable agriculture; and
- macro-economic policies and socio-economic factors that lead to stressed living conditions for vulnerable groups and internal migration to frontier agricultural areas (Adu and Owusu, 1996).

Of the immediate causes, agriculture (especially slash and burn shifting cultivation) and commercial logging are probably the most important (see Chapter 8).

3.8. Institutions involved in forest management in Ghana

The main institutions involved in forest protection and management in Ghana include the Ministry of Lands and Forestry (MLF), the Forestry Commission (FC), the Forestry Department (FD) (now the Forest Services Division [FSD]), the Forest Products Inspection Division (FPID), the Timber Export Development Division (TEDD) and the Forestry Research Institute of Ghana (FORIG).

The MLF is the supervising ministry of all the forestry sector institutions and is responsible for formulating policy on behalf of the government. The FC is an implementing agency of the MLF. Its main function is to advise government on forestry and wildlife policy, monitor policy implementation by sector institutions and assess the impact of policy on sustainable forestry. In July 1999, the government passed an Act to re-establish the FC with the aim of transforming it into an effective resource management institution outside the ambit of the Civil Service. This Act makes the Forestry and Wildlife Departments, the Forest Products Inspection Bureau and the Timber Export Development Board divisions of the FC.

In 1999, the FD was transformed into the Forest Service Division (FSD), a self-funding, service-oriented (rather than control-oriented) agency, freed to a large extent from the constraints of public sector management. The FD/FSD is a division of the FC and is the principal agency responsible for the conservation and sustainable management of Ghana's forest estate or forest reserves. It regulates the harvesting of timber and non-timber products from all forest areas (i.e. including outside forest reserves) and provides technical advice to support community programmes. In addition, it offers technical services for the development of the forest resource (e.g. forest plantation development). Thus, the FD/FSD is the principal agency executing forest management, protection and development in the country. To ensure consistency, "Forestry Department (FD)" has been used throughout this thesis.

The FPID and TEDD are also divisions of the FC. The FPID (formerly, Forest Product Inspection Bureau [FPIB]) supports the FD/FSD to check and record all logs harvested both on and off reserves. It is also a regulatory institution that monitors log export bans and issues permits for all timber exports. The main function of the TEDD (formerly, Timber Export Development Board [TEDB]) is to ensure that the timber industry has access to adequate information about product development to maximise utilisation of logs harvested from the forest, and thus maintain revenue in harmony with acceptable levels of exploitation.

Finally, the FORIG is the main institute responsible for forestry research and forest products development. It maintains close links with the FD/FSD.

3.9. Forestry's contribution to the Ghanaian economy

Economic activities in Ghana have been classified into three main sectors. These are (1) the Agriculture Sector (farming, fishing, hunting, forestry and logging, etc.); (2) the Industrial Sector (manufacturing, mining, quarrying, construction, water, electricity, gases, etc.) and (3) the Services Sector (ISSER, 1999). Agriculture remains the mainstay of the economy with cocoa and timber being the main traditional exports and backbone of the economy.

Timber has traditionally ranked third as a foreign exchange earner in Ghana, after gold and cocoa. The country has about 730 different tree species of which 126 grow to timber size and 50 are currently considered merchantable (Obiaw, 1994). In 1994, timber harvesting levels reached 1.8 million cubic metres, the highest since 1973. Timber accounts for about 6% of the country's GDP, although this could actually be as high as 8% if production by the informal sector is taken into account (Asiseh, *et al.*, 1996). The forestry sector employs about 100,000 people (MLF, 1997/9, cited in Brown, 1999) and provides direct and indirect livelihood to about 2 million people in the country, more than 10% of the entire population (Asiseh *et al.*, 1996; TEDB, 1995). Ghana's exports of wood and wood products increased almost fivefold between 1983 and 1988 (see Table 3.5). Export earnings from the timber sub-sector increased from US \$165.4 million in 1994 to US \$175.24 million in the year 2000. It however declined to US \$ 169.16 million in 2001 (Table 3.5) (ISSER, 1999, 2002).

Table 3.5. Ghana: Timber exports, 1983-2001

Year	Volume (m³)	Value (US \$ million)
1983	117,310	15.8
1984	140,231	18.8
1985	221,463	27.0
1986	295,954	49.8
1987	485,565	76.8
1988	536,213	98.9
1989	375,769	80.3
1990	367,662	118.0
1991	-	124.0
1992	177,000	114.0
1993	500,000	147.0
1994	780,000	165.4
1995	590,000	190.6
1996	364,771	146.8
1997	442,017	172.0
1998	416,164	171.0
1999	433,106	174.0
2000	498,843	175.2
2001	478,829	169.2

Sources: Ghana Timber Export Development Board (TEDB), in Friends of the Earth (1992); Bank of Ghana, in ISSER (1999, 2002)

It is also possible to take a broader view of the overall contribution of the forestry sub-sector to the Ghanaian economy, taking non-market outputs and outputs which are not recorded in official statistics into account. For example, a recent survey of non-timber forest product enterprise activities suggested that, in an area within 10km of forest reserves, a total of 258,000 people (representing 10% of the total population of this area) obtained income from non-timber forest products (Townson, 1995). Three-quarters of these activities were considered "important" to them. Income-generating activities based on forest products thus contribute significantly to rural livelihoods and the rural economy of Ghana.

Although forest resources contribute greatly to rural livelihoods and to the rural economy of Ghana as a source of food, medicines, building materials, materials for household equipment such as baskets, pestles, mortars, etc., and income through the gathering, processing and sale of forest products, Ghana's Forest Policies and associated Forestry Legislation have never dealt with this effectively. The Policies (both the 1948 and 1994 policies) have not done anything by way of managing forest resources to cater for the needs of local people. In particular, they do not recognise indigenous rights to

forest resources. People need to obtain permit from the FD in order to collect products from forest reserve areas. This has created a rift between the Government FD and the local people. The result is an irresponsible local attitude towards forest management and protection (see chapter 8).

3.10. Conclusion

This chapter has set the scene for the study by providing the background to forests and forestry practice in Ghana. It has traced the history of forest reservation and conservation as well as the historical development of forest policy and forestry legislation. Considering the rate at which the forests outside reserves have been converted into farms and other land uses, the Colonial Authorities perhaps did a great service in reserving part of the forest. It is to their credit that Ghana still has any forest at all today. The legislation and regulations that followed reservation, and their enforcement by the FD, have also contributed immensely to conserving the forest for various levels of sustained use.

However, reservation has modified locally evolved tenure systems and resulted in a disincentive for those situated nearest to the resource to take responsibility for it. The laws that accompanied reservation more or less alienated the rights of communities and villagers near the reserves. Generally, forestry legislation has turned traditional landowners into passive and marginalised recipients of insignificant and irregular shares of revenue, with no decision-making role in any aspect of forest management, as can be seen from subsequent chapters.

Although forest resources/products play an important role in Ghana's rural economy, the country's forest policies and legislation have never recognised and dealt with this effectively. The policies do not recognise indigenous rights to forest products. The restriction on local people's rights to forest products has fostered or encouraged poor and hostile relations between the FD and local communities.

The next chapter provides a background to the study setting and sets out the methods employed for data collection and analysis.

CHAPTER 4

RESEARCH STRATEGY AND METHODOLOGY

4.1. Introduction

The nature of the links between the rural poor and the forest resources they draw upon is indeed a complex one. Large numbers of poor people in developing countries base their livelihoods on the use of forest resources. Increasing demands from people and society put forests under pressure, which may result in degradation. A growing body of evidence indicates that virtually all forests on the planet have been substantially influenced by humans, most for at least several thousand years. Studies by foresters, ecologists, historians and anthropologists on forests in tropical, temperate and boreal regions conclude that forests and people have evolved together over thousands of years, with people planting the trees they prefer, using fire to burn forests to improve hunting conditions, and managing forest fallows to maintain their agricultural fields (McNeely, 2002).

Therefore, in order to gather information, which will lead to an understanding of the complexity of issues surrounding local people's use of forest and tree resources, no one method is sufficient. Thus a multiple methodology is required in order to clearly understand the complex relationship between nature (forests and tree resources) and society (livelihood security). An important issue to consider is how to become an 'insider' in the rural society so as to achieve a thorough observation and acquire a deep and comprehensive understanding of the issues being studied.

This chapter discusses the strategy and the various methods of data collection employed in this study. Some methodological issues in research design and fieldwork have also been considered. The chapter begins with a description of the study area and choice of the study sites. The final section discusses the main methods of data analysis.

4.2. The study area and sites

The study was conducted in the Wassa Amenfi District in the Western Region of southern Ghana. It shares boundaries with Jomoro District and Nzema East District to the south, Wassa West District to the south-east, Upper Denkyira District to the north-east, Bibiani-Anhwiaso-Bekwai District to the North and Sefwi Wiaso and Aowin-Suaman Districts to the West (see Figure 4. 1).

The area lies in the Evergreen forest zone and in terms of forestry it falls within the jurisdiction of the Asankrangwa Forest District¹. The total land area of Wassa Amenfi District is approximately 4,747 square kilometres, which is about 17.8% of the total land area of the Western Region (WADA, 1996). The area represents a new frontier district, in which the processes of conversion of forest into secondary bush are still occurring.

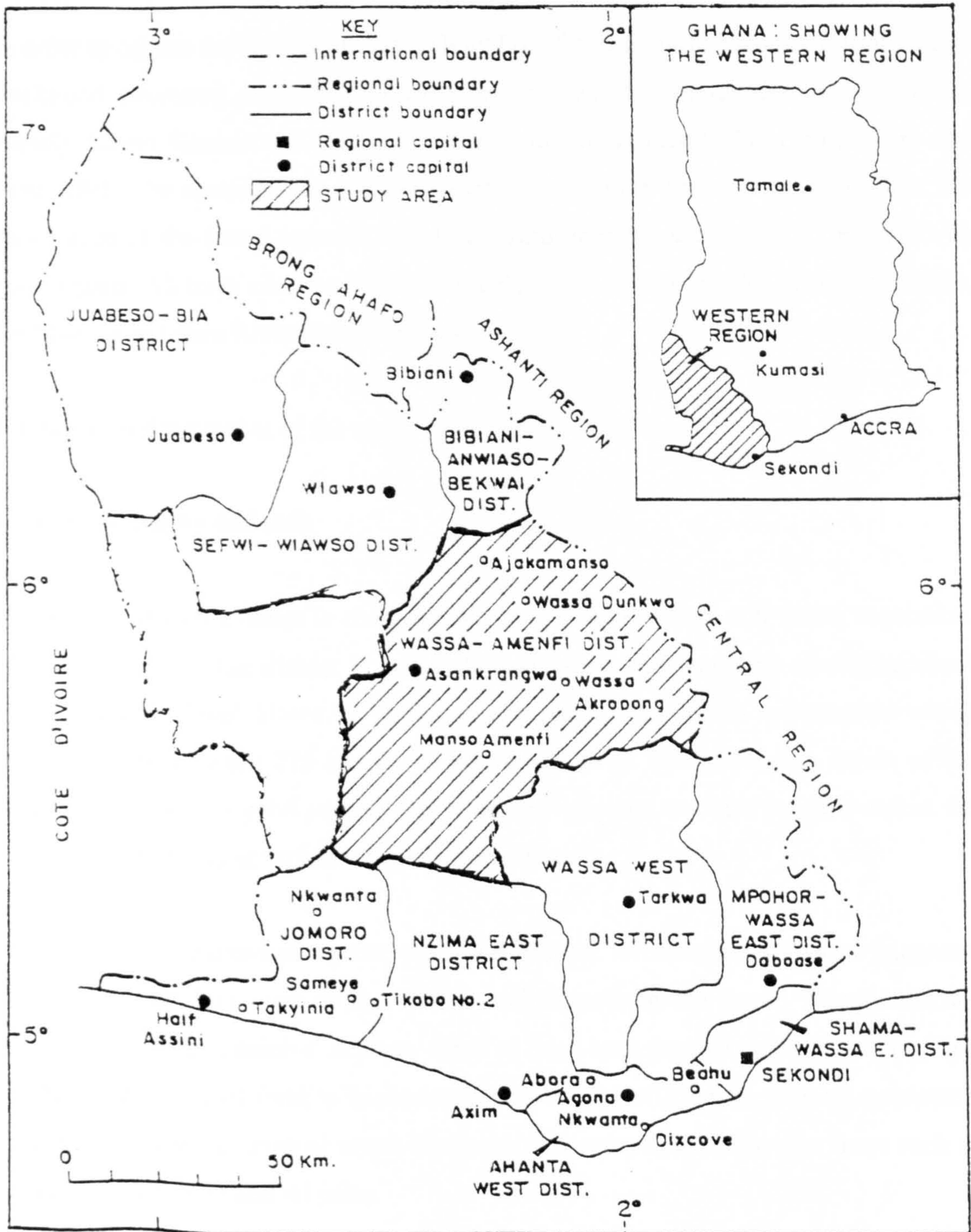
4.3. Selection of the study area

A number of factors influenced the selection of the Evergreen forest zone in general and the Wassa Amenfi District in particular for the study.

- Firstly, the Evergreen zone has the highest proportion of its land area under forest reserves and it is also the zone where much of the remaining off-reserve forest is found. In general forests in this zone are in a relatively good condition (Townson, 1995: 4). Hence this area provides a great potential for land use, subsistence and trade in forest products.
- Secondly, most areas (within and outside reserves) of the district and the Evergreen forest zone are under timber concession (Townson, 1995). Therefore this zone offered the opportunity to uncover or reveal possible conflicts and divergent opinions (regarding use rights) between the local people who depend on the forests for NTFPs and concessionaires or timber contractors whose motive is to make profit by extracting timber from the forests.

¹ Apart from administrative districts the whole of Ghana is divided into about 50 forest districts. The Asankrangwa forest district is one of the biggest forest districts in Ghana.

Figure 4.1. Map of the study area in relation to Western Region and Ghana



Source: WADA (1996)

- Thirdly, many of the communities living in the Wassu Amenfi District are amongst the most isolated in the entire forest zone of Ghana. They are often far away from major towns and poorly served by infrastructure, with accessibility being a major

problem in the area. Hence it is an area where little information has been previously gathered on the forestry related activities of communities residing in this district.

In order to capture the full set of issues about how forest and tree resources form part of livelihood structures, data was collected in three forest communities in the district, namely Sureso, Kamaso and Kamaboi, for a period of six months between January and June 2001. The communities selected were situated near forest reserves so that the importance of the forest reserves and forest resources for the communities could be investigated. All three communities were within 6km of two blocks of forest reserve, the Mamire and Bura River forest reserves.

4.4. General description of the study area

4.4.1. Topography and soils

The Wassa Amenfi District is characterised by a unique terrain and dense vegetation. The topography of the district is generally undulating with summits averaging about 153m above sea level. However, to the eastern part of the district are summits which reach levels of between 275 and 305m above sea level. The undulating nature of the district provides very good scenery which is very pleasant to observe but it makes the construction of roads and other infrastructure difficult.

The district is characterised by two main soil groups: forest ochrosol-oxysol integrates found in the northern part of the district and oxysols in the south. These soils are strongly leached in a number of areas, some of them with poor retentive capacities. In a number of places soil fertility is discontinuous and insufficient to support permanent cultivation of a wide range of crops. They are, however, suitable for tree crops such as cocoa, coffee, rubber and oil palm.

4.4.2. Climate and drainage

The district is one of the wettest in Ghana. Average annual rainfall ranges from 1660mm to 1800mm and is distributed over two long wet seasons, separated by two short dry seasons. The two wet seasons cover March to July and September to December with relatively higher rainfall in March to July. The maximum and minimum

temperatures for the area are on average 30°C and 17°C respectively. The maximum and minimum temperatures occur in March and August respectively.

The climate of the area has a favourable effect on the conservation of natural resources and agricultural production even though occasional extreme rainfall events cause floods and adversely affect agricultural production.

The area is drained by a number of rivers and streams, namely Rivers Fure, Suhen, Samre, Sure, Tano, Totua, Ankwo, Ankobra, Funya, Subin, Kama, Mansi, and Offin. The river Tano, Ankobra, and Offin are among Ghana's largest. These rivers provide water for both domestic and industrial uses. However, some of them occasionally flood their banks, especially during the major rainy season, making access to farm lands and general transportation difficult.

4.4.3. Local/natural resources

The district is rich in natural resources, including gold and other minerals, clay deposits, forests and water bodies (both surface and ground). Several mining companies have carried out surveys with a view to establishing mines in the district. However, because of poor infrastructure, the exploitation of minerals has not taken off. Consequently, gold mining is left in the hands of small-scale miners, popularly known in Ghana as "Galamsey operators" whose activities have damaging effects on the local environment.

The district has extensive forest resources which are part of the only surviving high forests of Ghana. Its eleven forest reserves cover 1,215 square kilometres (Table 4.1). These forests contain many species of timber and provide the necessary raw materials for the wood industries in the area. Timber from these forests is also exported, providing Ghana with foreign exchange for national development. The forests are also rich in bamboo, which provide raw materials for the craft industries.

According to the District's 1995 Economic Survey Report, revenue generated from timber royalties in the reserved and unreserved areas between the period 1992 to 1995 amounted to ₵400m (400 million cedis)². Between the same period, ₵2.5m was received

² At the time of the fieldwork, 1 Great Britain Pound (£1) was equivalent to 9,500 Cedis (₵9,500).

as revenue from the sale of NTFPs such as canes, raphia palm, poles and so on (WADA 1996).

Table 4.1. Forest reserves in the study area

Reserve	Area (sq. km)	Area (ha)
Mamire forest reserve	45.32	4,532.52
Fure headwaters reserve	169.44	16,943.88
Fure forest reserve	158.27	15,827.58
Angoben shelter belt forest reserve	34.65	3,465.44
Totoa shelter belt forest reserve	63.53	5,353.30
Bura river forest reserve	104.87	10,486.97
Bowiye range forest reserve	120	12,000.00
Oppong mansi forest reserve	117	11,700.00
Tonton forest reserve	146	14,600.00
Upper Wassa forest reserve	101	10,100.00
Bonsa-Ben forest reserve	155	15,500.00
Total	1,215.08	121,509.69

Source: WADA (1996: 4)

The forests in the area provide a suitable habitat for antelopes, elephants, squirrels, birds, snails and a host of other forest species. These provide the main source of meat for the local people. The forests and the different species of animals found in them add to the beauty of the environment of the area and act as tourist attractions. However, the bush fallow system of farming practised in the district which involves traditional slash and burn methods of farming is not only destroying forests and tree species but also animal species.

4.4.4. Population, settlements and roads

The population of the district has increased since 1960 (see Table 4.2). The year 2000 population and housing census revealed a population of 229,421 persons for the district with a population density of 48 persons per square kilometre compared with a national average of 77 persons per square kilometre (Ghana Statistical Service, 2000).

Table 4.2. Population of Wassa Amenfi District (1960-2000)

Year	Population
1960	76,096
1970	92,942
1984	144,326
1996	206,866
2000	229,421

Source: WADA, 1996; Ghana Statistical Service, 2000

Major settlements in the district are Asankrangwa (the district capital), Wassa Akropong, Opon Valley, Samreboi, Asankran-Bremang, Asankran Saa and Juabo. Although the district has about 386 settlements, only four of them (Asankrangwa, Asankran-Bremang, Wassa Akropong and Samreboi) are classified as urban. The district can therefore be described as rural with agriculture being the major occupation.

Although the Wassa Amenfi District abounds in natural resources, it remains one of the most deprived and undeveloped areas in Ghana. It is heavily handicapped by a poor road network. Only 46.2km of the total 176.8km of trunk roads are tarred. The rest, all gravel roads, do not last because of the nature of rainfall pattern in the area. Indeed gravelled roads do not last one month in the area. Most of the over 516km of feeder roads are in a poor state as they are not maintained. Many parts of the district have no roads at all. Transport of agricultural and forest products is therefore difficult (WADA, 1996). The poor nature of roads has adversely affected the delivery of services to the entire district and has made many residents "prisoners" in their own small communities.

4.5. History and description of the study villages

The three study villages, Sureso, Kamaso and Kamaboi are all farming communities and they all derive their names from two rivers that drain the area, namely River Sure and River Kama. Sureso literally means "upon River Sure" while Kamaso means "upon River Kama". Kamaboi is so called because it is located at the confluence of the two rivers, Kama and Sure.

While the population of Sureso is mainly composed of indigenous people called Wassas, Kamaso and Kamaboi are largely peopled by migrant, settler farmers who have come for cocoa farming. The majority of the people of Kamaso belong to the Akuapem ethnic group from the Eastern Region, while those of Kamaboi are largely Fantes from the Central Region of Ghana.

Sureso is the oldest village amongst the three, although all attempts to get a written history of the village proved unsuccessful. It is an indigenous village, and according to oral histories, started as a small cottage in the early 1930s, when a man called Opanin³ Efa and his family moved from a nearby village called Akyikyire to settle along the River Sure. This was in response to a land dispute between the chief of Asankrangwa (the district capital) and the chief of Akyikyire, a village about 10km from the district capital.

The elders explained that during those days both chiefs claimed ownership of the same piece of land lying along River Sure. The chief of Akyikyire quickly appointed Opanin Efa to settle on the land in order to prevent the chief of Asankrangwa from taking the land from him. The village was initially named after Opanin Efa as Efakrom⁴ but later, as other people moved to settle and as their numbers increased, they named the village after the River Sure - hence the name Sureso. Around that time a British timber company (Africa Veneer Mahogany Exporters (AVME)) established a sawmill which attracted people from several parts of the country. The sawmill led to further expansion of the village. It has long since closed down but many of those who previously worked in it still live in the village.

According to oral histories, residency in Kamaso dates back to the early 1950s when two men, Opanin Kwasi Mensah and Opanin Kwame Mantey migrated from the Eastern Region of Ghana to settle along River Kama to farm cocoa - after acquiring land from the chief of Akyikyire. At that time, the whole area was a virgin forest, but after the two men had settled and opened the area for cocoa farming, other people from the Eastern Region and other parts of Ghana began to move in. As numbers increased the settlement was named Kamaso. According to the elders, a man had earlier on settled along the river but, threatened by lions and leopards, he was forced out of the area.

³ The word 'Opanin' means an elderly man.

⁴ Efakrom literally means Efa's town.

As people became aware of the prospects of cocoa and with the encouragement of Ghanaian farmers by the government to go into cocoa production, farmers started migrating from many parts of the country into this area. In the year 1957 the people of Kamaboi were also attracted into the cocoa sector and they migrated from the Central Region to settle near the confluence of Rivers Sure and Kama. These people, mainly Fantes, were joined by other people from other parts of the country. The area was later named Kamaboi. During the early 1970s, the cocoa boom in Ghana further attracted people from many parts of the country into this area, which had been classified as lying within the cocoa belt.

Most of the older people in the villages claim that forest foods and other forest products were abundant when they settled in the area and bushmeat was their only source of meat. They complained that most of these products are now scarce and very difficult to find.

Thus, the people of Kamaso and Kamaboi are migrant, settler farmers who opened up the area for cocoa farming in the 1950s. The villages have become their home and their numbers are still increasing, as other people from the outside continue to move in for cocoa farming.

Each of the villages is governed by a local chief (locally called Odikro) and his council of elders, usually made up of seven members. Disputes between community members are usually settled by the chiefs and their elders and they have the right to sanction any one who behaves contrary to the rules and traditions of the villages. Apart from these traditional authorities, each village has a Unit Committee (made up of the chairman, the secretary and eleven members) that forms a link between the local people and the District Assembly, which is the highest political and administrative body. The Unit Committee thus represents the national government at the local level.

Kamaso and Kamaboi each have one primary school while Sureso has both a primary and a Junior Secondary School. All three villages have access to good drinking water. Most of the houses in the communities are mud houses with thatch roofing. Only a few have metal roofs. In these communities the type of house and roof provide a gauge of the relative wealth of a household. Families living in houses with metal roofs are considered relatively rich compared with those in thatch houses. None of the

communities has a health post. People travel to the district capital, which is about 8km away from Sureso, for medical treatment. According to Ghana's year 2000 population and housing census, the populations of Sureso, Kamaso and Kamaboi are 1,120; 566; and 403 respectively.

4.6. Gaining access to the communities

In order to collect data for subsequent analysis and interpretation, it is first necessary to gain access into the study setting and to sources of data including respondents or informants or material sources such as historical documents. Cassell (1988) describes a two-stage process of penetrating a 'closed access' group: getting in (achieving physical access) and getting on (achieving social access). Entering a study setting thus requires detailed planning and may include a number of discrete issues. First, access to a group of research subjects or a setting may require extensive negotiation and the permission of 'gatekeepers'. Second, co-operation from individual members of the study sample or the participants in a setting is required in order to maximise response, while ensuring informed consent (Arber, 1993).

Gaining access to the study communities was made easier by the fact that I am a Ghanaian and can speak Twi, the language used by almost all members of the communities for communication. Although some migrants have different languages, almost all can speak Twi. Language was therefore not a barrier. Living in Sureso Village also enabled the communities to trust me, as I lived among them and it helped me to establish a rapport with them.

Permission to enter the communities was first sought from Wassa Amenfi District Assembly and the District Co-ordinating Director who is the head of the District Administration before moving down to traditional and administrative structures at the local level. Following this, permission was obtained from all the political and administrative structures at the local level. In each village permission was first sought from the local chief and his elders and then from the Unit Committee chairman and his members. Assistance was obtained from the District Forest Manager, given his experience with the communities, and he was of great help in identifying key informants and opinion leaders in the communities. An introductory meeting was held in each of the villages where the study was finally introduced to the communities.

Prior to the field visit, a series of discussions were held with the District Forest Manager, Forestry Officials and Agricultural Extension Officers. These discussions ensured that the study would focus on relevant themes and established the relevance of the study objectives. At the community level, discussions were held with village leaders and other opinion leaders. The study was explained and its potential contribution to their lives discussed. These discussions were quite significant and helped to legitimise the study.

4.7. Specific questions considered

Drawing on the objectives of the study, the preceding sections, information gathered from initial discussions with village leaders and to understand how forest and tree resources form part of livelihood structures of the rural communities, the following specific research questions guided the investigation:

- What has been the history of tree and forest use in the communities?
- Who are the people involved in using forest resources and trees? How are these users differentiated by gender, income, age, ethnicity, etc. and what are the differences in these groups' use of the resources?
- What is the land and tree tenure situation governing the use of these resources? Where can people plant or use trees, and what rules regulate this access? Is there a relationship between land tenure and tree tenure? Does tree planting give land rights?
- What species of trees do people use, and from which specific tree and forest products do they derive benefits? Do these products serve commercial or subsistence purposes?
- What happens in times of catastrophe - droughts, floods, crop failure, etc? Are forests or tree products used at all? In other words, how - if at all - do forests and tree products contribute to survival in times of acute need?

- How do local people manage tree and forest resources? What methods, systems and technologies do they use? What is the importance given to this management activity as compared with other farm activities, and how do forests and trees fit into the overall rural economy?
- What is the local folklore about trees, woods, and forests, including local proverbs and sayings, myths and taboos? Are forests, trees or certain trees considered dangerous or beneficial? Which trees have ritual importance? In other words, what is the cultural and symbolic importance of forests and trees in the communities?
- What strategies do the local people adopt to cope with the decline of forest resources? Do they try to bring forests into their farms by planting or tending trees?
- Can there be sustainable management and conservation of the forests without some level of participation by adjacent people or communities?

4.8. Some methodological issues in research design and fieldwork

Social research in developing countries involves some barriers and difficulties, which may not be readily apparent. Most, if not all, social research is influenced by the environment in which it is conducted. The possibility of doing research and the success of the techniques used are often strongly affected by local or national structural and cultural variables. These vary not only between countries, but also within them - between rural and urban areas and between regions with differing historical or political backgrounds. Thus, not only must methods be chosen which suit the data to be gathered, they must also be tailored to the sources of these data (Peil, 1993: 71).

Besides a common lack of appropriate baseline information (i.e. what is already known-research reports, literature, etc.), Peil (1993) points out the influences of the local social, political and cultural environment on the research. Access to the study area is a key issue confronting social researchers. This involves two categories of barriers namely, *gatekeepers* - who make decision for research permission at various levels; and *respondents* - which refers to participation and co-operation from local people related to personal background of the researcher, local norms and traditions. Peil (1993) also

mentions personal characteristics of the researcher, language and the methods used, as important factors affecting data collection in the field.

In discussing access to the field, Flick (1998) focuses on the researcher himself and his role in the field in particular. He distinguishes four types of roles a researcher may play in the field, including:

- *a stranger* - aspects of reality remain hidden from the researcher;
- *a visitor* - the researcher appears in the field only once for a single interview;
- *an initiate* - the researcher adopts a sociological process of learning, i.e. the process of giving up the outsider's perspective step by step in the course of the research; and
- *an insider* - the researcher gets involved in the local setting to understand the individuals viewpoint or the organisational principles of social groups from a member's perspective, i.e. understanding people's expressions and activities in the local context.

Chambers (1983) also describes six types of biases existing in fieldwork, namely:

- *spatial bias* - preferring urban, tarmaced and roadside areas;
- *project bias* - towards advanced and known places to secure return;
- *person bias* - toward elite, men, etc.;
- *seasonal bias* - avoiding the bad time;
- *diplomatic bias* - not seeking out the poor for fear of giving offence; and
- *professional bias* - adopting a narrow discipline perspective.

Increasingly, researchers face problems of negotiating proximity and distance in relation to the person (s) studied. The decision has to be made between adopting the perspective of either an insider or an outsider with regard to the object of the research. Being an insider and/or an outsider with regard to the field of research may be analysed in terms of the strangeness and familiarity of the researcher. Where researchers locate themselves in this area of conflict between strangeness and familiarity will determine in the continuation of the research which concrete methods are chosen and also which part of the field under study will be accessible and which inaccessible to the researcher (Flick, 1998).

The position of an insider is particularly important for social research involving nature (environment)-society relationship in rural areas where there are so many barriers to

outsiders' observations and understanding of the rural poor. For example, villagers might be reluctant to talk about the supply and the source of NTFPs in the presence of an outsider, particularly where they have restricted access to the products. Similarly, they might be reluctant to speak of local ethnic conflicts in the presence of outsiders. Apart from the general suspicion of outsiders, natural factors such as the time of year the study is conducted, the weather, and the work schedule of villagers affect local people's ability or willingness to participate in a study. Villagers who are busy planting or harvesting will probably have little time or energy to respond to questions.

Because it involves complex natural and social processes, the extent and manner in which forests and tree products form part of livelihood structures of rural dwellers cannot be properly understood merely through a narrow, one-dimensional approach. Taking into account the research objectives, the fieldwork environment and the complexity of the issues that were studied, the following three principles were adopted for the research design and fieldwork:

Learning approach

This principle is based on the premise that rural forest dwellers are a repository of knowledge about their local environment, trees, their effective management and utilisation and therefore the researcher should be able to open his mind, be a good listener and learn from the local people. This means respecting the culture and traditions of the local setting and doing away with all forms of ethnocentrism. This enabled the researcher to obtain important and sensitive information about the local setting.

Practice approach

The key to 'insider' research is the ability of the researcher to identify himself with the 'locals', and to develop a constructive communication with the rural people. This requires a proper interface between academic aims and an understanding of local people's interests. According to Bin Wu (2000), the practice approach involves the following points:

- a belief that social practice is both the fundamental source of social theory and a sound base for theory test. As a result, rural dwellers and farmers are not merely a source of information, but the *readers, authors and judges* of new theory reflecting their practice;

- an assumption that the truth (or true hypothesis) should be simply and easily understood, and can be shared by local people;
- a value orientation that the best research should be able to reflect the needs of the local people and provide an insight into policy improvement; and
- an awareness of ignorance and social-cultural biases of the researcher, which may impede comprehensive observations and understandings.

Qualitative and quantitative integration

In quantitative research, the researcher adopts a structured and *nomothetic* approach accompanied by random and hence representative samples to 'establish general law-like findings' irrespective of time and place. Here, the researcher's contact with the people being studied is fairly fleeting or even non-existent. By contrast, qualitative research may adopt an *ideographic* mode of reasoning and a more open, unstructured and flexible style, which allows new leads to be followed up or additional data to be gathered in response to changes in ideas. Compared with the emphasis on generalisation in quantitative research, however, the representativeness in qualitative research is often 'unknown and probably unknowable' due to heavy dependence on a specific milieu (Bryman, 1988: 95 & 100).

The quantitative researcher adopts the posture of an outsider looking in on the social world. He or she applies a pre-ordained framework on the subjects being investigated and is involved as little as possible in that world. Among qualitative researchers there is a strong urge to 'get close' to the subjects being investigated - to be an insider. For qualitative researchers, it is only by getting close to their subjects and becoming an insider that they can view the world as a participant in that setting (Bryman, 1988: 96).

The data emanating from quantitative studies are often depicted as hard, rigorous, and reliable while qualitative researchers routinely describe the data deriving from qualitative studies as 'rich' and 'deep', often drawing a contrast with quantitative data, which tend to be depicted as superficial (Bryman, 1988: 103).

Owing to the advantages and disadvantages existing in both styles of research, many scholars (e.g. Warwick, 1993; Whyte and Alberti, 1993) advocate 'marriages' or 'blending' between quantitative and qualitative research. According to Bryman (1988), the advantages of combining quantitative and qualitative research include:

- *The logic of 'triangulation'* - triangulation is an approach in which multiple observers, theoretical perspectives, sources of data, and methodologies are combined. Within this context, quantitative and qualitative research may be perceived as different ways of examining the same research problem albeit with differing objectives. By combining the two, the researcher's claims for the validity of his or her conclusions are enhanced if they can be shown to provide mutual confirmation (Bryman, 1988: 131).
- *Mutual facilitation* - qualitative research can be used as a source of theories or hypotheses to be tested by quantitative research, while the latter may facilitate the former in the judicious selection of cases for further studies (Bryman, 1988: 134-6).
- Quantitative and qualitative research can be combined in order to produce a general picture (Bryman 1988: 137), i.e. a qualitative researcher may carry out a survey in order to fill some gaps in his or her knowledge of a community, group, organisation etc. because the gap cannot be filled through qualitative methods.
- *Structure and process* - qualitative research presents a processual view of social life, whereas quantitative research provides a static account. A division of labour is suggested here in that quantitative research may be conceived of as a means of establishing the structural element in social life, qualitative research the processual (Bryman, 1988: 140).
- *Researchers' and subjects' perspectives* - the integration of quantitative and qualitative research introduces a combination of insider and outsider perspectives within a single project (Bryman, 1988: 142).

In the context of investigating how local people depend on forests and tree resources for their livelihood, it seemed neither qualitative nor quantitative methodology alone was able to achieve the research objectives. Therefore an integration of quantitative and qualitative methods was a good approach to help unpack the interlocking deep-seated structures and processes that influence the way local people depend and manage the forest resources.

4.9. Methods of data collection

The complexity of the issues that were investigated necessitated the use of a multiple methodology, both quantitative and qualitative, and a less standardised and more interactive approach (see Sayer, 1992). Apart from data triangulation through evidence

of convergence, multiple methodology has the overriding advantage of enhancing both mutually cross-checking reliability and qualitative depth. As Mitchell (1989: 36) states '...evidence based upon a variety of cross-checking methods has a higher probability of representing the reality of a problem than evidence based upon a single method'.

Methods of data collection included rapid rural appraisal, household questionnaire survey, semi-structured interviews with key informants, in-depth household case studies, literature search and direct detailed observations. While these methods were applied individually, they were used to complement each other.

4.9.1. Rapid rural appraisal

Rapid appraisal (RA) refers to a family of methodologies designed to encourage the participation of local communities in the collection and use of information to improve their livelihoods (Freudenberger, 1994: 1). Rapid appraisal methods put a premium on the usefulness of research as well as the rapidity with which results are obtained. All RA methods use a wide variety of techniques to gather information including, among others, mapping exercises, diagrams, ranking activities, and semi-structured interviews with both groups and individuals. One of the key differences among the various methods in the RA family is the question of who does the research. In what is often called RRA (Rapid Rural Appraisal), the research process is mostly managed by outsiders while in PRA (Participatory Rural Appraisal) the local community manages the research process. That is, the villagers themselves work on the objectives of the study, they are the principal collectors and analysers of information, and they decide how the information will be used in the end (Freudenberger, 1994). Thus Brace (1995: 39) summarises PRA as 'a way of involving communities in analysing their lives and providing information about their priorities'.

In practice, however, RRA and PRA are not two distinct ways of proceeding. Rather, there is a continuum between the two. As Freudenberger (1994:8) notes, 'effective RRA teams, even when composed of outside researchers, put a lot of effort into building a rapport with local communities so that the study is in fact a collaboration process in which local participation is solicited at all stages of the research process'.

The basic principles of RRA and PRA, according to Chambers and Guijt (1995) include:

- Offsetting biases - spatial, project, person (gender, elite), seasonal, professional, courtesy.
- Rapid progressive learning - flexible, exploratory, interactive, inventive.
- Reversal of roles - learning from, with and by local people; eliciting and using their criteria and categories; and finding, understanding and appreciating local people's knowledge.
- Optimal ignorance and appropriate imprecision - not finding out more than is needed and not measuring when comparing is enough. We are trained to make absolute measurements but often trends, scores or ranking are all that are required.
- Triangulation - using different methods, sources and disciplines, and a range of informants in a range of places, and cross-checking to get closer to the truth through successive approximations.
- Principal investigators' direct learning from and with local people.
- Seeking diversity and differences.

RRA techniques such as community meetings, focused group discussions, transect walks and rankings were used in the initial stages of data collection to gain an initial understanding of the rural setting and to establish rapport with the local people as well as village leaders and key informants. These techniques were used to capture information relating to aspects of culture, attitudes and perceptions regarding farming practices and forest product use, tenure issues including land rights and tree access, local people's perception of the forest resources, and indigenous forest resources and tree management practices.

Separate discussions were held with different groups: women, men, youths, as well as the 'experts' in each village in order to give individuals the opportunity to talk freely and to capture a wide range of issues relating to forest use and use rights. A combined discussion was arranged involving all the groups for cross-checking purposes. Separate transect walks were also conducted with the 'experts' and 'locals' in each village. The focus of the walks was to involve the local people in discussions and to get them to answer questions. Questions that were asked during the transect walks included questions on land uses, land and tree tenure issues, tree planting and management, uses of various trees, etc. One of the advantages of transect walks is that often people are

more willing to address sensitive issues (such as land ownership patterns) when they are away from the village (Freudenberger, 1994: 31).

RRA was an appropriate tool for this research because apart from its cost effectiveness, it helped to identify the competing, convergent, complementary and conflicting interests and knowledge base between individuals as well as between the 'experts' and 'locals' in the overall environmental/forest management, and forest and tree resources utilisation in particular. Relevant cues obtained were particularly important in trying to explain some of the larger questions regarding the status of the forest resource base, its sustainability, and the reasons for forest resources degradation and decline. The exercise also helped in identifying indigenous local management and knowledge systems, particularly knowledge that links livelihood to ecology, referred to as 'science of survival' (Rochleau, 1994: 10).

The use of RRA provided the local people with a suitable forum to identify and define their own problems, conduct their own analysis of the problems, plus building the process of participation, discussion and communication (see Chambers and Guijt, 1995:6).

4.9.2. Household questionnaire survey

Household questionnaire survey was employed after the initial RRA exercise to gather detailed information on households and to fill gaps which could not be filled during the RRA exercise. Such information was needed in order to categorise households into different socio-economic groups (rich and poor) for case study purposes (see section 4.9.4). Information gathered during the survey included household characteristics, land ownership, size of landholdings, Agricultural production systems, off-farm activities, household livelihood strategies and income sources, how the forests contribute to their livelihoods (including food and income), the range of products collected or gathered from the forests and some resource management and environmental issues.

A household is usually defined as a set of persons most of whom are linked by kinship and marriage, acting as a joint consumption/residential unit having a single budget; operationally the group (whose core is a "family") eats from the same pot and lives under the same roof (Almeida, 1996: 122). Household goals often include provision of

food and essential subsistence and consumptive goods, cash for purchasing goods and services, savings and social security, and concern to mitigate risk (Pérez and Arnold, 1996).

The household was used as the unit of analysis because under a household head, a household has a common food supply, is an income-sharing unit (members pool their incomes for common support), acts as a corporate and productive unit, and often has a moral identity as a "house" associated to a "family name" (Dei, 1991; Almeida, 1996; and Whiteside, 1998).

The household questionnaire was administered to 160 households randomly selected from the three study villages. Face to face interviews were used to implement the questionnaire. Many of the questions were closed, as the possible response categories had been obtained from earlier methods of data collection. However, most questions had an "other" section to encourage respondents to specify their own response (see Appendix 2). Respondents to the questionnaire were either the household head or his wife. However, in some cases all or most of the household members were present during the questionnaire administration, generating some sort of discussion between the interviewer and household members. Four local school teachers were employed and trained to help with the administration of the questionnaire. Some of the aspects that were covered in the training included the aims and objectives of the study, who to interview, following customs of the respondents, and how to translate the questions into the local language. Each of the research assistants then conducted three interviews which were checked by the researcher to ensure that the training had been successful.

Before the implementation of the questionnaire survey, an exploratory survey was conducted in the villages to pre-test the questionnaire. The essence of pre-testing the questionnaire was to ensure the clarity of questions to respondents and the appropriateness of the questions and response sets.

The household questionnaire survey has been used in most studies relating to local people's dependency on forest resources. For example, Dei (1989) employed the method in a study of hunting and gathering in a Ghanaian farming community. Similarly, in a study to access the nutritional and food security roles of gathered food and livestock keeping in two villages in Babati District, Tanzania, Lindström and Kingamkono (1991)

employed a household questionnaire survey or structured interviews together with other methods.

Despite the cost involved (in terms of time and money) questionnaire surveys provide quantitative data and uncover important issues for further investigation using other methods and help to 'target' subjects for more intensive (qualitative) study.

4.9.3. Interviews with Key Informants

Following the household questionnaire interviews and analysis of the data, semi-structured interviews were conducted with selected respondents and key informants to investigate in detail key issues that emerged from the analysis and from the RRA.

Key informants are persons with particular occupational skills, persons in positions of leadership in village political and/or administrative units, activists or representatives of particular groups in the community and individuals who for one reason or another are in a position to know 'something special' about the community. As Freudental and Narowe (1991) note 'key informants are particularly suitable for asking "why" questions with regard to surveys or previously collected information. They might also be keen on making viable recommendations and/or suggestions for activities'.

In this study, key informants included agricultural extension officers, forestry professionals, village teachers, village leaders, religious (spiritual) leaders, and elders in order to reconstruct environmental and forest resources use knowledge through oral history.

Apart from issues that were raised in the household questionnaire survey, the key informant interviews captured issues of livelihood strategies, forest product use, including the range of products obtained from the forests, their contribution to livelihoods and their collection patterns, the dynamics of forest resources use, indigenous knowledge about forests and trees, access and use rights, forest and tree tenure issues, forest management issues as well as local people's views on forest policy and legislation.

Specifically, 25 interviews were conducted with key informants, including 2 elderly women, 2 elderly men, 2 village leaders and 1 village teacher in each of the three communities. In addition, the District Agricultural Extension Officer, the District Forestry Manager and 2 Forest Guards were interviewed. As many of the interviews as possible were taped. The flexibility involved in the structuring and subsequent administration of the questions allowed sufficient room for further exploration and probing.

All these interviews helped illuminate the links between forestry and livelihood security, as well as assessing various tenures and also relating these aspects to questions of tree development, management and general environmental conservation.

4.9.4. Household case studies

The extent to which forests and trees form part of livelihood structures of forest communities cannot be completely understood by merely asking people what they obtain from the forest. Issues concerning the use of forest products necessitate in-depth case studies to closely monitor and record the type of products consumed or sold by households, the sources of these products, and which socio-economic groups are most dependent on forest resources.

Two in-depth household case studies were therefore conducted per village, with each household representing a different socio-economic class (wealthy and poor). The categorisation of households was based on household possession of assets such as land, livestock, and farm size as determined by the questionnaire survey. As Barham *et al.* (1999) argue, 'a key factor conditioning how forest people use their local resources - and thus generate their incomes - is the level and type of wealth (i.e. land and non-land assets) held by forest peasant households...Indeed, wealth may be the key to unlocking the logic of the diversity seen in forest product extraction among forest people'.

Food and income sources and the livelihood strategies of the households were closely monitored by regular visits to these households for a period of one month. During this period, the households were asked to record all forest products collected, eaten and sold by the household, and the source(s) of the products (e.g. farm, fallow areas, forest reserves and off-reserve forest). The collection patterns (e.g. seasonal availability) of

these products were also studied through informal interviews in the case study households. The households were also asked to list and rank their income sources in order of importance to them.

The primary focus of the household visits was to observe and record the various forest products used by the households and to get the households to tell stories. Informal talks focused on issues of specific relevance to the household. The intimate atmosphere in the house encouraged the identification of backstage information. Data from these case studies provided supporting information on relevant aspects of forest product use and management. They were also used as illustrative and reinforcing information.

4.9.5. Literature search

A literature search was conducted in various institutions in Ghana, including the Forestry Department (FD) in Kumasi, the District Forestry Office in the study area, the Forestry Commission, the Forest Research Institute of Ghana, the Institute of Renewable Natural Resources, as well as the University of Ghana and the University of Science and Technology libraries to bring together what has already been done relating to forestry and local livelihood security in Ghana.

Relevant documents (such as policy and legislation materials) obtained from the search were analysed, and this provided the framework for evaluating the situation on the ground. The literature search retrieved useful records, which complemented interviews conducted with old people and key informants to assess the status and changes in the forest resource base as well as local peoples' perception of the resource. All the information were used primarily in documenting profiles of change, and also as a mutually corroborative tool, that is, for triangulation purposes to minimise data inconsistency.

4.9.6. Observation

To supplement the above methods, I also conducted my own detailed direct observation and assessment of the environment as pertains to the condition of the forests and forest resources use, farm and off-farm activities of the villagers, etc. plus engaging in informal talks and discussions with the villagers. The observation involved taking note

of events, objects, the physical qualities and other characteristics of the environment, as well as activities and other social phenomena - what people were (or seemed to be) doing all day.

The observations were made systematically and were repeated on several occasions. The researcher occasionally conducted participant observation of the everyday life in the villages, where the researcher occasionally visited some local farms. The researcher's experience in rural communities was invaluable to this research. Born and brought up in a rural community, the researcher has a good understanding of rural life, which was very important in a research of this nature.

4.10. Managing the data collection process

In each village, time was needed to overcome fears, as forestry issues (particularly those concerned with the use of resources in reserve areas) are potentially contentious in the study communities (see Chapter 8). During this period the researcher met informally with the village government or traditional leaders and explained the purpose of the study to them and also requested their full participation. The study schedule, procedure and the types of methods to be used were also explained to them. The essence of these informal meetings was to remove suspicion, quiet rumours and make subsequent meetings with villagers easier.

Informal talks were also held with members of the communities, including members of different age/ethnic groups, men, women, older people, etc. Assurances were given to respondents about maintaining confidentiality about their individual identities in the analysis and presentation of the study results.

In many cases interviews had to be pre-arranged for times that were convenient for respondents. Most of the interviews were conducted in the afternoons (when farmers have returned from farm), on taboo days (when people are not allowed to go to farm), and on weekends, especially sundays after church. As much as possible, the interviews and discussions were allowed to flow as naturally as possible. To avoid disrupting the respondents in the interview process many of the interviews and discussions were taped. A research assistant (a local schoolteacher) was also hired from the study area to take notes alongside the tape recordings and the researcher's own notes. Each focus group

discussion was made up of between 5 and 8 members in order to effectively manage the discussion process.

4.11. Data analysis

Quantitative data from the household questionnaire interviews were coded, keyed into the computer, checked, and then analysed using SPSS (Statistical Package for the Social Sciences). Frequencies were run for each of the variables across all the respondents in order to present the appropriate descriptive statistics and graphs of the study. In order to determine the association/relationships between certain major independent variables and dependent variables, cross-tabulations and the Chi-square statistic were run using a significance level of 0.05 (see Rose and Sullivan, 1996: 123-159).

The process of qualitative data analysis was, to some degree, a continuum with the data collection activity. This is simply due to the fact that, alongside the data collection activity, there was constant simultaneous reflections and 'mind inquiry' or probing, all of which were guided by the substantive and conceptual issues which underpin the study. In other instances, such issues influenced the selection of materials that were recorded. Analytic notes and/or memos formed the core of the preliminary analysis. As Burgess (1984: 174) describes, 'such memos may include summaries written at the end of a day in the field in which the researcher indicates themes that have emerged, and the concepts that can be developed, together with preliminary thoughts about the analytic framework'.

Tape recordings of qualitative data such as semi-structured interviews and focus group discussions were occasionally fully transcribed and analysed in the field. More often, the recordings were simply used to make notes, especially where mostly 'factual' information was required and the notes/information organised by objective. In most cases in the field, several large sheets of paper were taken and each objective written on top of a sheet. The important findings under each objective were then written under it. Another sheet was used to note down any contradictions or gaps in the data which were later verified and completed with the informants. Details from the RRA activities, including transect walks, rankings, etc. were also documented and analysed accordingly.

The data collected, however, were eventually analysed using an iterative and detailed process of analysis involving a number of techniques. Two main approaches were used: one involving convergence, or agreement of respondents' issues and concerns (after Guba and Lincoln, 1983) and the other dwelling on the emergence of themes out of the categories of agreement. This involved a number of steps.

Initially field notes and observations were systematically categorised into issues and concerns raised by respondents. These categories were then prioritised according to respondents' emphases of those that concerned them most. The final step involved checking of these categories for completeness in order to ensure that the categories still reflected the issues and concerns of respondents after the initial analysis. The process was facilitated through the continued reference to field notes. Once the categories of convergence/agreement had been determined, the main themes then became easier to identify which formed the basis of presenting the study results. Categories of data that diverged from the issues and concerns that were organised on the basis of convergence were retained as separate themes and presented under their own separate headings. Data obtained through literature search were critically examined and aspects of forest resources use and forest change evaluated.

4.12. Conclusion

In this chapter, the background and description of the study setting have been provided. The chapter has also outlined and discussed the various methods used for data collection and analysis. The key methodological issues that guided the investigation have also been discussed. The use of multiple sources of evidence had the advantage of building triangulation into the data collection process.

The next four chapters (chapters 5, 6, 7 and 8) present the results of the study. Interpretations and discussions have been provided alongside the presentation of the results. Chapter 5 focuses on land tenure issues and agricultural production while Chapter 6 examines the subsistence uses of forest resources. Chapter 7 focuses on forest-based income activities and their contribution to household livelihoods. Local management of forest resources and local people's perceptions of forests are presented in Chapter 8.

CHAPTER 5

SAMPLE CHARACTERISTICS, LAND TENURE AND AGRICULTURAL PRODUCTION

5.1. Introduction

A sustainable rural livelihoods approach acknowledges that most households depend on a complex web of support and is of particular importance in a forest context as dependence of the poor on forests is rarely, if ever, total (Arnold and Bird, 1999). It is therefore essential to be aware of the other components of poor peoples' livelihoods - such as land availability, land ownership, crop and livestock production, etc. - in order to understand how rural people make their livelihoods. This chapter focuses on land ownership, land holdings, and agricultural production in the study area. The reason for examining these issues first is that land ownership, land availability and agricultural production partly shape and influence the way rural people use and depend on forest resources for their livelihoods.

For example, as pressures on the agricultural land base increase, leading to progressive fragmentation of farm holdings and overuse of arable land, the ability of farm households to achieve food self-sufficiency from their land declines widely. Rural populations are therefore becoming increasingly reliant on both farm and non-farm income in order to meet their food and other needs and forest product activities have repeatedly been found to provide one of the main sources of non-farm income to rural households (Arnold 1996).

The chapter begins with the social structure, household characteristics, and ethnic composition of the study area. A general overview of land ownership in Ghana has also been considered in this chapter. This leads to a discussion on land ownership, land holdings and agricultural production in the study area. The final section examines the status of household food security in the area and the strategies adopted by the rural households to survive insufficient food crop harvest.

5.2. Social structure and household characteristics

Sixty-one percent (61%) of the 160 respondents to the household questionnaire were males and 39% were females (Table 5.1). Getting women to respond to the questionnaire was particularly difficult, as most of the women wanted the interviewers to seek permission from their husbands before they could be interviewed.

Issues concerning forest use in the study communities are potentially contentious, as the local people require permits from the Forestry Department (FD) to harvest products from forest reserve areas. Most people feel that they are being prevented from subsisting and therefore resent their exclusion and the FD's regulation of their use of NTFPs from forest reserve areas. There is therefore a general fear of outsiders and the FD in particular in these communities. Thus most women were afraid to discuss issues regarding forest use and did not want to say anything to conflict what their husbands said.

Table 5.1. Gender characteristics of the sample

	Sureso		Kamaso		Kamaboi		Total	
	No.	%	No.	%	No.	%	No.	%
Male	41	63.1	37	67.3	20	50.0	98	61.2
Female	24	36.9	18	32.7	20	50.0	62	38.8
Total	65	100.0	55	100.0	40	100.0	160	100.0

Seventy-two (72%) percent of the respondents were married with 9% single, 10% divorced and 9% widowed (Figure 5.1).

The ages of the respondents ranged between 20 and 79 years with a mean of 43 years. However, the majority of the respondents (54%) were above 40 years of age, thus the respondents were relatively mature (Table 5.2).

Figure 5.1. Marital status of respondents

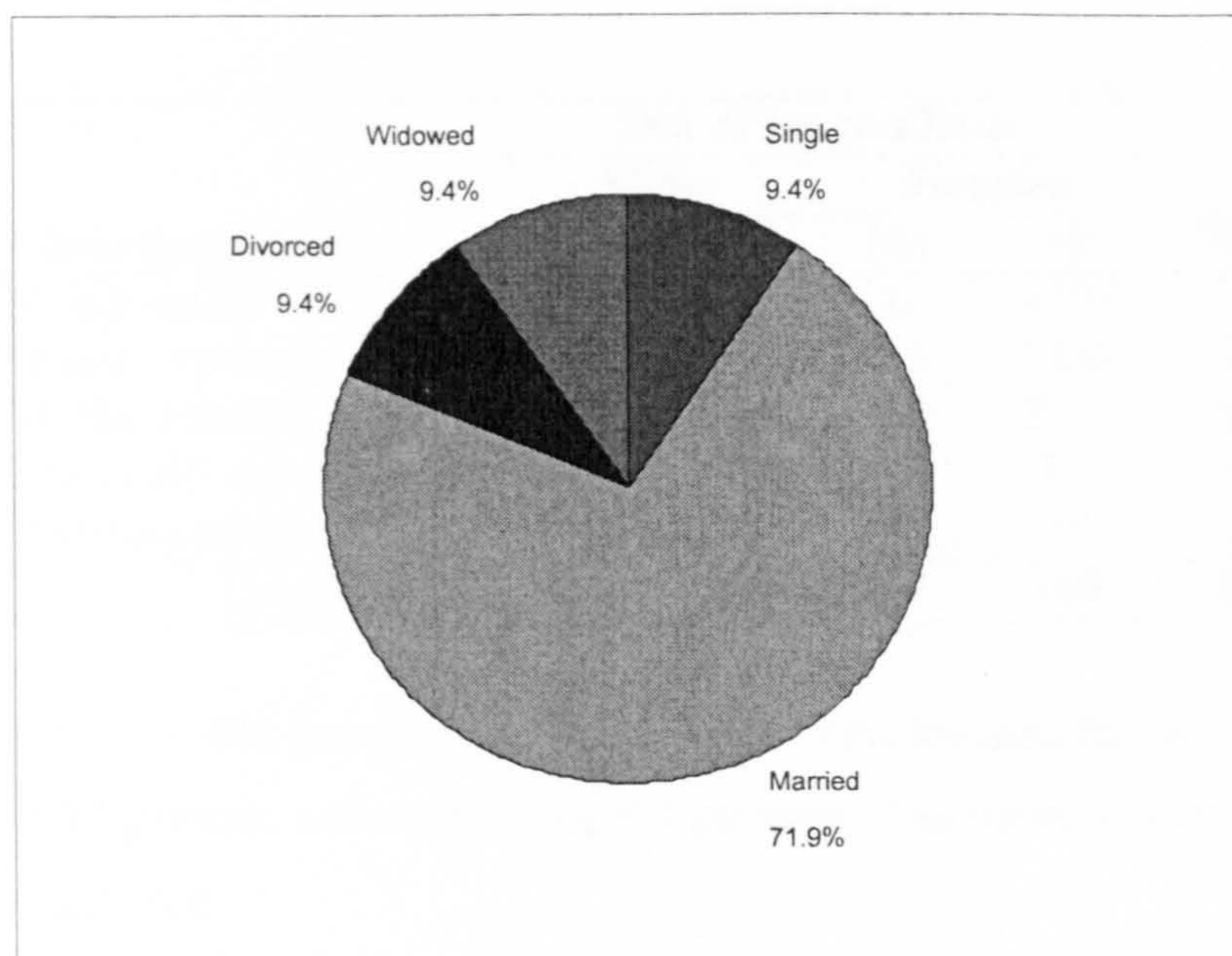


Table 5.2. Age distribution of respondents

Age (years)	Number of respondents	% of respondents
20 - 29	34	21.3
30 - 39	40	25.0
40 - 49	25	15.6
50 - 59	28	17.5
60 - 69	28	17.5
70 - 79	5	3.1
Total	160	100.0

Twenty eight percent (28%) of the respondents had no education at all, 18% were educated to primary school level, 43% to middle school level¹, 9% to secondary level (mostly Junior Secondary School) with only 3% having post-secondary education. Education was somehow biased against women since more men were educated compared with women (see Table 5.3). For example, 42% of the female respondents had no education compared with 18% of male respondents. Conversely, as much as 52% of the male respondents were educated to middle school level compared with only 27% of female respondents, and all those who had post-secondary education were males (Table 5.3).

¹ Middle School was the level of education between Primary School and Secondary School that existed in Ghana until the 1980s when it was replaced by the Junior Secondary School and Senior Secondary School scheme.

Table 5.3. Comparison of educational levels of male and female respondents

Educational level	Sex of respondents				Total	
	Males		Females			
	No.	%	No.	%	No.	%
No education	18	18.4	26	41.9	44	27.5
Primary school	15	15.3	13	21.0	28	17.5
Middle school	51	52.0	17	27.4	68	42.5
Secondary school	9	9.2	6	9.7	15	9.4
Post-secondary	5	5.1	0	0	5	3.1
Total	98	100	62	100	160	100

A total of 862 people lived in the 160 sample households. Household size ranged from 1 to 17 persons with a mean of 5.4 persons. The variations in household size were great (Table 5.4.)

Table 5.4. Variations in household size

Household size	Number of households			
	Sureso	Kamaso	Kamaboi	Total
1 - 3 people	18	16	12	46 (28.8%)
4 - 6 people	29	22	12	63 (39.4%)
7 - 9 people	13	13	9	35 (21.9%)
10 - 12 people	4	4	5	13 (8.1%)
13 - 15 people	0	0	2	2 (1.3%)
16 or more people	1	0	0	1 (0.6%)
Total	65	55	40	160

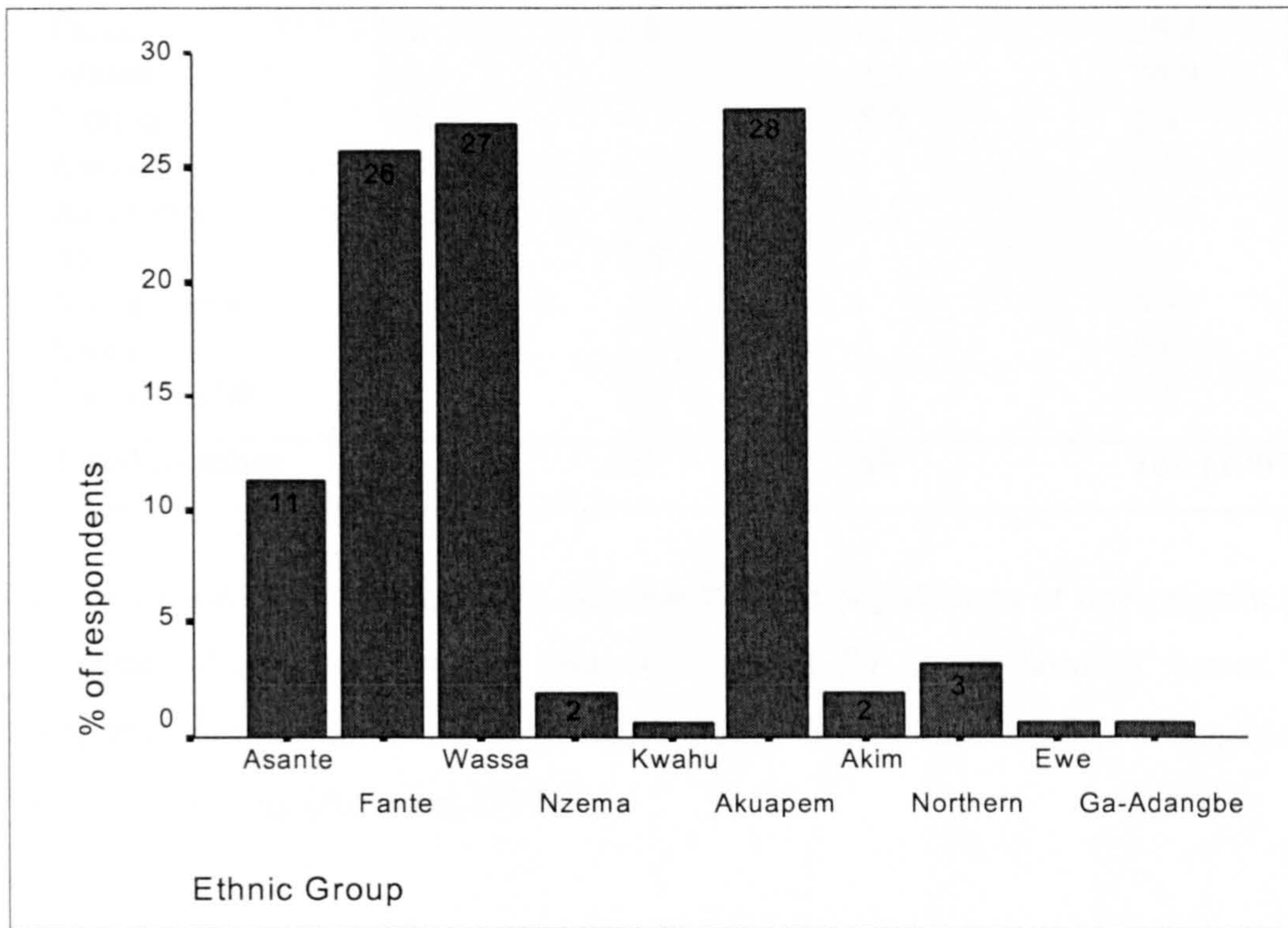
The communities are characterised by different religious groups. Ninety percent (90%) of the respondents were Christians, 1% were Moslems, 4% were traditionalists and 5% belonged to other religious groups including free thinkers. In all the villages, apart from chiefs and elders, unit committees and religious groups, no local organisations such as fire volunteers, youth associations, women's groups and farmers' co-operatives were in existence.

5.3. Ethnic composition and migration

The study area is characterised by different ethnic groups. Twenty seven percent (27%) of the survey respondents were indigenous Wassas while 73% were immigrants, including Asantes, Fantes, Nzemas, Kwahus, Akuapems, Akims, Ewes, Ga-Adangbes

and northerners (Figure 5.2). The Asantes, Wassas, Fantes, Kwahus, Akuapems, Nzemas and Akims, together with other ethnic groups are collectively called the Akans.

Figure 5.2. Ethnic composition of the study area



The Asantes come from the Ashanti Region, the Fantes the Central Region, and the Wassas and the Nzemas from the Western Region. The Kwahus, Akuapems, and Akims come from the Eastern Region, the Ewes from the Volta Region, the Ga-Adangbe from the Greater Accra Region, while the northerners are either from the Northern Region, Upper East Region or Upper West Region.

The populations of Kamaso and Kamaboi were predominantly migrants while that of Sureso was predominantly indigenous population. For example, more than 72% of the respondents in Kamaso were Akuapems, as many as 85% of the respondents in Kamaboi were Fantes, while more than 64% of the respondents in Sureso were indigenous Wassas (Table 5.5).

Table 5.5. Ethnic composition of the sample (% of respondents)

	Sureso (%)	Kamaso(%)	Kamaboi(%)	Total (%)
Asante	9.2	18.2	5.0	11.3
Fante	9.2	1.8	85.0	25.6
Wassa	64.6	-	2.5	26.9
Nzema	1.5	-	5.0	1.9
Kwahu	1.5	-	-	0.6
Akuapem	4.6	72.7	2.5	27.5
Akim	-	5.5	-	1.9
Northerners	7.7	-	-	3.1
Ewes	1.5	-	-	0.6
Ga-Adangbe	-	1.8	-	0.6
Total number	65	55	40	160 (100%)

The existence of settlements with dominant ethnic populations of one migrant group in this area reflects the fact that migrants settling for cocoa farming tended to form companies in their home towns, joining together to buy land in other areas, specifically for cocoa farming (Amanor, 1996).

The study area, and for that matter, the Western region as a whole has been noted over the past 30 years for in-migration of farmers from other parts of Ghana into the cocoa sector which is a major cash crop in this area (Amanor, 1994; Brown, 1999). Most of the indigenous people reported that this trend has put pressure on land and is causing increasing numbers of farmers to look for solutions outside cocoa farming. Some of these migrants are not fully settled and keep moving back and forth. These are mostly young men and women who travel to these areas to seek casual employment mostly in cocoa farms.

In general Ghana is characterised by diverse ethnic and cultural groups. In 1960, roughly 100 linguistic and cultural groups were recorded in Ghana². The major ethnic groups in Ghana include the Akan, Ewe, Mole-Dagbane, Guan, and Ga-Adangbe. Despite the cultural differences among Ghana's various peoples, linguists have placed Ghanaian languages in one or the other of only two major linguistic subfamilies of the

² Source: <http://www.ghanaweb.com/GhanaHomePage/ghana/general/tribes.html>

Niger-Congo language family, one of the largest language groups in Africa. These are the Kwa and Gur groups, found to the south and north of the country respectively.

The Kwa group, which comprises about 75% of the country's population, includes the Akan, Ga-Adangbe, and Ewe. The Akan are further divided into the Asante, Fante, Akuapem, Akim, Akwamu, Ahanta, Bono, Nzema, Kwahu, and Sefwi. The Ga-Adangbe people and language group includes the Ga, Adangbe, Ada, and Krobo. North of Ghana are the three subdivisions of the Gur-speaking people, classified in this study as northerners. These are the Gurma, Grusi, and Mole-Dagbane. Like the Kwa subfamilies, further divisions exist within the principal Gur groups. The subdivisions of each group share a common cultural heritage, history, language, and origin. Ethnic rivalries sometimes exist among some of the various ethnic groups in Ghana and ethnicity continues to be one of the most potent factors affecting political behaviour in Ghana.

No part of Ghana is thus ethnically homogenous. Urban centres are the most ethnically mixed because of migration to towns and cities by those in search of employment. Rural areas, however, tend to reflect more traditional population distributions, with the exception of cocoa-producing areas such as the study area that have attracted migrant labour from other parts of the country.

5.4. Land tenure and land holding

The term land tenure refers to the set of rights which a person or some private or public entity holds in land. It implies the various laws, rules and obligations governing the holding and/or ownership of rights and interests in land (Bruce, 1989: 1). Tenure relations in rural communities are often complex. Local tenure systems may incorporate aspects of official legislation as well as traditional or customary tenure systems, which are often highly complex.

For example, instead of one person having all the rights to a given plot of land and the resources on it, the "bundle of rights" may be divided up. It may be divided according to the resource: the land is owned by one person, the trees by another. It may also be divided according to the way the resource is exploited: one person may be considered the owner of a tree and have exclusive rights to chop it down or collect the firewood,

but many other people may have rights to collect fruits or leaves. Or, the rights to the resource may change over time: one person may hold land for cultivation purposes during the rainy season while it becomes pasture with much less restrictive rules of access during the dry season (Freudenberger, 1994: 5). One characteristic of local tenure systems is that they are often adaptive, evolving over time in response to changing ecological and/or social-economic conditions (Freudenberger, 1994).

Land tenure relations in rural communities have a significant effect on agricultural production and how rural people make and sustain their livelihoods as well as the management of natural resources on which rural livelihoods depend. Land tenure influences who could benefit from managing forest resources on a sustainable basis and who would not (Barraclough and Ghimire, 1995). In almost all developing countries, forests, woodlands, trees, etc. play important roles in supporting rural livelihoods, especially in remote areas and in times of hardship. However, for all these types of land resources, the rights held by the poor are frequently their most fundamental livelihood asset (DFID, 2002: 2). The security and quality of these rights directly affect how these resources are used and managed. Sustaining the forest resource for its own environmental, economic and sociological value can only be ensured within the context of secure land tenure systems which adequately reward and protect the majority of the people on the ground (Kasanga, 1994). These are the principal reasons for devoting this section to a discussion of land tenure.

5.4.1. An overview of land ownership in Ghana

Land ownership in Ghana can broadly be divided up into three categories, namely customary ownership, state ownership and split ownership (a partnership between the state and the customary owners)³ (Larbi, 1998; Larbi *et al.* 1998).

Customary land ownership occurs where the right to use or to dispose of use-rights over land rest neither on the exercise of brute force, nor on the evidence of rights guaranteed by government statute, but on the fact that they are recognised as legitimate by the community, the rules governing the acquisition and transmission of these rights being usually explicitly and generally known, though not normally recorded in writing

³ These are the categories of land ownership provided for in the 1992 Constitution of Ghana.

(Bower, 1993). As Larbi *et al.* (1998) note, such ownership may occur in any one or a combination of the following ways:

- discovery and long uninterrupted settlement;
- conquest through war and subsequent settlement;
- gift from another land owning group or traditional overlord; and
- purchase from another land owning group.

The customary sector holds 80 to 90 percent of all the undeveloped land in Ghana with varying tenure and management systems (Kasanga and Kotey, 2001). Certain distinct schemes of interest exist in customary or communal ownership, including the allodial interest⁴, which is the highest proprietary interest known to exist in customary land. Here land is acquired absolutely forever and one has the right to pass on the land to inheritors without acknowledgement to a superior. It is equivalent to the concept of freehold in the English system. Other lesser interests that flow out of the allodial interest are the usufructuary interest (right to acquire, use and dispose of land with no restriction on the use of the land), tenancies (sharecropping), licences and pledges (Kasanga and Kotey, 2001; Kasanga, 1988).

Customary lands in Ghana are managed by a custodian (a chief or a head of family) who manages the land with the principal elders of the community. Any decisions taken by the custodian that affects rights and interests in the land, especially the disposition of any portion of the communal land to non-members of the land holding community, require the concurrence of the principal elders. Custodians of customary lands therefore hold the land in a fiduciary capacity and they are accountable to the members of the land owning community (Larbi *et al.* 1998). Individuals and families from the landowning group hold the 'customary freehold' - denoting the near maximal interest in land. This principle is valid for all parts of Ghana where the allodial title is vested in the wider community (Kasanga and Kotey, 2001).

Although community-based systems remain the dominant form of land tenure in Ghana, the economic growth surge of the past has fuelled the emergence of land markets and more privatised forms of landholdings. This is particularly evident in the rural southern

⁴ The "allodial" title is coined on a Latin term "allodium" used in feudal medieval Europe (1241) originally to designate the relationship of Simon de Montfort to some of his lands in France. It describes an absolute power of allocation but not necessarily a title of personal use (cited in Hammer, M. (1998) 'Stool rights and modern land law in Ghana', *afrika spectrum* 33 (3): 311 - 338).

cocoa-growing regions (characterised by agricultural commercialism and mounting pressures on land) where customary lands are increasingly allocated to private individuals (Knox, 1998). Such lands are largely allocated on a leasehold basis rather than alienated outright, as the constitutional provision regulating the land market in Ghana does not allow the allocation of land on a freehold basis. The present provision stipulates that there can be no freehold grants of state, vested and stool/skin⁵ (customary) lands. Ghanaians are generally entitled to 99-year leases for residential development and 50-year leases for non-residential development, subject to renewal. Non-Ghanaians are entitled to 50-year leases for all types of land uses (Larbi, 1998). Since customary lands are largely allocated to non-members of the land-owning group on leasehold basis, such lands are still classified as customary lands. Thus, the landholders of customary lands include communities (represented by stools/skins), clans, families and individuals (Kasanga and Kotey, 2001).

Customary ownership is associated with considerable problems - the boundaries of such lands are not generally surveyed and in some cases undefined, there may be conflicting claims to ownership, and there is improper record keeping of judgements, dispositions and other records relating to the land by the custodians. Land litigation is therefore high (Larbi *et al.* 1998; Knox, 1998).

State lands are those which have been expressly acquired by the state through compulsory acquisition or negotiation. The boundaries of these lands are cadastrally surveyed but are scattered throughout the country. They vary in size depending on the purpose of the acquisition, and leases of these lands are granted to statutory institutions and private individuals for development.

Split ownership on the other hand occurs when the state takes over the legal incidents of ownership (the right to sell, lease, manage, collect rents, etc.) from the customary landowners and holds the land in trust for the land owning community. The landowners retain the equitable interest in the land - the right to enjoy the benefits from the land. This is generally referred to as vested land and it is managed in the same way as state

⁵ A 'stool' refers to a particular land-owning group represented by a 'stool' chief. It also refers to a community governance or administrative structure similar to dynasties (Kasanga *et al.*, 1996).
Note: A skin in Northern Ghana is the equivalent of a stool in Southern Ghana.

lands. However, unlike state lands, the boundaries are not cadastrally surveyed, and they are usually larger in size, covering wide areas (Larbi *et al.* 1998).

Any piece of land in Ghana falls into one of these ownership categories. The universal principle in Ghana is that "there is no land without an owner". Since state and vested lands are acquired expressly through legislation, all other lands outside these categories belong to the class of customary lands - either for stools/skins, clans or families.

5.4.2. Land ownership in the study area

The whole of the study area is under customary land tenure system, and all land is ultimately controlled by village chiefs and family heads on behalf of the community, clans and families. Land is therefore held by clans, families and individuals from the landowning community and by outsiders who have acquired land on leasehold basis. Individual lands are allocated family land or are acquired through inheritance or through leasing from the customary landowners and hence are still classified as customary land. Lands under forest reserves, however, are vested in the government in trust for the land owning communities.

While the majority of the rural people farm on individual land, others also farm on family land. For example, 25.6% of the survey respondents reported that they farm on family land, 51.9% farm on individual land, whereas 22.5% of the respondents were landless and therefore depend on land hiring and share tenancy (sharecropping) for their land needs (Table 5.6).

Table 5.6. Land ownership among migrants and indigenes (% of respondents)

	Indigenes (%)	Migrants (%)	Total (%)
Farm on family land	39.5	20.5	25.6
Farm on individual land	53.5	51.3	51.9
Farm on hired land or sharecropping	7.0	28.2	22.5
Total number	43	117	160

Land purchase

Land purchase (outright alienation of land) is rare in this area, as local people 'frown' upon land sales. People who are not part of the landowning group hold land on

leasehold basis usually for a long period (50 - 99 years) which can be renewed. Most farmers maintained that they pay annual rent to the local chiefs. The local people, however, literally refer to such leases as 'land purchase'. Interviews with farmers suggest that strong land rights are conferred on individuals who have acquired land on leasehold basis.

Although land purchase is rare in most areas of Ghana these days, several authors maintain that cases of land purchase have occurred in the past and it has been one of the common means by which earlier migrant farmers got access to land (Amanor and Diderutuah, 2001; Kasanga and Kotey, 2001; Knox, 1998; Hill, 1963).

For example, Knox (1998) notes that the introduction of cocoa to Ghana in 1879 invoked radical tenure changes as the profitability of the crop lured farmers to migrate to the Akyem Abuakwa area in the Eastern region and other cocoa-growing areas of southern Ghana. Since their purpose in inhabiting the land was to earn profits rather than subsistence, the local leaders rationalised that the land ought to be sold to them rather than granted, as had been the traditional means of allocating land to outsiders. Two main forms of tenure took root. In one, groups of unrelated individuals organised to purchase land and received parcel strips in accordance with their contribution to the purchase. These farmers largely originated from patrilineal⁶ groups, such as the Krobo. By contrast, the matrilineal⁷ Akan purchased land as individuals or among extended families, often in tracts larger than what they were capable of cultivating themselves as land became looked upon as an investment (Knox, 1998). Hill (1963) also observed that the chiefs were glad to seize the opportunity of selling land outright to enterprising migrant cocoa farmers. It is, however, not clear from the literature whether such past 'land purchases' constitute a final alienation of land from the chiefs' control.

In the Wassa Amenfi District (the study area), there is a great controversy between landowners and migrant farmers over the question of whether such past 'land purchases' give absolute title to the land to the farmer. Some chiefs refuse to acknowledge such

⁶ Patrilineal societies in Ghana follow the patrilineal system of inheritance. That is, the individual who succeeds is traced from the male ancestor in the direct male line. Land is passed by patrilineal succession from father to sons (Agyeman, 1993:15).

⁷ Matrilineal societies follow the matrilineal system of inheritance. The succession to property is through the matrilineal line according to primogeniture (Agyeman, 1993: 23).

transactions as constituting a final alienation of land from the chiefs' control. As the paramount chief of the Wassa Akropong traditional area pointed out:

"These tenant farmers fail to come to me for introduction and for confirmation of the transactions entered into. Furthermore, very few, if any, of the tenant farmers have valid documents or titles to the lands they have acquired. Some chiefs issue temporary receipts, which serve as documents on the land, while other tenant farmers make site plans, which only the chiefs sign. No indentures are prepared for the signatures of the divisional chiefs and their elders as well as mine. In the absence of indentures and accompanying survey papers, disputes concerning boundaries are legion" (Bassayin, 1985, in Benneh, 1988).

Share tenancy/sharecropping

Two main systems of share tenancy or sharecropping arrangements exist in the study area namely, *abusa* (one-third of cocoa output for tenant) and *abunu* (50:50 sharing arrangement).

In the *abusa* system, the tenant is admitted onto an already existing cocoa farm so that he primarily maintains and harvests the crop. The tenant receives one-third of proceeds or the cocoa output as his wages. In contrast, in the *abunu* system, tenants are requested to plant cocoa trees usually on bushland and manage cocoa trees until the whole field is planted to cocoa, at which time land ownership, rather than output, is usually divided between the tenant and the landowner on a 50:50 basis (see Asenso-Okyere *et al.* 1993). The major reason for dividing land rather than sharing output in the *abunu* tenancy may be rooted in the difficulty for the landowner to check cocoa output accurately and the suspicion that the tenant may be able to cheat the landowner.

Tenancy arrangements in Ghana differ from one locality to another and in most places these systems have undergone transformations over the years. Amanor (1994:45) provides evidence of how the *abusa* system has been transformed over the years into the *abunu* system in Ghana. He notes that in the period 1920-40 the landowner appropriated a third share of the proceeds of the cocoa harvest or received a third portion of the cocoa farm which was created under the *abusa* tenancy. However, in the post-war period, as land became increasingly scarce and expensive, this arrangement was increasingly transformed into a half share (*abunu* tenancy). The dominant system in most cocoa

growing areas in Ghana presently is for tenants to be admitted onto an existing cocoa farm in return for a third share of the cocoa output.

In the study communities, sharecropping or share tenancy is more important among migrant farmers as a mode of gaining access to land as most of the respondents who reported that they farm on hired land or depend on share tenancy for their land needs were migrants (see Table 5.6). Early migrant settlers in the study area were able to acquire large tracts of land cheaply. However, later migrants are faced with more developed land markets and growing land scarcity, and therefore depend on sharecropping for access to land. As uncultivated forestland outside reserve forests has largely disappeared in this area, renting land under share tenancy arrangements have become the major means for migrants to acquire access to land (Boadu, 1992).

5.4.3. Land acquisition and transfer

Differences in the history and inheritance laws of the patrilineal and matrilineal societies in Ghana have created different land ownership and transfer systems. However the mode of acquisition of land is similar in both societies (Agyeman, 1993). In general a Ghanaian man follows a sequential decision-making process with respect to land acquisition over his life cycle: if forest land is available, he acquires it through clearance when he is young; he acquires family land through inheritance, allocation, and gift when he gets married; and later he acquires additional land through renting and private purchase (usually leasehold) (Quisumbing *et al.*, 1999). No customary law in Ghana prevents women from owning land or trees. However, in most places, their right to inherit land is relatively weak and insecure but once they have acquired land its use is not restricted (Agyeman, 1993). For example, in patrilineal societies, if a man dies and his land is divided among his children, the daughters receive a much smaller portion than the sons do. In most cases, the daughters' claim to land is regarded as a privilege and not a right to be enforced in a court of law (Nukunya, 1972, in Agyeman, 1993). Similarly, women are relatively disadvantaged in acquiring land through forest clearance since forest clearance is a male activity.

Among the indigenous Wassa households in the study area land is most often acquired through inheritance, family allocation and gift. Gifts of land are usually made in appreciation of services rendered and it is a common practice for landlords to give

portions of land to children or servants after they have worked for a substantial period of time on their farm.

While the indigenous Wassa people and Akans in general have traditionally followed matrilineal inheritance⁸, the mode of land transfer has evolved and changed over time. When virgin forests were abundant, forests were appropriated primarily by young males before marriage mainly for the production of food crops. Relatively strong land rights were granted in return for the substantial labour input required to clear forest. Traditionally, in the Akan matrilineal system, this type of land was either bequeathed to nephews or allocated to other male members of the extended family, in accordance with the decision of the family head (Quisumbing *et al.*, 1999: 8). Wives and children were left with no rights to a man's property if he were to die intestate. Uncultivated fallow land was often allocated temporarily to members of the extended family, who otherwise possessed small land areas (Brydon, 1987, cited in Quisumbing *et al.*, 1999).

More recently, however, appropriated village land is increasingly being transferred directly to wives and children, even family land with the consent of the family members, particularly after the land has been planted either wholly or partially with cocoa trees. Such transfers are termed "gifts" and individual rights on such land are firmly established⁹. The evidence for land ownership in these communities is mainly through social recognition and tree demarcation.

Among migrants and strangers in the study communities the most common means of acquiring land presently is by hiring/renting (tenancy or sharecropping agreements) and land leasing from customary landowners. In all the villages tenants normally have restricted rights to the use of acquired land. In most cases they can use the land for growing food crops but not tree or cash crops unless it has been specifically agreed by the landlord. The land acquired by the tenant cannot be transferred to other people. He may also not sell, mortgage or sublet any part of the land. The land reverts to the landlord on the death of the tenant, but, if the landlord does not need it, then the

⁸ In the matrilineal system of inheritance, a man's property is generally inherited in the following order: (a) Brothers according to seniority, (b) Nephews (sister's sons), (c) Niece (sister's daughters) and (d) Grandsons and daughters. A woman's property is usually handed over to the deceased's mother who often waives her right in favour of the dead woman's relatives as follows: (a) Daughters, (b) Sister's daughters and (c) Granddaughters (Agyeman, 1993).

⁹ Such gifts are formalised by the husband presenting ritual drinks to family elders. This ritual, in which family elders and other members are present as witnesses, is crucial so that the transfer of land rights by gift will not be contested in the future.

children of the deceased may carry on farming it. Length of land occupation does not transfer ownership of land to a tenant. For example, in a case involving "Mensah versus Esah-1976", the court used customary law to disprove the 'successor's right of inheritance claim' of a tenant who had stayed with and farmed the land of a man for 63 years before the man's death (Agyeman, 1993).

In the context of rural areas, land, apart from being used as a basis for providing shelter, is also the basis of livelihood of the rural population. Where agriculture is the predominant occupation, the means of livelihood will be dependent not only on the fertility and ease of putting land into productive use, but also on the allocation of rights in land (Acquaye, 1986). Land tenure and land availability partly shape and influence the way rural people use and depend on forest resources for their livelihoods and thus have a significant effect on the management of forest resources on which rural livelihoods depend. Many studies have indicated that, where people have limited land for agricultural production, forest foods and income from forest products often play important role in rural livelihoods. Thus, dependence on income from non-timber forest products has been shown to be inversely related to size of landholdings in Orissa, India (Fernandes and Menon, 1987, cited in Arnold 1996), and in Brazil (Hecht *et al.* 1988, cited in Arnold, 1996).

The potential for the poor to generate forest product supplies and income from land they farm, rather than from forests, is usually affected by land rights. Because of the relatively long production period of tree products, if there is not sufficient security of tenure to ensure that planters will be able to reap the harvest from the trees they establish, tree growing is likely to be inhibited (Arnold and Bird, 1999). In some situations, tenorial conditions may need to be clarified or modified before tree management can succeed. Tenorial rights that enable, or appear to enable, the State to expropriate land that has trees on it may inhibit tree growing. More widely, insecurity of tenure generated by the threat or possibility of tenorial change, such as land titling, can inhibit investment in tree growing. Sharecropping and some other forms of short-term tenancy can also prevent or discourage tree growing (Warner, 1993, cited in Arnold and Bird, 1999).

5.4.4. Land holdings

It is always difficult to obtain reliable information on land holdings through interviews. Respondents are often uncertain about the actual acreage or how to measure or estimate it, or they may withhold the correct information. The data presented on land holdings should therefore be regarded as indicative rather than definitive or conclusive.

Land holdings ranged between 0.5 to 40ha with an average land size of 6ha. The majority of the respondents (60%) have up to 5ha of land with 25.6% having between 6 and 10ha. Only 1.3% of the respondents have over 25ha of land (Table 5.7.). In this area, the commonest unit of land size measurement is the 'pole', which is the equivalent of 40 outstretched arm lengths of a tall male adult. According to Benneh (1988), the 'pole' measures about 73.2 metres.

Table 5.7. Size of land holdings in the study area

	Number of respondents	% of respondents	Sureso (%)	Kamaso (%)	Kamaboi (%)
Up to 5 ha	96	60.0	72.3	61.8	37.5
6 - 10 ha	41	25.6	18.5	23.6	40.0
11 - 15 ha	14	8.8	6.2	7.3	15.0
16 - 20 ha	5	3.1	1.5	3.6	5.0
21 - 25 ha	2	1.3	1.5	0	2.5
Over 25 ha	2	1.3	0	3.6	0
Total no.	160		65	55	40

Patterns of land holdings show similar distributions for both indigenous people (or locals) and migrants, and for both men and women. However, migrants tend to have larger land holdings than the indigenous people. For example, 28.2% of the migrants own between 6 and 10ha as against 18.6% of the indigenous people and all the respondents who own between 21 and 25ha and above 25ha were migrants (Table 5.8.).

Table 5.8. Size of land holdings in relation to migrant and indigenous people, and gender (% of respondents)

	Indigenes (%)	Migrants (%)	Men (%)	Women (%)	Total (%)
Up to 5 hectares	74.4	54.7	56.1	66.1	60.0
6 - 10ha	18.6	28.2	26.5	24.2	25.6
11 - 15ha	4.7	10.3	12.2	3.2	8.8
16 - 20ha	2.3	3.4	2.0	4.8	3.1
21 - 25ha	0	1.7	1.0	1.6	1.3
Over 25ha	0	1.7	2.0	0	1.3
Total number	43	117	98	62	160

These results corroborate earlier findings by Amanor (1996: 4), who noted that land owned by both migrant men and women in this area tend to be more skewed towards larger acreages than land-holdings of locals. This is a reflection of the fact that migrants have longer traditions of commercial cocoa farming in this area and were instrumental in opening up the district for cocoa. Early migrant communities (as represented by Kamaso and Kamaboi who settled from the 1950s) were able to acquire large tracts of land cheaply. As local farmers eventually turned to cocoa farming, much land had already been appropriated, leaving less land for them to develop in this way.

5.5. Agricultural production

Agriculture is vital to the overall economic growth and development of Ghana and it is the largest contributor to the Gross Domestic Product (GDP), accounting for over 40% (ISSER, 1999). It also accounts for about 60% of export earnings and directly or indirectly supports 80% of the total population economically through farming, distribution of farm produce and provision of other services to the agricultural sector (MOFA, 1997).

Agriculture is, however, predominantly on a small holder basis in Ghana. The bulk of farmers (85% of land holders) are small scale operators (farming less than 2 hectares) who use traditional labour intensive methods of cultivation, with the use of hoes and cutlasses and account for about 80% of agricultural production (MOFA, 1997). While there is little mechanised farming, ox-drawn equipment is increasingly found, especially in the northern part of the country. Agricultural production varies with total rainfall and with soil factors, with strong regional diversity. Shifting cultivation is widely practised

and subsistence farming is common in the rural areas. Agricultural productivity in Ghana is thus low, mainly because of the low fertility of the land, limited use of available technical packages, non-timely delivery of inputs (particularly fertilizers) and poor credit availability (GNPGRC, 1995).

Agriculture is the main occupation in the study area with cocoa being the major cash crop cultivated by farmers. Agriculture dominates the economy of the entire Wassa Amenfi District and almost 85.6% of the district's working population is engaged in this sector, which constitutes the major source of household income in the district (WADA, 1996).

5.5.1. Crop production

While virgin forests outside reserves have largely disappeared in the study area, annual crop fields and fallow areas under shifting cultivation, including secondary forests, exist along with cocoa fields (see Table 5.9). Cocoa cultivation has historically spread from the Eastern Region towards the Ashanti and Brong-Ahafo Regions in the 1940s and 1950s and further towards the frontier area of the Western Region (including the study area) during the 1950s and 1960s (Quisumbing *et al.* 1999).

Table 5.9. Tonnage of cocoa from the Asankrangwa cocoa district (1992 - 1996)

Year	Tonnage		Total
	Main crop season	Light crop season	
1992/93	4469 (71,504 bags)	483.14(7,742 bags)	4952.8(79,245 bags)
1993/94	2988 (47,816 bags)	347.14(5,566 bags)	3336.3(53,382 bags)
1994/95	2387.4 (38,196 bags)	167.01(2,673 bags)	2554.3(40,869 bags)
1995/96	4370.8 (69,928 bags)	na	-

Note: Wassa Amenfi district is divided into four cocoa districts namely, Asankrangwa, Agona Amenfi, Manso Amenfi and Wassa Akropong cocoa districts. The data presented above represents only Asankrangwa cocoa district. It does not represent the whole of Wassa Amenfi district.

Source: WADA (1996: 24)

Virtually all farmers in the study area are involved in cocoa cultivation (see Plate 5.1). For example, more than 88% of the survey respondents reported that they cultivate this crop. Indeed relative prosperity in the study villages is reflected in differences in the extent of cocoa farming and availability of other economic opportunities. Other important cash crops are oil palm, kola and coconut.



Plate 5.1: The drying of cocoa using crop-drying mat. The study area is one of the major cocoa growing areas in Ghana. Cocoa is the main source of agricultural income in this area.

In all the study villages the majority of households rely on farming for the bulk of their foodstuffs. Cassava, plantain, yam, maize, rice and vegetables are the major food crops cultivated in this area (see Table 5.10).

Table 5.10. Estimates of cropped area and production level of major food crops

	Cropped area (ha) - 1996				
	Maize	Cocoyam	Cassava	Plantain	Rice
Wassa Amenfi District	12,514.7	2,347.8	10,504.5	8,009.4	4,690
Western Region	45,700	27,600	55,900	35,800	10,900
Ghana	668,600	204,500	551,500	212,460	99,900
	Production level (metric tonnes) - 1996				
Wassa Amenfi District	21,274.9	14,791.1	174,374.7	41,648.8	4,690
Western Region	61,650	158,400	512,400	253,800	13,620
Ghana	1,034,170	6,611,440	6,611,440	1,637,480	21,290

Source: WADA (1996: 26)

The estimated cropped area and production levels for major food crops of the district relative to Western Region and Ghana indicates that the district has substantial cropped land for maize, cocoyam, cassava, plantain and rice (Table 5.10). However, food insecurity is a major problem in this area as most households in the study villages maintained that they are unable to produce enough food to meet their subsistence needs.

In all the study sites no farmer uses fertilizers. Soil fertility is therefore maintained through a bush fallow system, with the fallow period ranging between 2 and 5 years depending on the type of crop to be cultivated. For example, most farmers indicated that the fallow period can be as short as 2 years for maize and cassava but for a crop like plantain, it should be longer in order to get a good yield. Most farmers complained that their landholdings are so small that they are unable to fallow land properly, if at all.

Almost all farmers in this area practice mixed cropping where two or more food crops are cultivated on the same piece of land in the same cropping season (see Plate 5.2).



Plate 5.2: A typical mixed crop farm. Bush fallowing and mixed cropping are the most common systems of farming in the study area. (Note the newly cleared area at the far end on the left).

The most important reason given by farmers for practising mixed cropping was land limitation or small land holdings which forces them to cultivate all the crops they need on the same small piece of land in order to obtain a wide variety of outputs. Farmers also reported that mixed cropping provides them some sort of security since one crop might succeed if others fail.

Mixed cropping follows a definite pattern in this area. Following slashing and burning, the first crop is maize. This is followed by cassava and then plantain. Cocoa is then planted when the plantains are established, and can provide shade. After harvesting the

maize and the cassava, the plantains provide shade for the cocoa until eventually they themselves are harvested leaving the cocoa only. The farm then becomes a cocoa plantation. Cocoa is the main source of agricultural income for farmers in this area.

5.5.2. Animal production

Animal keeping is practised on a very small scale and stocks are very low (Table 5.11). However, 83% of the respondents reported that they keep animals, leaving 17% with no animals at all. Sheep, goats and fowl (domestic chicken) are popular. Most farmers keep more than one type of animal and the system of animal keeping is largely free range. The most important reason for keeping animals is for subsistence though some farmers admitted that they sometimes sell their animals during periods of hardship. Farmers reported that they do not rear cattle since the gods of the land prohibit them from doing so. The real reason, however, may be disease (trypanosomiasis or sleeping sickness) due to the incidence of tsetsefly and probably insufficient grazing.

Table 5.11. Percentage of farmers owning sheep, goats and fowl

No. of animals	% of farmers		
	Sheep	Goats	Fowl
None	65.0	51.9	36.9
1 - 5	26.3	32.5	20.0
6 - 10	7.5	14.4	20.6
Over 10	1.3	1.2	22.5
No. of farmers	160	160	160

Note: Most farmers keep more than one type of animal.

5.6. Household food security

Food security is defined in its most basic form as physical and economic access by all people at all times to the food needed for a healthy and active life (Hoddinott, 1999; Nawani, 1994; Maxwell and Frankenberger, 1993; Hoskins, 1990). Although national food security is important in providing a foundation, what is crucial is food security for each and every household, and every family member within it. Thus household food security is defined as 'access to food that is adequate in terms of quality, quantity, safety and cultural acceptability for all household members' (Gillespie and Mason, 1991). The World Bank (1986) also defined household food security as "the ability of households to

ensure themselves sustained access to sufficient quantity and quality of food to live healthy and active lives, both now and in the future".

Achieving food security thus has three dimensions: First, it is necessary to ensure a safe and nutritionally adequate food-supply both at the national level and at the household level. Second, it is necessary to have a reasonable degree of stability in the supply of food both from one year to the next and during the year. Third, and most critical, is the need to ensure that each household has physical, social and economic access to enough food to meet its needs¹⁰.

In less developed countries, particularly in Africa, famine and malnutrition are serious and perennial problems that nations have to grapple with. It is estimated that by the end of 1989, approximately 552 million people across the world went to bed hungry each day (Ntiamao-Baidu, 1997). According to a recent analysis by FAO (FAO, 1995), the situation in Africa is becoming increasingly critical as conventional agriculture fails to meet expectations and the capacity of countries to import food is low due to the shortage of foreign exchange. As a consequence, one third of the population in Africa is chronically undernourished, and rural populations in many areas of Africa are already compelled by socio-economic stresses to exploit all the natural resources to the full. Thus, species which were not normally exploited for food or were eaten only by children as snacks are now important and regular items in the family diet and/or trade (FAO, 1995).

Food insecurity is a major problem for all the study communities. Most households are unable to produce enough food to meet their subsistence needs. As many as 61% of respondents indicated that the previous year's harvest was not enough for the needs of their families. They gave various responses when asked to mention the most important means by which they were able to survive the insufficient food harvest. The majority (48.1%) bought food, while 36.9% collected food from the forest or bush (Table 5.12). These results show the important role forest foods play in the subsistence economy in the area.

¹⁰ Taken from the Plan of Action of the International Conference on Nutrition held at Rome during December 1992.

Table 5.12. Means of surviving insufficient food crop harvest (% of respondents)

Means/Ways	% of respondents
Borrowed food	4.4
Bought food	48.1
Given food	9.4
Collected food from the forest/bush	36.9
Other ways	1.3
Total number of respondents	160

Most farmers reported that the problem of food insecurity in the area has come about because of land shortage resulting from an over-reliance on cocoa production. As one woman from Kamaso Village reported:

"All the land is finished... We do not have enough land for growing food crops. Food shortage is therefore a major problem in this village. Sometimes we have to travel to the city to buy food, which should not be the case. The forest land, which is fertile, is now finished and since our numbers are increasing fallow periods have reduced to between 3 and 6 years, by which time the soil had not regained its fertility. If the government does not help us, we will all leave for the city because we are dying of hunger. We are pleading with the government to release some of the forest reserve to us for farming" (Woman interviewee, Kamaso Village, March 2001).

The majority of households expressed similar sentiments. These sentiments reflect the gravity and the seriousness of the food insecurity problem in the area.

The characteristics of the cocoa economy and forest farming in Ghana have been determined by a process of pioneer frontier settlement - the movement of populations into new areas with empty, unsettled agricultural lands. In the forests of Ghana, frontier farming developed between the sixteenth and nineteenth centuries as a response to the opening up of large areas of sparsely populated land for agricultural colonisation (Amanor, 1994). During the early nineteenth century, pioneer frontier settlement was associated with the development of oil palm production for the export trade (Johnson, 1964). However, by the end of the nineteenth century, cocoa had become the major crop influencing the development of the frontier and during the early twentieth century the

Gold Coast (as Ghana was then called) emerged as the major world cocoa producer (Hill, 1963).

The cocoa pioneer frontier of the Western region of Ghana, including the study area, is one of the newest frontier areas and was first opened up by farmers during the late 1960s as land became scarce in other areas (Amanor, 1994). The expanding frontier has absorbed a considerable proportion of the growing agricultural population, and has led to a separation of the population from old declining pioneer zones, to the new frontier (Amanor, 1994). Thus Western region is now the major cocoa growing area in Ghana and the principal area to which farmers and labourers are migrating. This movement of cocoa farmers has therefore put severe pressure on land and has significantly reduced land available for food crop production. Again, as Arhin (1985) noted, the soils and ecology of this area are very fragile and the expansion of cultivation results in rapid degradation.

The Government of Ghana is also committed to the cocoa sector, which provides the principal source of levies raised from the agricultural sector. Cocoa is also a major foreign exchange earner. The Government has little control over the internal marketing of food crops and, as a result, a change of production from cocoa to food crops would be discouraged by the state (Amanor, 1994). State policies therefore tend to produce disincentives for food crop production in areas defined as lying within the cocoa belt. In fact, the converse is the case, and the state does provide incentives for the production of cocoa (Amanor, 1994). As one man in the study area complained:

"We do not receive technical support from the government for food crop production ...The Agricultural Extension Officers have neglected food crops. They only concentrate on cocoa when they visit us" (Man interviewee, Sureso Village, April 2001).

Consequently, most farmers in the area have turned their land into cocoa plantations, thus reducing the land available for food production. For example, in a study of farmers' management and perception of trees and other forest resources in this area, Amanor (1996) found that, of a total farming area of about 2,630 acres estimated by 142 farmers to be within their farming system, 30% was a fallow (bush) area, 50% was a cocoa plantation, 1% was other plantation crops, with food crop area constituting only 19% of

the total farming area. He noted that the majority of farmers have less than 5% of their land under food crops, and between 20-60% under cocoa (see Table 5.13).

Table 5.13. Distribution of land between food crops, perennial orchard crops and fallow on individual farms of 142 farmers (*percentage of farmers*)

<i>Percentage of farmers' land under:</i>	<i>Food crops</i>	<i>Orchard crops (including cocoa)</i>	<i>Cocoa</i>	<i>Fallow</i>
0%	7.7	7.7	7.7	15.5
Up to 5%	79.6	-	-	2.1
5 - 20%	10.6	9.9	9.9	17.9
20 - 40%	2.1	27.5	25.4	29.0
40 - 60%	-	27.4	26.8	22.8
60 - 80%	-	20.4	17.6	10.3
80 - 100%	-	10.6	9.9	0.7

Source: Amanor (1996: 6).

This trend has significantly shortened fallow periods and has led to a decrease in the yield of food crops. Meanwhile farmers complain that the yield of cocoa has also declined considerably over the years since they cannot afford the necessary inputs such as pesticides and fertilizers. A reduction in the yield of cocoa has significantly reduced household income and therefore the ability of households to purchase food.

5.7. Conclusion

The whole of the study area is under customary land tenure system and land is ultimately controlled by village chiefs on behalf of the communities. Among the indigenous population the most common means of acquiring land are through inheritance, family allocation and gifts. On the other hand, migrants largely depend on land leasing, land hiring and share tenancy or sharecropping.

This chapter has shown that land tenure in the study area is very complex and has a profound effect on agricultural production and the livelihoods of the people. Customary laws and practices on inheritance often result in the fragmentation of holdings, in land

disputes and in low agricultural production. Moreover, customary laws often place restrictions on strangers and tenants regarding the use of acquired land.

In most cases tenants can use acquired land for growing food crops but not tree or cash crops unless it has been specifically agreed by the landlord. The land acquired by the tenant cannot be transferred to other people. Neither may he sell, mortgage or sublet any part of the land. The land reverts to the landlord on the death of the tenant. Length of land occupation does not transfer ownership of land to a tenant.

Agriculture is the main occupation in the study area and the rural economy is largely dependent on this activity. Agriculture is, however, largely practised on a small holder basis and the majority of farmers still use traditional labour intensive methods of cultivation, with the use of hoes and cutlasses. Food crops are thus grown on a bush fallow system with very short fallow periods since farmers have small land holdings. This trend has severely reduced crop yield and, consequently, most households are unable to produce enough food to meet their subsistence needs.

Though agriculture is the production base and the main source of livelihood in the area, forest product gathering and/or processing are integral parts of the local production system. They complement cultivation and function to increase household food and livelihood security. The following chapters thus examine in detail the contribution of forest products to the livelihoods of households in the rural communities.

CHAPTER 6

SUBSISTENCE USES OF FOREST AND TREE PRODUCTS

6.1. Introduction

Rural people in the study area obtain a range of products from the forest that contribute significantly to their livelihoods. Forests contribute to all aspects of rural life: providing food, medicines, firewood (fuel), fodder, canes, building materials (poles and thatch), wrapping leaves, pestles, chewing sticks, and materials for all sorts of household items, as well as many more intangible benefits such as cultural symbols, ritual artefacts and sacred sites. Non-timber forest products thus form an integral part of the rural economy, providing subsistence goods and services as well as items of trade.

This chapter examines the range of livelihood goods that people obtain from forests. It shows how these products are collected and the contribution they make to the livelihoods and well-being of the household. It begins with a discussion of household consumption of forest plant foods, their collection patterns as well as their relative importance to the household. Other, non-food, forest products that serve various functions in the household are also considered. The final sections of the chapter examine the cultural and traditional values of forests and forest products and the sacred significance of particular forest products.

6.2. Household consumption of forest foods

Food obtained from forests and associated vegetation plays an important role in the household economy in the study area. Several authors have documented the edible species found in Ghana's forest regions (e.g. Abbiw, 1989, 1990; Irvine, 1961, 1952). Throughout this thesis, reference to any food which is gathered, whether at the farm periphery, in bush fallow, or in secondary or primary forest is called 'bush' or 'forest' food. Several species of bush foods are widely consumed throughout the entire area. Virtually all the respondents (98%) reported that they consume several varieties of

forest foods in their households including fruits, nuts, seeds, leaves, mushrooms, snails, honey, tubers, and bushmeat¹.

While some of these foods (e.g. fruits) are simply gathered and eaten raw as snack foods, others go through complex processing to be made edible. A good example is the tuberous roots of a climbing shrub called 'kokora' (*Smilax kraussiana*). The tubers, which are the edible parts of the plant, are covered by a blanket of thorns that makes harvesting difficult. The tuber itself is very fibrous and to be made edible, it must be shaved of all thorns, then thoroughly washed before it is cooked. Because of the numerous fibres in the tuber, it takes a longer period of time to cook than ordinary yams. Another example is 'abe' or the oil palm (*Elaeis guineensis*), whose fruits are cooked and pounded in a special palm-nut mortar in order to remove the pulp from the hard nuts. The fibrous fruit pulp so obtained is mixed with water and the solution obtained after sieving is used as soup base.

Although the quantities of forest foods consumed in households are small compared with the main staples, they play a very important role in supplementing what is obtained from agricultural production. In addition to their supplementary roles forest foods also play seasonal and emergency roles in the rural communities. Most people indicated that forest foods are used to help meet dietary shortfalls during particular seasons of the year, thus helping to bridge "hunger periods" (when stored food supplies are dwindling and the next harvest is not yet available). For example, 37% of the households surveyed reported that they collect wild food from the forest in times of crop failure.

6.2.1. Consumption of forest plant foods

A considerable variety of forest plant foods are gathered and consumed by the rural people. A list of different species of plant foods commonly consumed in the study area is presented in Table 6.1. together with their edible parts and how they are used. This list was compiled during interviews with old people, group discussions and household case studies. In all, 49 species were mentioned by respondents, including 12 species whose leaves are consumed, 34 species whose fruits, seeds and/or nuts are consumed, 2 species whose stems are consumed, and 2 species whose sap is consumed.

¹ The term "Bushmeat", which originated from West Africa (see Ntiamoa-Baidoo, 1997) is used in this work to refer to meat of wild animals hunted or collected for food.

Table 6.1. Forest plant species commonly consumed in the study area

Local Name	Scientific Name	Edible Parts	Uses
Abako	<i>Tieghmella heckelii</i>	Seeds	For making cooking oil
Abe	<i>Elaeis guineensis</i>	Fruits/nuts/sap	Soup base/edible oil/wine
Abesebuo	<i>Irvingia gabonensis</i>	Fruits/seeds	For making cooking oil
Adobe	<i>Raphia hookeri</i>	Stem sap	Sap tapped as wine
Adweaa	<i>Dacryodes klaineana</i>	Fruits	Eaten raw
Akankaben	<i>Chrysophyllum perpulchrum</i>	Fruits	Eaten raw
Akasaa	<i>Chrysophyllum albidum</i>	Fruits	Eaten raw
Akonkoree	<i>Bombax buonopozense</i>	Leaves	Used in preparing soup
Ankaa	<i>Citrus sinensis</i>	Fruits	Eaten raw
Asaa	<i>Synsepalum dulcificum</i>	Fruits	Eaten raw
Asamfena	<i>Aningeria robusta</i>	Fruits	Eaten raw
Asiapisiwa	<i>Justicia insularis</i>	Leaves	For preparing soup
Atoaa	<i>Spondias monbin</i>	Fruits	Eaten raw
Avocado	<i>Persea americana</i>	Fruits	Eaten raw
Ayoyo	<i>Corchorus olitorius</i>	Leaves	For preparing soup
Beduru	<i>Solanum anomalum</i>	Fruits	Used to prepare soup
Bese	<i>Cola nitida</i>	Fruits/Nuts	Eaten raw
Bokoboko	<i>Talinum triangulare</i>	Leaves	For preparing stew
Brofre	<i>Carica papaya</i>	Fruits	Eaten raw
Odoma	<i>Ficus capensis</i>	Fruits	Used as soup base
Dwindwera	<i>Lecaniodiscus cupanioides</i>	Fruits	Eaten raw
Efan	<i>Barleria opaca</i>	Leaves	Used as soup base
Esro wisa	<i>Piper guineensis</i>	Fruits/seeds	Spice/condiment
Fam wisa	<i>Afromomum spp</i>	Fruits/seeds	Spice/condiment
Fofoo	<i>Aspilia latifolia</i>	Leaves	Condiment/spice
Honhon	<i>Fleurya aestuans</i>	Leaves	Soup
Hwentiaa	<i>Xylopia aethiopica</i>	Fruits/seeds	Spice/condiment
Kakaweadwe	<i>Euphorbia hirta</i>	Leaves	Eaten raw
Katrika	<i>Drypeteo floribunda</i>	Fruits	Eaten raw
Kokuoduaba	<i>Myrianthus arborus</i>	Fruits	Eaten raw
Krobonko	<i>Telfairia occidentalis</i>	Seeds	Soup base
Mango	<i>Mangifera indica</i>	Fruits	Eaten raw
Misowa	<i>Capsicum frutescens</i>	Fruits	Spice/condiment
Nunum nini	<i>Hoslundia opposita</i>	Fruits	Eaten raw
Nwama	<i>Ricinodendron heudelotti</i>	Seeds	For making cooking oil
Nyankoma	<i>Heritiera utilis</i> (?)	Leaves	Soup preparation
Obua	<i>Napoleona leonensis</i>	Fruit pulp	Eaten raw
Ofewa/Afiafia	<i>Carpolobia lutea</i>	Fruits	Eaten raw
Oguaa	<i>Psidium guajava</i>	Fruits	Eaten raw
Okoro	<i>Abizia zygia</i>	Stem	Used as soup base
Onyina	<i>Ceiba pentandra</i>	Leaves	For preparing soup
Ope	<i>Dracaena mannii</i> (?)	Leaves	Soup preparation
Otwentorowa	<i>Vitex fosteri</i>	Fruits	Used to prepare soup
Prekese	<i>Tetrapleura tetraptera</i>	Fruits	Spice/condiment for soups
Sonkyi/Bohwa	<i>Allanblackia floribunda</i>	Seeds	For making cooking oil
Sukuruwa	<i>Buttneria catalpifolia</i>	Stem	Source of water
Watapuo	<i>Cola gigantea</i>	Fruits	Eaten raw
Wedeaba	<i>Monodora myristica</i>	Fruits/seeds	Spice/condiment
Wonyono	<i>Vernonia amygdalina</i>	Leaves	For preparing soup

While most of the fruits are gathered and eaten raw as snack, others and their seeds are used as condiments and spices to flavour food. Examples of species which are valued as spices or condiments are 'misowa' (*Capsicum frutescens*), 'hwentiaa' (*Xylopia aethiopica*), and 'esro wisa' (*Piper guineensis*). Some of the fruits, such as 'otwentorowa' (*Vitex fosteri*) and 'domene' (*Ficus capensis*) and almost all the leaves are used as soup base.

While the majority of these species have one edible part, other species have more than one and thus have multiple uses. For example, the fruits of *Elaeis guineensis* are used as soup base, edible oil is extracted from the nuts, and the stem sap is tapped and used as a palm wine, locally called 'nsafufuo'. More often, the palm wine is distilled to produce a local gin called 'akpeteshie' (see Plates 6.1 and 6.2). The process of tapping the sap involves felling the palm tree and piercing the terminal bud. A hollow, slender and cylindrical tube is then inserted into the pierced hole so that the top of the tube is at level with the base line of the cut terminal bud. An earthenware pot is then hung directly below the hollow tube so that the tube acts as a channel of flow from the palm tree into the pot. Occasionally, the cut surface of the terminal bud is fired to prevent deterioration by insect larvae. Though some of the plants such as the oil palm are widely cultivated in this area, some occur naturally in the forest.

Other forest foods, such as honey and mushrooms are also commonly consumed. Although most people, especially males, reported that they collect honey from the forest, people simply do not categorise honey as food in this area. Honey collection is entirely a male activity and the collection is done during the dry season from December to March. The collection of mushroom, on the other hand, is mostly done during the rainy season (usually from April to August) when mushrooms are more available and both men and women collect them. During this period mushrooms feature in most diets and are considered as meat substitutes. Different varieties of mushrooms are consumed in the area but the most popular are 'tweahrodo', 'sibire' and 'nkankom'.



Plate 6.1: Palm wine tapping. The stem sap of oil palm (*Elaeis guineensis*) is tapped and used as a palm wine locally called 'nsafufuo'.



Plate 6.2: 'Akpeteshie' distilling camp. Palm wine tapped from raphia and oil palm is distilled to produce a local gin called 'akpeteshie'.

The choice of forest foods is primarily dictated by availability and traditions in the area. Different groups and even different people within a household may have particular taboos, precluding certain forest foods from their diet. For example, amongst the indigenous Wassa people, it is a taboo for the tenth born child to eat giant rat, and amongst the Asantes it is a taboo for twins to eat the same animal. Similarly, Northerners in the area do not eat snails.

Bush foods may be broadly classified into two categories in the study area: those consumed as snacks, and those used in sauces and soups served with the staple starches of cassava, rice, yam, cocoyam and plantain. Fruits such as 'adweaa' (*Dacrodes klaineana*) and 'asamfena' (*Aningeria robusta*) are most commonly consumed as snacks, while the fruit of 'beduru' (*Solanum anomalum*) and 'misowa' (*Capsicum frutescens*), as well as leaves, mushrooms, snails, and other animals are all used in soups and sauces. Seeds are often valued for their oil or fat; for example, the oil extracted from the seeds of 'sonkyi' (*Allanblackia floribunda*) is widely consumed in the area and is used as a substitute to palm kernel oil.

Bush foods are not only popular in Ghana. They are widely consumed in several areas of the developing world. For example Bradley (1992) notes that virtually all families in the communal lands and resettlement areas of Zimbabwe collect a very wide variety of wild fruits, mostly for home consumption, but also for the market. Of relevance to food security issues is the clear impression that, where food aid is lacking, fruit consumption is most important during periods of stress: in the lean periods (towards the end of the dry season and during the early part of the rainy season before the new harvest is in), during droughts, or when famine conditions loom (Wilson, 1989, cited in Bradley 1992).

6.2.2. Household consumption of bushmeat

Bushmeat (or wild animals) is one of the most valued products of the forest in most of the rural households. Bushmeat is an important source of meat in both rural and urban diets, although these days it is consumed in small quantities due to reduced availability. In all the villages, rodents such as giant rat (*Cricetomys gambianus*) and grasscutter (*Thryonomys swinderianus*) are eaten regularly, and the giant snail is a regular feature in the diet during the rainy season. Most of the people interviewed reported that they eat

snails several times a week during the rainy season. However, they complained that the availability of snails has reduced dramatically in the area compared to the past.

The most commonly consumed bushmeat species in the area are giant rat, grasscutter, brush-tailed porcupine, duikers, bushbuck, squirrel and snails. A variety of birds such as francolin and weaver birds are also consumed, especially by children. The giant rat is a delicacy, particularly for the indigenous Wassa people. Most people, however, do not consider snails and birds as bushmeat. Table 6.2 provides a list of the various species of wild animals commonly consumed in the study area. This list was compiled during the key informant interviews, group discussions and the household interviews.

Table 6.2. Commonly consumed bushmeat species in the study villages

Local Name	English/Common Name	Scientific Name
Akokohwedie	Francolin	<i>Francolinus spp.</i>
Akrantee	Grasscutter (Cane rat)	<i>Thryonomys swinderianus</i>
Akyikyire	Tortoise	<i>Kinixyx belliana</i>
Amokua	Ground squirrel	<i>Xerus princeps</i>
Apese	Brush-tailed porcupine	<i>Atherorus africanus</i>
Kokote	Bushpig	<i>Potamochoerus porcus</i>
Kotoko	Porcupine	<i>Hystrix spp.</i>
Kusie	Giant rat	<i>Cricetomys gambianus</i>
Kwakuo	Monkeys	<i>Cercopithecus spp.</i>
Nankwansere	Fruit bat	<i>Eidolon helrum</i>
Nwa*	Giant snail	<i>Archachatina marginata</i>
Oha	Flying squirrel	<i>Epixerus ebii</i>
Opuro	Tree squirrel	<i>Protoxerus stangeri</i>
Otwe	Maxwell duiker	<i>Cephalophus monticola</i>
Oyuo	Bushbuck	<i>Tragelaphus scriptus</i>
Tromo	Bush cow (Buffalo)	<i>Synceros cafer</i>

*Snails are not always considered as bushmeat in the area.

Discussions with hunters suggested that a greater variety of species are consumed in the area. However, in almost every household people complained that they could not afford or catch enough bushmeat to satisfy their needs. Many elders spoke of its abundance in the past and the central role it played in the diet.

Bushmeat consumption is not limited to rural areas. In many urban centres in Ghana bushmeat is the most preferred meat. Bushmeat is eaten by all classes of people in Ghana and is preferred to domestic meat. Studies in Ghana (e.g. Falconer, 1992 and

Ntiamoa-Baidu, 1992) show that over 90% of the people interviewed in both urban and rural areas would eat bushmeat if it were available and for approximately 40 - 70% of the people, bushmeat was the preferred meat. In a similar survey of the meat preferences of customers visiting chop bars (traditional restaurants) in Accra, where they had a choice of various types of meat and fish dishes, 65% of the 374 visitors to the chop bars selected bushmeat dishes (Tutu *et al.*, 1993).

6.2.2.1. Hunting methods and practices

Virtually all farmers in the study villages were involved in some form of hunting. Two main methods are employed to harvest bushmeat species in the area: hunting with a gun and the use of snares to trap animals.

The use of wire snares is very popular in the area and all farmers employ it to obtain bushmeat. Wire snares are often placed within holes in brushwood fences, especially around fields of maize and cassava, in the hope of snaring birds and rodents such as the giant rat and grasscutter (cane rat). These wire snares sometimes also trap bigger animals like duikers and antelopes. The use of wire snares is very popular after the main planting season when the growing crops attract animals into farms or crop fields. During this period, people frequently and specially construct very low but dense brushwood fence-lines around crop fields, with wire snares placed at various positions within the fence. Animals get trapped as they cross the fence to find food in the crop fields. Women farmers sometimes employ the services of young men to construct these snares around their farms.

Hunting with a gun is a male activity and throughout the area there are people who are professional hunters. Most professional hunters are involved in hunting on a part-time basis throughout most of the year except from August to December when hunting is prohibited by the Department of Game and Wildlife. Hunters travel long distances into forest areas usually in the night in order to make a catch. Most hunters indicated that hunting is easier during the dry season when vegetation is dried up and animals are exposed. However, all the hunters I spoke to indicated that the availability of bushmeat has reduced drastically as they spend much more time in the forest in order to make a catch.

Agricultural activity influences the availability and seasonal involvement in the hunting and trapping of bushmeat. An early peak in bushmeat harvesting occurs around March, which corresponds to the time of land clearing and burning in preparation for planting. The burning drives animals out of cover and facilitates hunting. For this reason, fires are occasionally set solely for the purpose of driving out the animals. Hunting and trapping also peak after the main planting season. During this period (June - September) the growing crops attract animals onto farms and therefore farmers combine pest control with hunting and trapping.

Another important method of hunting in the area involves the use of dogs and cutlasses to pursue and kill animals. This method is usually employed by young males who sometimes hunt in groups. The method is mostly used for hunting rodents and involves smoking out the animal from its burrow and then pursuing and killing it. This method is becoming unpopular as it has been found to be an important cause of bush fires in Ghana.

6.2.3. Importance of forest foods in the household

Historically, forests were valued food sources in Ghana, especially in times of hardship or war (Boakye-Boaten, 1974). As forest areas have declined dramatically over the last generation, so too must the relative importance of forests as a food resource. Nonetheless, as this study has shown, forest foods feature regularly in the diets of almost all the rural people interviewed and they play a crucial role in household subsistence. Most forest foods are of local importance and are eaten by hunters, farmers, children, and field workers. Most people in the study area maintained that forest foods are very important in their households. As one elderly woman stated, “many are the people that would go to bed without food if there were no snails and mushrooms”. Almost all the people that reported that they eat forest foods indicated that these foods are very important in their households. For instance, of the 86 respondents that reported that they consume forest leaves, 98.8% indicated that these leaves are very important in their households (see Table 6.3). Bushmeat is the most highly valued and the most popular forest food in the study area and all the respondents who reported that they consume bushmeat also indicated that bushmeat is very important in their households.

Table 6.3. Importance and popularity of forest foods in the study area

Type of forest food	Number of households consuming the forest foods (N=160)	Percentage of households consuming the forest foods (N=160)	Percentage of those consuming that reported that the food is important in their households
Leaves	86	53.8	98.8
Tubers	111	69.4	96.4
Fruits	121	75.6	95.9
Honey	42	26.3	95.2
Mushrooms	91	56.9	96.7
Snails	129	80.6	94.6
Bushmeat	135	84.4	100
Spices	120	75.0	98.3

Many forest foods are added to sauces as flavouring, used as medicines or as substitutes for staples during periods of scarcity. Collectively, these foods add diversity and flavour to the diet as well as providing protein, energy, vitamins and minerals. Forest foods are perhaps most important for children, especially during the 'hunger season'² when snack foods play a more significant role in their diets.

Most forest foods, especially green leaves, are widely valued for their healing properties. In the study area, certain leaves are cooked with palm nuts and used in preparing soup for pregnant and lactating women. These soups are generally called 'abemuduro' soup and are believed to promote proper foetal growth and lactation, and to heal wounds (ulcers) in the uterus after child birth. A great variety of tree and herbaceous leaves are used in preparing 'abemuduro' soup including 'akonkoree' (*Bombax buonopozense*), and 'odoma' (*Ficus capensis*). Several varieties of leaves and fruits are also valued as blood tonics, for example, the fruit of *Vincentella revoluta* and *Albizia zygia*. Other bush foods are added to children's food to treat particular ailments. For example the leaves of 'wonwono' (*Vernonia amygdalina*) are added to stews as a dewormer; and the leaves of 'oguaa' (*Psidium guajava*) are used to treat diarrhoea.

Certain forest foods are also valued in times of food scarcity, including wild yam (*Discorea* spp.), pawpaw (*Carica papaya*), wild cocoyam (*Colocasia esculentum*), 'kwakuobise' (*Carapa procera*) and 'duabayere' (*Artocarpus communis*). In the study

² A time when food stocks have run out and new crops are not yet ready for harvesting; generally at the end of the dry season and during the early rains.

area many people still value wild yam and cocoyam as staple food substitutes. A few people in the area indicated that they prefer wild to cultivated yam and collect them whenever possible. However, the supply of these forest foods seems to be limited and very few people rely on this resource in an emergency. Most of the respondents indicated that they would buy food rather than gather food in the forest during crop failure, suggesting that the consumption of forest foods in emergencies appears to be declining. Irvine (1952) listed more than 100 plant species that are consumed in Ghana during emergency periods. He noted that foods gathered in famine periods were different from those found at other times: they were energy-rich and often required lengthy processing. For example many species of wild tubers are toxic and must be washed, soaked and cooked thoroughly.

Many wild fruits are considered children's food in the area. The most popular include 'atoaa' (*Spondias mombin*), 'adweaa' (*Dacryodes klaineana*) and 'watapuo' (*Cola gigantea*). Many children were seen to spend long hours in the bush catching birds and gathering foods. Termites are another delicacy loved by many children and are caught at the onset of the rains when the termites drop their wings. The termites are roasted and eaten as a snack or with 'ampesi' (cooked yam, cassava or plantain). Children also relish 'akokono' (oil palm grubs) and 'asomodwe' (beetle larvae) in the area, however, they rarely eat them as they are also sought by adults.

The most important value of forest foods is perhaps the diversity they bring to the diet, as they tend to be added to soups and stews for flavouring or for healing purposes. For example, several forest leaves are added to a number of popular soups in Ghana, notably palm nut soup, 'nkontomire' (cocoyam leaves) soup and 'abunuabunu' (a leaf-based soup prepared with snails). A range of foods, such as the fruits of *Piper guineensis*, are also used as spices or condiments for these soups and sauces while snails and mushrooms are extremely popular when in season.

6.2.4. The extent and frequency of consumption of forest foods

As mentioned above, many studies on forest foods in Ghana are generally confined to identifying edible species rather than the quantities of forest foods consumed and the frequency with which these foods are collected and consumed (e.g. Abbiw, 1990; Asibey, 1986; Falconer, 1990a; Irvine, 1961). No attempt was made in this study to

estimate the quantities of forest foods that rural people consume in their households, rather an attempt was made to study the frequency of consumption of different forest foods in the household. Studying the frequency of consumption gave an indication of the relative importance of the different types of forest foods. The assumption here is that the more frequent a product is consumed the more important the product.

The household questionnaire survey and group discussions revealed consumption patterns which indicated that the most widely consumed forest foods are bushmeat, mushrooms, snails, wild tubers, fruits and leaves. The frequency of consumption of most forest foods is influenced by their seasonal availability. For example, 44.1% of the 111 respondents who indicated that they consume wild tubers said they consume them occasionally while 55.9% said they consume wild tubers seasonally.

Similarly, the consumption of honey, mushrooms and snails is influenced by their seasonal availability. For example, 82.4% of the 91 respondents who reported that they consume mushrooms in their households indicated that they consume them seasonally while 17.6% indicated that they consume mushrooms occasionally (see Table 6.4). Mushrooms and snails are only available during the rainy season (from March to August) while honey is available during the dry season (from November to February). Though a greater percentage of respondents indicated they consume mushrooms and snails on a seasonal basis due to the seasonal availability of these foods, the majority of the rural people maintained that they consume snails and mushrooms daily when they are in season.

Table 6.4. Frequency of collection and consumption of different types of forest foods (% of households)

Type of forest food	% of households that consume				Total number of households
	Daily	Weekly	Occasionally	Seasonally	
Leaves	25.6	4.7	61.6	8.1	86
Tubers	0	0	44.1	55.9	111
Fruits	19.0	5.0	55.4	20.7	121
Honey	0	0	16.7	83.3	42
Mushrooms	0	0	17.6	82.4	91
Snails	1.6	0	16.3	82.2	129
Bushmeat	12.6	7.4	78.5	1.5	135
Spices	30.0	5.8	45.0	19.2	120

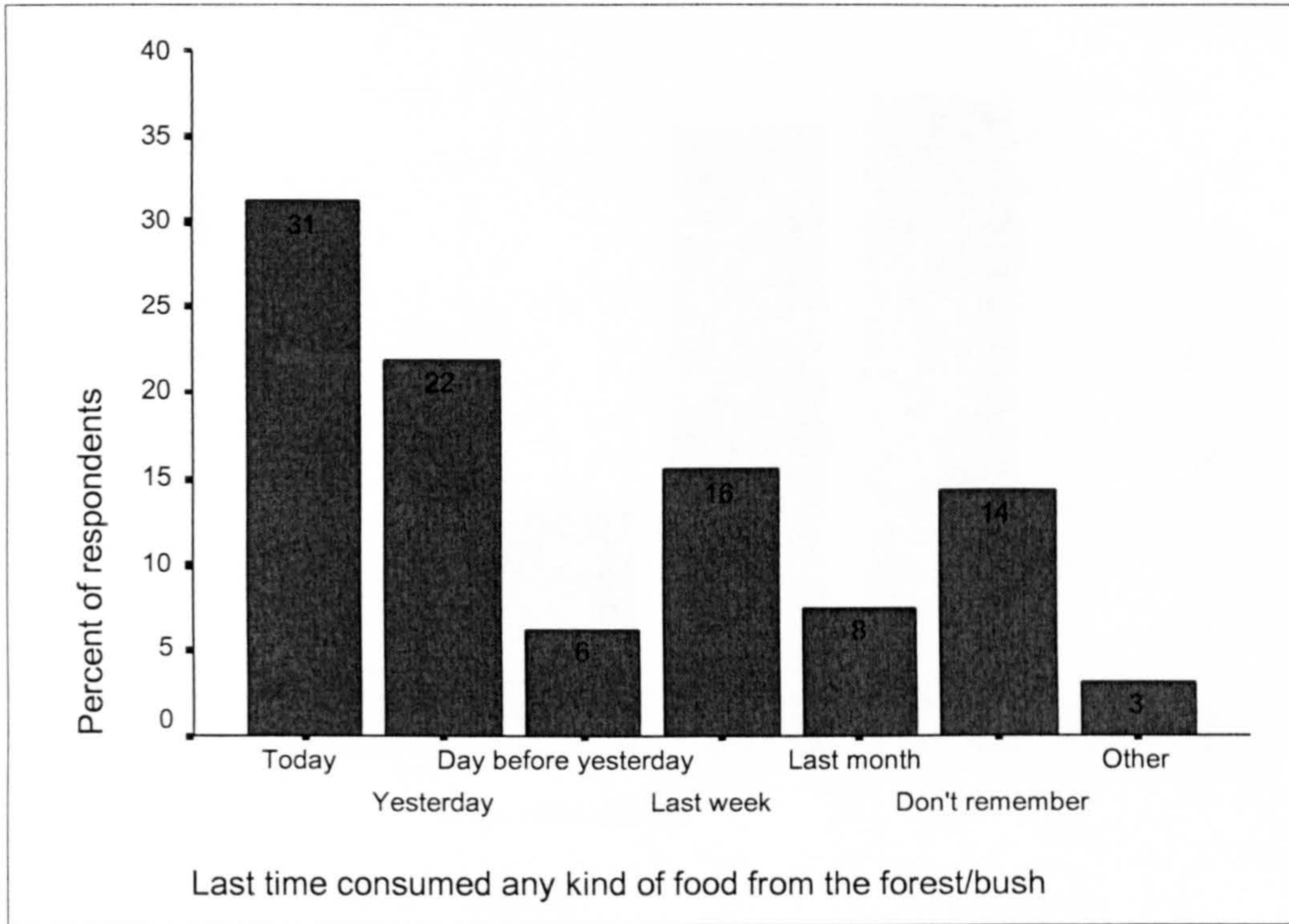
Though bushmeat and most forest leaves are available throughout the year the majority of respondents indicated that they consume them occasionally. For example 78.5% of those who reported that they consume bushmeat in their households indicated that they consume it occasionally, 12.6% said they consume it daily, 7.4% indicated that they consume it on a weekly basis while 1.5% reported that they consume bushmeat seasonally. Similarly, 61.6% of those who reported that they consume leaves said they consume them occasionally, 25.5% said they consume leaves daily, 4.7% indicated that they consume leaves weekly while 8.1% reported that they consume leaves seasonally.

The high percentage of people who indicated that they consume bushmeat and leaves only occasionally may be due to a general decline in the availability and supply of these foods. Indeed, most households complained bitterly about the decline in availability of bushmeat species. This decline means that most households are unable to obtain or afford enough bushmeat to satisfy their needs. They resort to eating bushmeat as and when they can find it.

In order to gain a general picture of how often forest foods are consumed in households, respondents were asked to indicate the last time they consumed any kind of food from the forest and then list the type. Of the 160 households interviewed, 31% had eaten or had included forest foods as ingredients in their meal preparations during the day of the interview, 22% indicated that they had eaten forest foods in the day preceding the day of the interview, 16% reported that they had eaten forest foods in the week prior to the interview, while 8% indicated that they had eaten forest foods in the previous month. Fourteen percent (14%) of the respondents, however, could not remember the last time they consumed any kind of food from the forest (see Figure 6.1).

The most common foods the respondents mentioned were bushmeat, snails, mushrooms, fruits, especially 'beduru' (*Solanum anomalum*), 'misowa' (*Capsicum frutescens*), 'brofre' (*Carica papaya*), 'atoaa' (*Spondias monbin*), mango (*Mangifera indica*), avacado (*Persea americana*) and leaves such as 'onyina' (*Ceiba pentandra*), 'ayoyo' (*Corchorus olitorius*) and 'honhon' (*Fleurya aestuans*). Most of the respondents however, maintained that they are unable to collect enough of these foods to meet the needs of their households.

Figure 6.1. Frequency of consumption of forest foods



6.2.5. Sources of forest foods

Forest foods are gathered from four main sources in the study area, namely, the reserve forest, the off-reserve forest, fallow areas or farm bush and the farm. Most of the respondents (38%) named the farm as their most important source for collection of wild foods. This was followed by the farm bush or fallow areas (36% of respondents), the off-reserve forest (14%) and the reserved forest (11%) (Figure 6.2).

Most forest foods are gathered from the farm (especially cocoa farms) and fallow areas rather than forests. The farm and fallow areas are especially important sources for bushmeat, leaves, wild tubers, fruits, mushrooms, and spices whereas forest reserves and off-reserve forest areas are important for snail collection (Table 6.5). Most forest foods are generally collected incidentally although snail collection, mushroom gathering and hunting are notable exceptions. Most hunting and trapping is done on the farm and in fallow areas, although professional hunters exploit the reserve and off-reserve forest. People have designated places on their farms, locally called 'esie', where they collect mushrooms. No one gathers mushrooms from another person's farm.

Figure 6.2. Most important source for collection of forest foods

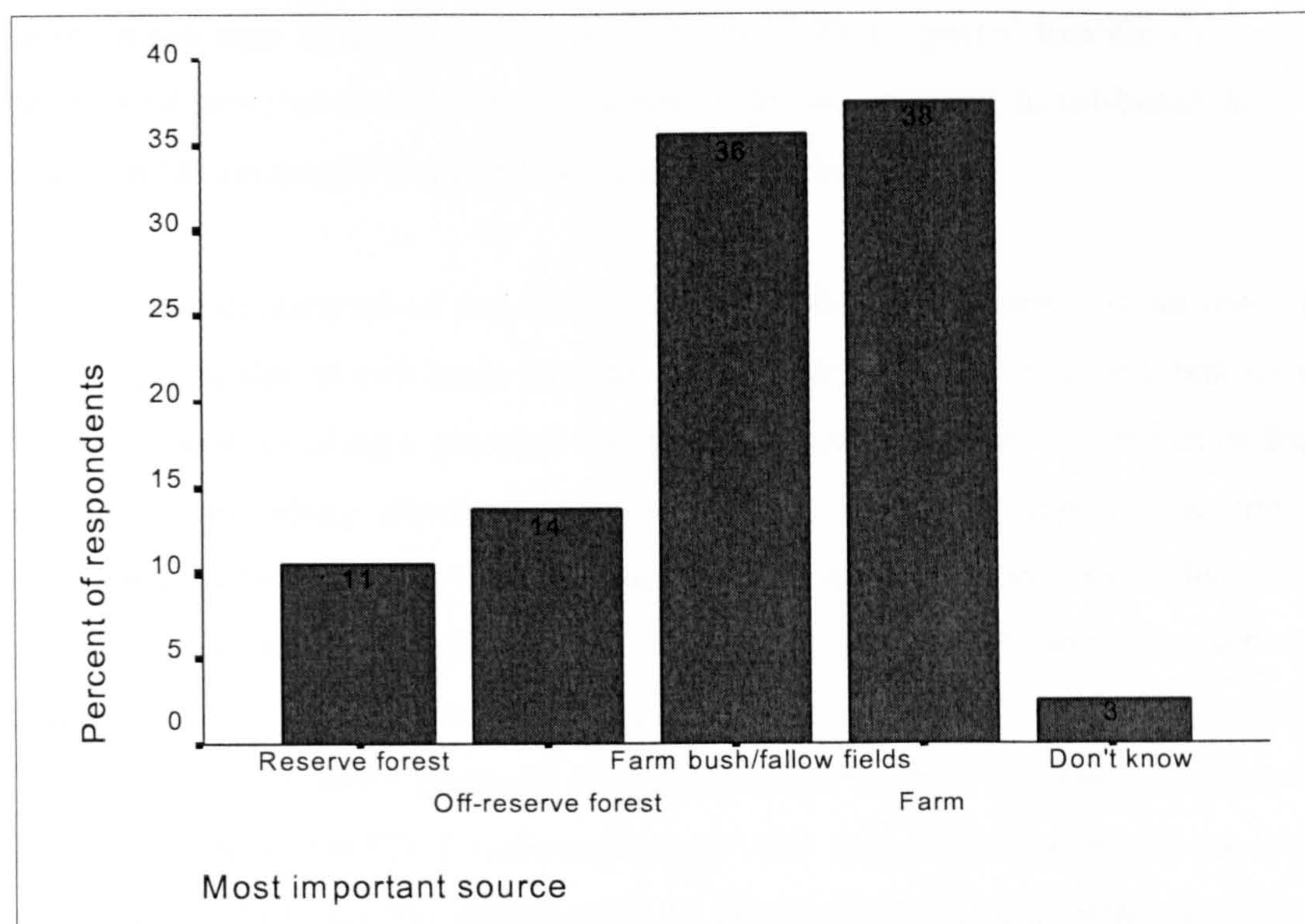


Table 6.5. Relative importance of sources of different types of forest foods (% of respondents)

Type of forest food	Source (% of respondents)				Total number of respondents
	Reserve forest	Off-reserve forest	Fallow fields	Farm	
Leaves	2.3	10.5	38.4	48.8	86
Tubers	0.9	18.0	59.5	21.6	111
Fruits	2.5	8.3	22.3	66.9	121
Honey	26.2	40.5	28.6	4.8	42
Mushrooms	2.2	12.1	52.7	33.0	91
Snails	38.0	27.9	18.6	15.5	129
Bushmeat	5.2	12.6	37.8	44.4	135
Spices	1.7	3.3	14.2	80.8	120

These results corroborate the findings of Falconer (1992) and Townson (1995). In a study to examine the importance of NTFPs for people living in two regions of southern Ghana, Falconer (1992) reported that most forest foods are gathered from the farm periphery and fallow areas rather than from the forest itself. She further stated that the farm periphery is a good source of leaves, seeds and fruits. Trees, especially fruit trees,

are often planted near the compound and village or on the farm and are also important in southern Ghana. Similarly, in a survey of income-generating activities based on NTFPs in the forest zone of southern Ghana, Townson (1995) reported that the most important sources of raw materials for the majority of income-earning forest-based activities in southern Ghana are the farm and the farm bush or fallow areas.

The relative importance of the farm and farm bush or fallow areas as sources of forest foods may be due to two main reasons. Firstly, very little off-reserve forest remains in the study area, creating a physical scarcity. With the exception of patches of forests in sacred groves, along riverbanks and on slopes, off-reserve forest areas are largely secondary forests and fallow fields since these areas are farmed. Secondly, the people are restricted from gathering products from forest reserve areas by the Forestry Department (FD) creating what may be referred to as "institutionally-induced scarcity". The collection of forest products from forest reserve areas in Ghana is controlled by permits issued by the FD. Local people resent this form of exclusion and see the permit as too expensive and too complicated to obtain for gathering items for personal or domestic use. As off-reserve forests have largely disappeared in the area and as access to forest reserves is restricted, the local people increasingly leave and maintain selected forest products on their farms in trying to cope or adapt to forest resources decline.

In fact, this is true for most parts of the developing world. For example, in Zimbabwe, Campbell *et al* (1993) reports that in the process of woodland clearance for agriculture indigenous fruit trees are selectively retained, despite attempts by government extension services to compel farmers to clear their fields completely of trees and shrubs. Thus across the whole of Zimbabwe, cultivated fields in the communal areas are characterised by the presence of individual fruit trees, retained in the cropland long after all other woody vegetation has been removed. In the southeastern areas of Nigeria, Okafor (1980) reports that forest fruit-trees are increasingly found on farmlands and there is increasing demand for fruit-tree seedlings. Similarly, a study in the hill areas of Nepal, where there has been progressive reduction in the forest resource, found that the households surveyed had increased the number of trees on their own land, particularly fodder and fruit-trees (Campbell *et al.*, 1987, cited in Arnold 1990).

Other authors also share similar views. For example, according to Arnold (1997), in most parts of the developing world, rural households have historically obtained most of

the complementary inputs of fodder, fuel, food and saleable commodities that are often critical to their livelihoods from nearby areas of forest, woodland or scrubland that were used as common property. However, nearly everywhere these resources, and their management and use systems, have been progressively eroded and undermined as a result of a long period of political, economic and physical changes. He notes that as off-farm resources disappear or are degraded, farmers nearly everywhere have tended to shift the production of selected forest outputs of value to them on to their own land by protecting, planting and managing appropriate tree species.

Warner (1991) also asserts that a substantial share of tropical smallholder agriculture is still based on a cycle of clearing and burning the forest vegetation, a short period of cultivation using the land and nutrients released in this way, and a longer period in which the land is left fallow to allow the nutrient and energy capital stored in the tree vegetation to be built up again. During clearance and cultivation, care is taken to preserve the root and seed stocks necessary to ensure the regrowth during the fallow period, and tree species are also encouraged which accelerate or enhance the recycling of nutrients, or which produce outputs of value for subsistence or income-generating purposes.

6.2.6. Availability and supply of forest foods

Most households in the study area complained that the availability of most forest foods has declined. To explore the pattern of change in the availability of forest foods in the study area, respondents were asked to compare the availability of different types of forest foods now with the situation 10 years before. In particular, they complained bitterly about the decline in bushmeat species, wild yam, fruits, honey, mushrooms and snails. For example, 95.6% of the 135 respondents who reported that they consume bushmeat in their households complained that bushmeat is less available these days compared with 10 years before; 2.2% reported that there is no change in availability while 2.2% could not make any comparison. Similarly, of the 129 respondents who indicated that they consume snails in their households, 85.3% reported that snails are less available these days, though 3.1% said that snails are more available, while 10.9% indicated that there is no change in availability (Table 6.6).

Table 6.6. Availability of forest foods now compared with 10 years before (% of respondents)

Type of forest food	Availability (% of respondents)				Total number of respondents
	More available	Less available	No change	Don't know	
Leaves	8.1	38.4	50.0	3.5	86
Tubers	7.2	78.4	14.4	0	111
Fruits	17.4	62.8	16.5	3.3	121
Honey	11.9	73.8	11.9	2.4	42
Mushrooms	3.3	78.0	15.4	3.3	91
Snails	3.1	85.3	10.9	0.8	129
Bushmeat	0	95.6	2.2	2.2	135
Spices	27.5	30.8	41.7	0	120

The respondents gave several reasons for this decline, including over-harvesting of forest resources, destructive harvesting practices, bushfires, forest guards restricting access to forest resources, logging operations damaging forest resources, clearance of source areas for agriculture and invasive weeds (see chapter 8 for a detailed discussion on the reasons for the decline of forest products).

In addition to the general decline in availability of forest foods in the area, the supply of many bush or forest foods is seasonal, as has already been mentioned. Snails, mushrooms and tubers are collected mainly during the rainy season. Bushmeat often increases during the rains as farmers combine pest control with hunting and trapping. The supply of bushmeat in the villages is also influenced by wildlife legislation, which prohibits hunting from August to December.

Bush foods available during the hunger period are most appreciated, and so leaves and mushrooms, which appear rapidly during the early rainy season, are widely consumed and especially valued. Fruits and seeds are common dry-season foods. 'Watapuo' (*Cola gigantea*), 'adweaa' (*Dacryodes klaineana*), 'akasaa' (*Chrysophyllum albidum*), 'asamfena' (*Aningeria robusta*) and 'brofre' (*Carica papaya*) are widely consumed during the dry season. 'Prekese' (the fruit of *Tetrapleura tetraptera*), used as flavouring for soups, was most frequently mentioned in discussions. Honey is also available during the dry season. Freshwater fish and crab trapping is generally confined to the dry season because rivers increase in volume and become hazardous during the rainy season.

Most households in the area prolong the supply of bush foods by preserving and storing them. The two common methods of preservation are sun-drying and smoking, especially for bushmeat and snails. Other methods include burying, or storing foods in the hollows of trees. The most commonly preserved bush foods are mushrooms, snails, 'misowa' (*Capsicum frutescens*), 'esro wisa' (seeds of *Piper guineensis*), 'abako' (seeds of *Tieghmella heckelii*), 'sonkyi' (seeds of *Allanblackia floribunda*), 'prekese' (fruits of *Tetrapleura tetraptera*) and 'krobonko' (seeds of *Telfairia occidentalis*). All of these foods are used in small quantities throughout the year to add flavour to soups and sauces.

6.2.7. Changing patterns of household use and consumption of forest foods

Although forest foods still contribute greatly to household subsistence, most local people, including the key informants, admitted that the quantities of certain food items consumed are dwindling. The majority of elders interviewed felt that the variety and importance of bush foods in the diet had declined over their lifetimes. The vast majority felt that changes in bush food consumption patterns were a result of declining availability rather than changing taste.

Most people reported that while the quantities of certain forest foods (such as snails and mushrooms) consumed has declined due to decreased availability of these resources, others (such as 'kokora', the tubers of *Smilax kraussiana*) are no longer consumed due to modernisation (backwardness or primitiveness associated with most forest foods), the availability of cultivated varieties, and a decline in knowledge of the different varieties of forest foods (see Tables 6.7 and 6.8).

For example, comparing the extent to which forest foods are consumed at present with 10 years before, 44.4% of the respondents reported that people eat less forest foods today although 33.8% reported that people eat more forest foods today. Twenty percent (20%) indicated that there is no change in consumption whilst a few (1.9%) could not describe the pattern of consumption (Table 6.7).

Table 6.7. Consumption of forest foods now compared with 10 years before

	% of respondents	Number of respondents
Today people eat more forest foods	33.8	54
Today people eat less forest foods	44.4	71
No change in consumption	20.0	32
Don't know	1.9	3
Total	100.0	160

Several reasons were given to explain the declining consumption of forest foods. Of the 44.4% who reported that people eat less forest foods today, 85.9% indicated that this is so because forest foods are less available, 4.2% reported that forest foods are considered inferior today, 2.8% mentioned the availability of better varieties of cultivated foods, 1.4% reported that people have more money to purchase food from shops, whilst 5.6% indicated that people eat less forest foods today because of lack of knowledge of the different types of forest foods (Table 6.8).

Table 6.8. Reasons for the decline in consumption of forest foods

Reasons	% of respondents	Number of respondents
Forest foods are less available today	85.9	61
Forest foods are considered inferior today	4.2	3
Availability of better varieties of cultivated foods	2.8	2
People have money to purchase food from shops	1.4	1
Lack of knowledge of the different types of forest foods	5.6	4
Total	100.0	71

It seems clear, therefore, that the most important reason for changes in forest food consumption is the declining availability of forest foods. Many authors have also noted this explanation, with a trend towards more mass-produced staples (Rocheleau *et al.*, 1988; FAO, 1992b). According to Rocheleau *et al.* (1988) and FAO (1992b), reasons for such a trend are:

- convenience, ready supply and easy preparation of the mass-produced staples;

- changing tastes and expanding markets for foreign goods as rural economies become increasingly exposed to market forces; and
- a matter of connotation of backwardness or primitiveness associated with most types of forest foods.

Byron and Arnold (1997) have also noted that subsistence use of forest foods appears to be dwindling. People rely to a greater extent on food purchasing; famine relief programmes have become more effective, and improved supplies of food crops have diminished the need to depend on forest foods. In Vanuatu, for instance, the introduction of the sweet potato, which can be planted at any time and produces an edible crop within three months; and manioc, which can be left unharvested for up to two years, has made the traditional emergency foods of wild taro, arrowroot, wild yams and sago virtually obsolete (Olsson, 1991, in Byron and Arnold, 1997).

According to Byron and Arnold (1997), other reasons for the declining subsistence use of forest foods include penetration of rural markets by new food products, changing tastes, reduced knowledge about the use of forest foods, and decreased availability of forest products.

6.3. The contribution of other forest products to rural livelihoods

In addition to forest foods the rural people obtain other products from the forest that contribute greatly to their livelihoods. These include fuelwood (firewood), medicines, building materials (poles and thatch), wrapping leaves, pestles, canes, chewsticks, chewsponge, bamboo, etc. Most household items such as baskets, sleeping mats, crop drying mats, grinders, mortars, spoons and other utensils are also produced from forest and tree resources found in the surrounding environment. The importance and value of forests and trees in the material culture of the study villages cannot therefore be overlooked. This is true in numerous other countries. For example, in the Communal Areas of Zimbabwe, Campbell *et al* (1991) report that, in addition to wild foods, trees provide almost all of the household energy; many of the products for building, fencing and manufacture of household utensils and agricultural implements; medicines; and a host of other more intangible benefits such as spiritual value. They estimate that trees provide goods worth about Z\$1,000 per year per household in these areas of Zimbabwe.

Table 6.9 provides a list of common household items made from forest and tree products in southern Ghana.

Table 6.9. Household items obtained from non-timber forest products

Household item	Most common species used for making item
Baskets	Canes, oil palm and raphia palm fronds
Brooms	Palm leaf ribs
Chewing sponge (for cleaning teeth)	<i>Acacia kamerunensis</i>
Chewing stick (for cleaning teeth)	<i>Garcinia</i> spp.
Crop-drying mat	Raphia and oil palm fronds
Drying line	<i>Calamus deeratus</i>
Food wrappers (wrapping leaves)	<i>Marantochloa</i> spp.
Grinders (used for mashing vegetables)	<i>Milicia excelsa</i>
Ladder	<i>Raphia hookeri</i>
Mattress	<i>Ceiba pentandra</i> , <i>Bombax</i> sp.
Mortar	<i>Nauclea</i> sp., <i>Milicia excelsa</i>
Pestle	<i>Baphia</i> sp.
Pillows	<i>Ceiba pentandra</i> , <i>Bombax</i> sp.
Sandpaper	<i>Ficus exasperata</i> (leaves)
Sleeping mats	Raphia and oil palm fronds
Stirrers/spoons/ladles	<i>Napoleonaea</i> sp., <i>Rauvolfia</i> sp.
Stools	<i>Alstonia boonei</i> ; canes
Trays/Plates (carved bowl)	<i>Triplochiton scleroxylon</i>
Washing sponge	<i>Momordica angustistepala</i>
Water containers	<i>Crescentia cujete</i>

Source: Fieldwork, 2001 and Falconer, 1992.

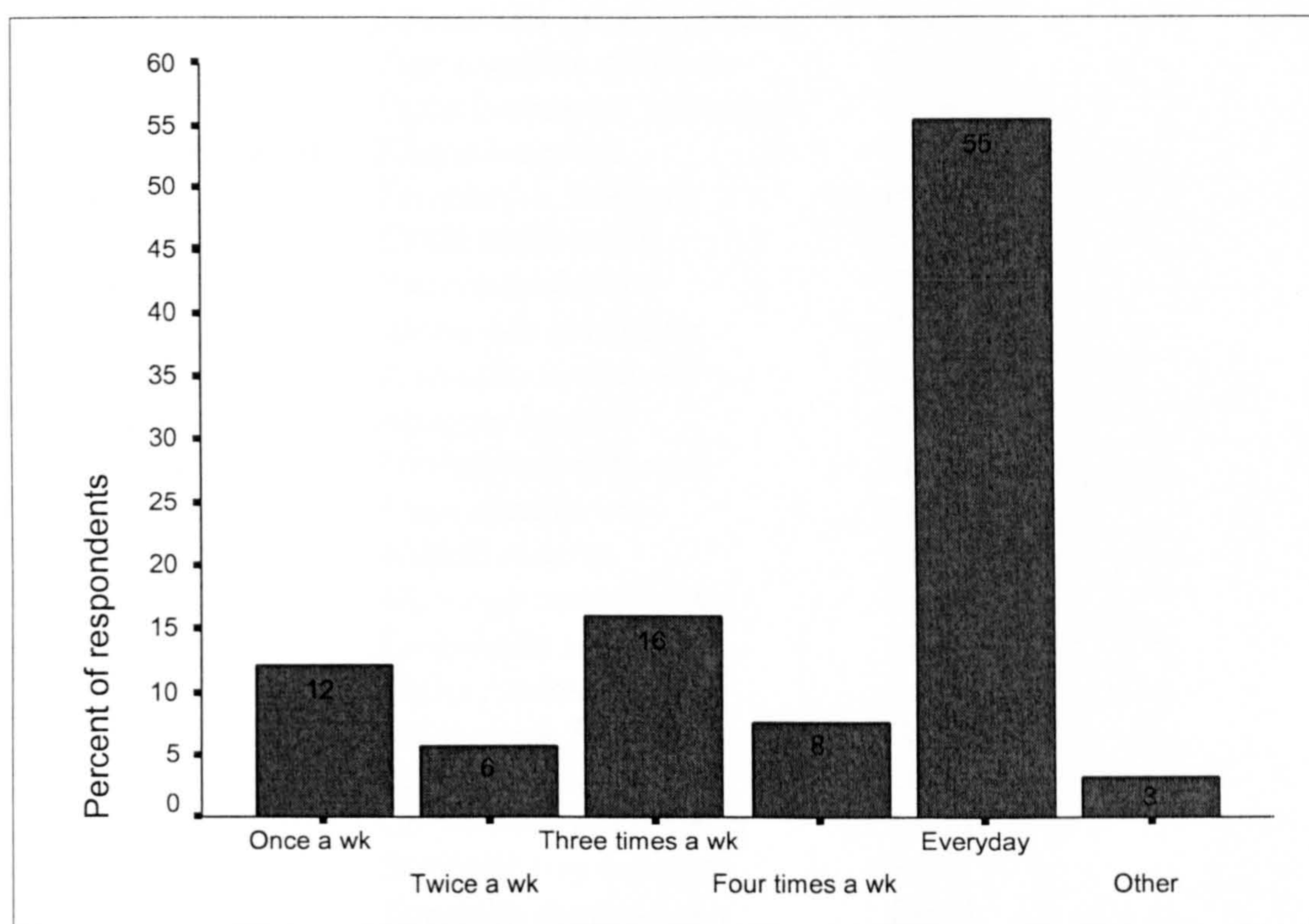
Many of these household items are sources of income to most people in the study villages who sell these products to local individuals and sometimes to both local and outside traders.

While some of these household items, such as the pestle and mortar, have no substitutes, others, such as grinders, sleeping mats, and sponge are often replaced by imported substitutes. For example, washing sponges made from several species of forest liana, are often replaced by nylon nets; wooden spoons are replaced by metal spoons, and foam-filled mattresses replace sleeping mats.

6.3.1. Household consumption of fuelwood

Fuelwood (firewood) is the main source of energy in the study area and all households rely on fuelwood to meet their energy needs. It provides the only source of energy for cooking and processing for all households in the study villages. Fuelwood collection is a daily activity (Figure 6.3), and is considered woman's work in the study area, although men (especially unmarried men) also collect fuelwood. For example, 83% of the respondents indicated that the collection of fuelwood is a female activity.

Figure 6.3. Frequency of household collection of firewood



Several species are used for firewood. The most popular are listed in Table 6.10. People prefer certain species to others, as all the respondents indicated that certain species make better firewood. The respondents were asked to mention the most common firewood species and indicate the good and poor quality species. Though people have different views regarding the quality of particular species, the information presented here reflects the views of the majority of respondents.

In all the study villages the supply of fuelwood was not seen as a problem. There was no evidence of a shortage of fuelwood and all respondents indicated that they are able to

satisfy their fuelwood needs. Almost all households are able to use good quality firewood species and do not have to search long. According to most women, good quality firewood species are those which are hard, do not produce too much ash, and which light readily. The best firewood species based on these criteria is 'esa' (*Celtis milbraedii*), however, most women reported that 'esa' is becoming scarce and is difficult to obtain in the study area.

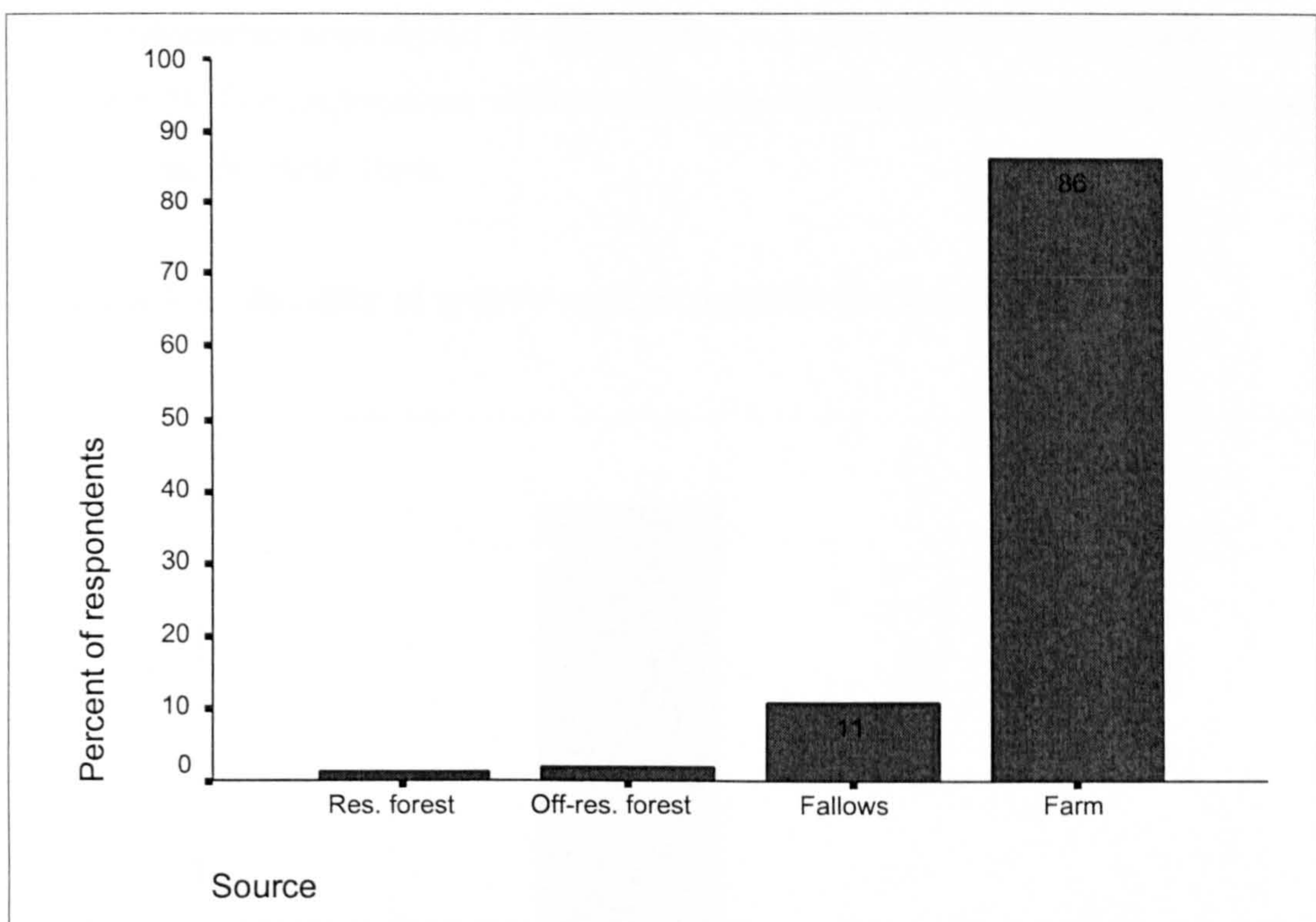
Table 6.10. Main species used as firewood in the study area

Local Name	Scientific Name	Comment on quality
Adweaa	<i>Dacryodes klaineana</i>	Good
Afena	<i>Strombosia glaucescens</i>	Good
Apapaye	<i>Turraeanthus africanus</i>	Good
Dahoma	<i>Piptadeniastrum africanum</i>	Good
Dubini (mahogany)	<i>Khaya ivorensis</i>	Good
Emire	<i>Terminalia ivorensis</i>	Poor
Esa	<i>Celtis mildbraedii</i>	Good
Frumtum	<i>Funtumia elastica</i>	Good
Ogyama	<i>Alchornea cordifolia</i>	Poor
Kakapenpen	<i>Rauvolfia vomitoria</i>	Good
Nyamedua	<i>Alstonia boonei</i>	Poor
Nyankuma	<i>Myrianthus arboreus</i>	Good
Nyankyere	<i>Ficus exasperata</i>	Good
Odum	<i>Milicia excelsa</i>	Poor
Odwuma	<i>Musanga cecropioides</i>	Poor
Ofram	<i>Terminalia superba</i>	Poor
Onyina	<i>Ceiba pentandra</i>	Poor
Opam	<i>Macaranga barteri</i>	Good
Pampena	<i>Albizia adianthifolia</i>	Good
Pamprama	<i>Corynanthe pachyceras</i>	Good
Sofa	<i>Sterculia tragacantha</i>	Poor
Tanuro	<i>Trachilia monadelphica</i>	Good
Wawa	<i>Triplochiton scleroxylon</i>	Poor

The most important source of fuelwood is the farm and fallow areas. People rarely seem to collect fuelwood from the forest (Figure 6.4). Because fuelwood is abundant in the study area, it has not been commercialised. Almost all households gather their own fuelwood. Bad roads (especially during the rainy season) also inhibit commercialisation. Few people sell firewood or process charcoal for sale and few people buy fuelwood in the study villages. The few who are involved in the market sell to local individuals who are involved in small-scale processing activities such as palm oil processing and 'akpeteshie' (palm gin) distilling, or sometimes transport the fuelwood to nearby towns.

Fuelwood supply has important effect on rural livelihoods. For example in a study in the coastal region of Ghana, Ardayfio-Schandorf (1986) found that fuelwood scarcity had an impact on household food and livelihood security. According to her, fuelwood scarcity forced households to spend money on fuel rather than food, to change cooking practices, and in extreme cases to change the staple diet to less energy-intensive foods. She noted that fuelwood scarcity also limited people's income-earning options as the increasing cost of fuel made some energy-intensive processing activities, such as fish-smoking, prohibitive.

Figure 6.4 Important source for collection of firewood



6.3.2. Pestles and Mortars

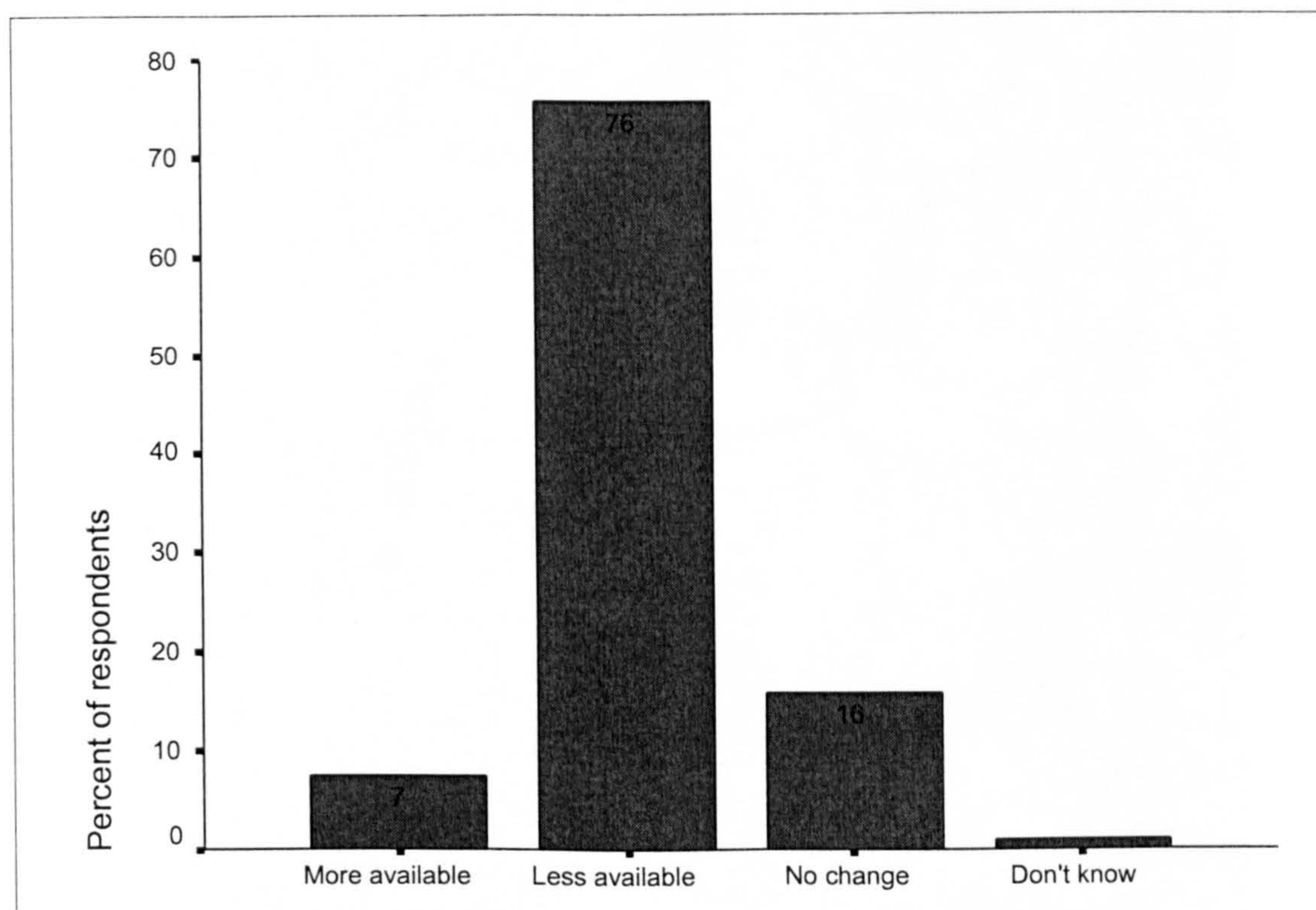
In all the study villages pestle was named as one of the most valuable forest product. Pestles are essential for pounding the staple 'fufu' (pounded cassava and plantain, cocoyam or yam) as well as for processing foods such as palm fruit into palm oil. All households had at least two pestles, one for pounding 'fufu' and the other for processing other foods such as palm fruits. The pestle is made from a durable but light wood, usually 6 - 8 feet long. Species used for making pestles in the study area include 'esa' (*Celtis milbraedii*), 'odwen' (*Baphia nitida*), 'tanamfere' (*Cola chlamydantha*) and

'danta' (*Nesogordonia papaverifera*). The most popular species, however, are 'esa' and 'odwen'.

Most households (67%) reported that they collect the material for their own pestles from the bush, whereas 33% buy from local individuals and local markets. The collection of pestle wood is largely a male activity in the area and is taken from forests rather than farms. For example, 48% of those who collect their own pestle wood reported the most important source as the reserve forest, 33% said that their most important source is the off-reserve forest, while 17% reported that they collect their pestle wood from fallow areas. Only 3% of the respondents indicated that they get their supplies from the farm.

Most respondents complained of the decline in availability of species used as pestles (Figure 6.5). The respondents attributed the decline to over-harvesting and clearance of source areas for agriculture.

Figure 6.5 Availability of species used as pestle in the study area



The mortar is carved from a hardwood and the most popular species are 'kusia' (*Nauclea diderrichii*), 'odum' (*Milicia excelsa*) and 'danta' (*Nesogordonia papaverifera*). People buy their mortars from local carvers or at nearby rural markets. Like pestles, all

households in the study area have at least two mortars - one for pounding 'fufu' and the other for processing palm fruits and other foods (Plate 6.3).

The pestle and mortar are the two most valued household items. Their usefulness and popularity are not limited to rural areas. Urban households also use them since 'fufu' is an important staple food for the majority of Ghanaians.



Plate 6.3: The use of mortar and pestle for pounding the staple 'fufu'. Fufu is prepared using cassava and plantain or yam or cocoyam.

6.3.3. Chewing sticks and chewing sponges

Chewing sticks (or chewsticks) provide the main means of dental care for almost all the people in the study area and are made from the split stems of a variety of species of forest trees. All households in the area reported that they use chewing sticks. Several species are favoured in this area, the most popular species being 'nsokor' (*Garcinia epunctata*) and 'tweapea' (*Garcinia kola*) (see Table 6.11).

Table 6.11 Main plant species used for chewing sticks

Local Name	Scientific Name	Part Used
Esa	<i>Celtis mildbraedii</i>	Stem/twigs
Fema	<i>Microdesmis puberula</i>	Stem/twigs
Kagya	<i>Griffonia simplicifolia</i>	Stem/twigs
Krakoo	<i>Sphenocentrum jollyanum</i>	Roots
Nsokor	<i>Garcinia epunctata</i>	Stem
Nsurogya	<i>Gongronema puberula</i>	Stem/twigs
Obua	<i>Napoleana vogelii</i>	Stem/twigs
Odwen	<i>Baphia nitida</i>	Stem/twigs
Ogyama	<i>Alchornea cordifolia</i>	Stem/twigs
Owebiribi	<i>Teclea verdoorniana</i>	Stem
Pepea	<i>Margaritaria discoidea</i>	Stem/twigs
Sakanee	<i>Anogeissus leiocarpus</i>	Roots
Toantini	<i>Paullinia pinnata</i>	Root
Tweapea	<i>Garcinia kola</i>	Stem

The roots of 'toantini' and 'krakoo' are chewed more as an aphrodisiac than as teeth cleaners. *Garcinia* species (Nsokor and tweapea) are the most popular chewing sticks, in forest areas especially and urban centres generally. The majority of Ghanaians refer only to *Garcinia* species as chewing sticks. These are the only species sold for the purpose in markets. More than 72% of the 160 respondents indicated that they obtain their chewing stick from the market, 15.6% reported that they collect their chewing stick from the reserve forest, 6.9% reported that they collect their chewing stick from off-reserve forest areas, while 3.8% indicated they collect chewing stick from fallow areas (Table 6.12). In all, only 44 out of the 160 respondents indicated that they collect their own chewing stick (*Garcinia* spp.) from the bush.

Most people complained that the availability of chewing sticks (*Garcinia* spp.) has reduced considerably in the area. For example, of the 44 respondents who reported that they collect their own chewing stick, 75% indicated that chewing stick is less available

(Table 6. 12). The collection of chewing stick, i.e. *Garcinia* spp is largely a male activity in the study area while its sale is dominated by women.

Table 6.12 Source and availability of chewsticks (*Garcinia* species) in the study area

	Source	
	<i>No. of respondents</i>	<i>% of respondents</i>
Reserve forest	25	15.6
Off-reserve forest	11	6.9
Fallow areas	6	3.8
Farm	2	1.3
The market	116	72.5
Total	160	100
	Availability	
	<i>No. of respondents</i>	<i>% of respondents</i>
Less available	33	75.0
More available	6	13.6
No change in availability	3	6.8
Don't know	2	4.5
Total	44	100

Chewing sponges (locally called 'sawe') are used in the same way as chewing sticks and are very popular in the study area, especially amongst the Kwahu and Akuapem ethnic groups. Many species are used to produce chewing sponge, although the most common species is the forest climber *Acacia kamerunensis* (locally called 'oguaben').

Chewing sticks provide the main means of dental care for more than 90% of the people of southern Ghana. In a survey of chewing stick usage in southern Ghana, Adu-Tutu *et al.* (1979) estimated a total of 28 plants used as chewing stick. Irvine (1961) also estimated about a hundred such plants for the whole country. However, only two varieties of chewing stick are sold in markets: 'nsokor', the more important, made from *Garcinia epunctata* or *Garcinia afzelii*, and 'tweapea', made from *Garcinia kola*.

The good condition of people's teeth in West Africa is common lore and several authors claim that diet, combined with regular chewstick use, helps to keep teeth healthy (Falconer, 1992). A considerable amount of research has been conducted in Ghana on the effectiveness of different chewstick species for dental hygiene. Some researchers have suggested that chewsticks are effective because of the greater length of time they are used daily compared to toothbrushes, perhaps cleaning better and giving better gum

massage. Others also claim to have identified anti-microbial properties in some chewstick species (Buadu *et al.*, 1973).

6.3.4. Washing sponge

Washing sponges are produced from beating the stems of several species of forest lianas or vines. The main species of lianas exploited for sponges used for bathing and washing include 'ahensaw' (*Momordica angustistepala*), 'bekye' (*Cyphostemma adepodum*) and 'asoma' (*Parkia bicolor*), a tree.

The production of washing sponges is a female activity in this area. Most people have access to sponge-making species, although few people produce washing sponges for sale. The majority of the rural households use this type of sponge for washing cooking utensils and majority of respondents indicated that they get their supplies from forest and fallow areas.

6.3.5. Canes

The stems of several species of climbing palm commonly known as cane or rattan have a wide variety of uses in the study area and in Ghana in general. Canes are found in most types of forest in southern Ghana but are most prevalent in the evergreen forest zone, including the study area. Canes feature prominently in the material culture of the study villages. The central importance of canes was apparent from the initial visit to the study area. The flexibility and strength of canes makes them ideal for house building, basket making and furniture production. Canes are used for a great variety of household items in the study villages, including housing, storage containers (baskets), furniture, fish traps, sleeping mats, and crop-drying mats to name but a few (see Plate 6.4).

The main species of cane used in the area and which are commercially traded are 'mfia' (*Eremospatha* spp.), 'eyee' (*Laccosperma opacum*), and 'dem mire' (*Calamus deeratus*). Rural people in the study area use cane to meet subsistence needs and earn income by selling unprocessed (raw) cane or woven baskets. Cane gathering is largely a male activity and throughout the study area many people, usually men, weave baskets and other household items on a part-time basis, both for their own use as well as for sale to local people.



Plate 6.4: The use of canes for making baskets. The weaving of cane baskets is an important source of household income in the study villages.

Most people reported that their most important source of canes is the reserve forest. For example, of the 65 respondents who indicated that they are involved in cane collection, 66.2% maintained that they collect cane from the reserved forest, 26.2% said that they collect it from off-reserve forest areas, while 7.7% indicated that they collect it from fallow areas. None of the respondents reported that they collect canes from the farm. Virtually all the respondents who reported that they collect canes complained that the availability of canes has reduced considerably in the area (see Table 6.13).

Table 6.13. Source and availability of canes in the study villages

	Important source	
	<i>No. of respondents</i>	<i>% of respondents</i>
Reserve forest	43	66.2
Off-reserve forest	17	26.2
Fallow areas	5	7.7
Total	65	100.0
	Availability	
	<i>No. of respondents</i>	<i>% of respondents</i>
Less available	58	89.2
More available	5	7.7
No change	2	3.1
Total	65	100.0

6.3.6. Wrapping leaves

The leaves of *Marantaceae* species are commonly used as packaging material by traders and people who sell cooked foods. They are the only material used by traders and food sellers for wrapping vegetables, kola nuts, cassava dough, fish, soap, salt and cooked foods, notably rice, yams, beans, 'kenkey'³ and fried plantain. The *Marantaceae* are herbaceous forest plants and the leaves are strong, large, durable, able to withstand heat, and are impermeable.



Plate 6.5: *Marantaceae* leaves as household packaging or wrapping material and a source of income and employment.

The most common *Marantaceae* leaves used in the household and which are commonly traded are 'ntrentrema' (*Marantochloa* spp.), 'anwonomo' (*Marantochloa mannii*, *Megaphrynium* spp., and *Thaumatococcus daniellii*), and 'suahahan' (*Halopegea azurea*) (Plate 6.5).

The harvesting of *Marantaceae* leaves involves breaking the stems of mature leaves just beneath the leaf node. The leaves are then stacked and tightly tied into large bundles, which are then grouped into bales to make a headload. Virtually all households in the

³ Food prepared with fermented maize dough.

study area use *Marantaceae* leaves. However, only 28% of the respondents collect them. The rest buy them from local gatherers and from the market. The collection and sale of *Marantaceae* leaves is entirely a female activity in the study area.

Marantaceae are herbaceous perennial plants and their leaves are available throughout the year (though they grow more vigorously during the rainy season when they can be harvested at greater intensities). They are most commonly found in disturbed forest sites (i.e. tree gaps and clearings), in swamps and in moderately burnt forest. They are also common in fallow areas and on abandoned cocoa farms, especially during the rainy season. For example, of the 45 respondents who admitted that they collect the leaves, 15.6% indicated that they collect it from reserve forest areas while 40% maintained that they collect the leaves from fallow areas (see Table 6.14).

Table 6.14. Source and availability of *Marantaceae* (wrapping) leaves

	Important source	
	<i>No. of respondents</i>	<i>% of respondents</i>
Reserve forest	7	15.6
Off-reserve forest	11	24.4
Fallow areas	18	40.0
Farm	9	20.0
Total	45	100.0
	Availability	
	<i>No. of respondents</i>	<i>% of respondents</i>
More available	8	17.8
Less available	33	73.3
No change in availability	4	8.9
Total	45	100.0

In the dry season, the supply of leaves on fallow and cocoa farms dwindles and collections at this time of the year are from forest areas only. The respondents maintained that the leaves do not survive in areas which have been severely or repeatedly burned. Most households complained that the availability of the leaves has declined and they therefore spend more time gathering them than before. For example, 73.3% of the 45 respondents who admitted that they collect the leaves reported that the leaves are less available (Table 6.14).

6.3.7. Building materials

The majority of the rural households rely on the forest and farmlands for building materials. In all 3 study villages people emphasized the importance of forests for building materials, primarily poles, palm leaves, palm leaf petioles, bamboo, raphia palm leaves, and lianas. The reliance on natural building materials is the norm in most rural areas of southern Ghana. More than 90% of houses in the study villages are made of mud and wattle (locally called 'atakpame' houses). The construction of mud and wattle houses involve the use of sapling-sized trees as standing poles and raphia or bamboo to form a lattice structure which is tied together using canes or other forest climbers (Plate 6.6). Kitchens, food storage barns, livestock pens and other farm buildings are invariably made from a variety of forest trees, raphia and oil palm fronds, or bamboo. Table 6.15 provides a list of different species of plants or poles used in house construction in the study area.

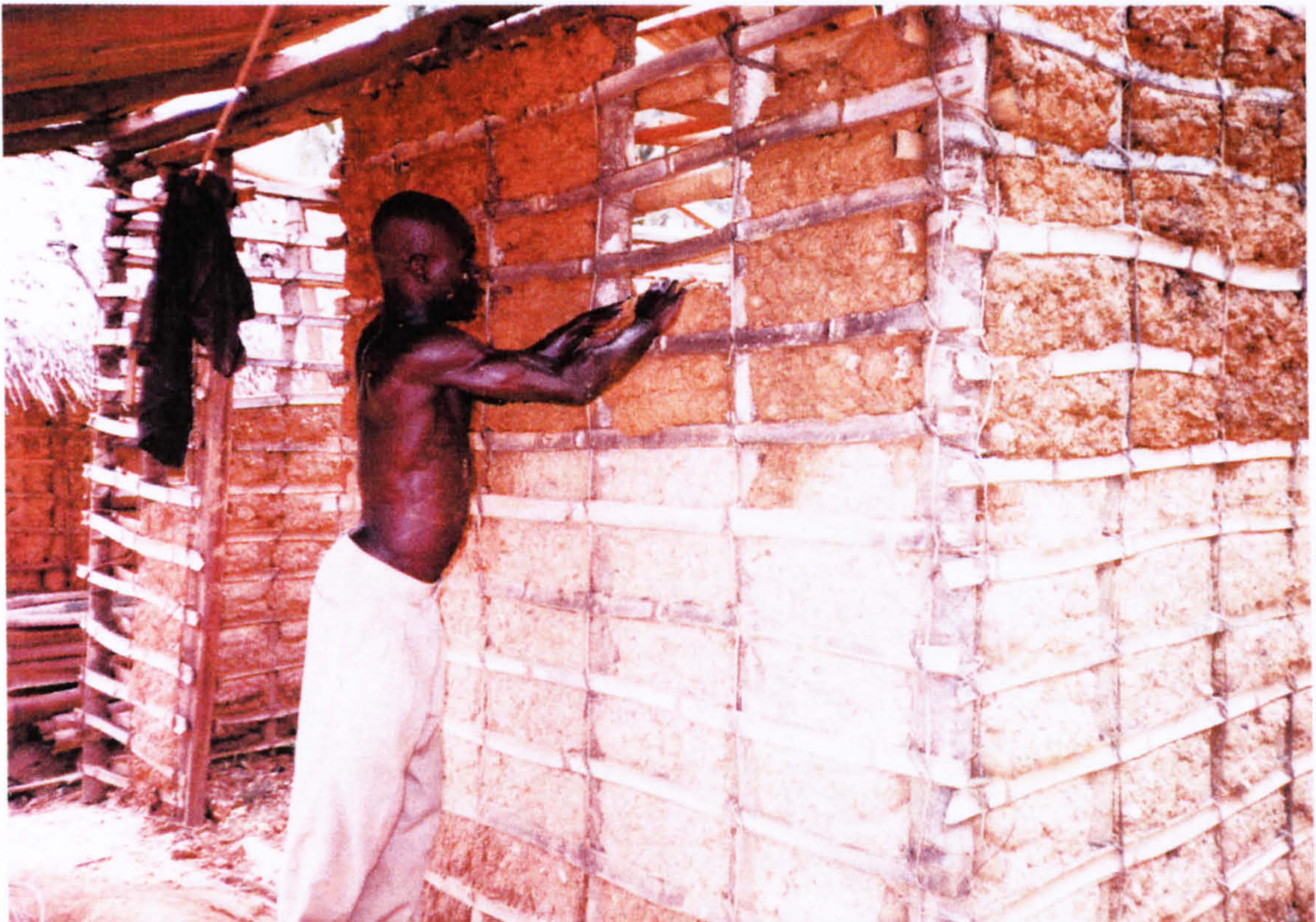


Plate 6.6: The construction of mud and wattle house using natural building materials such as poles, bamboo, canes and raphia thatch. Virtually all houses in the study villages are made of mud and wattle.

The most common roofing materials in all the study villages are raphia palm leaves (thatch), split wood and bamboo. Very few houses are roofed with metal sheets. The type of house and roof provides a gauge of the relative wealth of a household.

Table 6.15. Forest species commonly used as poles for building houses

Local Name	Scientific Name
Afena	<i>Strombosia glaucescens</i>
Apapaye	<i>Turraeanthus africanus</i>
Pampro	<i>Bambusa vulgaris</i>
Odwen	<i>Baphia nitida</i>
Ofram	<i>Terminalia superba</i>
Adobe	<i>Raphia hookeri</i>
Obaa	<i>Xylopia quintasii</i>
Sofa	<i>Sterculia tragacantha</i>
Opam	<i>Macaranga barteri</i>
Odum	<i>Milicia excelsa</i>
Emire	<i>Terminalia ivorensis</i>
Teak	<i>Tectona grandis</i>
Afiafia	<i>Carpolobia alba</i>
Atena	<i>Parinari curatellifolia</i>
Esa	<i>Celtis spp.</i>
Tanuronini	<i>Trichilia tessmannii</i>
Abe	<i>Elaies guineensis</i>
Otwewa	<i>Carpolobia lutea</i>

Some species of pole are particularly sought after due to their quality. The most important qualities of building materials are durability, insect resistance and, in the case of poles, length and straightness. 'Obaa' (*Xylopia quintasii*) is the most widely used pole species due to its quality. Most of the building materials are collected from farm and fallow areas as well as from reserved forests. While certain materials such as raphia palm leaves were mentioned as declining in availability, others such as bamboo were said to be more available (see Table 6.16).

Table 6.16 People's perceptions of the availability of bamboo and raphia palm leaves (thatch)

	% of respondents	
	Bamboo	Raphia palm thatch
More available	42.0	12.2
Less available	28.4	73.5
No change	29.6	13.3
Do not know	0	1.0
Total number of respondents	81	98

6.3.8. The use of forest resources in traditional medicine in Ghana

Forest plants are essential components of health treatments used throughout southern Ghana and are the main medicines used by the vast majority of rural and urban Ghanaians. Although there are many different healing practices and beliefs, common to most is the use of plants in conjunction with mystical and ritual practices. Knowledge and use of plant medicines in Ghana is not confined to specialist healers. By far their most common and important use is by people treating themselves in first aid.

In contemporary Ghana two types of medical systems - the traditional and the "scientific" (Western-style) exist simultaneously. For example, Falconer (1992) notes that there are generally five options for treatment of most common diseases, namely:

- a clinic or hospital;
- treatment from a nurse at home;
- buying western-style pharmaceutical drugs, primarily painkillers and chloroquine, by the wayside;
- self treatment using plant medicines; and
- traditional healers.

A range or combination of these options is typically used, depending on the particular ailment, the patient's financial situation, their access to western and traditional healers, and their past experience.

However, access to Western-style health care is extremely limited in rural regions and even where clinics exist the majority of people cannot afford to use them. For example, Abbiw (1990: 118) claims that in rural areas of Ghana there is only one medical doctor to 70,000 people, whereas in urban centres such as Accra the ratio is about 1: 4,000.

Before colonial contact in Ghana, indigenous health practitioners were the sole practitioners of medicine in the country. When the colonial administration arrived in the Gold Coast (now Ghana), it rapidly initiated a new regime based on western medicine. The aim of the colonial government was to "liquidate native practices of traditional medicine" (Twumasi and Warren, 1986). This objective was implemented by the institutionalisation of the new western medical system through legislation in 1878. Indigenous medicine lost its prestige and was stigmatised, a process aided by missionary influence. The colonial government denied indigenous healers any official

mandate and legitimacy, and hence they were forced to practice in secret (Brown, 1995).

At independence in 1957, the nationalist government of President Kwame Nkrumah campaigned to create a national identity which included the active encouragement of African arts, culture, and medicine. This led to a resurfacing of traditional medical practitioners and practice, which together with the present inaccessibility of western medicine to large sections of the population, has stimulated the popularity of indigenous medical practice (Brown, 1995).

There are clear distinctions in people's attitudes to different forms of health care depending on where they live and on their level of education. The majority of urbanites turn first to western-style medicine and only use herbal medicines when western treatment has failed. In contrast, amongst rural households, the majority turn first to plant medicines known to them, or their friends or family. The second option for the majority of rural households is pharmaceuticals, generally painkillers, bought from primary health care posts or from wayside vendors. If the first two options fail then people turn either to a clinic or traditional healer, depending on the disease in question, access to the clinic or healer, and the family's financial situation (Falconer 1992).

6.3.8.1. Household use of plant medicines

The belief in traditional medicine is very strong in rural areas in southern Ghana. Some believe that such medicines are better and more potent than modern medicine for certain types of ailments. The curative powers of certain wild species are common knowledge and self-medication is practised regularly. In the study villages, knowledge and use of plant medicines is not limited to specialised healers. Virtually all households use plant medicines. For example, 92.5% of the households interviewed regularly use plant medicines. Even children are particularly knowledgeable about first aid treatments for common problems such as cuts, stomachaches and fever.

The list of diseases treated with plant medicines is extensive since in most cases plant medicines are tried first. They include eye problems, convulsions, epilepsy, stomach problems, fractures, piles, rheumatism, measles, guinea worms, headaches, cough, skin diseases such as boils and eczema, menstrual problems, pregnancy and delivery

problems, burns and cuts, and sexually transmitted diseases, such as gonorrhoea (see Table 6.17).

Table 6.17 Medicinal plants commonly used in the study area⁴

Local name	Scientific name	Parts used	Diseases/ conditions treated
Abronkuma	<i>Antrocaryon micraster</i>	leaves	Abdominal pains in pregnancy
Adubrafo	<i>Mareya micrantha</i>	Leaves	Fever, malaria
Afena	<i>Strombosia glaucescens</i>	Bark	Hernia
Ahabankankan	?	Leaves	Lower abdominal pains, childbirth
Akyempong	<i>Chromelaena odorata</i>	Leaves	Cuts, waist pains, stomach problems
Awiemfosemina	<i>Albizia ferruginea</i>	Leaves	Coma
Bese	<i>Cola nitida</i>	Seeds/bark	Shingles / toothache
Brofre (Pawpaw)	<i>Carica papaya</i>	Seeds	Stomach pains
Dahoma	<i>Piptadeniastrum africanum</i>	Bark	Waist pains, chest pains
Dinsikro	<i>Euadenia eminens</i>	Roots	Waist troubles
Edinam	<i>Entandrophragma angolense</i>	Bark/roots	Anaemia, / fever
Emire	<i>Terminalia ivorensis</i>	Bark	Chest pains
Esoro wisa	<i>Piper guineensis</i>	Seeds	Convulsions, stomach pains
Fam wisa	<i>Afromomum</i> spp.	Seeds	Boils, fever, piles
Frumtum	<i>Funtumia elastica</i>	Bark	Diarrhoea
Guava	<i>Psidium guajava</i>	Roots/leaves	Hernia, malaria, / diarrhoea
Hwentiaa	<i>Xylopiya aethiopica</i>	Fruit/seeds	Anaemia, diarrhoea, purgative, boils
Kagya	<i>Griffonia simplicifolia</i>	Leaves	Cuts/wounds
Kakapenpen	<i>Rauwolfia vomitoria</i>	Roots	Impotency, waist pains, piles, asthma
Kanwono	<i>Picralima nitida</i>	Bark	Waist pains, Rheumatism
Kookoo (Cocoa)	<i>Theobroma cacao</i>	Roots/ leaves	Chest pains, cough, / anaemia, malaria
Krabese	<i>Carapa procera</i>	Bark	Stomach pains, cough
Kuokuonisuo	<i>Spathodea campanulata</i>	Leaves	Fracture (broken legs)
Maatwa	<i>Strophanthus hispidis</i>	Stem/ roots	Headache
Mahogany	<i>Khaya ivorensis</i>	Bark	Chest pains, hernia, fever, abortion
Mango	<i>Mangifera indica</i>	Bark	Chest pains, jaundice
Nkrandedua	?	Roots	Ear problems (used as ear drop), boils
Ntanta	<i>Grewia carpinifolia</i>	Leaves	Piles
Nunum	<i>Ocimum viride</i>	Leaves	Stomach pains, headache
Nwamma	<i>Ricinodendron heudelotti</i>	Bark	Heart problems
Nyamedua	<i>Alstonia boonei</i>	Bark	Measles
Nyankyerene	<i>Ficus exasperata</i>	Leaves	Cataract (eye), promotes childbirth
Nyanya	<i>Momordica charantia</i>	Leaves	Measles, malaria, Gonorrhoea, convulsion
Odum	<i>Milicia excelsa</i>	Bark	Rheumatism
Odwen	<i>Baphia nitida</i>	Leaves	Cuts (stops bleeding)
Ofema	<i>Mocrodesmis puberula</i>	Leaves	Diarrhoea, malaria
Ogyama	<i>Alchornea cordifolia</i>	Leaves	Fracture, cough, waist pains
Okoro	<i>Abizia zygia</i>	Roots/bark	Waist pains, / cough
Otie	<i>Pycnanthus angolensis</i>	Bark	Anaemia (blood tonic), dysentery
Peabaa	?	Leaves	Headache
Sempe	?	Leaves	Eczema (skin disease)
Sinduro	<i>Alstonia boonei</i>	Bark	Measles
Sonkyi	<i>Allanblackia floribunda</i>	Leaves	Headache in babies
Susumasa	<i>Newbouldia laevis</i>	Leaves	Miscarriage in pregnant women
Tanuro	<i>Trichilia monadelpha</i>	Leaves	Stomach ulcer, chest problems
Toantini	<i>Paullinia pinnata</i>	Roots	Impotency, wounds, rheumatism
Tutuani	?	Leaves	Diarrhoea
Wedeba	<i>Monodora myristica</i>	Leaves	Waist pains, stomach problems
Wonwono	<i>Vernonia amygdalina</i>	leaves	Stomach ulcer, worm infestation

⁴ Only species that were mentioned by more than one people are included in the list.

A wide variety of plant species are used both for first aid and for specialist treatments in the study area. The respondents were asked to mention the names of medicinal plants they know and the diseases they treat. Over 45 plant species were identified to be the most common species whose parts are used in traditional medicine (see Table 6.17).

Different parts of the plants are used, ranging from roots, stems, bark, leaves, fruits, seeds, buds and flowers, although the most common part used is the leaves. A single plant may be used for the treatment of several diseases and several plants can also treat a single disease. The parts of the plants are prepared in a variety of ways. For example, leaves and bark can be mashed and pounded (for example, in the treatment of rheumatism and swellings with root bark and leaves of *Alstonia boonei*), powdered, stewed or oil extracted from seeds. There is also a range of different modes of application and administration: most commonly as enemas, ingested as decoction, as poultices, ingested with spirits, as eye drops, nasal drops, or added to soups and stews.

Many treatments combine a variety of different plant parts or ingredients in order to be potent. For example, the leaves of *Ocimum viride*, *Carapa procera*, *Carica papaya* and the seeds of *Piper guineensis* and *Xylopia aethiopica* are cooked together and drunk several times a day to treat stomach aches. Similarly, the leaves of *Carica papaya* and *Mormordica* spp. and the bark of *Celtis* sp. are cooked with the seeds of *Piper guineensis* and *Capsicum* sp. and given to a woman who has just delivered a child for strength.

Certain mystical powers and rites are often associated with the gathering and use of different plant medicines. The way the plant is harvested, when it is harvested, and how the plant is used or prepared are all associated with mystical powers. Some plants are collected only at certain times of the day or from specific locations. For example, 'odii' (*Okoubaka aubrevillei*) is believed to have supernatural powers and so certain rites are performed before its parts are harvested. An egg is often broken at the foot of the tree to pacify the spirits before harvesting, and a person cutting any part of the tree is forbidden to mention anyone else's name as it may have disastrous consequences for the named person. Most people reported that the effectiveness of traditional medicine is highest when plants are collected from the wild rather than from cultivated fields. Plant medicines that are collected from deep in the forest are thought to be more potent. Some traditional healers, traditional birth attendants and elders who were interviewed reported that in most cases leaves are not collected during mid-day because the plant's spirit may

be out wandering in the field. According to them medicines are most effective when plants are collected early in the morning or at sunset.

The results of household interviews suggest that forest areas are not the only source of plant medicines. Fallow areas, the farm and the village periphery are also important. For example, of the 92.5% of the respondents who reported that they use plant medicines, 36.5% indicated that they collect the medicines from forest areas, 51% maintained that they collect the medicines from fallow areas, while 12.5% reported that they collect it from their farms. Most people reported that they plant and protect medicinal plants on their farms; the common ones include 'brofre' (*Carica papaya*), 'atoaa' (*Spondias mombin*), 'fam wisa' (*Aframomum melegueta*) and 'hwentiaa' (*Xylopiya aethiopica*).

6.4. Traditional and cultural values of forests and trees

The contribution of forests and forest products to rural livelihoods and the well-being of rural people is manifest in the spiritual, cultural and traditional values placed on forests and forest products by rural communities. Throughout the study area certain forest products are considered sacred and are therefore feared and protected (see below). Forest products also feature in many cultural ceremonies such as marriages, funerals, initiations, the installation of chiefs and the celebration of births.

In many societies the forest is seen as dark, mysterious, and dangerous, the abode of strange and threatening creatures. It is regarded as the antithesis of 'civilisation' with its landscape of domesticated humans, other animals, and plants. For example, a shadow play from Palembang, Indonesia, mentions a creature of the forest with no knowledge of literary Javanese or Javanese ways and hence a monster (Andaya, 1993: 78). Among the Khmer people of Cambodia, the forest is viewed as a chaotic place from which civilisation was born (Mabbett and Chandler, 1995: 108). In Ghana, forests are believed to be the home of dwarfs, and the domain of the mythical 'sasabonsam' - a legendary figure believed to be responsible for all the woes of mankind and to which mishaps and everything evil are attributable (Abbiw, 1990).

When NTFPs are considered from the economic point of view, their cultural value is often neglected. Sacred forests (forests with spiritual, cultural and religious value) are often disregarded in the context of forest conservation projects. If this happens, the

intended aim may not be achieved and the opportunity to link conservation to the needs and spiritual life of the population will be lost. It is therefore essential to understand the cultural and spiritual values of forests because this, in large part, determines the extent to which people relate to them.

For example, in the Communal Areas of Zimbabwe, there are taboos on cutting certain trees (such as *Parinari curatellifolia*, *Ficus sycomorus*, *Gardenia spatulifolia*, and *Burkea africana*), since tradition holds that these are a resource owned by the community at large (present and future) and trees are linked to ancestral spirits (Wilson, 1989). The practice of leaving trees in fields is grounded in the spiritual lives of the rural people. Thus some trees are important for rain making ceremonies and other important functions, and it is believed that some trees harbour ancestral spirits and therefore should not be cut (Wilson, 1989; Campbell *et al* 1993). These cutting taboos are traditional conservation practices that protect forest and tree resources. Such "native" knowledge and management systems are essential when setting up management systems for forests in general and for NTFPs in particular.

6.4.1. Sacred forests/groves

In essence, sacred and protected forest groves are traditional conservation areas. These traditional conservation areas are found throughout southern Ghana and are attracting an increasing amount of interest as possible sites of biological diversity and as models for forest conservation. They are often small areas of intact or slightly degraded forest that have been reserved for religious reasons.

Sacred groves have different origins and serve different functions in different communities. Some are burial grounds and are believed to house the spirits of ancestors, while others are believed to house protective spirits. Others are renowned for the healing powers of their deity, and priests and healers of these groves derive their powers from the spirits. In other cases, rivers and other features are sacred and the forest vegetation serves to protect them. For example, in Kwapanin, a village in the Ashanti region of Ghana, a large rocky outcrop is considered sacred and the forest immediately surrounding it is protected (Falconer, 1992). The origins of some sacred groves are linked to specific historical events such as battles, while others are believed to have existed since creation.

One sacred grove occurs near the study area, in a village called Akyikyire, about 4km from Sureso village. This sacred grove is believed to be the abode of spirits and, therefore, fetish priests are the only people entrusted to manage it. The people reported that only members of the royal family are allowed to enter this grove and only once a year. They believe that people who are not from the royal family would die mysteriously if they enter the grove. Throughout the study area people do not keep dogs or rear cattle; they maintain that the gods of the land, believed to be the deity associated with the sacred grove in Akyikyire village, prohibit them from so doing.

In southern Ghana, different sacred groves are governed by different rules. In some cases entry to a sacred grove is strictly limited, but in others the area may be exploited, or may be restricted for certain forest resources and not others. For example, in Nanhini, a village in southern Ghana, farming, hunting and snail gathering are not permitted in one sacred grove, but palm wine tapping and the collection of medicines are (Falconer, 1992). Most sacred groves have sacred days ('daboni') associated with them, when farming activities are prohibited. The sacred days are held in remembrance of particular historical events such as battles, or settlements of disputes in which the particular deity played a role.

Sacred groves are believed to be associated with gods or deities that protect people living in those areas. For example, in a study to examine the importance of forest products for people living in southern Ghana, Falconer (1992) reported that the 'numafoa' sacred grove in Nanhini village is especially revered; even the most ardent Christians believe in the goddess's protective powers. The 'numafoa' goddess associated with the grove is believed to participate actively in people's daily lives and many people recounted testimonies of her recent visits to them and of her healing prowess. Falconer's study identified several sacred sites in southern Ghana and the powers associated with them (see Table 6.18).

It is evident from the above discussion that there are considerable variations in the beliefs and prohibitions associated with sacred forests in Ghana, but one prohibition common to all is that on the cutting of live trees. Testimony to the fact that prohibitions are effective is found in the fact that sacred groves within forest reserves are often better preserved than other parts of the reserve (Prah, 1994: 16). Outside reserves, these

'ecological islands' have conservation significance far outweighing their diminutive size. For example, there are many sacred groves in the southern marginal forest zone of Ghana, which generally have a high genetic heat index⁵ (Hawthorne and Abu-Juam, 1995).

Table 6.18 Sacred forest sites in some Ghanaian villages and the powers associated with them

Village	Sacred site(local name of site)	Powers
Nanhini	Forest - (Numafoa)	Healing powers, protective powers
	Forest - (Kobri)	Power of sanction
	River	Healing powers
Essuowin	River - (Tano)	Healing powers, protective powers
	River - (Essuowin)	Healing powers, protective powers
	Forest - (Kobri kwaye)	Healing powers, protective powers, power of sanction
Nkwanta	Forest - (Mintiminim)	Healing powers, power of sanction
	River - (Wine)	Power of sanction
Koniyao	River - (Kyirade)	Protective powers, power of sanction
Kwapanin	River - (Boa)	Protective powers
Banso	Burial ground	
	River - (Ankobra)	Protective powers, power of sanction

Source: Adapted from Falconer (1992)

Sacred forests are not only found in Ghana or indeed throughout Africa, they occur across the world. For example, in the south of the province of Yunnan in south-west China, there are some 400 "dragon hills" which provide for the spiritual needs of the local population. In addition the sacred forests are important as a source of traditional Chinese medicine, some of which are of commercial value (Sochaczewski, 1998).

6.4.2. Sacred significance of particular forest products

Many wild plants retain a deep cultural and traditional significance in many areas of Africa and in other parts of the world. Indeed, 'plants have had symbolic significance as well as utilitarian meanings since the beginnings of civilisation. They have been tokens of birth, death, harvest, and celebration, and omens of good (and bad) luck. They are powerful emblems of place and identity, too, not just of nations, but of villages,

⁵ Genetic hotspots have been identified throughout the high forest zone of Ghana reflecting their conservation priority. These genetic hotspots are assigned numeric values. A numeric value associated with a hotspot is known as its genetic heat index (GHI). Forest reserves or portions of reserves with a high GHI (greater than 150) are designated as Special Biological Protection Areas and are permanently removed from timber production.

neighbourhoods, and even personal retreats' (Maybe 1996, cited in Pretty, 2002:19). Throughout the study area several forest plants and animals are believed to be sacred and are therefore protected. These plants and animals are believed by the local communities to be the abode of spirits or to have supernatural powers. The forest plant 'odii' (*Okoubaka aubrevillei*) and the liana 'ahomakyem' (*Spiropetalum heterophyllum*) are two most important life forms of the forest believed to be sacred in all the study communities. According to all those interviewed, these two species are gods among all trees and lianas and it is claimed that they sometimes talk like human beings. Several people maintained that where an 'odii' tree is found, no other tree survives within some distance of the tree. Wild pineapples usually grow around the tree and define its territory as being within the confines of the wild pineapple. It is said that the only animal able to pass underneath the 'odii' tree and feed on its seed without harm is the brush-tailed porcupine (*Atheropus africanus*).

The communities have a strong believe that such sacred species are not to be cut or burnt - whoever cuts them risks a supernatural death. Most sacred species, especially the two mentioned above, have wide medicinal potency but before portions are collected for medicinal use, certain rituals have to be performed. For example, an egg and a piece of white calico are placed under the 'odii' tree and libations are poured before any part of the tree can be collected. According to some people the tree cannot be approached at midday and it must be approached naked. A person cutting any part of the tree is forbidden to mention anyone else's name as it may have disastrous consequences for the named person. Similar rituals are performed before the liana 'ahomakyem' can be harvested.

Other sacred plants in this area are 'onyina' (*Ceiba pentandra*) and 'odum' (*Milicia excelsa*). Before 'odum' is felled an egg is broken at the foot of the tree to pacify the spirits. Table 6.19 provides a list of plant species considered sacred in the study communities. Some species may be used to protect an entire community. For example, when disease strikes, the village is swept with the 'adwira' plant (*Costus afer*), and the debris piled up and left on the outskirts of the village. It is believed that the plant drives away evil spirits from the village.

Table 6.19. Plant species believed to be sacred in southern Ghana

Local Name	Scientific Name
Odi	<i>Okoubaka aubrevillei</i>
Ahomakyem	<i>Spiroptalum heterophyllum</i>
Odum	<i>Milicia excelsa</i>
Onyina	<i>Ceiba pentandra</i>
Adwira	<i>Costus afer</i>
Nyamedua	<i>Alstonia boonei</i>
Kyeneua	<i>Cordia millenii</i>
Bonsamdua	<i>Distemonanthus benthamianus</i>
Nwadua	<i>Ficus sur</i>
Susumasa	<i>Newbouldia laevis</i>
Kwaetawa	<i>Oxyanthus unilocularis</i>
Katawani	<i>Pseudospondias microcarpa</i>
Bese	<i>Cola nitida</i>
Kanto	<i>Zanthoxylum xanthoxyloides</i>

Many wild animals also have spiritual and cultural value and are therefore regarded as sacred and accorded special respect or are feared. They may not be touched or killed. According to Ntiamoa-Baidu (1997), wild animals with spiritual and cultural uses in Ghana fall into three main categories:

- Totem species: animals regarded as symbols of an existing, intimate, and unseen relationship; accorded respected and considered sacred. These may not be killed or eaten.
- Taboo species: (a) animals regarded as sacred or holy because of some protection, guidance or help accorded to the ancestors through association with the species; and (b) animals regarded as unclean and abhorred because of some misfortune in the past associated with the species. In both cases, eating, killing or even touching of such animals may be forbidden.
- Sacrificial and/or ceremonial species: animals used in specific cultural rites and festivals, either in the rituals or in the preparation of the special dishes that go with such ceremonies.

Wild animals with spiritual or cultural associations in Ghana include the Leopard (totem of the 'bretuo' clan), Buffalo (totem of the 'ekoona' clan), African Grey Parrot (totem of the 'agona' clan), and Pied Crow (totem of the 'asona' clan). In many cases, the belief in the association is so strong that the psychological effects on an individual who breaks

any of the taboos and is unable to fulfil the purification or pacification rites dictated can result in mental or physical illness (Ntiamoah-Baidu, 1997).

In the study area, some animal species are believed to have fetish value and are used for spiritual healing and protection. Common animals whose parts are used in healing are chameleon, duiker, alligator, tortoise, leopard, elephant (skin) and python (oil). For example, part of a chameleon is tied to the wrist of newborn babies to ward off evil spirits and diseases. The belief is that the chameleon imparts its camouflage characteristics on to the child in the presence of evil spirits. The child then becomes invisible and the evil forces are unable to impart diseases on the child.

6.4.3. Uses of forest products in traditional ceremonies

Forest products feature in many cultural practices and traditional ceremonies in Ghana. Several plant species are used in traditional ceremonies in the study communities. Common ones include 'adwira' (*Costus afer*), 'sumani' (*Palisota bracteosa*), 'nyanya' (*Momordica charantia*), and 'duasika' (*Anatia polycarpa*). 'Adwira' is a wild herb believed to be associated with good luck and it is often used at funeral ceremonies. The leaves are usually placed in a brass plate containing water and kept on the table where donations are made. The belief is that the good luck attributes of the plant will encourage or attract people to donate more. 'Nyanya' is also believed to be associated with the expression of sorrow. During funerals, people tie this plant around their heads to indicate how sorrowful they consider the occasion.

The leaves of 'egoro' (*Bryophyllum pinnatum*) are dipped in water and sprinkled about the house after a girl passes her menses to indicate her entry into womanhood. When pouring libations, the leaves of 'odwen' (*Baphia nitida*) are similarly dipped and sprinkled along with 'eto' (cooked and mashed yam) to pacify one's defiled soul.

'Sumani' (*Palisota bracteosa*) is also used in purification ceremonies by chiefs while the bark of 'duasika' (*Anantia polycarpa*) is ground and used in polishing carved objects such as stools in shrines.

In this culture, kola nuts and palm wine are commonly used in connection with funerals, births and installation ceremonies. Amongst Moslems in this area, kola nuts feature in

many ceremonies and rituals and are 'broken' as a sign of welcome at births, marriages and deaths.

In all the study villages there are some plants which are believed to possess magic-religious powers. For example the leaves of 'adwira' (*Costus afer*), 'odwen' (*Baphia nitida*) and 'sinsam' (*Aframomum* spp.) are used for warding off evil spirits at religious and cultural ceremonies.

Certain plant species are commonly used for the demarcation of farm or land boundaries. The two common species are 'ntome' (*Dracaena arborea*) and 'kwadu' (*Musa* spp.). These species are used because they can withstand fire, coppice easily and have a long life span. Their large, long leaves are also distinctive enough to stand out even at a distance. In this culture whoever cuts, uproots, fells or changes the position of such trees which are being used as boundary markers commits an offence.

The Asantes of Ghana offer a good example of the cultural and traditional significance of forests and trees. "Indeed, meaningful constructions placed upon the forest and the plants (and animals) contained within it is a pervasive presence in Asante thinking about culture, society and polity...In olden times, if a Chief wished to settle some subjects in a new extension of the town, he would go there and plant a 'gyadua' (tree) in the middle of the street. This tree appeared then to become a monument to the Chief and to serve as a record of the event. In course of time it was regarded as a potential dwelling-place of the spirit of the Chief who planted it...The planting of trees by authorisation of chiefship simultaneously determined and validated the morphology of Asante settlements. It was an act taken - and continually retaken - in delineation of cultural space" (McCaskie, 2000:104-111).

6.5. Conclusion

The study has shown that forests and related flora and fauna contribute to all aspects of rural life in the study communities. Rural people in the study area obtain a wide range of products from the forest that contribute significantly to their livelihoods. Non-timber forest products thus form an integral part of the rural economy, providing subsistence goods and services as well as items of trade.

Food obtained from forests and associated vegetation plays an important role in the household economy. Several species of bush foods are widely consumed throughout the entire area. Virtually all households consume several varieties of forest foods, ranging from fruits to bushmeat. However, the frequency with which most forest foods are consumed is influenced by their seasonal availability.

Although forest foods contribute greatly to household subsistence, most people maintained that the consumption of most forest foods is declining. Most elders indicated that the variety and importance of bush foods in the diet has declined over their lifetime. The vast majority of people maintained that changes in bush food consumption patterns are largely the result of declining availability rather than changing tastes.

In addition to forest foods a wide range of other forest products contribute greatly to the material livelihoods of the rural households, including fuelwood, medicines, building materials, wrapping leaves, pestles, canes, chewstick, chewsponge, bamboo, and so on. Most household items such as baskets, sleeping mats, crop drying mats, grinders, mortars, spoons and other utensils are also produced from forest and tree resources. Forest products thus feature significantly in the material culture of the study villages.

The contribution of forests and forest products to rural livelihoods and well being of rural people is also manifested in the spiritual, cultural and traditional values placed on them. Forest products feature in many cultural ceremonies such as marriages, funerals, initiations, the installation of chiefs and the celebration of births.

Nowadays most forest foods and other forest products are gathered from the farm and fallow areas rather than forests and the availability of most forest products appear to be declining. For most products the demand may soon outstrip supply. For example, the desired *Garcinia* species for chewsticks (*Garcinia epunctata*) are becoming scarce in all the study communities.

Most forest products and processed goods derived from them are sources of income to most people in the villages who sell these products to local individuals and sometimes to both local and outside traders. The next chapter examines these forest-based income-earning activities and their contribution to household livelihoods.

CHAPTER 7

FOREST-BASED INCOME ACTIVITIES AND HOUSEHOLD LIVELIHOODS

7.1. Introduction

Though a significant proportion of forest products are used in the household, the sale of gathered forest products and processed goods derived from them also provide an important part of the family income throughout the year. These activities are especially important at times when agricultural tasks diminish, or when the need for cash is acute. For some of the rural households NTFPs provide the main source of livelihood. Many urban traders are also wholly dependent on the forest product trade. Monies obtained from such activities are often used to support the family; buying food, clothing and paying school fees; or invested in farming.

This chapter examines the range of forest-based income earning gathering and processing activities in the study area, the patterns of engagement in such activities and the relative importance of these activities in terms of their contribution to household incomes and livelihoods. Forest-based income activities are defined here as those activities that use any materials or products that occur in forests or woodland or from trees outside the forest (after Arnold, 1994: 1).

7.2. Economic activities and livelihood diversification

Livelihood diversification is an important household strategy in the study area. Although for most households agriculture is the major source of income, off-farm activities have an important role. Virtually all the rural households rely on a diversity of activities to help make a living (see Table 7.1).

Table 7.1. Range of livelihood diversification activities

Activities	Description / Comment
A. Agriculture	Primary source of livelihood. Main economic activity in the area.
1. Cocoa farming	Main source of agricultural income. Main activity attracting people into the area.
2. Other tree crops	These include kola, oil palm, and coconut.
3. Food crop production	Includes maize, cassava, yam, plantain, cocoyam and vegetables. With the exception of maize, the rest are mainly on subsistence basis.
4. Animal rearing	Includes sheep, goats, & domestic chicken. Stock sizes are low.
B. Off-farm activities	
1. Casual labouring	Both men and women work as day labourers, especially during the cocoa season (Sept-Dec).
2. Petty trading	Sale of cooked food and other items. Usually undertaken by women.
3. Soap making	Local soap making using cocoa pod husks, usually by women.
4. Gari processing	Food prepared with cassava dough, usually by women.
5. Forest-based activities	Rural people engage in forest product gathering and processing activities to supplement their income.
▪ Gathering activities (Various activities)	Various products are gathered from the forest for sale including kola, snails, mushrooms, firewood, bamboo, pestles, canes, chewing sticks, spices, honey, medicines, wrapping leaves, and fruits such as 'abesebuo', 'sonkyi', 'abako', etc.
▪ Hunting	Bushmeat is the main source of protein in the area. Some men are professional hunters. Most farmers also combine pest control with hunting and trapping when growing crops need to be protected from rodents such as the grasscutter and the giant rat.
▪ Fresh water fishing	Both men & women engage in fishing during the dry season when the volume of rivers has reduced.
▪ Processing activities	Various forest products are processed for sale in the area.
- Thatch making	Main material used for roofing. Made from raphia palm leaves. Important source of income for men.
- Basket making	Mainly a male activity. Made from canes and oil palm or raphia palm fronds. Main container for carrying cocoa. Demand for baskets increases during the cocoa season.
- Mat making	Made from oil palm or raphia palm fronds. Used for drying crops. Demand increases during cocoa season.
- Palm oil processing	Extraction of cooking oil from palm fruits. Important source of income for women.
- Sponge production	Mainly a female activity. Certain species of vines/climbers are beaten to produce sponge used for bathing. Sold throughout the region.
- Broom making	A year-round source of income for women. Made from oil palm leaf ribs. Used for sweeping.
- Palm wine tapping	The sap of oil palm or raphia palm is tapped and used as palm wine. Mainly a male activity. Provides very high returns.
- Akpeteshie distilling	An important source of income for men. Akpeteshie is a gin made from the distilled sap of the raphia and/or oil palm.
- Wood carving	Various household items such as mortar are carved and sold. Usually undertaken by men.
- Charcoal production	Men engage in charcoal production while women engage in its sale.
6. Formal employment	Few civil servants, especially teachers and artisans such as tailors, carpenters, etc. were found in the study area.
7. Remittances	An important livelihood strategy in the area. Households sometimes receive money from wage earning relatives living outside the villages.

Note: This list is not exhaustive. It is possible that some activities might have been overlooked.

Three important reasons were given by the rural people to explain why they engage in more than one livelihood activity or income earning activity either simultaneously or sequentially. These are:

- risks and uncertainties associated with farming activities;
- low returns offered by the majority of livelihood activities; and
- the increased need for cash at particular times of the year when agricultural income has run out.

Most farmers maintained that they are unable to afford farm inputs, especially fertilizer. This, coupled with a reduction in fallow periods due to limited land, has resulted in a reduction of crop yields. Again crop farming is heavily dependent on rainfall¹, making production highly uncertain. Farmers therefore diversify into non-farm activities in order to ensure that they have something to fall back on in times of crop failure.

However, most off-farm livelihood activities in the area, such as broom making, snail and mushroom gathering, chewsponge making, mat making and most petty trading activities are characterised by low returns to labour. Consequently, most people engage in more than one off-farm activity in order to broaden their source of livelihood.

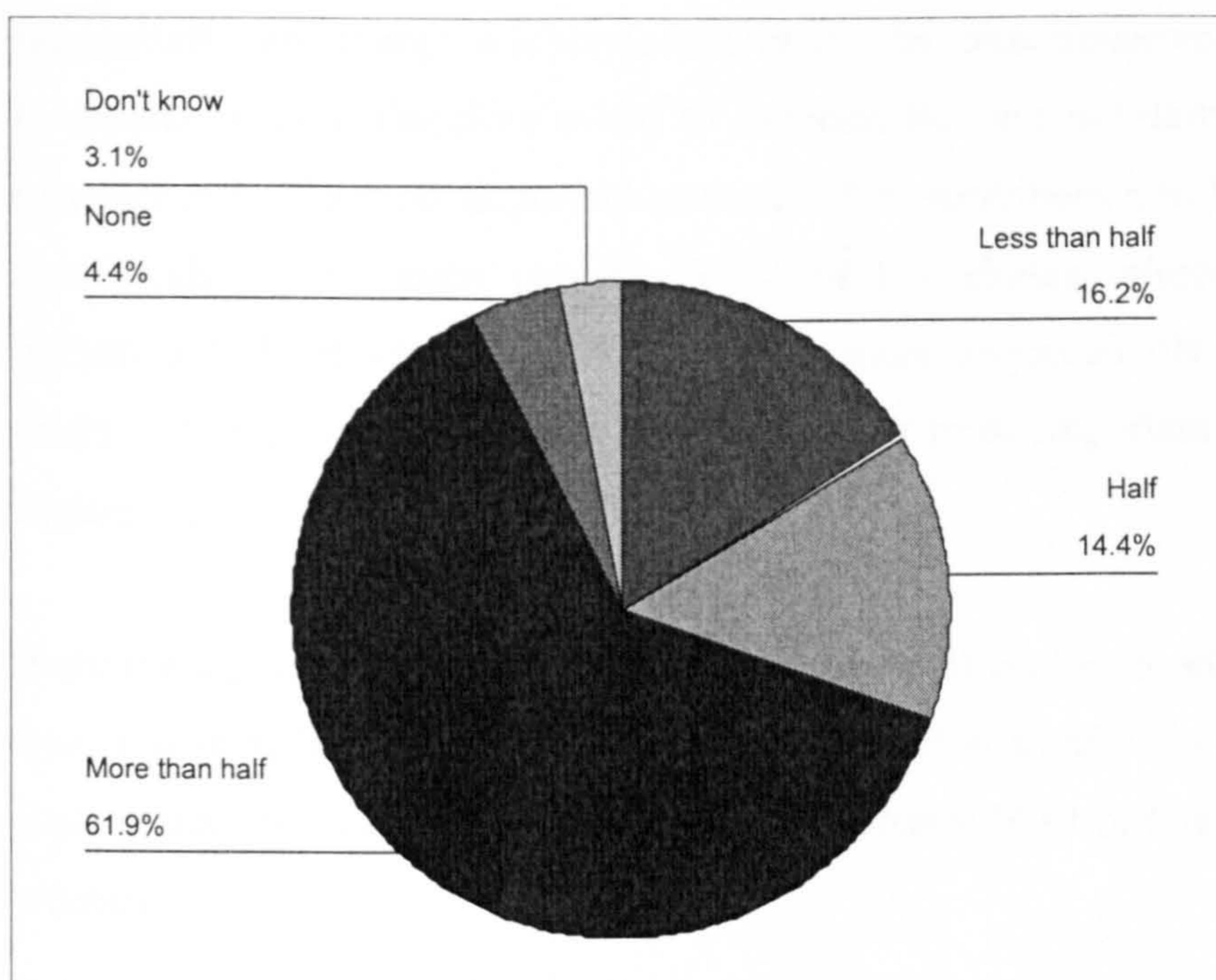
As has already been discussed, cocoa is the most important cash crop in this area and accounts for the major portion of household income from agriculture. This makes household income from agriculture highly seasonal as the cocoa-harvesting season occurs between September and December each year. Most farmers maintained that the money obtained from the sale of cocoa is only able to sustain them during the cocoa season and shortly after Christmas, most of the money being spent during the Christmas festivities. Thereafter, hardship starts to set in around March, when cocoa money has almost finished, and when stored food stocks have run out and new crops are not yet ready for harvesting. During these hardship periods most people engage in off-farm activities to raise extra income to support their families.

¹ In Ghana, total area under irrigation as at 1994 was 10,500 hectares, representing 0.04% of the country's total land area or 0.20% of the total area under cultivation (MOFA, 1997).

7.2.1. Income from agriculture

Agriculture is the main economic activity in the area with as much as 96% of the survey households dependent on this activity as a source of income. No attempt was made to obtain absolute figures of income from agriculture; however, respondents were asked to estimate the proportion of their household's income from agriculture. The majority of the households (61.9%) indicated that more than half of their income comes from agriculture, 16.2% indicated that they obtain less than half of their income from agriculture, 14.4% reported that they obtain half of their income from agriculture, while 4.4% indicated that they do not obtain any income from agriculture (see Figure 7.1).

Figure 7.1. Proportion of households' income from agriculture²



These results reflect the importance of farming as an economic activity in the study area. As has already been mentioned, cocoa is the most important cash crop in the area. Other cash crops are kola, oil palm and coconut. Although food crop farming is mainly on a subsistence basis, most households sell some of their foodstuffs to local individuals to generate income to buy other needed items.

² The respondents were asked to estimate the proportion of their household income from agriculture by making reference to their previous year's income.

7.2.2. Off-farm income activities

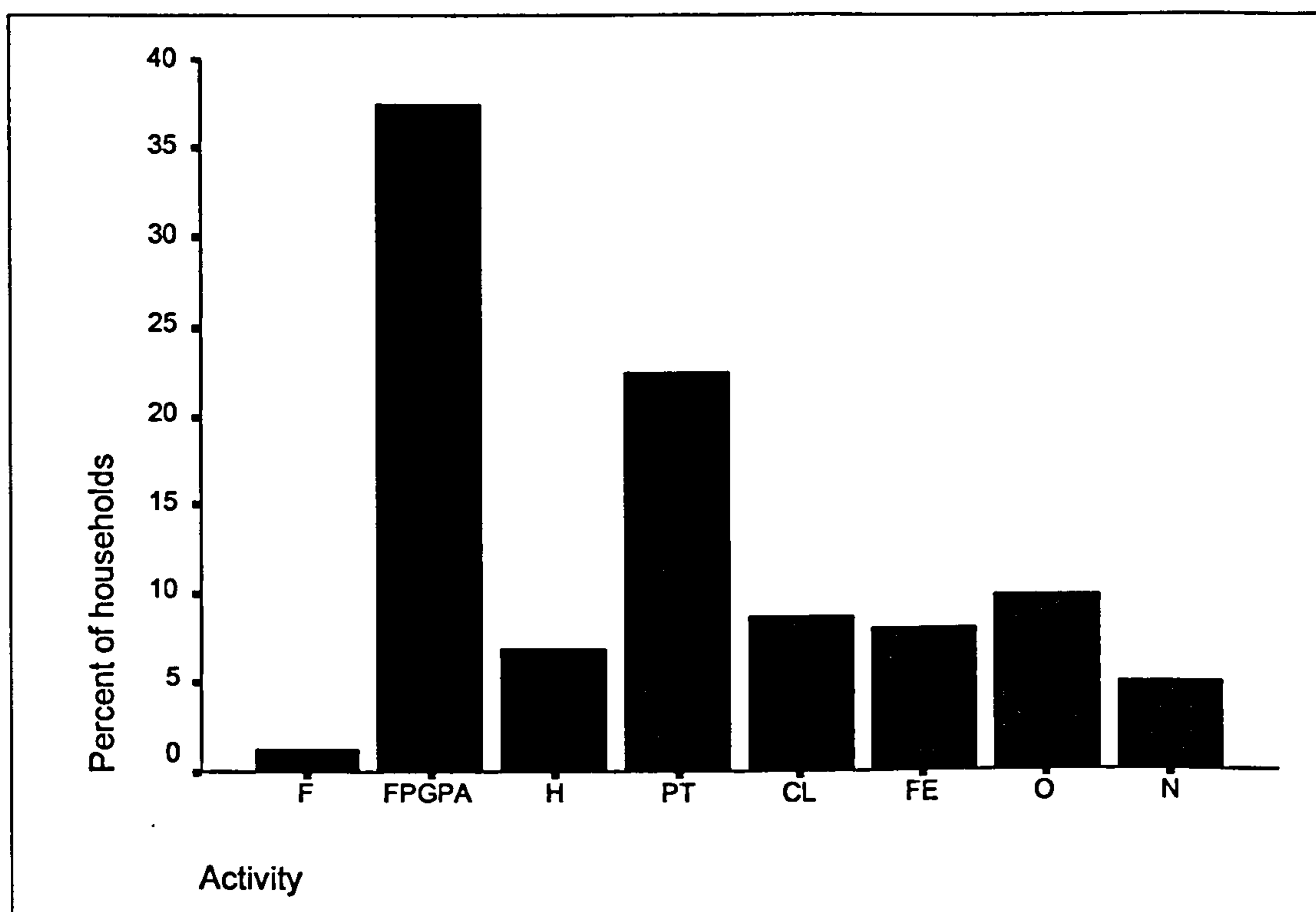
The majority of rural people are also involved in non-farm income earning activities. Most people are engaged in a wide range of individual and household activities at the village level. For example, 95% of the respondents said that they were involved in off-farm income earning activities. These livelihood activities include petty trading, casual labouring (day labourers), freshwater fishing, forest product gathering and processing activities, including snails, mushrooms, medicines, *Marantaceae* leaves, wild fruits, kola, basket, mat, raphia thatch, palm oil processing, palm wine tapping, palm gin (akpeteshie) distilling, and hunting. There were also a few civil servants (e.g. teachers) and artisans such as tailors, carpenters, etc.

Since households engage in a wide range of off-farm activities either simultaneously or sequentially, an attempt was made to identify the most important household activities. Respondents were therefore asked to mention the one non-farm activity which they consider to be the most important in terms of its contribution to household income and livelihoods. Thirty eight percent (38%) of households related that forest product gathering and processing activities is their most important off-farm income activity, while 23% maintained that petty trading is their most important off-farm activity (see Figure 7.2).

Petty trading activities in the area include the sale of cooked food such as rice, 'kenkey', fried plantain, bread, etc. Some people also operate small village shops selling items such as matches, candle, milk, and other food items. Most of this trade is carried out by women.

Both men and women engage in casual work during the cocoa season. They are often involved in harvesting and transporting the cocoa from the farm to the village. These activities sometimes attract seasonal labour from urban areas throughout southern Ghana. Off-farm activities are mostly undertaken in slow periods of the agricultural cycle, although they are sometimes important throughout the year.

Figure 7.2. Most important off-farm income activities in the study villages (% of households)



Activities:

F - Fishing

FPGPA - Forest product gathering and processing activities

H - Hunting

PT - Petty trading

CL - Casual labouring (day labourers)

FE - Formal employment (civil servants, especially village teachers)

O - Other types of employment (e.g. tailoring, hairdressing, carpentry, etc)

N - None, i.e. do not engage in off-farm activities.

Although it proved impossible to obtain detailed data on remittances, it was found to be an important livelihood strategy in the study area. Most households occasionally receive money and other gifts from wage-earning household members who have emigrated to urban or foreign areas. Most people, however, reported that remittances are highly unreliable and sometimes not forthcoming due to economic hardships facing all employees in the country. In all the study villages, the direction of assistance was from urban to rural; very few people indicated that they sometimes support urban relatives by sending them food.

Employment and income from small-scale non-farm enterprise activities are becoming more important in the rural economy of developing countries. In stagnant or slowly growing agricultural areas small enterprise activities provide employment for surplus

labour, and in conditions of growing agricultural incomes they contribute to the process of growth, diversification, and the shift to more productive uses of rural resources (Haggblade and Liedholm, 1991, cited in Arnold 1994).

It has been estimated that rural non-farm work provides 20 to 45% of full-time employment in rural areas and 30 to 50% of rural household income (Kilby and Liedholm 1986, Haggblade and Hazell, 1989). However, despite its magnitude and importance study of the small enterprise sector has until recently been largely neglected and information about the sector is therefore limited (Arnold, 1994). Much of the early knowledge-generating effort has been devoted to census-type surveys, to determine the magnitude, structure and basic characteristics of the small enterprise sector, and these studies have shown that small forest-based activities everywhere account for a substantial proportion of small-scale non-farm income activities (Arnold, 1994).

According to Liedholm and Mead (1992) three activities have consistently been identified as the most important categories among micro and small manufacturing enterprises around the world and these are textiles and clothing, food and beverages, and wood and forest products. They relate that this is as true of countries with limited forest resources as of forest-rich countries.

7.3. Forest-based income-earning activities

In addition to providing the rural people with a source of food, forests are also a source of income and employment. In the study area forest-based activities provide one of the most common income-earning options for households, although the majority of the rural people are principally farmers for whom the forest-based activities represent a supplemental source of income. The extent of a household's dependence on forest-based activities is, thus, a function of the availability of other income-earning opportunities (especially agriculture), availability of NTFP resources, access to markets and the existence of established trade networks.

A wide variety of products are gathered for sale, including mushrooms, bushmeat, snails, medicines, seeds, fruits, honey, chewstick logs and canes, whereas numerous products are also gathered and processed for the local or urban market. Products derived from such processing include cane and raphia baskets, sleeping and crop-drying mats,

stools, mortars, raphia roof tiles (thatch), etc. Forest-based income-earning gathering and processing activities identified in the study area and the proportion of households naming them as a source of income are presented in Table 7.2. Most households obtain income from more than one activity.

Table 7.2. The extent of involvement in forest-based income-earning activities

Activity	Number of households obtaining income from activity (N=160)	% of households obtaining income from activity (N=160)	% of households obtaining income from activity who reported that the income is important to their households
<i>Gathering/collection</i>			
Leaves	8	5.0	100.0
Fruits	59	36.9	88.1
Honey	23	14.4	100.0
Mushrooms	22	13.8	86.4
Snails	36	22.5	91.7
Hunting (bushmeat)	48	30.0	89.6
Medicines	7	4.4	85.7
Wrapping leaves	13	8.1	76.9
Chewstick	1	0.6	100.0
Canes	9	5.6	100.0
Firewood	5	3.1	80.0
Pestles	4	2.5	75.0
Bamboo	5	3.1	20.0
Kola	100	62.5	89.0
Spices	7	4.4	85.7
<i>Processing/manufacturing</i>			
Palm oil production	13	8.1	100.0
Palm wine tapping	4	2.5	100.0
Akpeteshie distilling	11	6.9	90.9
Chew sponge production	2	1.3	100.0
Washing sponge prod.	3	1.9	100.0
Basket making	11	6.9	100.0
Mat making	13	8.1	92.3
Charcoal production	3	1.9	100.0
Carpentry	4	2.5	100.0
Wood carving	3	1.9	100.0
Raphia thatch production	21	13.1	85.7

Kola gathering is the most important activity in the study area as almost two-thirds of the households obtain income from this activity. Because of its importance, most farmers protect, tend or plant kola trees on their farms. Both men and women, and children engage in kola gathering when it is in season. However, in this culture money

accruing from kola gathered from the farm or fallow areas belongs to the household head, the man. No one gathers kola from someone else's land without permission from the landowner. Kola is sold to local as well as urban traders who travel to the village to buy the kola. Sometimes traders travel all the way from Burkina Faso to the study area to look for kola (Plate 7.1).



Plate 7.1. Bagging/packaging kola nuts for the market. (Kola gathering is an important household activity in the study area).

7.3.1. Contribution of forest-based income activities to household livelihoods

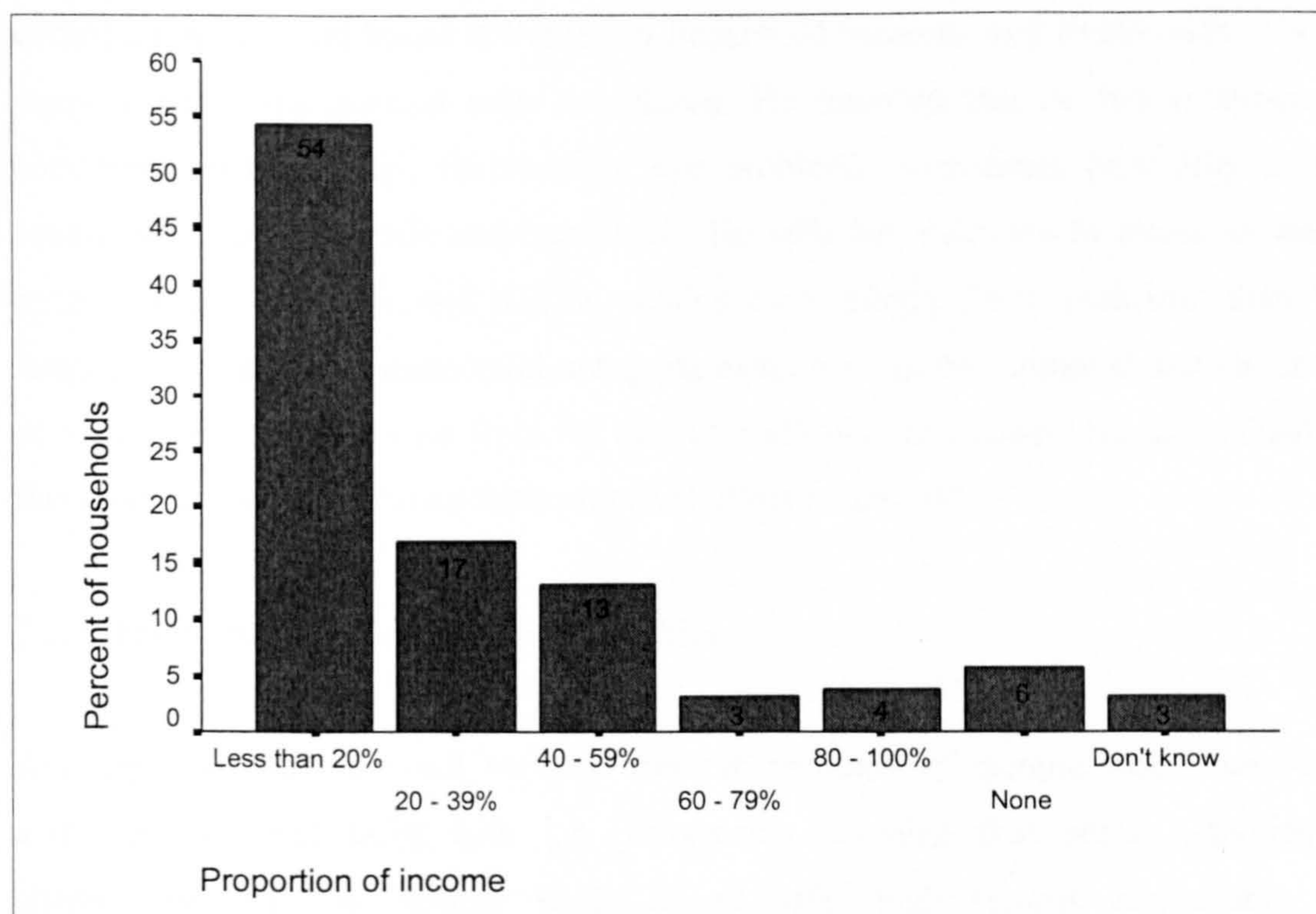
Ninety four percent of households obtain some sort of income from forest product activities. Only 6% (or 10) of the households reported that they do not obtain any income from forest-based activities.

Because of rural sensitivities, it was not possible to obtain precise data from households on the absolute amount of income that the individual forest-based activities provide in a year. Such data, based on respondent recall would have been open to serious inaccuracies (see Liedholm, 1991). Questions concerning absolute amounts of income from individual activities raised fears among households that the data provided was to be used for income tax assessment. The negative effect that this would have had on the

general willingness of households to answer questions on forest-based income-earning activities was judged to be a more important consideration than the potential value of income data.

Instead, respondents were asked to estimate the proportion of their household's income derived from forest-based activities and whether they view this income as "important" (in absolute terms, at a particular important time of the year or is important for what it is used to purchase, e.g. agricultural implements, school clothes, school fees, etc.) (see Townson, 1995). Although more than 50% of the respondents reported that the proportion of their household income from forest based activities is very small (less than 20%), almost all of them indicated that this income is of great importance (see Figure 7.3 and Table 7.2).

Figure 7.3. Proportion of households' income from forest-based activities³



Most households maintained that the income obtained from forest-based activities contributes immensely to their livelihoods, as it is often available in times when

³The respondents were asked to estimate the proportion of their household income from forest-based activities by making reference to their previous year's income.

agricultural income is non-existent. This income is often used to pay school fees, or to buy food. It is sometimes invested in agricultural production.

Almost all the respondents that reported that they obtain income from forest-based activities indicated that the income is important to their households. For example, of the 36.9% of respondents that reported that they obtain income from fruits, 88.1% indicated that the income is of great importance to their households. All the respondents that reported that they obtain income from leaves, honey, palm oil, palm wine, chewsticks, chewsponge, washing sponge, canes, baskets, charcoal, carpentry, and wood carving indicated that this income is important to their households (see Table 7.2). With the exception of bamboo, more than 50% of respondents who reported that they obtain income from any activity also indicated that such income is important to the livelihoods of their households.

An interview with a herbalist in Kamaso village provides an example of the enormous contribution of forest-based activities to household incomes and livelihoods. The 62-year-old man was married with 6 children. He reported that he has treatment for conditions such as piles, rheumatism, eye problems, barrenness (infertility in both sexes), waist pains, hernia and impotence. He sells his medicine to locals as well as outside traders and indicated that he obtains more money from medicines than from farming. Although this man could not quote exact figures, he estimated that about 80% of his annual income comes from the sale of traditional medicines. He maintained that this income is very important to the survival of his household.

7.3.2. Profitability of forest-based activities

Although the study did not look at absolute amounts of income from forest-based activities, informal talks with key informants revealed that some activities are characterised by low returns while others offer high returns comparable with agricultural activities. Most people maintained that the returns from some activities such as medicines, palm wine production, 'akpeteshie' distilling, palm oil processing, carpentry, wood carving and cane furniture production are quite high while from others such as chewsponge production, washing sponge production, snail gathering, mushroom gathering, and thatch production returns are very low. Most of the people involved in 'akpeteshie' production, for instance, indicated that this activity is their only source of

income as 'akpeteshie' production compares favourably with cocoa farming. Similarly, cane furniture production is a lucrative activity in many urban areas in Ghana and for many people it represents the only source of income (see Plate 7.2).

For some activities such as kola gathering, 'abesebuo' (*Irvingia gabonensis*) gathering, and honey collection, returns can be relatively high but supplies are uncertain as the products are only seasonally available. For example, according to a key informant, returns from the collection of the fruits of 'abesebuo' can be very high, between 300,000 and 500,000 cedis⁴ per month, when the fruits are in season. However, the people reported that the plant is sparsely distributed in the forest, fruits only once in two years, and the fruits are only available for a few months when in season. The seeds of 'abesebuo' are used for making edible oil and are primarily sold to Nigerians and Ivorians.



Plate 7.2. The processing of raw canes into cane furniture and various cane products.

Though this study reveals significant differences in the returns from the various forest-based activities, more comprehensive studies are required for an accurate picture of the economic viability of different enterprises and to understand the variations in

⁴ At the time of the fieldwork, 1 British Pound (£1) was equivalent to 9,500 Cedis (¢9,500).

profitability of different forest-based activities and the potential role they can play in sustaining the livelihoods of the rural poor.

7.3.3. Seasonality/Periodicity of forest-based activities

The majority of forest-based income activities in the study communities display considerable fluctuations with respect to involvement or engagement in these activities. The periodicity or seasonality of involvement is usually a result of changes in farm labour requirements, an increased need for cash during hardship periods, seasonal availability of raw materials or some NTFPs and fluctuations in demand. Generally, forest-based cash earning activities decline during planting and harvesting periods, when farm labour requirements are high, and increase during the hunger season when people need to earn cash to buy staple foods.

To get a general picture of the seasonality of individual forest-based activities, households were asked to indicate whether they are engaged in each activity year-round (more than six months of the year), occasionally (less than six months per year in total but with no seasonal pattern) or seasonally (less than six months per year with a seasonal pattern) (after Townson, 1995) (Table 7.3).

The periodicity of involvement varies between products or activities. Most of the gathering activities are seasonal due to seasonal availability of the products. This is especially true of snails, mushrooms, kola, fruits, spices and honey. For example, snail gathering and sale occurs during the rainy season, from April to August, due to the seasonal availability of snails at this time of the year. Of the 22.5% of households that reported that they are involved in snail activities, 91.7% indicated that they are engaged in the activity seasonally while 8.3% said they are engaged in the activity occasionally (Table 7.3).

Most types of mushrooms are only available during the rainy season, from March to August, and consequently most people are involved in mushroom collection and sale during this time of the year. Similarly, 95.7% of households involved in honey activities reported seasonal involvement - in the dry season, from December to around March when the production of honey by bees has reached its peak. Palm oil processing is also a

seasonal activity since palm fruits (the raw material for palm oil) are only available seasonally.

Table 7.3. Periodicity of forest-based activities

Activity	Pattern of involvement (% of households)			Total No. of households
	<i>Year-round</i>	<i>Occasionally</i>	<i>Seasonally</i>	
<i>Gathering/collection</i>				
Chewstick	100.0	0	0	1
Medicines	71.4	28.6	0	7
Firewood	60.0	40.0	0	5
Canes	55.6	44.4	0	9
Bamboo	40.0	40.0	20.0	5
Wrapping leaves	30.8	61.5	7.7	13
Pestles	25.0	75.0	0	4
Leaves	12.5	25.0	62.5	8
Hunting (bushmeat)	10.4	85.4	4.2	48
Fruits	1.7	27.1	71.2	59
Kola	1.0	2.0	97.0	100
Spices	0	0	100.0	7
Honey	0	4.3	95.7	23
Mushrooms	0	4.5	95.5	22
Snails	0	8.3	91.7	36
<i>Processing/manufacturing</i>				
Carpentry	100.0	0	0	4
Basket making	72.7	18.2	9.1	11
Charcoal production	66.7	33.3	0	3
Wood carving	66.7	33.3	0	3
Chewsponge prod.	50.0	50.0	0	2
Akpeteshie distilling	45.5	45.5	9.1	11
Raphia thatch prod.	42.9	52.4	4.8	21
Washing sponge prod.	33.3	33.3	33.3	3
Mat making	15.4	46.2	38.5	13
Palm oil production	7.7	38.5	53.8	13
Palm wine tapping	0	100.0	0	4

Other activities are also engaged in seasonally due to demand fluctuations. Although most people reported year-round involvement in basket making, production is at its peak during the cocoa season, from September to December when the demand is high (since baskets are mainly used for carrying cocoa, which is the major crop in this area). The same is true of crop-drying mats, which are used for drying the cocoa.

For most other activities, the pattern of involvement is not seasonal; it is either occasional or year-round. Activities in which the majority of the people are engaged in year-round include medicines, chewing stick, canes, baskets, firewood, charcoal,

carpentry and woodcarving. Similarly, the majority of respondents involved in hunting or bushmeat, palm wine, wrapping leaves, pestles (Plate 7.3), mats and raphia thatch activities reported that they are involved in these activities occasionally. Raphia thatch production, however, peaks during the long rainy season when leaking roofs need attention.



Plate 7.3. Pestles on display at a local market. (Pestles are used for pounding the staple 'fufu' and for processing other foods).

Falconer (1992) provides a more descriptive account of the seasonality of exploitation and supply of NTFPs in southern Ghana. In her study, she noted that there are considerable seasonal fluctuations in the supply and exploitation of NTFPs, which is reflected in market prices. These fluctuations are usually a result of changes in farm labour requirements as well as increased need for cash during particular periods of the year. Table 7.4 describes some of the seasonal variations in NTFP exploitation and supply as noted by Falconer (1992).

Table 7.4. Seasonal variation in the supply of NTFPs

Produce	Seasonality of exploitation	Seasonality of supply
<i>Marantaceae</i> leaves	Year-round; increases early rains (cash needs)	Increases in rains
Sponge	Year-round; increases during Christmas	None
'Nsokor' (<i>Garcinia epunctata</i>) chewstick logs	Year-round; decreases late rains	None
Palm wine	Year-round; increases dry season and slack periods	None
'Akpeteshie' (palm gin)	Year-round; increases dry season and slack periods	None
Plant medicines:		
Barks and leaves	Year-round	None
Seeds and fruits	Seasonal (species dependent)	Varies, increasing in dry season
Cane baskets	Year-round; increases in dry season and harvest periods	None
Woven sleeping mats	Year-round; increases in labour-slack periods	None
Crop-drying mats	Harvest season	None
Mortars	Year-round; increases in farm labour slack periods	None
Pestle	Year-round	None
Honey	Dry season	Increases in dry season
Charcoal/fuelwood	Year-round; increases in dry season	None
Fish traps	Rainy season	None
Roof tiles (thatch)	Mainly early rainy season	None
Snails	Mainly rainy season	Increases in rains
Bushmeat-trapping	Year-round; increases in rainy season for crop pest control	?
Bushmeat-hunting	Year-round; increases in farm labour slack periods	?
Mushrooms	Mainly rainy season	Increases in rains
Canes	Year-round	None

Source: Falconer (1992:97).

Forest-based income activities therefore vary over time, reflecting seasonality of supply and demand and labour needs within the agricultural calendar.

7.3.4. Relative importance of forest-based activities

Since most households in the study area are engaged in more than one forest-based activity, an attempt was made to identify the most important activities. The respondents were therefore asked to mention the one activity which they consider to be the most important on the basis of its contribution to household income and livelihoods. In all, 19

activities were emphasized; however, the percentage of households involved in the different activities differed.

For example, of the 150 households (or 94% of the households) who reported that they obtain income from forest-based activities, 49.3% indicated that Kola gathering is their most important activity, as against 7.3% for fruit gathering and 6% for hunting (Table 7.5).

Table 7.5. Most important forest-based activities in terms of contribution to household income

Activity	Households that reported that activity is their most important source of income	
	No. of households	% of households
Kola gathering	74	49.3
Fruit gathering	11	7.3
Hunting (bushmeat)	9	6.0
Akpeteshie/palm wine prod.	9	6.0
Spice collection	7	4.7
Palm oil production	6	4.0
Mat making	5	3.3
Raphia thatch production	5	3.3
Snail gathering	4	2.7
Firewood collection	4	2.7
Carpentry	4	2.7
Cane collection	3	2.0
Wrapping leaf gathering	2	1.3
Basket making	2	1.3
Honey collection	1	0.7
Mushroom gathering	1	0.7
Medicine collection	1	0.7
Charcoal production	1	0.7
Wood carving	1	0.7
Total	150	100.0

Although chewsticks (*Garcinia* spp.) contribute greatly to household incomes and livelihoods in most parts of Ghana and even in urban areas such as Kumasi and Accra (see Plate 7.4), surprisingly, none of the households in the study area mentioned chewsticks as their most important forest-based activity. Most people maintained that chewstick was once an important source of income in the area and often attracted people from urban centres to harvest chewstick logs. They claim that chewsticks, particularly 'nsokor' (*Garcinia epunctata*), are now very scarce in the area due to over-exploitation.

Other people, however, were of the view that chewsticks occur in the reserve forests but forest access restrictions prevent them from harvesting the products.

Though people appreciate that the supply of chewsticks, particularly *Garcinia* spp., from forest areas is dwindling, they have not cultivated them or incorporate them into their farming systems. Indeed, most people reported that they did not know whether such species could be cultivated. Because chewsticks are important, both in terms of their use in dental care and their role in the regional economy, there will continue to be a steady demand for this product. There is therefore the need for the Forestry Department to encourage local people to cultivate these species in order to assure future supplies of the product.



Plate 7.4. The processing of *Garcinia* species logs into chewsticks. (Chewsticks are used for cleaning teeth. The sale of chewsticks is a source of income for many women in southern Ghana).

The proportion of households' income from forest-based activities varies according to the type of activity or their most important activity. For example, 88.9% of households who said that hunting is their most important activity reported that the proportion of their income from forest-based activities is less than 20% while 11.1% indicated that the proportion of their income from forest-based activities is between 20 and 39%. All the households who said that honey, mushrooms, mat and wood carving activities are their most important forest-based activities indicated that the proportion of their income from

forest-based activities is less than 20%. For medicine activities, all the households maintained that between 80 and 100% of their income comes from forest-based activities (Table 7.6). These differences could be probably due to the differences in the returns offered by the different activities.

Table 7.6. Proportion of households' income from forest-based activities by their most important activities (% of households)

Most important activity	Proportion of household income from forest-based activities (% of households)						Total No. of HHs
	< 20%	20-39%	40-59%	60-79%	80-100%	<i>Don't know</i>	
<i>Gathering/collection</i>							
Fruits	63.6	18.2	18.2	0	0	0	11
Honey	100.0	0	0	0	0	0	1
Mushrooms	100.0	0	0	0	0	0	1
Snails	75.0	0	0	0	0	25.0	4
Kola	55.4	18.9	16.2	2.7	4.1	2.7	74
Spices	57.1	42.9	0	0	0	0	7
Hunting (bushmeat)	88.9	11.1	0	0	0	0	9
Medicines	0	0	0	0	100.0	0	1
Wrapping leaves	50.0	0	0	0	0	50.0	2
Firewood	50.0	25.0	0	0	25.0	0	4
Canes	33.3	0	33.3	33.3	0	0	3
<i>Processing/manufacturing</i>							
Palm oil production	33.3	33.3	16.7	0	16.7	0	6
Akpeteshie/palm wine	44.4	22.2	22.2	11.1	0	0	9
Basket making	50.0	0	50.0	0	0	0	2
Mat making	100.0	0	0	0	0	0	5
Charcoal production	0	0	100.0	0	0	0	1
Carpentry	25.0	25.0	25.0	25.0	0	0	4
Wood carving	100.0	0	0	0	0	0	1
Raphia thatch prod.	80.0	20.0	0	0	0	0	5

7.4. Patterns of involvement in forest-based activities

7.4.1. Gender roles in forest-based activities

Men and women usually play different roles with respect to engagement in forest-based income earning activities in the study communities. Women predominate in gathering activities such as snails, mushrooms, spices and wrapping leaves gathering, while men predominate in processing activities such as basket making, thatch making, palm wine tapping, palm gin (akpeteshie) distilling, carpentry and woodcarving (see Table 7.7 and Plates 7.5 and 7.6). Though, in general, men predominate in processing activities, palm oil processing (the extraction of edible oil from palm fruits) is mainly a female activity in the area (Table 7.7).

Table 7.7. Income earning forest-based activities amongst men and women

Activity*	Males (% of all males engaged in forest- based activities)	Females (% of all females engaged in forest-based activities)
<i>Gathering/collection</i>		
Fruits	8.5	5.4
Honey	1.1	0
Mushrooms	0	1.8
Snails	2.1	3.6
Kola	50.0	48.2
Spices	1.1	10.7
Hunting (bushmeat)	8.5	1.8
Medicines	1.1	0
Wrapping leaves	1.1	1.8
Cane	1.1	3.6
Firewood	1.1	5.4
<i>Processing/manufacturing</i>		
Palm oil processing (extraction of oil from palm fruits)	1.1	8.9
Palm wine tapping & akpeteshie (palm gin) distilling	9.6	0
Basket making	2.1	0
Mat making	2.1	5.4
Charcoal production	0	1.8
Carpentry	4.3	0
Wood carving	1.1	0
Raphia thatch production	4.3	1.8
Number of respondents	94	56

* Respondents' most important activities

Key informant interviews suggest that cane gathering, mat making and charcoal production are largely male activities. However, the results of the household survey show the contrary (see Table 7.7). The greater percentage of females involved in cane, mat and charcoal activities may be due to the fact that respondents misunderstood the question and were referring to trade in these products rather than the gathering or production of the product.

Generally, in this area, certain activities are classified as male activities while others are regarded as female activities. The reason for this division is not very clear but may be rooted in the culture of the people.



Plate 7.5. Men engaged in wood carving activities. (A wide variety of household items are carved from wood and is a source of income to many people).

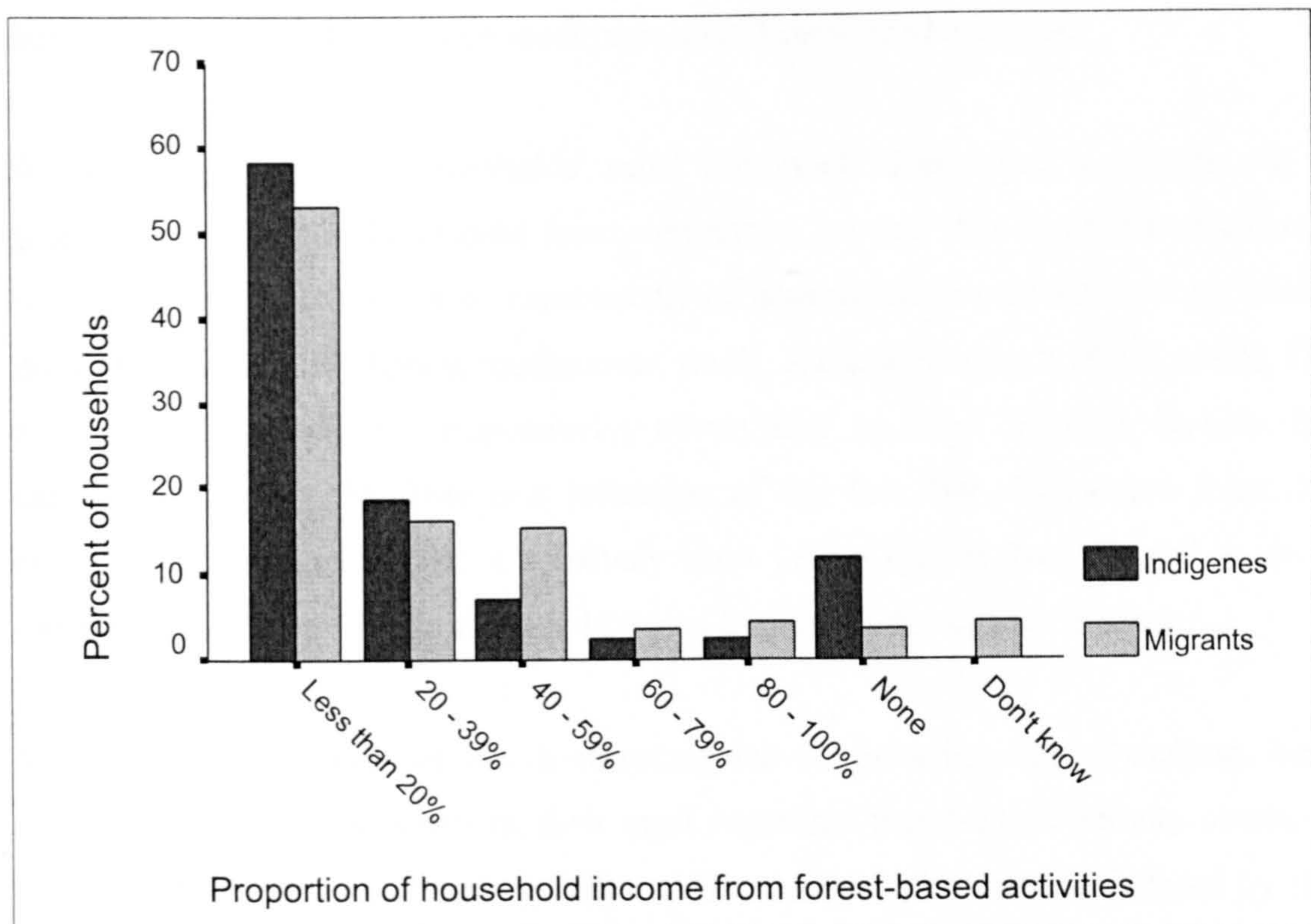


Plate 7.6. The use of raphia palm leaves for making roofing tiles (raphia thatch).

7.4.2. Migration and involvement in forest-based activities

Migrant households in the study area tend to be much more dependent on forest-based activities than the indigenous households. For example, 96.6% of the migrant households reported that they obtain income from forest-based activities compared with 88.4% of the indigenous households. This is reflected in the proportion of income from forest-based activities amongst migrant and indigenous households in the area. A greater percentage of migrant households reported a higher proportion of income from forest-based activities than the indigenous households. For example, 15.4% of the migrant households reported that the proportion of their income from forest-based activities is between 40 and 59% compared with 7.0% of the indigenous household (see Figure 7.4).

Figure 7.4. Migrants and income from forest-based activities



Migration of individuals, principally to establish cocoa farms, is a significant factor in the development of agriculture and also has consequences for the level of commercialised forest-based activity in the study area. In the earlier stages of establishing a cocoa farm, migrant farmers supplement their incomes by engaging in forest-based activities.

Although early migrant settlers in the study area were able to acquire large tracts of land cheaply, later migrants are confronted with more developed land markets and growing land scarcity and therefore have less land and fewer income options. The majority of later migrants are therefore tenant farmers, renting land under share tenancy agreements and therefore depend to a greater extent on forest-based activities for their initial livelihood. Most of these migrants have good networks outside the villages facilitating trade in forest products.

7.4.3. Income from agriculture and engagement in forest-based activities

The majority of households rely on forest-based activity for only part of their income. For only 4% of households do forest-based activities represent between 80 and 100% of their income. Indeed, agriculture is the main economic activity and the major source of income in the study communities. However, the importance of agricultural income for households varies between their most important forest-based activities.

A comparison between households' most important forest-based activities and the proportion of household income from agriculture reveals that forest-based activities which are highly seasonal are characteristic of households more reliant on agricultural income. These include honey, mushrooms, snails, and kola in which 100%, 100%, 75%, and 84% of households, respectively, obtain half or more of their income from agriculture (Table 7.8). This is a reflection of the fact that the income from these activities is restricted to only a relatively short period during the year and so cannot form the basis for much of a household's total livelihood throughout the year.

Majority of households for which wrapping leaves gathering, thatch making, basket making or mat making represent their most important forest-based activity obtain half or more of their income from agriculture. The relatively low returns offered by these activities appear to be the result of the increased importance of agricultural income for households engaged in them.

Table 7.8. Forest-based activities and household income from agriculture

Most important activity	Proportion of income from agriculture (% of households)					Total no.
	None	< 50%	50%	> 50%	Don't know	
<i>Gathering/collection</i>						
Fruits	0	9.1	27.3	63.6	0	11
Honey	0	0	0	100.0	0	1
Mushrooms	0	0	0	100.0	0	1
Snails	0	0	50.0	25.0	25.0	4
Kola	2.7	10.8	13.5	70.3	2.7	74
Spices	0	42.9	14.3	42.9	0	7
Hunting (bushmeat)	0	11.1	0	66.7	22.2	9
Medicines	0	100.0	0	0	0	1
Wrapping leaves	0	0	0	100.0	0	2
Canes	0	0	0	100.0	0	3
Firewood	0	25.0	0	75.0	0	4
<i>Processing/manufacturing</i>						
Palm oil production	0	0	16.7	83.3	0	6
Akpeteshie/palm wine	11.1	33.3	11.1	44.4	0	9
Basket making	0	0	50.0	50.0	0	2
Mat making	40.0	0	20.0	40.0	0	5
Charcoal production	0	0	0	100.0	0	1
Carpentry	25.0	25.0	25.0	25.0	0	4
Wood carving	0	100.0	0	0	0	1
Raphia thatch prod.	0	40.0	0	60.0	0	5

Conversely, all households for which wood carving and medicine activities represented their most important forest-based activity reported that they obtain less than half of their income from agriculture. Indeed, the higher returns from these activities and the greater amount of time devoted to them appear to be responsible for the decline in importance of agricultural income.

7.5. Categorising households: A typology of people – forest relationships

In different situations, NTFPs contribute to household self-sufficiency, food security, income generation, accumulation of savings and risk minimisation. NTFP-based activities can be important in filling seasonal and other food or income gaps, can provide a buffer in times of hardship or emergency, be an activity of last resort, or can present an opportunity for improving household income and security.

While analysts often put local forest users together and consider them as belonging to one category, forest-dependent households are not homogenous. In terms of their

relationship with forests, some households are more dependent on forest resources than others. These differences are often shaped by household characteristics and the type of assets they possess. For example, landless households are more dependent on forest resources than land-rich households. Similarly, migrant households who are yet to establish cocoa farms are more dependent on forest resources than households who own cocoa farms.

Based on their dependence on forest resources, four main categories of households were identified in the study communities. These are:

- households that depend on NTFPs mainly for domestic consumption;
- those that depend on NTFPs as their main source of livelihood year-round;
- those that depend on NTFPs as a source of supplemental income; and
- those that depend on NTFPs as a source of income in an emergency.

However, it should be emphasized that there are no clear-cut boundaries between these categories of households. For instance, a household that depends on NTFPs mainly for domestic consumption may become dependent on NTFPs as a source of income when crops fail or when there is an acute cash shortage. Similarly, those that depend on NTFPs as a source of supplemental income may become reliant on NTFPs as their main source of livelihood during particular times of the year. Equally important, there is often a wide range of different levels and patterns of people-forest relationship even within a single household. Nevertheless, such a framework does help in capturing some of the salient features of different forest-people relationships.

Households that depend on NTFPs mainly for domestic consumption

Households in this category rarely depend on forest resources for income. They often obtain very little, if any, income from forest-based activities. The majority are casual gatherers who collect NTFPs incidentally while carrying out other farm duties. They usually collect NTFPs for home consumption rather than for sale. These are the wealthy households who have their own land for farming and have established large cocoa farms. Indeed, relative prosperity in the study villages is reflected in differences in the extent of cocoa farms.

Most of these households are also involved in profitable non-farm activities such as petty trading and local soap making. Wage and salary workers such as village teachers

and artisans (such as dressmakers) are in this category. The majority of these households are early migrant households; few of them are indigenous Wassa households. They are the smallest group in the area.

Households that depend on NTFPs as their main source of livelihood year-round

For some households in the area, forest-based income activities constitute their main source of livelihood. The vast majority are poor tenant farmers. They are often landless and therefore depend on land hiring or sharecropping for their land needs. The majority of them are later migrant farmers who are yet to establish cocoa farms. They are therefore dependent on forest-based activities for their initial livelihoods.

These households are often engaged in the more profitable processing activities such as palm wine production, 'akpeteshie' distilling, palm oil processing, carpentry, and woodcarving. They are often formal collectors who allocate time for collecting and/or processing NTFPs. The majority of these households obtain more than 50% of their income from forest-based activities. The money they obtain is usually invested in their cocoa farms.

Households that depend on NTFPs as a source of supplemental income

Households in this category represent the largest group in the area. The majority of households engage in forest-based activities to generate income to supplement what is obtained from agricultural sources. The majority of households in this category often obtain less than 50% of their income from forest-based activities. These households possess land but their landholdings are often small. Most of them have cultivated their land with cocoa leaving very small areas for food crop production. Most female-headed households fall into this category. Women are often engaged in gathering activities, which offer very low returns and therefore cannot constitute their main source of livelihood.

Households that depend on NTFPs as a source of income in an emergency

For some households, dependency on forest-based income activities is mainly during emergency periods (especially crop failure) and during hunger periods - particular times of the year when agricultural money has almost finished, and when stored food stocks have run out and new crops are not yet ready for harvesting (usually from March to July). Or when there is an emergency cash need - e.g. for paying school fees or for

meeting other contingencies. During these hardship periods most people engage in forest-based income activities to raise extra income to support their families. These activities therefore serve as a buffer for such households.

NTFPs thus play a very important role in the lives of rural households. They have an important role as a reserve or safety net, providing both subsistence and income in times of crop failure, shortfall, unemployment or other emergencies, or to meet exceptional needs.

7.6. Patterns of trade in forest products

There is a long tradition of forest product trade in and from southern Ghana and this was found to be an important economic activity in the study area and throughout the whole district. The rural forest product trade involves a great number of gatherers, producers, wholesale and retail traders, operating along complex trading channels and selling a wide range of products. This trade often attracts traders from all over the country, especially from neighbouring districts to the communities to buy forest products or processed goods derived from them.

There are daily and weekly markets in most towns in the district where traders from most parts of the country trade in a wide variety of commodities ranging from agricultural to forest products. However, the major market centres in the district are Asankrangwa, Agona Amenfi, Samreboi, Wassa Akropong and Oppon Valley.

7.6.1. Major customers of forest products

To obtain a better understanding of the marketing channels for forest products in the study area, respondents were asked to name their most important customers⁵. NTFPs are sold to a wide range of markets ranging from individuals in the same village to traders from neighbouring towns and large urban areas such as Takoradi, Kumasi and Accra. In general, traders (both local and from outside) are the main purchasers of NTFPs or processed goods derived from them.

⁵ The respondents were asked to distinguish between local individuals or local public, local traders and outside traders. 'Local' in this context refers to those from the same or neighbouring communities.

Overall, 24% of the respondents reported that their most important customers are local individuals, 33% mentioned local traders whilst 43% maintained that their most important customers are outside traders.

The major customer, however, differs considerably between the various products or activities (Table 7.9). Table 7.9 shows that the majority of products are primarily sold to local consumers. These include fruits, honey, mushrooms, snails, canes, mats, firewood, charcoal, raphia thatch and carpentry products where over 60% of respondents named local individuals and local traders as their principal customer.

Table 7.9. Major customers of forest products⁶

Most important activity	Most important customer (% of HHs)			Total number of HHs
	Local individuals	Local traders	Outside traders	
<i>Gathering/collection</i>				
Mushrooms	100.0	0	0	1
Canes	66.7	0	33.3	3
Snails	50.0	25.0	25.0	4
Fruits	45.5	18.2	36.4	11
Hunting (bushmeat)	33.3	11.1	55.6	9
Spices	28.6	14.3	57.1	7
Firewood	25.0	50.0	25.0	4
Kola	1.4	50.0	48.6	74
Honey	0	100.0	0	1
Wrapping leaves	0	50.0	50.0	2
Medicines	0	0	100.0	1
<i>Processing/manufacturing</i>				
Raphia thatch production	100.0	0	0	5
Mat making	80.0	20.0	0	5
Carpentry	75.0	0	25.0	4
Basket making	50.0	0	50.0	2
Akpeteshie/palm wine	33.3	11.1	55.6	9
Palm oil production	33.3	16.7	50.0	6
Charcoal production	0	100.0	0	1
Wood carving	0	0	100.0	1

Though urban markets exist for mushrooms and snails, the decline in availability of these products appears to be responsible for their relative importance on the local market. Most people said that they are unable to harvest sufficient quantities of snails and mushrooms for sale to outside traders or markets. For mats, raphia thatch, firewood

⁶ The figures presented in the table refer to percentage of respondents and therefore are not a reflection of the quantities being sold to the various different markets.

and charcoal, the bulkiness of the product, coupled with bad roads, make transportation difficult and expensive. In addition the primary customers for mats and raphia thatch are obviously rural people, as mats are used for crop drying and raphia thatch is used for rural house construction.

It should be noted, however, that some local traders act as go-betweens or intermediaries, selling their products on to outside traders. Therefore not all products sold to or by local traders are consumed locally; some find their way to external (including urban) markets.

For products such as bushmeat, palm oil, 'akpeteshie', wrapping leaves, baskets, kola and spices, local and outside markets are of equal importance. However, local traders involved in these products are more likely to be go-betweens and therefore sell on to outside traders, as there is a very attractive market and high demand for these products in most urban areas in Ghana. For example, the third Ghana Living Standards Survey conducted by the Ghana Statistical Service revealed that total annual expenditure throughout Ghana on bushmeat and 'akpeteshie' in 1992 was US\$ 18 million and US\$ 63 million, respectively (Table 7.10).

Table 7.10. Annual expenditures on selected forest products

	Annual expenditure			
	Mean per household		Total - Ghana	
	Cedis	US\$	Cedis (millions)	US\$ (millions)
Furniture	1689	4.38	5613	14.58
Charcoal	7765	20.16	25600	66.49
Firewood	2512	6.53	8462	21.98
Bushmeat	2151	5.59	7148	18.57
Snails	462	1.18	1535	3.99
Palm wine	818	2.12	2747	7.14
Akpeteshie	7313	18.99	24302	63.12
Honey	186	0.48	618	1.6
All	22896	59.43	76025	197.47

Source: Ghana Statistical Service: The third Ghana Living Standards Survey (GLSS) conducted during 1991 - 1992, cited in Townson (1995: 57).

For bushmeat, product differences determine whether producers or hunters would sell to local or outside markets. Small animals (particularly those caught by trapping, such as porcupine, squirrel, giant rat, etc.) are sold to local markets (usually roadside markets)

whereas larger animals such as antelopes and duikers that are usually shot are sold to outside traders who travel to the rural area to buy the product.

7.6.2. Forest product trade networks

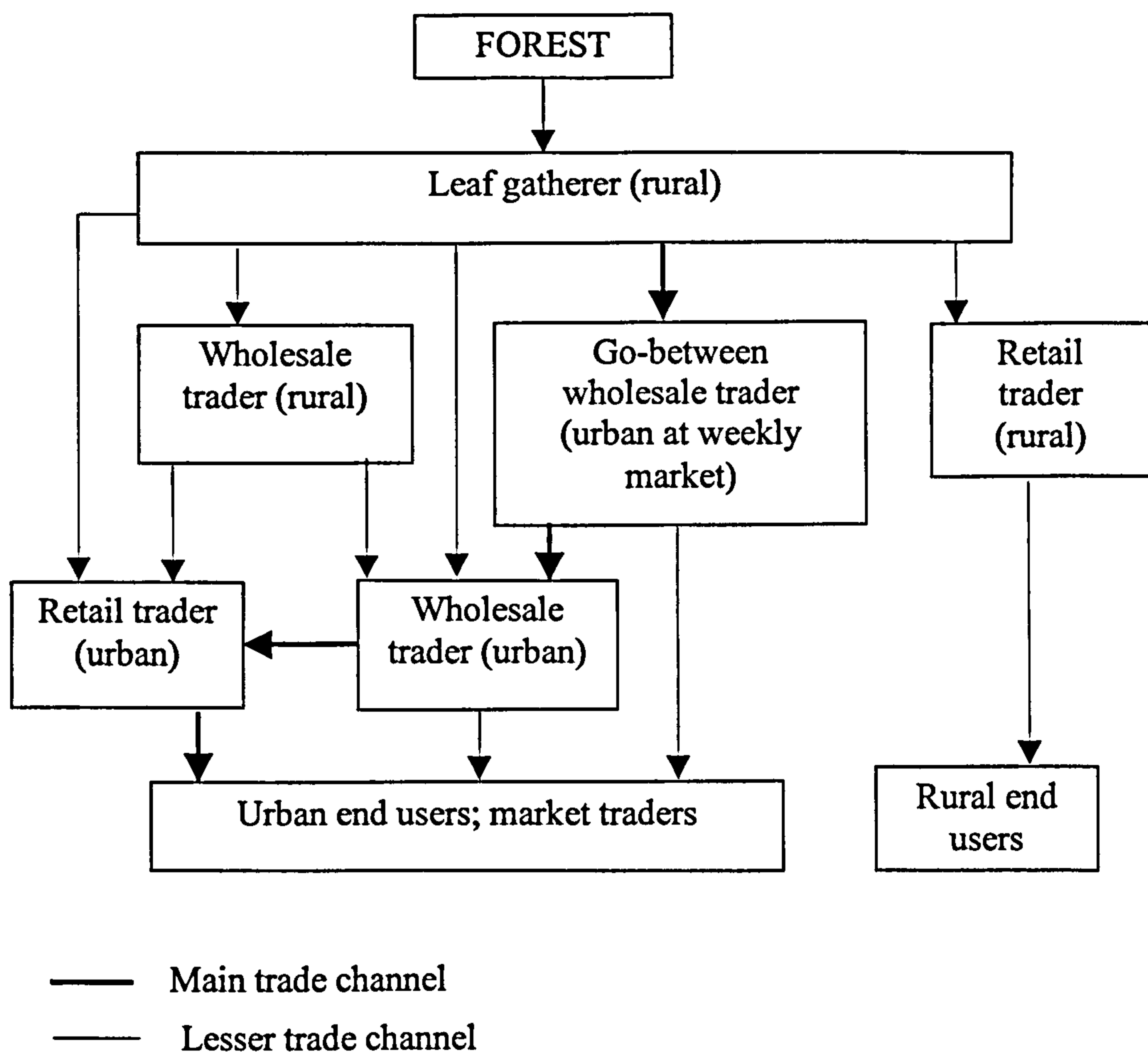
Products that are destined for more distant markets, such as food wrapping leaves (*Marantaceae* leaves), bushmeat and medicines, are often distributed along complex marketing channels involving a complex of gatherers, processors, and wholesale and retail traders.

For example, according to Falconer (1992), *Marantaceae* leaves (wrapping leaves) are one of the most widely traded NTFPs in both rural and urban markets in southern Ghana. She notes that there are three types of wholesale traders involved in the wrapping leaf trade: those based in rural areas who regularly bring leaves to retail traders in urban areas; those who go to large weekly markets and villages to buy leaves to sell in urban areas (go-between wholesalers); and those who trade only in urban centres buying leaves from gatherers and traders (see Figure 7.5). Wholesale traders rarely sell directly to the public and prefer to deal with retailers.

Retail sellers buy leaves from wholesale traders or directly from gatherers and the majority carry leaves around the market to sell to other traders and sellers of cooked foods, although some have fixed stalls. Retail traders in Kumasi and other urban centres generally sell on a full-time basis but at the rural weekly markets they tend to be part-time, often only trading one day in the week (Falconer, 1992).

The NTFP trade therefore provides an opportunity for many people in southern Ghana to earn cash and contributes greatly to the local economy. Thousands of rural people rely on the NTFP trade to generate income, particularly at certain times of the year when few alternative income-earning activities are available. This income is often important in filling seasonal or other cash flow gaps, and in helping households to cope with particular expenses or to respond to unusual opportunities.

Figure 7.5. *Marantaceae* leaf trade network



Source: Falconer (1992: 124)

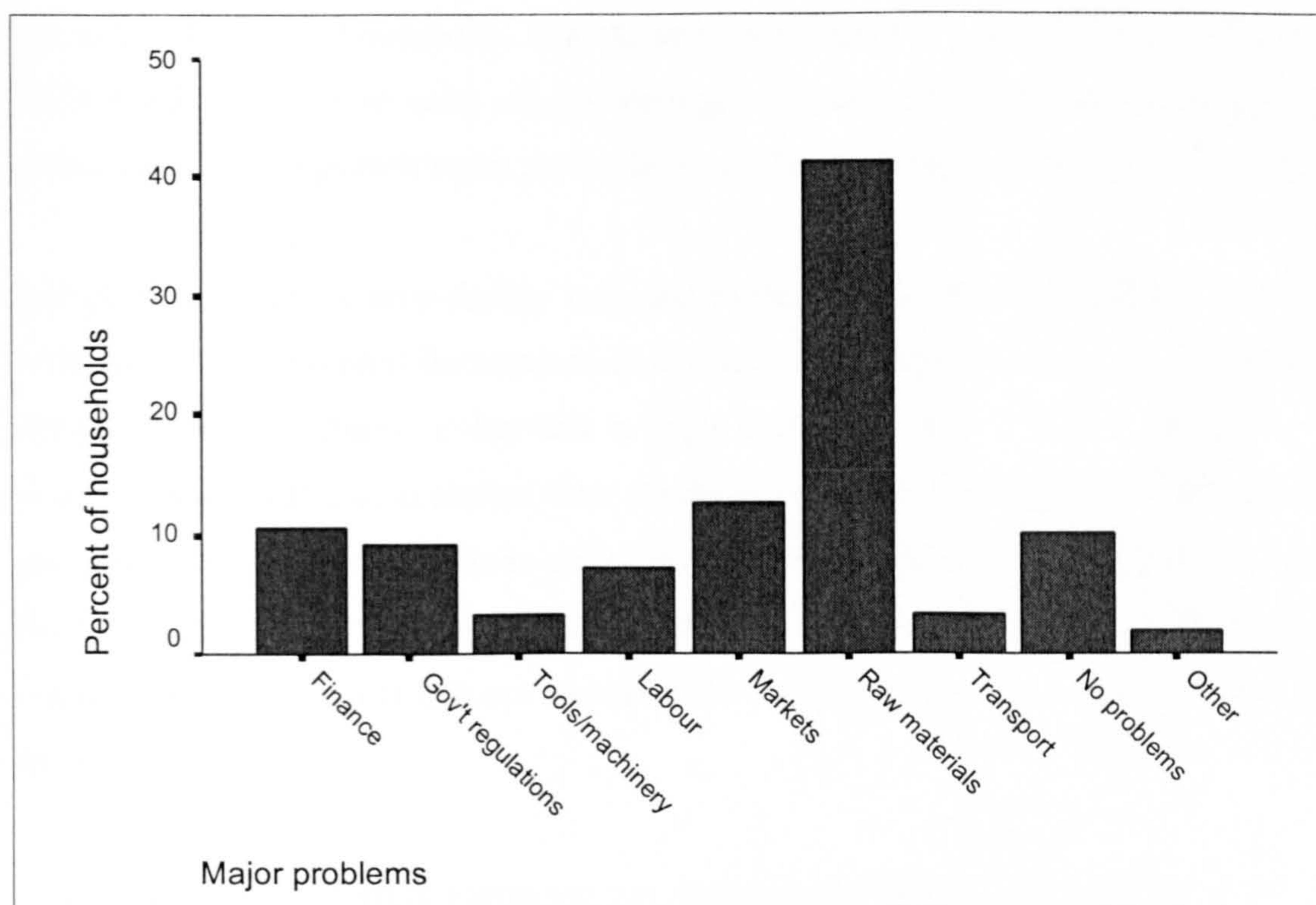
7.7. Constraints to local people's involvement in forest-based activities

Despite the enormous contribution of forest-based activities to household incomes in the study area, local people are faced with a wide array of problems that sometimes discourage them from engaging in these activities. Important problem areas reported by households include access to raw materials, government legislation and regulations, finance, tools or equipment, marketing, labour, and transportation problems.

The majority of households (41.3%) named NTFP or raw material availability as their most important problem. This was followed by marketing problems, named by 12.7% of households, financial problems (10.7%), government legislation and regulations (9.3%),

labour availability (7.3%), lack of tools or equipment (3.3%), and transportation problems (3.3%). Two percent (2%) of households named "other" problems (including problems with storage) as their principal constraint - all of them were households for whom kola gathering represented the most important forest-based activity. Ten percent (10%) of households, however, reported no problems (Figure 7.6).

Figure 7.6. Major problems with forest-based income activities



NTFP or raw material availability

The decline in availability of forest resources was apparent during initial visits to the study area. In all village meetings and focus group discussions people complained bitterly about difficulties in meeting their needs for forest foods and other forest products.

In particular, raw material availability is an important constraint for households involved in mushrooms, snails, fruits, kola, baskets, and wrapping leaves activities (100%, 100%, 45.5%, 52.7%, 50%, and 50% respectively of households who said that the activity is their most important source of income). Honey, medicines, firewood, charcoal, carpentry and woodcarving are the only activities for which raw materials do

not constitute the most pressing problem, with none of the households giving this as their principal problem.

Local people's views on the condition and availability of forest resources and the reasons for their decline are discussed in detail in Chapter 8.

Marketing problems

Markets represent the second most important problem reported by households. In general, 12.7% of households maintained that marketing is their major problem. Households involved in palm oil processing, mat making, raphia thatch making, kola gathering and sponge making in particular named marketing as a major problem.

For products such as crop-drying mat and raphia thatch, the marketing problem is a reflection of the seasonal fluctuations in demand. Crop-drying mats are mainly used for drying cocoa and therefore demand is high during the cocoa season. However, mat weavers find it difficult to market their products outside the cocoa season. Similarly, the demand for raphia thatch tends to peak during the rainy season since households replace their roofing tiles only when it starts leaking and this is only possible during the rains. Again mat and raphia thatch are mostly sold locally as they have a very small urban market.

The reduced demand for products such as sponges may be a reflection of the availability of substitutes. For instance in most rural households nylon nets have become more popular for bathing. For households involved in kola gathering and palm oil processing the marketing problem may relate more to the low prices paid for these products.

Financial problems

Financial constraint was named as a major problem by 10.7% of households. In particular financial problem was mentioned by households involved in hunting, palm oil processing, 'akpeteshie' distilling and carpentry activities. For example, 33.3%, 50%, 55.6%, and 75% respectively of households that reported that hunting, palm oil, 'akpeteshie', and carpentry activities represent their most important activity mentioned financial problems as their principal constraint. For activities such as hunting, 'akpeteshie' distilling and carpentry the financial problem relates more to the initial capital required for obtaining tools/equipment and other inputs.

The financial difficulties associated with small forest-based income activities in southern Ghana has been recorded previously (Townson, 1995). In a study of forest-based enterprises in southern Ghana, Townson (1995) reported that finance is a constraint to the operation of many small rural enterprises including those based on NTFPs. He noted, however, that many of those that give finance as their principal problem are referring more to the poor returns they are receiving from the activity rather than to problems related to financing the operation of their enterprise. The findings of this study suggest that for gathering activities such as snail gathering, mushroom gathering, wrapping leaf gathering, etc., the financial problem relates to the poor returns offered by the activities. However, for processing activities such as 'akpeteshie' distilling, carpentry, etc. and hunting, the problem relates more to the initial capital required for obtaining tools/equipment and other inputs.

Government legislation and regulations

In general 9.3% of the households reported that government legislation and regulations are their major constraint. This is especially so for canes, fruits, hunting, 'akpeteshie' distilling, baskets, charcoal, carpentry and woodcarving activities. For example 66.7%, 36.4%, 22.2%, 50% and 25% respectively of households involved in cane gathering, fruit gathering, hunting, basket making and carpentry activities indicated that their major problem is government regulations. Again all households who reported that charcoal production and woodcarving represent their most important activities gave government regulations as their major problem. The majority of people who stated government regulations as a constraint are those who reported that their most important source for collection of raw materials and other forest products is the reserved forest.

In almost all cases the problems or constraints related to the permit regulations⁷ of the Forestry Department (FD), which require people to obtain permit for harvesting products from forest reserves. Local people reported many problems with the permit system, including the cost of the permit, travelling to the District Forest Office to collect the permit and harassment by forest guards. For those involved in carpentry activities the problem also related to measures by the FD to stop illegal chainsaw operation in forest areas, since chainsaw operators are a major source of sawn wood for carpenters.

⁷ The permit system has been discussed in detail in Chapter 8.

In the case of hunting the problem may also relate to the wildlife legislation which prohibits hunting from August to December.

Transportation problems

Households involved in wrapping leaves, mats and firewood activities were the only ones that registered transport as their major problem. The problem in most cases relates to the unavailability of vehicles to transport the products to market centres due to bad roads that become even worse during the rains and the remoteness of the area. This often makes the cost of transporting products to market centres very prohibitive.

Labour availability

Labour represents a major problem for most people involved in forest-based activities, especially those involved in 'akpeteshie' distilling, firewood gathering, palm oil processing, charcoal production, thatch making and wood carving. However, only households involved in honey collection registered this as their principal problem. Honey collection often involves felling a whole tree before the honey can be harvested making the process strenuous and labour intensive. More often bees attack honey collectors during the harvesting process.

Lack of tools/equipment

Only 3.3% of households mentioned tools or equipment as their major problem. This includes households involved in fruit gathering (9.1%), hunting (22.2%) and 'akpeteshie' distilling (22.2%). In the case of hunting and 'akpeteshie' distilling, those that mentioned lack of tools as their most important problem may be referring to the expense involved in purchasing the equipment rather than a problem with its general availability. The results for fruit gathering is unusual, as households did not mention any special tools or equipment required for this activity.

Several authors have also noted similar problems facing small-scale forest-based enterprises (e.g. Townson, 1995; Arnold *et al.* 1994; Fisseha, 1987 and FAO, 1987). For example, according to FAO (1987: 9) the range of problems facing small-scale forest-based enterprises can be summarised as follows:

- *Small and insecure markets*, due to low rural incomes, seasonality, poor access to large markets, and severe competition;

- *Raw material shortages*, often compounded by wasteful processing, restrictive regulations, poor distribution, and lack of working capital;
- *Shortage of finance*, in particular working capital, worsened by problems of access to what is available and by its cost; and
- Non-availability of appropriate technology in the form of suitable *tools and equipment*.

Small-scale forest-based enterprises also often encounter a policy environment which compounds many of their problems. Forest policies and practices tend to focus on conserving the forest resource and on protecting the rights of those licensed to harvest timber. This commonly results in policy prescriptions relating to use of non-timber products that are generally restrictive rather than enabling. Such policies are typically pursued through systems of licensing, fees and other measures designed to limit rather than encourage production and sale of such products (Deweese and Scherr, 1996).

7.8. Conclusion

The findings of this study show that livelihood diversification is an important household strategy throughout the study communities. Virtually all the rural households rely on a diversity of activities to help make a living. Although for most households farming is the major source of income, off-farm activities such as petty trading, casual labouring (day labourers), and forest product gathering and processing activities have an important role.

The results of this study reveal that forest-based activities provide one of the most common income-earning options for households throughout the study area. For many households the gathering, processing and sale of forest products provide one source of supplementary income whiles for some households, especially those involved in 'akpeteshie' distilling, carpentry, woodcarving and medicine, forest product activities provide the main source of livelihood.

The majority of forest-based income activities in the study communities display considerable seasonal fluctuations with respect to engagement in these activities, mainly as a result of changes in farm labour requirements, an increased need for cash during hardship periods, seasonal availability of raw materials or some NTFPs and fluctuations

in demand. Generally, majority of forest-based cash earning activities decline during planting and harvesting periods, when farm labour requirement is high, and increase during the hunger season when people need to earn cash to buy staple foods.

While some forest-based activities are characterised by high returns comparable with agricultural activities, others offer very low returns to labour. For example, returns from activities such as medicines, palm wine production, 'akpeteshie' distilling, palm oil processing, carpentry and wood carving are reported to be quite high while other activities such as chewsponge production, washing sponge production, snail gathering, mushroom gathering, and thatch production are reported to offer extremely low returns.

It is important to note, however, that although the returns from forest-based activities may be small in absolute terms, what is more significant is how important households consider this income in terms of its contribution to household livelihoods. Most households maintained that the income obtained from forest-based activities contributes immensely to their livelihoods, as it is often available in times when agricultural income is non-existent. They related that this income is often used to pay school fees, buy food to feed the family, and is sometimes invested in agricultural production.

For forest dependent livelihoods to be more sustainable requires the forest resources to be managed sustainably whiles at the same time ensuring that local people have better access to the resource. These are the issues discussed in Chapter 8.

CHAPTER 8

FOREST AND TREE RESOURCES MANAGEMENT AND USE RIGHTS

8.1. Introduction

Most rural livelihoods are at least partially reliant on the natural resource base, as the previous chapters have shown. Therefore, for rural livelihoods to be more sustainable, the resources and systems on which these livelihoods depend should themselves be used and managed sustainably. Thus, sustainable use of natural resources is critical for sustainable rural livelihoods.

The sustainability of rural livelihoods raises two broad questions. That is, whether a livelihood is sustainable environmentally, in its effects on the resources and other assets on which it depends; and whether it is sustainable socially, that is, able to cope with stress and shocks, and retain its ability to continue and improve. Sustainability is thus a function of how assets (resources) and capabilities are utilised, maintained and enhanced so as to preserve livelihoods (Chambers and Conway, 1992). Most conventional thinking equates sustainability with preservation or enhancement of the productive resource base, particularly for future generations. At the local level, an important question to ask is whether livelihood activities maintain and enhance, or deplete and degrade, the local natural resource base (Chambers and Conway, 1992).

The potential of forest and tree resources to continually support the livelihoods of the rural poor depends on the security of tenure that local residents possess related to forests, their perceptions and attitudes towards the resource, and how they manage it. People who lack secure rights to the continued use of forests often show little sense of custodianship or stewardship towards the resource and may not have any sense of responsibility towards sustainable management of the resource (Banana and Gomya-Ssembajjwe, 1998; Byron and Arnold 1997).

This chapter examines the local management and conservation of forest resources. It begins with a discussion of forest and tree tenure and use rights and how these shape people's attitudes towards the forests. Within the forest sector, key constraints to improving forest-based livelihoods lie in the institutional environment and, in particular, in the relationship between the Forest Department (FD) and the forest users. These institutional processes are examined.

Local people's perceptions of forests and the availability of forest resources are also considered. In particular, the chapter explores the changing patterns of the availability of forest products, the reasons for the decline of forest resources, and the forms and extent of adaptation to it. In addition, local institutions that influence people's access to forest resources are explored. The final sections of the chapter examine farmer tree planting and management, the reasons why farmers do not preserve certain tree species, and local people's perceptions of collaborative forest management.

8.2. Forest and tree tenure and use rights

Security of tenure of natural resources is an important issue if local communities are to use the natural resources in their localities sustainably. Natural resources tenure simply refers to the terms and conditions on which natural resources are held and used. Thus forest and tree tenure refers to the terms and conditions on which forests and trees are held and used (Bruce, 1986, cited in Birgegard, 1993). It includes questions of both ownership and access or use rights. The set of rights that a person or some private entity holds to forests or trees may include the right to own, to inherit, to plant, to dispose of and to prevent others from using trees and tree products (Fortmann, 1985).

Tenure is not a matter of man's relationship to natural resources such as forests and trees. It is a matter of relationships between individuals and groups of individuals in which rights and obligations with respect to control and use of natural resources are defined. It is thus a social institution (Birgegard, 1993).

Access to and use of natural resources is the key to survival for a majority of people in the developing world. The control and use of land and other natural resources has been the way to sustain the family or the household (Birgegard, 1993). One of the factors that affects the level and type of consumptive utilisation of forests in many settings is the

security of tenure that local residents possess in relation to forests. Individuals who lack secure rights are strongly tempted to use up these resources before they are lost to the harvesting efforts of others (Banana and Gomya-Ssembajjwe, 1998). Similarly, where forest habitats have little economic value to local people because of restrictive access rules, sustainable local management institutions are unlikely to emerge (Lawry, 1990). Tenure therefore determines, in large part, whether local people are willing to participate in the management and protection of forest and tree resources.

In the study area and, indeed, in most parts of Ghana, tree tenure systems operating in forest reserves are different from those outside reserves. In off-reserve areas, tree tenures are also different for planted trees compared to those growing naturally, and for timber trees compared with non-timber species. These differences are considered below.

8.2.1. Rights to planted trees

In all the study villages any individual (man or woman) who has the right to use a piece of land in perpetuity (subject to certain conditions which vary from situation to situation) also has the right to plant any species of trees. Such trees are vested in the planter/cultivator. People who have the right to use a piece of land in perpetuity are individual members of the land-owning group who have acquired land through inheritance, gift or allocation. Strangers who have acquired long-term title or right to the use of land through some form of agreement (such as granting on leasehold basis) also have the right to plant and use any species of tree. Strangers with temporary use of land, however, do not have the right to plant permanent trees on those lands.

Although customary laws do not prevent tenants from planting trees, landowners do not encourage this because most people believe that the long production period and the lack of appropriate documentation of land ownership, increases the security of the tenant to land rights when trees are planted. Thus, an attempt by a tenant to plant trees is regarded as an attempt to acquire permanent ownership of land. This appears to be a common practice throughout much of Africa (Warner, 1993; Agyeman, 1993; Arnold and Bird, 1999)

People generally have more secure rights to planted trees than those occurring naturally. The planter can will planted trees on privately acquired land to anyone he likes.

However, trees that are planted on family or lineage lands can only be inherited by members of the lineage group.

Apart from the use of small portions for medicinal purposes, no one has the right to any other use of planted trees and their products without permission from the planter (including even fruits that are found under the trees). Persons with temporary rights who cultivate sites planted with trees enjoy only subsistence rights; they can pluck fruits or any other produce for their personal use but not in commercial quantities.

Trees that have been planted on communally owned land cannot be harvested by individuals without the approval of the Chief or Unit Committee (or Village Development Committee). Planting and maintenance of trees on communal land is normally done by the whole community on taboo or rest days.

8.2.2. Rights to naturally occurring trees outside reserves

Rights to naturally occurring trees outside reserves vary between timber and non-timber species. In the case of non-timber trees (such as kola, oil palm, raphia palm, bamboo, etc.), the rights also depend on whether the tree has some commercial value or it is for subsistence use only.

Rights to naturally occurring non-timber trees that have some commercial value, such as kola, oil palm, raphia palm, etc. are restricted and are vested in the landowner. For example, only landowners or people who have perpetual use of land on which kola or oil palm trees occur can harvest the fruits. Members of the community can, however, pick fruits that have fallen on the ground. Any other use of such commercially valued non-timber trees will have to be agreed by the landowner. For example, permission has to be obtained from the landowner before naturally occurring oil palm or raphia palm can be tapped for palm wine.

The right to naturally occurring non-timber trees that are only of subsistence value is very much more relaxed. For example, bamboo and fruit trees (such as pawpaw, *Dacryodes klaineana*, *Chrysophyllum albidum*, *Spondias monbin*, etc.) can be collected from anywhere without permission from the landowner provided crops are not

damaged. In general, naturally occurring non-timber trees on communal land belong to the whole community and anyone can harvest products from them.

All naturally occurring timber trees - whether on private or on communal land, or even on private farms - however, 'belong' to the government. The use of such trees is controlled by legislation and it is an offence for an individual or community to cut or sell timber or merchantable tree species without permission from the Forestry Department (FD). People complain that there are cumbersome processes involved in requesting and being granted permission to cut merchantable trees (cf. Matose, 2002). Royalties which accrue to timber exploitation are split between the traditional council/authority (20%), the stool land owners (25%) and the local district assembly (55%). These allocations are made net of the management costs of the FD, which presently is 60% of the total royalties (District Forest Manager, 2001, *Pers Comm.*; cf. Brown, 1999; Amanor, 2000) (see Appendix 5 for stumpage fees for common timber species).

Thus, farmers have no legal rights, either to harvest timber trees they maintain on their farms, or to any of the revenue accruing to timber extraction by concessionaires. In fact, all respondents reported that they do not have the right to harvest timber trees from their own land. Even the custodian chiefs complained that they do not have legal access to timber trees on their own land. They maintained that the right of access is vested only in the government and the FD is the only agency authorised to permit felling of timber trees. This appears to be the result of British colonial forest policy; virtually all ex-British Forestry Departments regulate local people's access to forest and tree products (cf. Bradley, 1992; Cline-Cole, 2000a). Farmers therefore do not benefit directly from timber trees they protect on their farms, which is a strong disincentive to farmer tree management and protection on farms.

In 1995, the FD introduced a set of felling procedures (referred to as Interim Measures) to control illegal timber harvesting in off-reserve areas. These measures require loggers to pay compensation to affected farmers for the destruction to property and farm crops and make it illegal for timber contractors to fell trees on farmland without the consent of farmers. The new rules also specify that all on-farm logging should be done in the presence of a forestry official (Brown, 1999; Amanor, 2000). However, loggers rarely compensate farmers for damage to food and cash crops resulting from logging

operations on their land since these measures are weakly enforced. Indeed, most people complained that they are not consulted, even when timber trees on their farms are felled and, in most cases, they are not compensated for damages caused to tree and food crops. This, in addition to frustrations in claims processes, and the fact that farmers do not benefit from timber trees they protect on their farms, has resulted in some farmers illegally destroying valuable tree species on their farms before concessionaires can gain access to them. The frequency of such conflicts casts doubt on the effectiveness of forest and tree tenure systems in Ghana regarding adoption and implementation of sustainable forestry practices (Owubah *et al.*, 2001).

8.2.3. Rights to trees and other products in forest reserves

In pre-colonial Ghana (then called the Gold Coast), forests were owned in common by communities (families, clans and 'stools'). A 'stool' refers to a community governance or administrative structure similar to dynasties (Kasanga *et al.*, 1996, cited in Owubah *et al.* 2001). However, the country's Forest Ordinance of 1927 gave authority to the colonial government to reserve parts of the country's forests. Although the bill did not alter ownership of the forest reserves, it vested control of them in the government of Ghana and prescribed that they should be held in trust for the communities (Owubah *et al.* 2001). Thus, all forest products within forest reserves, including both timber and non-timber tree species and even NTFPs are vested in the government.

Although, in theory, the ownership of land and forests did not alter at the time of reservation, in practice, the traditional owners have no right of access to the trees or land in the reserve, except on permit from the competent government authority, the FD. In fact, all respondents reported that they have no right to harvest even non-timber forest products from the forest reserves without a permit from the FD. The management of trees, the right to own, plant, use and dispose of trees within the forest reserves is controlled by the state, through the Forest Protection Decree of 1974 (or National Redemption Council Decree (NRCD) 243). This decree has, from the beginning, created a feeling of animosity between local communities and the FD (Agyeman, 1993).

Under the working plans of all forest reserves, the following communal rights are usually admitted in forest reserves on permit: communal rights to hunting, fishing,

collecting of fuelwood, snails, medicine, etc.; and farming rights to admitted or allowed farms. Admitted farms are portions of land inside the forest reserves, which were farmed at the time of reservation and allowed to continue as such. These lands do not constitute part of the reserves even though they are situated inside them.

These communal rights, admitted in forest reserves only on permit, have been the subject of several disputes between the FD and local communities. The communities want less restricted access to the forests. Indeed, several households complained that the procedure for acquiring a permit is cumbersome and that the FD does not readily give permits for the collection of certain forest products. The FD, on the other hand, claim that wherever possible, permits are granted for NTFPs based on the needs of the applicant. Forest Officers cited monitoring of the use of permits as one of the problems facing the FD.

While the FD claims that subsistence uses of NTFPs, such as snails, mushrooms, fruits, etc. from forest reserves is allowed, local communities report that this is rarely the case. The problem therefore seems to be one of distinguishing between what constitutes subsistence use and commercial use. The local people resent this form of exclusion and see the permit as too expensive and complicated for obtaining items for personal or domestic use. Most of them, however, admitted that they sometimes sneak into the reserved forests to hunt game and collect other forest products. This raises questions about the effectiveness of the permit system itself.

8.3. Managing the exploitation of NTFPs through permits

Local people's interest in forest resources, both inside and outside reserves, is largely confined to the exploitation of NTFPs. While NTFPs may not generate revenue of the same order of magnitude as timber, the income they do generate is critical to many households - it can mean the difference between going to school and not going to school (Forestry Department of Ghana, 1995).

Although the FD is expected to manage forest reserves to cater for the needs of forest owners, including free access to the forest to gather NTFPs for domestic use, as stated in the reserve settlement agreement and forest management plans, this does not happen in practice (CFMU, 1998). Rather, NTFPs are presently managed through a permit

system, where people apply for the right to exploit specific NTFP resources within reserve forests, irrespective of whether or not they are exploiting for domestic or commercial use and whether or not they are land owning communities of the particular reserve. According to the Collaborative Forest Management Unit (CFMU) of the FD, the main objectives of the permit system are:

- to control and monitor the exploitation of NTFPs;
- to check illegal exploitation of NTFPs;
- to generate revenue from the exploitation of NTFPs for management purposes;
- to sustain the NTFP resource;
- to enable people gain access to NTFPs; and
- to create a legal environment for the exploitation of NTFPs (CFMU, 1998).

The method of acquisition of permits to harvest NTFPs from forest reserves involves making an application to the District Forest Office through the Range Officer (or in some cases the Forest Guard) in charge of the particular reserve. The application is considered in the initial instance by the Range Officer who then makes a recommendation to the District Forest Manager as to whether the permit should be granted to the applicant or not.

When the application is granted, a permit is issued to the applicant for a stated quantity of the particular product within a certain time period, after which the permit expires (see Appendix 3 for a sample of NTFP permit). The area in which the successful applicant is to operate is stated in the permit together with the time period that the permit holder has to harvest the product. The fee paid for the permit depends on the type of product and the quantity demanded by the applicant (see Table 8.1 and Appendix 5). The activities of permit holders are monitored by Forest Guards but, in most cases, monitoring is difficult as permit holders often operate during odd hours (District Forest Manager, 2001, *Pers. Comm.*).

Table 8.1. Permit fees/rates for common NTFPs

Product	Approved price (cedis, ¢)¹
Dead wood	Same as fresh wood of the species
Oil/raphia palm (per tree)	8,000
Chewstick (<i>Garcinia</i> spp.) (nsokor/tweapea) (per tree)	10,000
Pestle (per tree)	2,000
Canes - <i>Eremospatha</i> spp (mfia) (30 pieces/5 metres)	6,500
- <i>Calamus deeratus</i> (dem mire) (25 pieces/5metres)	7,000
- <i>Laccosperma opacum</i> (eyee) (10 pieces/3metres)	8,000
Firewood (cord)	16,000
Firewood (headload)	1,500
Conveyance of firewood (truckload)	10,000
<i>Marantaceae</i> leaves (wrapping leaves) (headload)	1,000
Stones/gravels (cubic metre)	15,000
Sandstone/clay (headload)	1,500
Latex (gallon)	2,000
Sponge (sawe) (headload)	2,500
Incense (ehye) (mini bag)	6,000
Bamboo (headload)	2,000
Tree bark (medicine) (mini bag)	5,000
<i>Monodora myristica</i> seeds/other seeds (mini bag)	2,000
Roofing tiles/leaves (raphia thatch) (headload)	2,000
Charcoal (mini bag)	2,500
Charcoal (maxi bag)	4,000
Conveyance of charcoal (truckload)	20,000
Hunting permit (3 months)	50,000
Poles (below 10m)	2,000
Poles (10 - 20m)	2,500
Poles (20 - 30m)	3,000
Poles (above 30cm)	3,500
Yam stakes/sticks (per stick)	300
Kapok (cracked - maxi bag)	5,500
Kapok (uncracked - maxi bag)	2,000
Temporally structure for akpeteshie distillation	20,000

Source: Asankrangwa Forest District Office, Forestry Department (2001)

In general, local communities dislike the permit system and see it as exploitative and a measure designed by the FD to exclude them from the use and management of forest resources. Their perceptions of the system are discussed below.

¹ At the time of the fieldwork, 1 British Pound (£1) was equivalent to 9,500 Cedis (¢9,500).

8.3.1. People's perceptions of the permit system

Discussions with households suggest that the permit system is associated with many problems. The majority of people interviewed complained that the system is cumbersome and bureaucratic. It is inconvenient and expensive for them to travel to the District Forestry Office to obtain a permit to use what is only a few minutes away. In general, permits are obtained for set quantities but people report that they have little clear idea of how much they will gather in a given period. Another problem that was repeatedly mentioned is the fact that permit rates do not vary according to fluctuations in market prices of NTFPs.

Some people also reported that NTFPs are often collected to meet emergency cash needs and so it is difficult to purchase permits during such crises periods. Villagers believe that the FD is not effectively managing the NTFP resource and that it is only interested in timber. They complain about undue harassment from FD staff and assert that it is not them, but the forest guards and the FD that benefit from the permit system.

Most people maintained that they rarely obtain a permit from the FD due to these problems. People believe that there is little likelihood of getting caught in the forest. They claim that NTFPs are collected in small quantities irregularly and therefore do not see the need to obtain a permit each time they want to collect. Some also feel that it is their right to collect materials from the forest (especially where the forest reserve is situated on a stool land) and therefore do not see the need to obtain a permit.

Many people are of the view that the supply of forest resources is inexhaustible and therefore should be given unrestricted access. They believe that NTFP harvesting causes little damage to the forest compared to timber extraction. Thus, most people feel they are being prevented from subsisting and therefore resent this form of exclusion. A woman in Sureso Village complained, "we have become strangers on our own land as we are not allowed to enter the so called 'government forests' to collect food and other livelihood items".

With these divergent views, it is not surprising that the relationship between Forestry staff and local forest users is generally poor. This poor relationship leads to other unforeseen consequences. For example, it has meant people adopting destructive

harvesting practices. Since the permit system is both impractical and expensive, especially for occasional uses, it forces villagers to occasionally sneak into the forest illegally to remove NTFPs. Thus, rather than fostering a responsible attitude towards the forest, the permit system does just the reverse. Even foresters believe that it is an inefficient system. They maintain that there is the need for much more information and manpower to effectively manage the NTFP resource in this way.

Although the permit system is the only means of managing or controlling the exploitation of NTFPs, it does not provide an indication of the extent of exploitation, nor does it provide any indication of the condition of the NTFP resource (Prah, 1994; Falconer, 1991). Generally, the permit system favours the outside resource extractor over the local users. Outside gatherers and traders have easier access to District Forest Offices, often have greater capital resources, collect in bulk over a short time span and thus earn higher profits from bulk sales (Falconer, 1991). Thus, the system does not encourage the development of rural forest-based income earning activities.

Nor does it encourage any sense of stewardship or responsibility towards the resource. Rather, it creates a sense of alienation, which is a strong disincentive to local management of forests. For example, as one man from Sureso Village said:

"Since we are not allowed to enter the forest reserves, we harvest as much of any product as we can when we secretly enter them. We know this destroys the forest resources but we also need to survive".

There is little motivation for urban traders to develop sustainable harvesting strategies. They often 'mine' the resource. Following depletion in one locality they move on to another reserve. For the local gatherer who must either pay the fee or risk arrest, the attitude is the same.

Rather than promoting the value of the forest to those living near it, the permit system discourages people from having anything to do with the forest resource. Meanwhile, NTFPs have the potential to help sustain and develop people's interest in forest management and in keeping the forest forested. The value of forests for people living near them therefore needs to be sustained, promoted and developed. The type of system needed is one which helps to promote more active involvement in sustained

management. In other words, what is needed is a system which helps to build on or foster people's concern for the future of the resource, and their long term interest in the resource and its management (see section on collaborative forest management below).

It is only when the forests have a real value to the local people that their co-operation and energy can be gained for forest protection and management. Without co-operation, the future of the forests of Ghana cannot be guaranteed. The FD therefore needs to institute effective alternatives to the permit system, by creating an environment in which people using NTFPs across southern Ghana will automatically be able to take more control over the management of this resource.

8.4. Relations between the FD and local forest users

Although the permit system serves to limit and control the exploitation of NTFPs, it is evident that those it deters (the rural poor living at the forest boundaries) are the very people with whom the FD should be working or serving most closely. This system of controlling NTFP exploitation has fostered poor and hostile relations between the FD and the local people. In fact, people refer to forest guards and other forest officials as 'kwaye polisi' (meaning forest police). Rather than capitalising on the positive link that can be provided by NTFPs between forest managers and communities, the permit system worsens the relationship, fostering fear and distrust of all forestry agents. This fear is likely to be greatest in those communities and amongst those households who are most dependent on the forest for their livelihood.

Indeed, most respondents maintained that they have nothing to do with the FD. One man from Kamaboi Village described the relationship between the local people and the FD as follows:

"There is a very poor relation between us and the forest guards since they deprive us of our living. We are not in good terms with them. The restrictions on access to the forest reserves are too much. We sometimes fight them when they arrest us for entering the reserves. We are always angry when we see them. Sometimes they take bribe from us when they arrest us".

Most NTFP gathering and trading activities are therefore carried out illicitly as a result of the permit system. However, substantial positive benefits for the FD as well as local communities can be gained from small efforts to modify the NTFP management system at the local level. For example, in Kwapanin village in southern Ghana, after negotiations between the gatherers and the FD officials, a flat monthly charge for *Marantaceae* leaf gathering was instituted. A registration system was established conferring most of the responsibility for monitoring the gatherers onto village institutions. This programme generated interest among the villagers in protecting the forest reserves and improved relations between the FD and the villagers (Agyemang, 1996).

8.5. Local people's perceptions of forests and availability of forest resources

Changes in the meanings and perception of forests over the years have suggested that there is a dynamic relationship between humankind and forests. In the past, forests were generally viewed as obstacles to agricultural growth and development. Later, forests were viewed as a means of timber production to support increased demand for wood products (Owubah *et al.*, 2001). However, the advent of environmentalism in developed countries, coupled with changing social values, and increased scientific understanding of human impacts on forest ecosystems has altered this perception dramatically. Today, forests are seen by some as objects to view and use non-consumptively while others see forests as a linkage with gods and spiritual powers (Yaffee, 1994; Schmithüsen, 1995, in Owubah *et al.*, 2001).

These latter perceptions and views have influenced forest management to the extent that even those who believe in the productive aspects of forests do not accept the massive clear cutting that characterised forest management decades ago (Owubah *et al.* 2001). An important question to ask is whether perceptions and values of forests among forest-dependent communities have also changed. An understanding of how local people view and value forests and forest resources and how these perceptions are changing is essential for the long term planning and management of forests.

In most rural communities, attitudes and perceptions towards forests are inextricably linked to beliefs about their origins and the bundle of rights governing the use and management of such forests (Falconer, 1992; Owubah *et al.*, 2001). In the study

communities, views and attitudes towards different areas of forest vegetation vary considerably. In general, government-managed forest reserves are viewed differently from forests on stool lands outside the reserves. Certain forest areas outside reserves are considered sacred and are therefore revered and protected. In fact, most people reported that forests and trees are important to the spiritual well-being of their households.

In most parts of rural Ghana, forests were especially valued in the past as food reserves in times of food scarcity, war, and other emergencies (Boakye-Boaten, 1974). However, in all the study communities discussions with households suggest that this use of the forest has declined considerably. The majority of people indicated that they obtain their emergency food supplies from the market rather than from the forest. They maintained that the reason for this is the relative scarcity of forest foods rather than changing tastes.

Virtually all local people view the forests as land banks for agricultural production. They encroach into the reserved forest because forestlands are relatively fertile for farming. Some people felt that areas of degraded farmland should be reserved as forest in exchange for land currently in reserves. Thus, many people feel alienated on their own land since they see reserved forests as areas they could farm or gather forest products from but to which they have no access.

Because of poor agricultural systems in the country (lack of appropriate technology, non-availability of inputs, especially fertilizers, etc.), there is enormous pressure to convert forestlands into agricultural lands, as these lands are seen to be relatively fertile. This has resulted in much illegal farming, especially in forest reserves where access by the FD is limited or difficult. In fact, land rotation/shifting cultivation and population pressure have been the main causes of deforestation in the country (Agyeman and Brookman-Amissah, 1987).

Several local people recognised the environmental benefits of forests. They are valued for their influence on the local environment; as windbreaks, in maintaining water resources, encouraging rain, for temperature regulation, maintaining soil fertility, and for helping to maintain a stable climate. Indeed, in all communities, trees are believed to attract rain. Many people also value the products they get from the forest, especially subsistence goods. In fact, the majority of households maintained that NTFPs are very important to them. The most highly valued forest products in these communities are

bushmeat, canes, medicines, kola, material for pestles, building materials, wrapping leaves and chewsticks.

In order to gain a general picture of local people's perception of forest condition, households were asked to describe the condition of the forests, especially forest reserves. Virtually all the local people complained that the condition of the forests is very poor, as most areas are degraded. Most of them described the reserved forests as 'government grassland' because there are no trees in them. Others also described them as deserts. Some people reported that the forest reserves are very much degraded due to the activities of logging companies and chainsaw operators. People felt that logging companies have taken the forests as their own property. They cut the timber without replacing them. Local people's views on the value and condition of forest reserves are presented in Appendix 4. Most of them are worried since they feel that their source of livelihood is being eroded. They reported that the availability of most NTFPs has declined considerably, with some products becoming almost extinct.

For example, 78% of the survey households reported that forest products in general are less available these days (Table 8.2). In particular, they complained bitterly about the reduced availability of bushmeat species since it is the main source of protein in the study area.

Table 8.2. Availability of forest products compared with 10 years before

	% of households	Number of households
Forest products are less available	78.1	125
Forest products are more available	7.5	12
No change in availability	11.3	18
Don't know	3.1	5
Total	100.0	160

One elderly man at Kamaso village reported that when they first settled in the village, bushmeat species were so abundant that they could use the noise made by monkeys to tell the time. He went on to say that they could even get bushmeat species in their own backyards, but now they have to sneak and travel long distances into the reserved forest before they can make a catch.

This would appear to confirm the results discussed earlier in chapter 7, with the majority of households stating that raw material availability is the principal problem that discourages them from engaging in forest-based activities.

8.6. Reasons for the decline in availability of forest products - local people's perspectives

Respondents mentioned more than one reason as responsible for this decline. These included over-harvesting of forest resources due to population pressure, destructive harvesting practices, bush fires, forest guards restricting access to forest resources, logging operations damaging the resource, logging workers harvesting the resource, clearance of forest areas for farming, and invasive weeds (Table 8.3). Some people also believed that the availability of forest products has declined because local people have not been observing or respecting traditional rites and customs.

Table.8.3. Reasons for the reduced availability of forest products

Reasons	Number of households	% of households	Total number
Over-harvesting of forest resources	110	68.8	160
Destructive harvesting practices	42	26.3	160
Clearance of forest areas for farming	109	68.1	160
Forest access restriction by forest guards	104	65.0	160
Bush fires damaging forest resources	48	30.0	160
Logging operations damaging the resource	59	36.9	160
Logging workers harvesting the resource	14	8.8	160
Invasive weeds	13	8.1	160

Note: Households could mention more than one reason.

Over-harvesting of the resource

Over-harvesting is the prime reason given by households for the decline in availability of forest products in general. Indeed, 68.8% of the survey households mentioned over-harvesting as an important cause of forest product decline. Most people believe that there is much more pressure on forest resources these days, as their population is increasing. In fact, the population of the district has been increasing since 1960. The

district had a population of 76,096 persons in 1960; 92,942 in 1970; 144,326 in 1984; and 206,866 in 1996 (WADA 1996). Ghana's year 2000 population and housing census revealed a population of 229,421 persons for the district with a population density of 48 persons per square kilometre compared with a national average of 77 persons per square kilometre (Ghana Statistical Service, 2000). According to the same census, the populations of the study villages, Sureso, Kamaso and Kamaboi, are 1,120, 566 and 403 respectively, compared with a 1984 population of 619, 217 and 134 for Sureso, Kamaso and Kamaboi respectively. The increasing population of the area has put severe pressure on forest resources.

There is little doubt that increasing population is a driver of forest loss (Olorunfemi, 1994; Arizpe *et al.*, 1994), although this relationship is quite complex. Fulfilling the resource requirements of a growing population ultimately requires some form of land-use change - to provide for the expansion of food production through forest clearing, to intensify production on already cultivated land, or to develop the infrastructure necessary to support increasing numbers of people. Human-induced changes in land use often result in habitat fragmentation and loss, the primary cause of species decline.

Many people maintained that forest products have declined because they are not replaced when they are harvested. As one woman from Kamaso Village reported:

"The condition of the forests has changed drastically. There is more degradation because when we harvest trees and other forest products we don't replace them. Don't we replace cassava when we uproot them from our farms? Can't we do the same to our forests?"

Such sentiments suggest that the local people living near the forests have much impact on the forest resources. However, most of them attribute the decline in availability of forest resources to outside people using more of the resource. 'Outsiders' largely refers to urban NTFP collection groups that come to the area to collect certain products. For example, people complained that chewstick species (particularly *Garcinia epunctata*) have declined considerably in the area due to the activities of urban harvesting groups. This problem is also noted by Townson (1995) and Falconer (1992).

Destructive harvesting practices

Destructive harvesting practices was named by 26.3% of households as an important reason for the decline in forest product availability. Although the exploitation and harvesting of NTFPs is widely believed to be less harmful to the forest than timber extraction, and therefore are often argued to be more sustainable, this is not true for all NTFPs (Falconer 1991). For example, the felling of whole trees of *Garcinia epunctata* and *G. afzelia* that provide the logs from which chewsticks are produced is likely to have a quite different impact on the sustainability of the resource than the harvest of canes, which can regenerate readily and re-grow in a few years. Similarly, for products such as honey, palm wine (from oil palm) and charcoal, the method of acquiring them is naturally destructive, requiring the felling of the tree or palm (Townson, 1995).

Rapidly growing demand can result in unsustainable harvesting of even the most readily regenerated resources. Local people complained that despite the fact that most products can be harvested using non-destructive methods, people deliberately harvest these products destructively due largely to the lack of secure rights to the resource. Most households mentioned medicines (bark), pestles, fruits, raphia thatch, and canes as some of the products that are harvested destructively. For instance, in some cases, fruit trees are felled in order to access the fruits. The harvesting of 'esro wisa' (*Piper guineensis*) is one such example.

Piper guineensis is a forest climber and its fruits are used as medicine and spice and are widely traded throughout southern Ghana. The traditional method of harvesting entails cutting the climber and clearing the forest undergrowth from around the host tree to provide a clear spot for the fruits to fall as they dry. After a week or two, they are then collected from the forest floor where they drop after wilting. This method ensures that more of the fruits are gathered. However, this traditional method is rarely used these days. People rarely leave the cut climber to wilt in the forest because they believe that someone else may harvest them before they have the chance to gather the fruits. Instead, people either attempt to pull the climber from the host tree, losing a substantial portion of the fruits in the process or, if possible, fell the host tree to get to the climber's fruits.

Several authors have noted the problem of destructive harvesting of NTFPs in many areas. For example, Townson (1995) reports that this problem has been noted by Falconer (1992) in Ghana, Cunningham and Mbenkum (1993) for medicinal barks in

Cameroon, Vasquez and Gentry (1989) for forest fruits in the Amazon and Peluso (1992) for rattan canes in Indonesia.

The non-destructive harvesting of many NTFPs only results in a short-term loss for the collector. This can be either in terms of a lower quality (e.g. poles cut below the root collar are stated to produce better quality pestles) or lower quantity of products as well as in terms of more time consuming or cumbersome harvesting techniques (e.g. cutting rather than uprooting chewsponge climbers) (Townson, 1995). However, the fact that NTFPs are commonly located in reserved forests where gatherers have no tenurial claim to the resource, and the fact that there is a strong likelihood that any regeneration will be harvested by other gatherers, results in little incentive for gatherers to practice non-destructive harvesting methods.

Clearance of forest areas for farming

As many as 68.1% of households reported that clearance of forest areas for farming is an important reason for the declining availability of forest products. As has already been discussed in Chapter 5, agriculture is the main occupation in the study area with cocoa being the major cash crop cultivated by farmers. Agriculture dominates the economy of the entire Wassa Amenfi District and almost 85.6% of the district's working population is engaged in this sector, which constitutes the major source of household income in the district (WADA, 1996: 24). The popularity of cocoa has attracted people from other parts of the country into this area. With increasing rural populations and with agriculture being the main occupation, land availability has become an important problem in the area. Thus, in all the study communities, there is enormous pressure to convert forestlands into agricultural lands, as these lands are seen to be relatively fertile.

None of the farmers in the study villages use fertilizers. They therefore try to bring more land into production each year through slash and burn shifting cultivation. In fact, shifting cultivation and population pressure have been the main causes of deforestation in Ghana (Smith 1994; Agyeman 1993; Agyeman and Brookman-Amisshah 1987). This widespread land clearance for cocoa farms and food crop production has caused major changes in NTFP supply and use in the area. Today, off-reserve forests have largely disappeared in the area; these are largely secondary forests or bush fallow areas. Most households therefore maintain certain forest products on their own farms in order to cope with this widespread decline in the availability of forest product (see below).

Townson (1995) has also noted the problem of land clearance for agriculture in southern Ghana. He reports that 44% of proprietors of forest-based activities mentioned land clearance for agriculture as an important reason for the decline in raw material availability.

Forest access restriction by forest guards

Access restriction by forest guards was given as one of the reasons for the reduction in availability of NTFPs. Indeed 65.0% of households gave this as an important reason, representing the third most important reason for the decline in availability of NTFPs. As was mentioned earlier, local people do not have the right to harvest forest products from reserved areas, except with a permit issued by the FD. This is seen as a restriction on their rights and has created an "artificial" shortage of NTFPs. Some people recounted numerous instances when forest guards have arrested and harassed them for illegally harvesting products from forest reserve areas.

The extent to which access restriction by forest guards is perceived to be an important factor appears to be dependent on the forest product in question and where it is gathered from. Most people claim that the decline in availability of products such as snails, wrapping leaves, canes, chewsticks (particularly *Garcinia epunctata*), chewing sponges, and bushmeat is largely due to forest guards restricting access to forest reserves rather than a physical shortage.

Bush fire damage

Although mentioned by only 30% of households, bush fires are thought to be one of the most important factors responsible for forest product decline in Ghana. Hawthorne and Abu-Juam (1995) and Townson (1995) have also noted the effect of bush fires on forest resources in Ghana. Fire is an integral part of the farming systems in the forest zone of Ghana, where the greater part of the land is fallow vegetation and subject to regular burning. However, following the 1982-83 drought in Ghana, fire damage has become more widespread, significantly altering the forests of the dry semi-deciduous and moist semi-deciduous zones (Townson 1995). Indeed fire has become the greatest, single threat to the long-term survival of half of the forest in Ghana (Hawthorne, 1994, cited in Townson, 1995).

Although fire damage is not as important in the evergreen forest zone (including the study area) as in the semi-deciduous zone, local people claim that bush fire is occasionally a problem in the area. In particular, several people complained about the effects of bush fires on bushmeat resources. People maintained that bush fires are largely caused by slash and burn agriculture as well as the activities of hunters and palm wine tappers.

Logging operations

The majority of Ghana's forest reserves are dedicated to timber production and environmental protection. In addition, much of the timber resource outside reserves is located within concessions. Thus, timber harvesting is one of the most important factors responsible for forest loss and degradation in Ghana (Hawthorne and Abu-Juam, 1995).

Overall, 36.9% of households reported that timber logging is one of the most important factors responsible for the decline in availability of forest resources in the area. Most people believe that the forest reserves are more or less 'grassland' due to the activities of loggers. They claim that timber harvesting destroys important NTFPs such as canes, wrapping leaves, chewing sponges, medicines and bushmeat species.

Discussions with hunters suggest that logging operations have a particularly severe effect on bushmeat resources. Logging activities open up or disturb the habitats of animal species, forcing them to migrate. In Sureso village, people reported that chimpanzees had harassed some school children a few days before the fieldwork started, following the disturbance of their habitat by logging operations. Several elders narrated stories of the abundance of bushmeat species before timber logging became intensive in the area.

Some people reported that the decline in NTFPs is also related to logging workers harvesting the resource. They claim that logging workers usually harvest products such as canes, pestles, chewsticks (*Garcinia* sp), and *Irvingia gabonensis* whilst working in the forest. These products are usually smuggled with the timber and are therefore not detected by forest guards.

Invasive weeds

Although only 8.1% of households named invasive weeds as one of the reasons for the decline in forest products, this is generally seen as a real problem in the area. The majority of people who mentioned invasive weeds refers to *Chromolaena odorata*. This weed is a native of the West Indies and Continental America, from Florida to Paraguay (Abbiw, 1990). It is an annual composite, growing to 2 metres and is particularly troublesome in oil palm and cassava plantations. It was first introduced into the University of Ghana Botanical Gardens, but later spread beyond the institute's perimeters into neighbouring land. Now it is widespread in all the forest areas of Ghana. It is a pest weed in both new and abandoned farms, growing in open sunlight and partial shade (Abbiw, 1990).

In Ghana, *Chromolaena odorata* is popularly called 'Akyeampong' (or Busia) Weed. The invasion of farmland and uncultivated land by this weed has radically altered farm-fallow systems in Ghana. Frequently, the spread of this species is associated with bush fires. According to local people, the only positive feature of this aggressive weed is the shelter (and habitat) it affords wild animals.

8.7. Patterns of change in the availability of forest resources

People living in forest environments, and practising hunting, gathering and shifting cultivation, draw heavily on forests and their outputs to sustain their livelihoods. As well as providing a wealth of material outputs of subsistence or commercial value, and the basis for rotational agriculture systems that depend on the ability of bush fallow to revive the productivity of the land, forests constitute an integral part of the social and cultural framework of those living within them (Arnold and Bird 1999).

Local people's dependency on forests for livelihoods often results in forest loss and the decline in availability of many forest products, especially NTFPs (Contreras-Hermosilla, 2000). Thus, reports of worsening NTFP supply situations have been widespread in many areas of the developing world (Arnold, 1996). Complaints about raw material supply problems feature prominently, for example, among forest product producers included in small enterprise surveys. More of these producers report supply as their main problem now rather than at start-up (Fisseha, 1987; Arnold *et al.* 1994; Townson, 1995). An understanding of the patterns of change in the availability of forest

products at the local level is very important, as it provides a gauge of the extent and gravity of the problem and its implications for the livelihoods of the rural poor.

Key informants (especially elderly people) were asked to describe the changes that have taken place in the area with regards to the availability of forest products, particularly NTFPs. People narrated stories to describe the changing patterns of NTFP availability in the area. In particular, people were much concerned about the declining availability of bushmeat species. The stories or descriptions suggest that the decline of forest products in the area is closely associated with timber logging and population pressure. These descriptions also revealed patterns which suggest that, since the 1950s, every decade has seen a major change in the availability of forest products in the area.

The majority of elders interviewed indicated that NTFPs were plentiful in the area when they settled there in the 1950s. They claim that the area was a virgin forest in the 1950s and both the off-reserve and reserve forests were sources of NTFPs. The vast majority maintained that snails and bushmeat species were so common that they could harvest them in the middle of footpaths and at their backyards. There was no need to enter the reserve forest or travel long distances to hunt bush animals. Indigenous fruits such as 'prekese' (*Tetrapleura tetraptera*), and 'watapuo' (*Cola gigantea*), as well as wild yams were not difficult to find. People did not have to plant kola as they occurred naturally in the forest.

Most believe that NTFPs started to decline in the 1960s, as timber logging became intensive in the area and loggers opened up a significant proportion of the forests. The activities of the loggers - entering the forest with their heavy machinery, felling trees, constructing roads in the forest - caused major changes. They destroyed forest resources and disrupted the habitats of animals. Wild animals started moving away and disappeared from the area. For example, some people said that monkeys used to make much noise around 8 o'clock in the morning, as they came out to feed. However, when loggers started operating in the area they could hardly hear this noise. Important plants whose parts were used as medicine were felled. Illegal loggers felled almost any tree they could find. Several people reported that the opening of the forest by loggers increased the incidence of bush fires in the area.

Nevertheless, although timber logging continued well into the 1970s, the most important driver of forest decline in the area during the 1970s was the migration of tenant cocoa farmers into the area. As mentioned earlier in chapter 5, the study area has been noted for in-migration of farmers from other parts of Ghana into the cocoa sector. During the early 1970s, the cocoa boom in Ghana attracted people from many parts of the country into this area. Forest areas were cleared and turned into cocoa farms. Land became fragmented as the population of tenant farmers increased. Pressure on forestlands and forest resources also increased, leading to over-harvesting and unsustainable harvesting practices.

Smith (1994) reports that during the 1960s a number of reserves in the Western Region suffered massive encroachment. These included Manzan, Sukusuku, Bodi, Tano Ehuro and Bia-Tawya Forest Reserves, all of which were converted to cocoa farms with well developed infrastructural and government services. By 1974 there were about 63 different settlements, 22 government schools and 9 market centres in these reserves. Of the total forest reserve area of 1,636.58 km², 999.39 km² were illegal farms with 195.83 km² being areas of admitted farms (Smith, 1994).

By the late 1980s, virgin forests outside reserves had virtually disappeared. Certain NTFPs had become scarce with some products almost extinct. People reported that they had to search for a long time to find important products. They maintained that the quantity of snails they could gather declined considerably even in the high season. The scarcity of NTFPs led to the commercialisation of most products. Canes, chewsticks (*Garcinia* spp), wrapping leaves (Maranthaceae leaves), kola nuts, snails, mushrooms and bushmeat commanded high market prices.

Several people indicated that urban commercial gatherers began harvesting NTFPs in the early 1990s, which further aggravated the problem. Today, very little off-reserve forest remains in the area. People spend a longer time gathering NTFPs. Most complained that they do not get bushmeat, their traditional source of protein. In fact, certain species of bushmeat such as the red colobus monkey were reported extinct. Most people also reported that 'nsorkor' (*Garcinia epunctata*), the best species for chewing stick, is almost extinct in the area. These examples suggest that the local people are at risk of losing important resources on which their livelihoods depend. There is therefore

the need to maintain and develop the remaining resources, if forests are to continue to support local livelihoods.

8.8. Impact of declining forest resources on local communities

The decline and degradation of forest resources is usually undesirable. In varying degrees, it is economically wasteful and environmentally negative, as well as socially undesirable. The process usually adversely affects the social condition of weaker sectors of society and leads to the progressive impoverishment of ecosystems (Contreras-Hermosilla, 2000).

Some analysts argue that forest clearance is not always harmful since, like most human interventions, it yields both positive and negative impacts (Contreras-Hermosilla, 2000). Thus, for some, deforestation is desirable because it results in financial gain but for others, the negative environmental and social impacts may be more important. Perspectives and values can therefore be very different.

However, for rural households living near forests, who depend on forest products for part of their subsistence needs and income, the decline of forest resources impacts greatly on their livelihoods (see Table 8.4).

Nearly everywhere users of forest products are faced with a decline in the size of the resource from which they obtain their supplies (Arnold, 1994). In many rural areas, the decline in forest resources means that an ever-expanding rural population must rely on decreasing forest and land resources. In terms of livelihood security, this trend implies diminishing availability and use of forest food resources as well as diminishing knowledge about their use, fewer income earning opportunities for the rural poor, and increased burdens on households in their efforts to meet their basic needs (Arnold and Falconer, 1988).

Indeed, most people in the study area reported that the amount and variety of forest foods they consume in their households has declined, not because they don't appreciate them anymore, but because these foods have become difficult to find. Thus, the seasonal and emergency roles of certain forest foods seem to be dwindling. The declining importance of forest foods in the household diet means that rural households

must rely more on agricultural sources for the bulk of their food. Meanwhile, local people report that crop yields have declined, as they are unable to fallow land properly due to land limitation. In fact, fallow periods have reduced to between 3 and 6 years in the area.

Table.8.4. Socio-economic impacts of continuing forest decline

Social group	Implications of continuing forest loss and degradation
Forest-dwelling indigenous communities	<ul style="list-style-type: none"> ▪ Loss of spiritual values. ▪ Social disruption of traditional structures and communities. Breakdown of family values. Distress and social hardship. ▪ Loss of traditional knowledge of how to use and protect forests in sustainable ways. ▪ Reduced prospects for preservation of forest environmental and aesthetic functions of interest and potential benefit to society as a whole.
Forest farmers and shifting cultivators	<ul style="list-style-type: none"> ▪ For shifting cultivators, an immediate opportunity to survive. ▪ Forest degradation and declining soil fertility. ▪ Loss of access to forest land and the possibility of food crop production and reduced possibilities for harvesting forest products, both for subsistence and income generation. ▪ Prospects of malnutrition or starvation. ▪ Disruption of family structures and considerable social hardship.
Local communities, the poor and landless living outside forests	<ul style="list-style-type: none"> ▪ Decreased availability of essential fruits, fuelwood, fodder and other forest products. ▪ Reduced agricultural productivity (through loss of the soil and water protection potential of remnant woodlands and on-farm trees; loss of shelterbelt influence leading to reduced crop yield). ▪ Reduced income generation and possibilities to escape from the poverty trap.
Urban dwellers	<ul style="list-style-type: none"> ▪ In developing-country situations, reduced availability of (and/or overpriced) essential forest products such as fuelwood, charcoal, fruits, building materials and medicinal products. ▪ In developed countries, loss of the amenity and recreational values of urban forests and parks. ▪ Reduced prospects for assured supplies of clean drinking water and clean air. ▪ Loss of the recreational opportunities and amenity values afforded by national forest parks and wilderness areas.
Commercial forest industrial companies and forest worker communities	<ul style="list-style-type: none"> ▪ Immediate large profits. ▪ In the longer term, loss of company business and forced closure of forest operations. ▪ Loss of jobs for forest-dependent communities, social disruption and hardship. ▪ Loss of income and possible negative social implications of reduced income of shareholders with significant savings invested in forest industrial company stocks.
National government planners and decision makers	<ul style="list-style-type: none"> ▪ Immediate escape from political pressures when impoverished populations migrate to frontier forest areas. ▪ Loss of potential source of development revenues with consequences of reduced employment opportunities, sustainable trade and economic development. ▪ Loss of wide range of environmental functions that forest provide in contributing to societal needs and habitable earth. ▪ Loss of political support in situations where forest loss and degradation adversely affect the welfare of many citizens.

Source: Adapted from Contreras-Hermosilla (2000)

Consequently, most households are unable to produce enough food to meet their subsistence needs. The majority obtain additional supplies from the market (see Table 5.12 in Chapter 5), putting more stress on limited incomes. For example, several reported that bushmeat is hard to find and so they depend greatly on smoked fish from

the market, which is very expensive in the area. The livelihoods of the rural households are therefore threatened by food insecurity.

The worsening NTFP situation has forced some households out of business. Examples of households in this category are those involved in palm wine tapping, palm gin (akpeteshie) distilling, palm oil processing, hunting (bushmeat) and chewsticks (*Garcinia* spp.) activities. In fact, the majority of households maintained that the decline in availability of NTFPs or raw materials is the most important factor that discourages them from engaging in forest-based income activities. Many involved in palm wine tapping, palm gin distilling and palm oil processing complained that the increasing scarcity of the oil palm tree in the area has forced them to engage in alternative activities that offer relatively low returns to labour. Similarly, most hunters complained that the decline in availability of bushmeat has compelled them to give up professional hunting.

The impact of the declining availability of forest resources on local communities is often better understood by examining local people's responses to abrupt changes in their forest environment. In a study to assess the local impact of the Subri Development Project, which converted a large forest area into a *Gmelina arborea* pulp and fuelwood plantation in Ghana, local people from the surrounding area complained that their supply of forest products had diminished and housing and food prices had increased. Ninety-four percent of those interviewed reported that the project had reduced their access to forest products, which provided a source of income. In their view, the most important losses were bushmeat, chewsticks, canes, poles and other housing materials, and condiments (Korang 1986).

The above examples suggest that the decline in NTFPs poses a real threat to the rural livelihoods. However, different households are likely to be affected differently, depending on their vulnerability contexts, the assets they possess and the extent of their dependency on forest products (see Chapter 7). For example, households that have access to land and have established cocoa farms are likely to be less affected than landless households who have not established cocoa farms and therefore depend on forest products for a greater part of their livelihoods. Any form of intervention must therefore recognise these differences between households.

8.9. Forms and extent of adaptation to the decline of forest resources

An important response to the declining availability of forest resources throughout the study area is the protection and incorporation of these resources into farming systems, both for subsistence use and for trade. This became apparent when respondents were asked to mention their most important source for collection of forest or bush foods. Most of the respondents (38%) named the farm as their most important source for collection of wild foods. This was followed by the farm bush or fallow areas (36% of respondents), the off-reserve forest (14%) and the reserved forest (11%).

The majority of farmers reported that they retain important trees on their land during land clearance for cultivation. Indigenous fruit trees such as 'adweaa' (*Dacryodes klaineana*), 'atoaa' (*Spondias monbin*), 'prekese' (*Tetrapleura tetraptera*), 'abesebuo' (*Irvingia gabonensis*), and exotic ones such as avocado, mango, pawpaw and orange, as well as oil palm and kola are retained on farmlands. Kola is perhaps the most important of these. In fact, the majority of respondents reported that they plant or protect kola trees on their farms. Other products that farmers retain on farms include spices such as 'misowa' (*Capsicum frutescens*), 'fam wisa' (*Aframomum* spp.), 'esro wisa' (*Piper guineensis*), 'wedeaba' (*Monodora myristica*) and 'hwentiaa' (*Xylopiya aethiopica*).

Several studies in West Africa have found that the bulk of forest products gathered by rural people are in fact collected from the farm, farm bush or fallow areas and other forms of tree cover that are managed to encourage desired species (Townson 1995, Davies and Richards 1991, Falconer 1991). As natural forests recede or degrade and forest resources become scarce, and as local people are denied access to reserved forests, farmers have shifted to managing trees on their own land in order to provide selected outputs. They have done so by protecting, planting and managing trees of selected species of importance to them (Cline-Cole, 2000b; Arnold and Dewees, in Arnold, 1994).

In Nigeria, for example, Falconer (1990a) cites Umeh (1985) as reporting that as nearby forests disappear farmers increasingly preserve trees on their farms. These on-farm trees are particularly valued for cash income, shade, fruits, fuelwood, building materials, agricultural implements, soil conservation, and palm wine. Similarly, in a survey of fuelwood use and farm tree management in northern Nigeria, more than half of a sample

of 790 landowning respondents reported up to ten trees growing on their land and a further 9.5%, between eleven and twenty trees. Less than 10% of respondents owned farms that were completely treeless. The survey revealed that a significant proportion of farmland trees is planted: only 7% of landholders do not plant trees. Most of those who reportedly plant trees (85.2%) claim to plant between one and twenty. But wildings or saplings are also protected, with only a third of farmers reporting that they do not provide any protection for seedlings that regenerate spontaneously; of the two-thirds who do, the commonest form of protection offered is from grazing animals (Silviconsult, 1991, in Cline-Cole, 2000b).

Fruit trees are perhaps the most common trees preserved on farmlands (Pretty *et al.*, 1992). For example, according to Bradley (1990), the source of fruits for small farmers in the communal areas of Zimbabwe comes about in two ways: the preservation of wild fruits as land is cleared for cultivation, or their replacement by the planting of exotic (and sometimes even indigenous) species in home gardens. He notes that as woodland is cleared for agriculture, through population growth, or through general degradation resulting from over-grazing or over-harvesting of wood, indigenous fruit trees are selectively preserved - in agricultural land itself, or in remnant woodlands. Similarly, Gumbo *et al.* (1990) note that deforestation in Zimbabwe's communal areas is largely a result of clearance for cultivation. However, there is selective clearance with a clear bias towards saving fruit trees. They found that the ten most important trees that farmers selectively retain in fields are *mupfura*, *mutobwe*, *musuma*, *musvimwa*, *mukwakwa*, *munyii*, *mutamba*, *mupani*, *mutarara* and *mutsviri*. In northern Nigeria, Cline-Cole (2000b) reports that farm trees provide a sometimes bewildering range of services and products. However, of these products and services, those that exert the greatest influence over farm forestry practice are fruit and food production and shade provision.

Another response to the declining availability of forest products in the study area is the domestication of certain bushmeat species. The two most common species kept by households are the giant snail (*Archachatina marginata*) and grasscutter (*Thryonomys swinderianus*). Several households are involved in snail farming while few households rear grasscutter, though these are on a very small scale and are largely for subsistence use. The progressive domestication of these species reflects pressures to bring the source of supply under closer control as a result of declining availability and irregularity of supply from wild sources.

Most people reported that they had tried to domesticate other animals such as the giant rat (*Cricetomys gambianus*) and the tree squirrel (*Protoxerus stangeri*) but these animals often do not do well in captivity. Some people also expressed interest in mushroom cultivation. However, most people were not aware that NTFPs such as canes can be cultivated and attributed this to the lack of technical support from the FD. This is an area where foresters can involve local communities; both in terms of managing forests for these locally needed products and in redirecting forest policy and laws to incorporate the needs of local communities.

8.10. Farmer tree planting and management

Throughout history, farmers have protected, planted and managed trees on their land in order to maintain supplies of sought after products no longer readily available from forests (Falconer, 1990b; Arnold, 1990; Arnold, 1997). The inclusion of trees as a component of the agricultural system increases the structural complexity of the field environment, provides a degree of complementarity in seasonal and interannual production patterns with annual crops and changes the labour commitments to an area of land (Pretty *et al.*, 1992). Retaining trees on farmland during clearance for agriculture or subsequent planting of trees produces a range of ecological habitats and seasonal niches ideal for wild food production (Pretty *et al.*, 1992). Generally, farmers incorporate trees into their farming systems for a variety of products and overlapping motivations. Thus, while trees may be planted for marketable fruits or poles, these products and many others are also valued for consumption and use by the household (Falconer 1990b).

Arnold (1994) reports that planted fruit trees appear everywhere at a very early stage in agricultural settlement, and as natural tree stocks diminish the amount and range of planting generally increases. He notes that though the main impetus for this domestication is to meet household needs, it can include species intended for non-farm enterprise activities.

For example, in Zimbabwe, Bradley (1990) reports that in the event that excessive clearance of woodland (and trees in cultivated land) takes place, farmers show enthusiasm for planting exotic fruit trees in their own plots (usually close to the house in

the home garden where they can be protected). Indeed, fruit tree cultivation occurs even where indigenous trees remain extant in the fields and grazing areas. Campbell (1986) also found that farmers in severely deforested areas in Zimbabwe selectively plant and maintain their favourite fruit species on farms. He noted that in this region the frequency of consumption and availability of the most popular forest fruit species was not affected by the conditions of the forest resource.

In a similar study in three communal areas (Shurugwi, Mangwende, and Chivi) in Zimbabwe, Campbell *et al* (1993) reported that 92% of the 359 households surveyed had planted trees within the last five years prior to the study. Almost all of these households had planted fruit trees. They noted that shade and ornamental trees are the second most common type of trees planted by households. They found that 72% of households had planted such trees. In a study in western Kenya, Scherr (1997) reported that farmers increasingly cultivate and maintain fruit trees on their farms both for household consumption and for the market. She noted that fruits are particularly used as food for children, and to tide over during the pre-harvest period.

Throughout the study area, attitudes to the planting and preservation of timber species differ from that of non-timber species. Most farmers plant or preserve non-timber tree species on their land/farms but the planting or preservation of timber species is not common. Overall, 94% of households reported that they plant or protect non-timber tree species on their farms. Common trees planted or left on farmlands include fruit trees, such as orange, coconut, avocado, pawpaw, and mango. Other commercially important non-timber species such as oil palm and kola are also increasingly planted and maintained on farmlands.

Discussions with households revealed that farmers are most interested in planting or preserving trees that will give them immediate and direct benefits. Thus, the majority of households reported that they either plant or preserve kola trees on their farms. Kola is an important source of income in the area and nearly all households are involved in the sale of kola when it is in season.

Although, farmers are mostly interested in planting or retaining trees that provide immediate and direct benefits on farmlands, they also preserve other trees for the purpose of providing shade and enhancing the soil, especially on their cocoa farms.

Many farmers recognise that different trees have different impacts on the environment and that some have favourable effects on the soil and farm environment. Thus, when clearing land for cultivation farmers do not cut all trees on their plots, but they preserve those that are important in terms of shade and soil enhancement (see Table 8.5). Even those that are felled are allowed to coppice to serve as shade for cocoa. This is an indication that farmers do manage trees to meet their farming needs.

Table 8.5. Common tree species preserved/planted on farmlands and reasons for preserving them

Local/Common Name	Scientific Name	Important reasons for preserving/planting
Abe	<i>Elaeis guineensis</i>	Fruits/sap for subsistence/income
Abesebuo	<i>Irvingia gabonensis</i>	Fruits/seeds for income
Adweaa	<i>Dacryodes klaineana</i>	Fruits for subsistence
Ankaa	<i>Citrus sinensis</i>	Fruits for subsistence/income
Avocado	<i>Persea americana</i>	Fruits for subsistence/income
Bese	<i>Cola nitida</i>	Nuts for income
Brofre	<i>Carica papaya</i>	Fruits for subsistence
Emire	<i>Terminalia ivorensis</i>	Shade, soil fertility improvement
Frumtum	<i>Funtumia elastica</i>	Shade/soil enhancing
Kakapenpen	<i>Rauvolfia vomitoria</i>	Shade/soil enhancing
Kuokuonisuo	<i>Spathodea campanulata</i>	Soil enhancing/shade
Kyenkyen	<i>Antiaris toxicaria</i>	Soil enhancing
Mango	<i>Mangifera indica</i>	Fruits for subsistence/income
Nyamedua	<i>Alstonia boonei</i>	Shade/soil moisture and soil fertility improvement/suppression of weeds
Nyankyerene	<i>Ficus exasperata</i>	Soil enhancing
Esa	<i>Celtis milbraedii</i>	Fuelwood/soil enhancing
Odum	<i>Milicia excelsa</i>	Shade/soil fertility improvement/ suppression of weeds
Odwuma	<i>Musanga cecropioides</i>	Soil enhancing/ suppression of weeds
Ofram	<i>Terminalia superba</i>	Shade/soil moisture improvement
Ogyama	<i>Alchornea cordifolia</i>	Soil enhancing
Onyina	<i>Ceiba pentandra</i>	Soil fertility improvement /shade/ enhance the fruiting of cocoa
Opam	<i>Macaranga barteri</i>	Soil enhancing
Prekese	<i>Tetrapleura tetraptera</i>	Fruits for subsistence/income
Sesemasa	<i>Newbouldia laevis</i>	Soil enhancing
Sofu	<i>Sterculia tragacantha</i>	Soil enhancing/enhance the fruiting of cocoa
Sonkyi	<i>Allanblackia floribunda</i>	Seeds for subsistence/income

Farmers mentioned three main reasons for planting or preserving trees on their farms. Overall, 55.9% of households that reported that they preserve trees on their farms indicated that their most important reason for doing so is income generation, 23% said that their main reason is subsistence needs, 18.4% mentioned environmental protection (such as shade, windbreaks, provision of soil moisture and soil fertility improvement) while 2.6% of households stated "other" as their reason for planting or preserving trees. The high proportion of farmers indicating income as their most important reason for

planting or leaving trees on farms clearly shows the extent to which the rural people are dependent on the cash economy.

As was mentioned earlier, the planting or tending of timber trees is not popular in all the study communities. In fact, none of the households interviewed had planted timber trees on their land. Again, as many as 72% of households reported that they do not tend or protect timber trees on their farms. Only 28% of households reported that they protect timber species on their farms. The vast majority of farmers maintained that, where possible, they destroy timber species on their cocoa farms in order to protect their crops from the damaging effects of timber logging. The reasons given by farmers for not planting or preserving timber species on their farms are presented and discussed below.

Although 28% of households reported that they preserve timber species on their farms, almost all of them indicated that they do so for the purpose of providing shade for the cocoa and not for the production of timber. Most people who participated in the focus group discussions, however, agreed that timber trees have future economic benefits. In a similar study in southern Ghana, Amanor (1996) found that 99% of farmers had never planted timber trees. Instead, farmers had planted fruit trees on their farms.

Although in most parts of the developing world rural people recognise the role of trees in providing a number of locally important goods and services, growing or preserving trees is seldom the first priority of rural people. An experience of a development project in Sudan illustrates the point. After an entertaining puppet show that advised the community to plant trees, one of the community leaders spoke up: "Most of us are landless here. If you can bring us land we will first grow food for our children and then we would be glad to plant your trees for you" (FAO 1993). In other words, in this case, food security was the pivotal issue around which virtually everything else turned. It is therefore important to integrate or incorporate livelihood objectives in forest management and tree planting activities in order to win the participation and commitment of rural people.

8.11. Reason for not planting/preserving timber species on farmland

In order to understand why farmers do not plant timber trees on their farms, households were asked to mention any factors that hinder or prevent them from planting or

protecting such trees on their farms. They gave several reasons to explain why they do not plant or preserve timber trees on their farms. These included lack of knowledge on tree planting, long maturity period of timber species, lack of financial support, and land tenure. The rest are tree tenure (Forestry Department control), lack of seedlings, damaging effects of trees on crops (particularly cocoa), and lack of interest in tree planting (Table 8.6). Most households mentioned more than one reason.

Table 8.6. Reasons for not planting (preserving) timber species on farms

Reasons	Number of households	% of households	Total number
Lack of knowledge on tree planting	72	45.0	160
Timber species take too long to mature	38	23.8	160
Lack of financial assistance	91	56.9	160
Lack of seedlings	41	25.6	160
Land tenure and small landholdings	108	67.5	160
Tree tenure (Forestry Department control)	41	25.6	160
Damaging effects of timber trees on crops	22	13.8	160
No interest in tree planting	18	11.3	160

Note: Households could mention more than one reason.

Lack of knowledge

Lack of knowledge on tree planting was cited by 45% of households as one of their reasons for not planting or preserving timber trees on farmland. Most of them reported that they are unable to identify the saplings of timber species and so destroy them when clearing land for farming. Indeed, they maintained that they are not able to distinguish between saplings of timber species and other species. As one woman said, "I cut all of them away because I don't know which sapling is a timber species and which is not".

Several people also said that they have not been trained to plant trees and so do not know what trees to plant, where to get seeds and how to plant them. For example, one woman from Kamaboi Village complained as follows:

"We have no knowledge in tree planting - we have not been trained to do so. All that the forest guards do is to threaten and arrest people for harvesting products from the reserve but they do not train us to plant more trees".

The majority of farmers were of the view that the FD has not done anything by way of training farmers to plant trees, collect seeds and raise nurseries.

Timber species take too long to mature

Nearly 24% of households reported that the long maturity period of timber trees discourage them from planting such trees. Most of them feel that since timber species take too long to mature, the planter may not live to enjoy the benefits of such trees. For example, an elderly woman from Kamaso Village reported as follows:

"I am now 65 years and timber trees may take about 25 years to mature. So if I plant timber trees now I may die before the trees mature. I will not be able to benefit from the fruits of my labour".

Thus, people see investment in timber tree planting as waste of time and something that should be done by the government.

Lack of financial assistance

Lack of financial assistance was named by 56.9% of households as a reason for not planting timber trees. Many of these households maintained that since the planting of timber trees is labour intensive, and since timber species take too long to mature, planting of such species should be considered only by wealthy farmers. In particular, they complained about the initial funds for clearing the land and acquiring seedlings. Most of them believe that the FD should give them financial support in order to plant trees. However, it is not clear whether financial assistance or financial incentives will encourage these farmers to plant timber trees given the other constraints.

Lack of seedlings

Non-availability of seedlings was reported by 25.6% of households as an important reason for not planting timber trees. Whiles some of the households were referring to the general lack of seedlings, others were referring to the non-availability of particular species, such as 'odum' and mahogany. In fact, some people reported that they did not even know where to obtain seedlings. Others also reported that they could not afford seedlings from the FD, as they are very expensive. Thus, for some the problem is one of physical availability of seedlings while for others it is a problem of affordability.

Land tenure and small landholdings

As many as 67.5% of households named land tenure and land shortage as important factors that hinder them from planting timber trees. Most farmers in the area, especially migrants, are tenant farmers who either rent land or depend on sharecropping (share tenancy) for their land needs. Tenant farmers normally have restricted rights to the use of acquired land. In most cases they are not allowed to plant trees unless it has been specifically agreed by the landlord. Most landowners believe that tree planting increases the security of the tenant to land rights and so discourage them from planting trees. Some tenant farmers reported that landowners do not allow them to even use non-timber trees on their farms and so they feel that landowners may appropriate trees they plant on their land.

Most farmers also reported that their landholdings are so small that they do not have land for planting trees. Indeed, 60% of respondents had less than 6ha of land. In a similar study in the area, Amanor (1996) reported that 54% (78 people) of the 145 people interviewed felt that they had insufficient land for farming purposes. This comprised 58% (55) of migrants and 47% (23) of local people, 54% (26) of women and 54% (52) of men.

Most people (especially the indigenous Wassas) maintained that forest reserves have taken a substantial portion of their land while the remaining has been cultivated with cocoa. Thus, timber tree planting is not considered a priority by farmers compared to other land uses, such as food crop production, given the level of land shortage in the area.

Tree tenure

Nearly 26% of households reported that they do not plant or preserve timber trees on their land due to issues of tree tenure. As mentioned earlier, presently all naturally occurring timber trees in Ghana, whether occurring on private land/farm, stool land or public land, are vested in the government. Farmers have no right to harvest timber trees occurring on their farms except on permit from the FD. Thus, farmers do not benefit from timber trees which they themselves preserve and tend/manage on their farms (see also Kotey *et al.*, 1998). Indeed, many people complained about their lack of right to

timber, which is so close to them. Again, most farmers reported that they rarely get compensation from loggers when their crops are damaged during timber harvesting.

These factors discourage farmers from planting or protecting timber species on their land. In fact, the incentive has rather been for farmers to destroy valuable timber trees on their farms before concessionaires have access to the trees. For example, as an elderly man from Sureso Village reported:

"If I will not get anything from timber trees I protect on my land and if timber contractors will harvest them and destroy my crops, then I will destroy them while they are young in order to avoid future damage to my crops".

Most people who took part in the focus group discussions reported that timber trees are for the government and so there is no need for them to plant such trees. Others reported that they are not allowed to harvest timber trees they protect on their land and so there is no incentive to protect timber species. For example, as one woman from Sureso Village said, "since timber trees are for the government and we don't benefit from them, I burn them on my farm in order to plant my crops". An elderly man from Kamaboi Village also reported as follows:

"The most important tree we preserve on our farms is kola since we get direct benefit from the kola nuts when we sell them, and since no timber contractor harvests kola trees. As for timber species I kill them off because they are of no use to me. It is useless for me to protect timber trees for loggers to harvest them without benefiting from the trees".

Thus, 'while legislation can criminalise the economic use of timber trees by farmers, it cannot prevent them from felling trees to make way for farming, particularly as agriculture contributes a much larger share of both gross domestic product and export earnings to the national economy than timber exploitation' (Amanor, 2000: 316).

Although planted trees in Ghana are vested in the cultivator, the widespread misconception about tree tenure issues (that all timber trees are vested in the government) discourage farmers from planting timber trees. Most farmers argue that planted trees may be mistaken for naturally occurring trees and therefore appropriated by the government. Some farmers also question how the FD would be able to

distinguish between planted trees and naturally occurring ones, if they should plant timber trees. Thus, it seems clear that forest and tree tenure systems in Ghana are ineffective with regards to the protection and management of timber species. These systems need to be reviewed to ensure that farmers benefit from timber trees they protect on their farms in order to encourage them to plant or preserve such species.

Damaging effects of timber trees on crops

Damaging effects of trees on crops was cited by 13.8% of households as a reason for not preserving timber trees on farms. Almost all of them were referring to the bad effects of trees on cocoa. Three main varieties of cocoa are grown in the study area: the traditional *amelonado* or *Tetteh Quarshie* variety, the *amazonia* variety, and the new improved hybrid variety. Farmers reported that the *amelonado* and *amazonia* varieties are shade-dependent while the hybrid cocoa has very low shade requirements.

The majority of farmers indicated that too many trees on cocoa farms is actually not good for the new hybrid cocoa. Many of them claim that too much shade reduces the yield of the hybrid. Under such circumstances farmers would have no direct incentives or benefit from keeping timber trees on their farms. Thus, the introduction of the new light-tolerant hybrid cocoa in the area has compelled many farmers to reduce the number of trees on their farms. Farmers reported that the Cocoa Service of Ghana advises them to preserve fewer trees on their hybrid cocoa farms in order to improve yield. This is obviously an inter-sectoral policy conflict; i.e. increased cocoa production and forest and tree conservation.

Several timber trees are also considered by some farmers to have an unfavourable effect on cocoa and other crops. Even some of the species mentioned by some farmers to provide shade and enhance the soil were also mentioned by other farmers to have bad effects on cocoa and other crops. Timber species reported by farmers as being bad for cocoa include 'wawa' (*Triplochiton scleroxylon*), 'dahoma' (*Piptadeniastrum africanum*), 'onyina' (*Ceiba pentandra*), 'asamfina' (*Aningeria robusta*) and 'odum' (*Milicia excelsa*).

Farmers consider these trees to be bad because either they draw heavily on soil nutrients and soil moisture (asamfina and wawa), dry out soils and compete against nearby crops, have large buttress roots which occupy planting space (dahoma), have leaves that are

slow to decompose (wawa), have the tendency to drop large branches thereby destroying crops (onyina) or because they harbour and spread diseases and mistletoes to cocoa (odum, onyina, and dahoma). 'Asamfina' and 'wawa' were particularly mentioned in discussions to have extensive roots that drain the soil of nutrients and moisture. 'Onyina' was also reported by several farmers to be a wild host for cocoa swollen shoot disease.

No interest in tree planting

A little over 11% of households reported that they simply have no interest in tree planting. Most of them maintained that the planting of timber trees is not important. Some of them have not even bothered to know about growing timber trees. This could be probably due to the misconception on tree tenure.

8.12. Traditional tree and forest conservation practices

Local communities living in forest environments have traditionally protected forest and tree resources through the creation and evolution of local institutions. Indeed, in Ghana and other parts of Africa, forestry is constituted by individual practices, cultural beliefs and local societal institutions (Cline-Cole and Madge, 2000). Local institutions in this context refer to local 'regulations', including the rules and norms, which govern individual and group behaviour (Mearns and Dulamday, 2000; North, 1990). These institutions, including customary local rule systems play a critical role in determining how local people use forest resources on a day-to-day basis (Mearns and Dulamday, 2000). They are more often taboos, which govern how certain forest resources are harvested or prohibit the local people from entering the forest or using certain forest resources.

For example, in all the study villages, there is a taboo day called "adim" which occurs once every three weeks, during which people are prohibited from going to the farm or entering the forest for three consecutive days (usually Wednesday, Thursday and Friday). According to the local people, going to the farm or entering the forest at this time could provoke the gods of the land and the consequence could be death or protracted illness. Key informant interviews suggest that the taboo days are very important for the management of forest resources, especially wild animals, because the quiet atmosphere during the taboo days enables the animals to come out of their hiding

places to feed, thereby protecting the resources. Taboo days are locally called 'daboni', which literally means 'bad day'.

Before the wide scale forest reservation in Ghana, local communities practised a form of forest protection by creating sacred groves. Places that were normally reserved as sacred groves are graveyards, river courses, historical abandoned settlements and ancestral homes (locally called 'amanfon') (Agyeman, 1993). As has been discussed in Chapter 6, sacred groves are generally believed to be the abode of spirits and, therefore, fetish priests are the only people entrusted to manage them. Different tenurial restrictions apply in different sacred groves depending on the purpose and type of the grove. Normally, groves which are set aside as burial grounds for chiefs have the greatest restrictions while those along river courses and on historical abandoned settlements have the least restrictions (Agyeman, 1993).

Although communal rights to the collection of parts of trees and other forest products such as snails and fuelwood are usually admitted in most groves, the cutting of trees is not permitted in them. Because of the restricted access, sacred groves provide a gene bank for flora and fauna (Tuffour *et al.* 1991). Many people in Ghana believe that the concept of sacred groves may have finally persuaded local chiefs to agree (although in some cases they were forced) to the reservation of their land as forest reserves with similar restrictions.

Although sacred forests still occur in many areas of Ghana, they are increasingly being threatened because of population pressure, the introduction of Christianity, the decreasing number of Traditional African Worshipers and the arrival of new-comers who do not always respect local traditions. Nowadays, most people no longer believe that the groves are sacred. Local communities therefore need to be educated to protect them for their intrinsic value and tree products rather than their spiritual value.

Throughout the study area, certain trees are considered sacred and therefore people are prohibited from felling them. They are believed to be the abode of spirits or to have supernatural powers. The felling of those trees can only be carried out after certain sacrifices have been made. The two most important species that are considered sacred in these communities are 'odii' (*Okoubaka aubrevillei*), a huge tree and 'ahomakyem' (*Spiropetalum heterophyllum*), a giant liana. These two species are believed to have

wide medicinal potency and therefore this is a means of protecting them. Other trees believed to be sacred in the area include 'odum', 'onyina' and 'bonsamdua' (see Table 6.19 in Chapter 6).

Similarly, in these communities, the use of a lamp or lantern to harvest snails in the night is reputed to be a taboo. An investigation revealed that snails are nocturnal organisms and so one is likely to make more catch in the night, which can lead to the depletion of the resource. This institution therefore helps to protect the snail resource. Local people believe that going contrary to these traditions could lead to undesirable consequences.

Traditional forest conservation practices are not only common in Ghana. They are found in many parts of Africa. For example, in Zimbabwe, Fortmann and Nihra (1992) report that sacred controls are part of the woodland management systems. They found in their study that people did not cut trees on burial sites and there were certain trees, which women reported should not be used for firewood, either because they were associated with death or because of their reputed destructive social effects. Indeed, one VIDCO², in its attempt to control deforestation, linked a revitalisation of *mhondoro* cult prohibitions to a ban on cutting fruit trees such as *Uapaca kirkiana* (Wilson 1987, in Fortmann and Nihra, 1992).

According to Clarke *et al.* (1996), there is a strict taboo on felling fruit trees and other trees considered valuable in the Miombo Woodlands of Zimbabwe, Zambia, Tanzania and Mozambique. Certain tree species, such as *Parinari curatellifolia*, are thought to have ties to the spirits and therefore the felling of such trees is prohibited. They note that there are 7 types of traditional forest reserves in the Babato district of Tanzania, which are used for circumcision ceremonies, as meeting places for wise men, and as burial places. The felling of trees in these traditional reserves is strictly prohibited.

Although sacred controls of forest resources appear to be disappearing in many areas due particularly to the introduction of Christianity and/or Western ideas, many local people in Ghana still adhere strongly to these traditions with the belief that going contrary to them could lead to fatal consequences.

² VIDCO is an acronym for Village Development Committee. VIDCOs were set up in 1982 as the smallest administrative unit, which comprises 5-7 traditional villages.

8.13. Collaborative forest management: the perceptions of local people

Forest management and conservation policies in many developing countries have traditionally been characterised by a general distrust of local people's ability to manage the natural resources on which they depend. Governments have nationalised forests and other natural resources and established protected areas in order to protect habitats from human utilisation. However, for a number of reasons, state ownership and management has failed to prevent the conversion and degradation of many forests (see Contreras-Hermosilla, 2000; Repetto, 1993; and Kiss, 1990).

Realising the shortcomings of the traditional top-down technocratic state forest and biodiversity management, many developing countries are increasingly embracing participatory approaches to natural resource management. The goal is to promote local people's active involvement in the management of forests and other natural resources (Kiss, 1990).

Collaborative Forest Management (CFM) can be defined as "working partnerships between the key stakeholders in the management of a given forest" (Carter, 1999:1). The term draws from experience in social forestry, community forestry, rural development forestry, shared forest management, joint forest management, co-management and participatory forest management (Carter, 1999). As the term is conventionally used, emphasis is placed on the crucial (though partial) contribution of local communities in those partnerships. Indeed, the involvement of local communities as well as the state in forest management is now a major component of most internationally-supported programmes of forest sector development in the tropics, and a significant feature of forest policy and practice on a global scale (Brown, 1999).

While critics would argue that communities have been involved in forest management for millennia, their general right of involvement as a question of public policy has, with only a few exceptions, come about within the last 20 years (Brown, 1999). The rationale for involving local communities in forest management are numerous and compelling, ranging from considerations of practicality and cost-effectiveness to philosophical concerns relating to equity and social justice (Brown, 1999; Brown *et al.*, 2002) (see Table 8.7).

Table 8.7. The rationale of involving local communities in forest management

Rationale	Basis/Justification
Proximity:	Local people are the immediate custodians of the forest, and those most dependent on it in a variety of ways. Hence they are best placed to ensure its effective management.
Impact:	Their livelihood activities likewise have a very direct effect on the condition of the forest; thus, their involvement in its management makes sound practical sense.
Equity:	Community-based forest management may be expected to increase the resource flows to rural populations, leading to important effects on poverty alleviation and income distribution.
Livelihoods:	Given that forests are often an important source of rural livelihoods - often particularly to the economically or socially disadvantaged, CFM has the potential to strengthen social security.
Capacity:	Recent experience of community forestry (e.g. in Nepal) suggests that it can result in improved forest quality and condition, over and above the levels which governments have been able to establish independently.
Biodiversity:	Increasingly, CFM is viewed as a means of supporting biodiversity conservation. Multiple purpose management of forests by communities is likely to lead to better conservation of biodiversity than industrial management.
Cost-effectiveness:	Involving local communities in forest management may be an effective way of cutting forest management costs.
Adaptation:	Almost by definition, flexible and adaptive management cannot be delivered centrally; local circumstances and interests must be incorporated.
Governance:	Involving communities and community institutions in forest management (a sector often noticeably lacking in 'good governance') may help to introduce discipline into the management of the sector and offer significant checks and balances on otherwise unregulated public services.
Development philosophy:	CFM tends to fit well with the wider development assistance strategies of the international community, stressing local participation, decentralisation and 'subsidiarity' (the view that decisions should be taken as close as possible to the affected citizens), as well as the promotion of civil society.

Source: Adapted from Brown (1999).

From a local perspective, Carter (1999) also puts forward the following rationale for involving local people in forest management:

- *Securing tenure and rights of resource use* - Where local people do not have legally recognised rights of access and use of forests, CFM can be a means of achieving such security. Where they do, CFM can still be seen as a confirmation of such rights.
- *Sustainable, long term production* - CFM provides a mechanism for ensuring the availability of forests and forest products for future generations.
- *Distribution of assets* - Different individuals may hope for a greater share of forest resources under CFM agreements.
- *Local decision-making* - CFM provides the opportunity to participate in forest-management decisions.

- *Empowerment* - In some cases, control over forest management may be seen as, ultimately, a tool for greater overall empowerment (Carter, 1999: 2).

Collaboration in forest management can only be achieved where the key stakeholders are willing to participate in the process. One of the most important barriers to the adoption of CFM is the level of national political will, particularly where forests have high commercial value for their timber and timber products, values which governments (or their representatives) are often unwilling to surrender (Brown, 1999). From the perspective of local people, if they already have full rights of access and use over forest land, and an established system of management that they believe to be sustainable, they may have little interest in collaborative arrangements (Carter, 1999). Thus, CFM mainly appears to have potential where it is recognised by the state and local people that the current status quo is not working, and change is needed.

Although the FD of Ghana has initiated attempts to involve local communities in forest management with the creation of a Collaborative Forest Management Unit (CFMU) within the department, there is still much reluctance on the part of authorities and vested interests to relinquish control over the management of forest resources. The debate is now focused on where and how such collaboration can be achieved.

In order to explore local people's views on CFM, households were asked to mention what they think is the best way to manage their forests. These discussions suggest that the local people are very much in support of collaboration. For example, 69% of the households surveyed reported that the government or the FD should involve them in forest management and protection (see Table 8.8).

Most people maintained that the problem of forest resource depletion could be addressed if the communities collaborated with the FD. The vast majority felt that their involvement would enhance forest protection, and control the utilisation of forest resources. They claim that local communities are in a better position to check unauthorised exploitation of forest resources since they live closer to the forests. Indeed, most people maintained that they help the FD by protecting the reserves against illegal timber harvesting.

Table 8.8. Local people's views on how forests should be managed

Views/Perceptions	Number of households	Per cent of households
Put more forest under reservation	6	3.8
Plant more trees	129	80.6
Prevent local people from harvesting NTFPs in reserves	14	8.8
Prosecute those who enter the reserve forests illegally	35	21.9
Allow local people to harvest NTFPs from the reserves but harvesting should be regulated	63	39.4
Outright prevention of timber harvesting from the forests	65	40.6
Involve local people in forest management/protection	110	68.8
Prosecute those who set fire in the forests	106	66.3
Prevent farming in the forest reserves	42	26.3

Note: Households could report more than one view on how the forests should be managed.

In general people have well-developed proposals for ways of involving local people in the management of forests and control of exploitation from the reserves. Some suggested a local task force to check unauthorised exploitation while others said that both the communities and the FD should share responsibilities in protecting the forests. People therefore appreciate the need to support the efforts of the FD. One woman from Kamaso Village described her perceptions of CFM as follows:

"Working with the FD is a laudable idea because we are the people who live in the forest and therefore we are in a better position to detect any offences in the reserve. If the FD involves us in forest management, it will empower us to question any illegal activity in the forest. Last year a gentleman came to this village and was harvesting timber from the forest. He claimed that he had a permit. We knew it was not true but we did not report it since we have not been made aware that we are involved in forest management".

People suggested some roles that the local communities can play in protecting the forest reserves. These included checking illegal activities in the forest, boundary clearance, and fire prevention. In order to make community involvement effective and attractive, some of the community members suggested that the government should give them authority (such as identity cards and uniforms) to protect forest resources and should

also provide incentives such as cutlasses, Wellington boots, means of communication and allowances.

8.14. Conclusion

This chapter has shown that current statutes in Ghana provide few incentives for farmers to engage in sustainable management of forests or to plant/preserve timber trees on their farms. Local people have no right to harvest NTFPs from forest reserves without a permit from the FD. However, most people complain that the NTFP permit is expensive and complicated to obtain. Again, all naturally occurring timber trees (no matter where they occur) are vested in the government. Farmers have no right to harvest timber trees on their farms without a permit from the FD. Farmers therefore do not benefit from timber trees they protect on their farms. This discourages them from preserving timber species on their farms and results in some illegally destroying valuable trees on their farms. In fact, the permit system has fostered very hostile relations between the local people and the FD.

The chapter suggests that people's current attitudes towards forests and forest products may pose problems for the future. Many people view the reserves as land banks for future generations while, on the other hand, they have little sense of custodianship because the management of the reserves is seen as a Government responsibility.

Indeed, the environment of many parts of the study area is changing rapidly. Forest resources, which have long been plentiful, are now becoming scarce, especially in off-reserve areas and near villages. Pretty soon the forest reserves will come under increasing pressure for NTFPs and probably for farmland as well, if not already so.

Throughout the study area people recognise the value of trees for both subsistence and income. Thus, farmers increasingly incorporate trees in their farming systems in order to provide important products no longer available in nearby forests. Although, people deliberately plant and preserve trees on their farms, the planting and preservation of timber species is not common in all the study villages. Farmers are interested in planting/preserving trees that yield immediate and direct benefits. Reasons given by farmers for not planting or preserving timber trees include land and tree tenure, lack of knowledge, lack of seedlings, damaging effects of trees on farms and the long maturity period of timber species.

Local people's interest in forest resources, both inside and outside reserves, is largely confined to the exploitation of NTFPs. Thus, NTFPs provide an asset to forest managers in that they are the main link between FD activities and the people living near the forest. However, forest managers have largely ignored locally valued products since their mandate has been to manage forests for an industrial timber market and to conserve the forest estate. And yet, it is clear that forest resources continue to support the economies of communities living near them and evidence from this study suggests that the forests are being more extensively exploited for NTFPs than in the past, especially for those products in trade. The economic buffer provided by these resources is helping to tide households through hardship periods, to keep their children at school, and to support farming.

As the people are dependent on the forests for income as well as subsistence needs, there is a great need and opportunity for the FD to work with them at forest management. Indeed, the vast majority of people support collaborative forest management and many have well-developed proposals for ways of involving local communities in forest management.

While the livelihood value of NTFPs has long been recognised, these resources do not yet feature in forest management planning in Ghana. However, NTFPs, as the main link between communities living near forest reserves and the FD, provide a means for collaboration. NTFP management systems, which sustain and develop the value of forests for people living near them, can help to assure people's interest in the forest's long-term management. More active and flexible management is therefore required to promote and develop local communities' interests in maintaining the forest while at the same time, ensuring the sustainable exploitation of the NTFP resource.

CHAPTER 9

SUMMARY AND CONCLUSIONS

9.1. Introduction

The aims of this study were to determine the extent and manner in which forest-based resources form part of livelihood structures of forest and near-forest dwellers in Ghana and to identify the impact of local people's dependency on the forest resources and the extent of adaptation to forest resource decline. The study has revealed in detail some relevant issues pertaining to the contribution of forests to rural livelihoods in Ghana. This concluding chapter summarises the main findings of the study and considers their implications for the management of forest resources to ensure that the forests are conserved while they continue to supply benefits to local people. The final sections of the chapter present recommendations and suggestions for further research and highlight areas of weakness in the study.

9.2. Forests and rural livelihoods

This study has shown that although agriculture is the production base and the main source of livelihood in the Wassa Amenfi District, forest product gathering and/or processing are integral parts of the local production system. They complement cultivation and function to increase household food and livelihood security. Indeed, forests and related flora and fauna contribute to all aspects of rural life in the study communities: providing food, medicines, firewood (fuel), fodder, canes, building materials (poles and thatch), wrapping leaves, pestles, chewing sticks, and materials for all sorts of household items, as well as many more intangible benefits such as cultural symbols, ritual artefacts and sacred sites. Though a significant proportion of forest products are used in the household, the sale of gathered forest products and processed goods derived from them also provides an important part of the family income throughout the year. Non-timber forest products thus form an integral part of the rural economy.

9.2.1. Subsistence uses of forest products

Food obtained from forests and associated vegetation plays an important role in the household economy. Several species of forest foods are widely consumed throughout the entire area. Virtually all households consume several varieties of forest foods, ranging from fruits to bushmeat. However, the frequency of consumption is influenced by seasonal availability. Though the quantities of forest foods consumed in households are small compared with the main staples, they play a very important supplementary role. In addition, forest foods also play seasonal and emergency roles in the rural communities; they are used to help meet dietary shortfalls during particular seasons of the year and are important in times of crop failure, famine, and other emergencies.

In addition to forest foods, a wide range of other forest products contribute greatly to the material livelihoods of rural households, including fuelwood, medicines, building materials, wrapping leaves, pestles, canes, chewsticks, chewsponges, bamboo, and so on. Most household items such as baskets, sleeping mats, crop drying mats, grinders, mortars, spoons and other utensils are also produced from forest and tree resources. Forest products thus feature significantly in the material culture of the study villages.

The contribution of forests and forest products to rural livelihoods and the well being of rural people is also manifested in the spiritual, cultural and traditional values placed on them. Forest products feature in many cultural ceremonies such as marriages, funerals, initiations, the installation of chiefs and the celebration of births. Throughout the study area certain forest products are considered sacred and are therefore feared and protected. These plants and animals are believed by the local communities to be the abode of spirits or to have supernatural powers.

Today, forest areas are not the only source of NTFPs. Many forest foods and other forest products are gathered from the farm and fallow areas rather than from forests. Even so the availability of most NTFPs appears to be declining these days. For most products the demand may soon outstrip supply. For example, the desired species for chewsticks (*Garcinia epunctata*) is becoming scarce in all the study communities.

9.2.2. Income from forests and household livelihoods

Livelihood diversification is an important household strategy throughout the study communities. Virtually all rural households rely on a diversity of activities to help make a living. Although for most households farming is the major source of income, off-farm activities such as petty trading, casual labouring (day labourers), and forest product gathering and processing play an important role. Household livelihood strategies such as diversification of income activities, multiple resource exploitation and intensification of other economic or occupational activities, all aimed at coping with stress conditions, provide useful lessons for those interested in seeking models of the way whole societies adapt to their biotic and geographic surroundings.

The results of this study reveal that forest-based activities provide one of the most common income-earning options for households throughout the study area. Indeed, 94 per cent of households obtain some income from forest product activities. For many households the gathering, processing and sale of forest products provides one source of supplementary income, while for some households, especially those involved in 'akpeteshie' distilling, carpentry, woodcarving and medicine, forest product activities provide the main source of livelihood. However, the majority of forest-based income activities (especially the gathering activities) display considerable seasonal fluctuations in the degree of involvement, mainly as a result of changes in farm labour requirements, the increased need for cash during hardship periods, the seasonal availability of raw materials or some NTFPs and fluctuations in demand. The majority of forest-based cash earning activities usually decline during planting and harvesting periods, when farm labour requirements are high, but increase during the hunger season when people need money to buy staple foods.

While some forest-based activities are characterised by high returns comparable with agricultural activities, others offer very low returns to labour. For example, activities such as medicines, palm wine production, 'akpeteshie' distilling, palm oil processing, carpentry and wood carving are good 'earners' while other activities such as chewsponge and washing sponge production, snail and mushroom gathering, and thatch production offer extremely low returns. Nevertheless, most households maintained that the income obtained from forest-based activities contribute significantly to their livelihoods, especially when agricultural income is non-existent. This income is often used to pay

school fees, to buy food for the family, and is sometimes invested in agricultural production.

There are often gender differences with respect to engagement in forest-based income earning activities in the study communities. Women feature in gathering activities - for snails, mushrooms, wrapping leaves, chew sponge, washing sponge, etc. while men dominate processing activities such as basket making, thatch making, palm wine tapping, palm gin (akpeteshie) distilling, carpentry and woodcarving.

Recent immigrants to the area are much more dependent on forest-based income generation than indigenous households. Migration of individuals, principally to establish cocoa farms, is a significant factor in the development of agriculture and also has consequences for the level of commercialised forest-based activity in the study area. In the earlier stages of establishing a cocoa farm, migrant farmers supplement their incomes with forest-based activities. Early migrant settlers in the area were able to acquire large tracts of land cheaply. However, later migrants are confronted with more developed land markets and growing land scarcity and therefore have less land and fewer income options. The majority are therefore sharecroppers, renting land under share tenancy agreements. As a consequence, they depend, to a greater extent, on forest-based activities for their initial livelihood.

Despite the significant contribution of forest-based activities to household incomes in the study area, local people are faced with a wide array of problems that sometimes discourage them from engaging in these activities. Important problem areas reported by households include finance, access to raw materials, government regulations, tools or equipment, marketing, labour, and transportation problems.

9.3. Dynamics of local use and availability of forest resources

Although forest foods contribute greatly to household subsistence, their consumption appears to be declining. Most elders indicated that the variety and importance of forest foods in the diet has declined over their lifetimes. Several reasons were given to explain the declining consumption of forest foods, including the reduced availability of forest foods, the perception of backwardness or primitiveness associated with most forest foods, the availability of alternative cultivated varieties, a decline in knowledge of the

different varieties of forest foods, and the increasing reliance of rural people on the cash economy - purchasing food from the market rather than gathering from forests. The vast majority of people, however, maintain that changes in forest food consumption patterns are largely the result of declining availability rather than changing tastes.

In the past, in most parts of rural Ghana, forests were especially valued as food reserves in times of scarcity, war, or other emergencies. However, this use of the forest appears to be declining in all the study communities. Most people now obtain their emergency food supplies from the market rather than from the forest. They argue that this is because of the relative scarcity of forest foods. Indeed, local people report that the availability of most NTFPs has declined considerably. Some products have virtually disappeared. In particular, people complained bitterly about the reduced availability of bushmeat species, since it is the main source of animal protein in the study area.

It is important to recognise the huge change in bushmeat trading in Ghana and in other parts of Africa. Though deforestation and habitat loss are often cited as the primary causes of the decline of wildlife, hunting for both local consumption and large commercial markets has become an immediate threat to the future of wildlife in many parts of Africa (BCTF, [undated])¹. The trade in bushmeat has become a business in many parts of Africa. In 1992, the bushmeat trade in Ghana was estimated at US\$ 18 million². Indeed, expanded bushmeat markets exist in many parts of West and Central Africa. For example, it is estimated that Ghana consumes about 15,000 tonnes of snails a year, of which 13,000 tonnes is imported from neighbouring Côte d'Ivoire (Ghana Daily Graphic, 2003). Bennett *et al.* (2002) report that the equivalent of 4 million cattle in wildlife are hunted and consumed each year by the about 30 million people living in the tropical forests of Central Africa. In Cameroon, a recent study in a village (600 inhabitants) located in the buffer zone of the Dja Faunal Reserve revealed that 13 tonnes of bushmeat were extracted and sold in a month (Koulbour, 1999, in Yamagiwa, 2002). Similarly, in Gabon, the overall annual bushmeat trade is worth \$3 million in markets and \$21 million through rural consumption (Steel, 1994, in Yamagiwa, 2002). The

¹ Bushmeat Crisis Task Force (BCTF) (undated) 'Bushmeat: A Wildlife Crisis in West and Central Africa and around the World'. (<http://www.bushmeat.org/pdf/BCTFBRIE.PDF>)

² Source: The third Ghana Living Standards Survey (GLSS) conducted during 1991 - 1992 by the Ghana Statistical Service (cited in Townson 1995).

rising commercialisation and expanded markets of bushmeat threatens not only the future of wildlife in Africa, but also rural livelihoods.

Discussions with key informants suggest that the decline of forest products in the study area is closely associated with timber logging and population pressure. These discussions also revealed patterns which suggest that, since the 1950s, every decade has seen a major change in the availability of forest products. Most believe that NTFPs started to decline in the 1960s, as timber logging became intensive in the area and loggers opened up a significant proportion of the forests. Although logging continued well into the 1970s, the most important driver of forest decline in the area during the 1970s was the migration of tenant cocoa farmers into the area. Forest areas were cleared and turned into cocoa farms. Land became fragmented as the population of tenant farmers increased. Pressure on forestlands and forest resources also increased, leading to over-harvesting and unsustainable harvesting practices.

By the late 1980s, virgin forests outside reserves had virtually disappeared. Certain NTFPs had become scarce and some almost extinct. The scarcity of NTFPs has led to the commercialisation of most products. Urban-based commercial gatherers began harvesting NTFPs in the early 1990s, further aggravating the problem. Today, certain species of bushmeat, such as the red colobus monkey and 'nsorkor' (*Garcinia epunctata*), the best chewing stick species, have almost disappeared from the area.

9.4. Institutional issues in forest access and use rights

In spite of the important contribution of forest resources to rural livelihoods, current statutes in Ghana do not recognise indigenous rights to forest products in forest reserve areas. Local people have no legal rights to forest products in forest reserves. All products within forest reserves, including timber and non-timber tree species, even NTFPs, are vested in the government. The management of trees, the right to own, plant, use and dispose of trees within the forest reserves is controlled by the state through the FD. NTFPs within forest reserves are presently managed through a permit system, where people apply for the right to exploit specific NTFP resources, irrespective of whether or not they exploit for domestic or commercial use and whether or not they are land owning communities of the particular reserve.

Similarly, all naturally occurring timber trees - whether on private or on communal land, or even on private farms - 'belong' to the government. The use of such trees is controlled by legislation and it is an offence for an individual or community to cut or sell timber or merchantable tree species without permission from the FD. Farmers therefore do not benefit directly from timber trees they maintain or protect on their own land and are rarely compensated for damage to food and cash crops resulting from logging operations. Local people resent this form of exclusion and see the permit system as too complicated and expensive for collecting products for personal or domestic use.

This policy of exclusion has fostered poor and hostile relations between local people and the FD. In fact, the permit system discourages any sense of stewardship or responsibility towards forest resources. It creates a sense of alienation, which is a strong disincentive to local management of forests and timber resources. Most NTFP gathering and trading activities are therefore carried out illicitly because of problems of the permit system. People harvest NTFPs profligately and often destroy valuable timber species on their farms before concessionaires can gain access to them.

Indeed, throughout the study area, attitudes to the planting and preservation of timber species differ from that of non-timber species. While most farmers plant or preserve non-timber tree species on their land/farms, the planting or preservation of timber species is rare. None of the households interviewed had planted timber trees on their land. To the contrary, the vast majority of farmers maintained that, where possible, they destroy timber species on their cocoa farms in order to protect their crops from the damaging effects of logging. Although farmers gave various reasons for not planting or preserving timber species on their land, their exclusion from the benefits of timber exploitation (timber tree tenure) and the FD's control appear to be the most important reasons.

9.5. Impact of forest decline on local communities and their coping and adaptive strategies

Nearly everywhere users of forest products are faced with a decline in size of the resource from which they obtain their supplies. Indeed, the environment of many parts of the study area is changing rapidly. Forest products, which have long been plentiful,

are now becoming scarce, especially in off-reserve areas and near villages. This decline has meant a reduced use of forest foods, with fewer income earning options for the rural poor, and increased burdens on households as they strive to meet their basic needs.

The declining importance of forest foods in the household diet means that rural households must rely more on agricultural sources for the bulk of their food. Meanwhile, local people report that crop yields have declined, as they are unable to fallow land properly due to land limitation. Consequently, most households are unable to produce enough food to meet their subsistence needs. The worsening NTFP situation has also forced some households, which were hitherto involved in high return NTFP activities, to engage in alternative activities (such as chew sponge and washing sponge production, snail and mushroom gathering) that offer relatively low returns to labour, putting more stress on households.

As off-reserve forests have largely disappeared and as access to reserves is restricted, local people increasingly leave and maintain selected forest products on their farms in trying to cope with or adapt to the decline. Indeed, throughout the study area farmers recognise the value of trees for both subsistence and income. They therefore retain important trees on their land during land clearance in order to provide the important products that are no longer available in nearby forests. Indigenous fruit trees such as 'adweaa' (*Dacryodes klaineana*), 'atoaa' (*Spondias monbin*), 'prekese' (*Tetrapleura tetraptera*), 'abesebuo' (*Irvingia gabonensis*) as well as oil palm and kola are increasingly retained on farmlands. Others are spices such as 'misowa' (*Capsicum frutescens*), 'fam wisa' (*Aframomum* spp.), 'esro wisa' (*Piper guineensis*), 'wedeaba' (*Monodora myristica*) and 'hwentiaa' (*Xylopiya aethiopica*).

Another response to the declining availability of forest products is the domestication of certain bushmeat species. The two most common species kept by households are the giant snail (*Archachatina marginata*) and grasscutter or cane rat (*Thryonomys swinderianus*) though these are still only produced on a very small scale and are largely for subsistence. The progressive domestication of these species reflects pressures to bring the source of supply under closer control. Most people had also tried to domesticate other animals such as the giant rat (*Cricetomys gambianus*) and the tree squirrel (*Protoxerus stangeri*) but these animals often do not do well in captivity. Most people were however not aware that NTFPs such as canes can be cultivated and

attributed this to the lack of technical support from the FD. This is an area where foresters can involve local communities; both in terms of managing forests for these locally needed products and in redirecting forest policy and laws to incorporate the needs of local communities.

9.6. Implications for the management of forest resources

The results of this study indicate that NTFPs provide critical resources across southern Ghana, fulfilling nutritional, medicinal, financial and cultural needs. However, the way forests are presently managed poses a threat to both rural livelihoods and the sustainability of the forest resources, which support these livelihoods. The potential of forest products to continue to support rural livelihoods in Ghana can only be realised by an increase in the stream of forest benefits to local people. Forest management systems, which are deliberately designed to sustain and develop the value of forests for people living near them, will gain support for long-term, sustainable management. This will require security of access to forest resources, local incentives to protect the forest and its timber resources, and the involvement of local communities in forest management. These are discussed in turn.

9.6.1. Secure access to forest resources

In situations where forest products have important livelihood functions, users need security of access to the resource. Indeed, meeting the needs of local forest users on a sustainable basis should be the principal objective of forest management, and this should be reflected in control and tenure arrangements (Peluso and Padoch, 1996). Security of access to natural resources is an important issue if local communities are to use their local resources sustainably. Those who lack secure rights to the continued use of forests often show little sense of custodianship or stewardship, with little sense of responsibility towards sustainable resource management (Banana and Gomya-Ssembajjwe, 1998; Byron and Arnold 1997).

Insecurity of tenure often encourages short-term exploitation, such as the destructive harvesting practices that assure more certain though (over time) lower returns than might otherwise be obtained. More often, people living in forest margins in Ghana see themselves as 'aliens' in their own land. Their lands have been taken away from them

and turned into reserves with accessibility often non-existent. Because local forest users have no legal right to NTFPs in forest reserves, gatherers often have little or no incentive to harvest the resource sustainably. The value of forests for local communities therefore needs to be promoted and developed. Indeed, indigenous rights to NTFPs in forest reserve areas need to be recognised to enable local people take responsibility for the resource. In this regard, the FD has a role to play in reviewing the present NTFP permit system to ensure that local people have fair and equitable access and entitlements to products in forest reserves for at least subsistence purposes, and to promote their active involvement in the management of the resource.

While the FD claims that subsistence uses of NTFPs from forest reserves is allowed, local people maintain that this is rarely the case. The FD therefore needs to provide a clear distinction between what constitutes subsistence use and commercial use. Although the distinction between 'subsistence' and 'commercial' uses of NTFPs is important, this distinction seems to have little relevance for the present rural economic system, as rural people are becoming increasingly reliant on the cash economy. For example, if a man obtains money from NTFP activities and uses the money to buy food for his family, is the family not subsisting on NTFPs? This makes it very difficult to separate out subsistence uses from commercial uses at the local level. However, a distinction can be made between urban commercial gatherers who often collect in large quantities and local gatherers who usually collect in small quantities, often for subsistence use. A sustainable management system acceptable to locals needs to separate these two forms of exploitation.

The Kwapanin Village in southern Ghana case presented in chapter 8 (where the FD conferred most of the responsibility for monitoring *Marantaceae* leaf gathering onto village institutions) offers a good example of how small efforts to modify the NTFP management system at the local level could benefit both the FD and local communities. This programme generated interest among the villagers in protecting forest reserves and improved relations between the FD and the villagers (Agyemang, 1996).

It is important to note that sustaining rural livelihoods requires putting people at the centre of development, thereby increasing the effectiveness of support aimed at alleviating poverty and sustaining the environment. Access to assets is a critical factor in strengthening poor people's livelihoods. Indeed, tackling inequitable and insecure

access to forest goods and services is one of the most important actions needed to improve forest-dependent livelihoods and enhance forest condition.

9.6.2. Local incentives for protecting forest and timber resources

Current statutes in Ghana provide little or no incentives for farmers to engage in sustainable forest management or to plant/preserve timber trees on their farms. As a former chief of Kofikrom, a village in the Sefwi Wiaso District of southern Ghana reported:

"Government does not reward any farmer who conserves his forest, rather it promotes forest destruction through the National Best Farmer Award, because the underlying criterion for the award is the extent of one's cultivated farm. Why can't there be an award for farmers who are conservation-minded, or at least incorporate conservation into the criteria for the National Best Farmer Award?" (Owubah, *et al.* 2001: 254).

This quotation suggests that there are no incentives for farmers to conserve forests in Ghana. Yet, the importance of incentives to the adoption of sustainable practices has been underscored in many studies. For example, market incentives have been shown to increase adoption of agroforestry practices in Kenya (Scherr, 1995, in Owubah *et al.* 2002).

The case of timber resources is particularly disturbing. Within Ghana's forest zone few natural forests exist outside forest reserves. The landscape is largely made up of orchard crops, with cocoa dominating, along with fallow and food plots (Amanor, 2000). However, significant timber resources continue to exist in these off-reserve areas. The FD estimates that 80 per cent of logged timber comes from outside forest reserves (Richards and Asare, 1999). The FD's recent off-reserve inventory shows that, taken together, cocoa farms, food crop farms and fallow land contain more timber trees than the remaining area of natural forest outside reserves, and that cocoa farms are the second most important source of timber trees, after natural forest remnants (Richards and Asare, 1999). Thus maintenance of the off-reserve (particularly farmland) timber supply is critical for sustainable on-reserve forest management.

This observation highlights the potential for developing farming areas as sites of integrated agricultural and timber production, and for the formulation of policies which encourage closer cooperative links between farmers and foresters. Yet there is a strong feeling that the Ghanaian FD appears to respond only to the narrow concerns of the timber industry, and the preoccupations of people who influence policy-making in international timber circles. Local farmers are marginalised in the process, and any opportunity for building on their knowledge of integrating trees and crops is lost (Amanor, 2000). Currently there is no incentive for farmers to tend or preserve timber trees on their land since they have no timber tenure rights. Indeed, farmers have no share in the value of timber trees they maintain on their land, and have rarely been compensated adequately for damage to crops during timber logging. Many farmers therefore destroy valuable timber trees on their land to avoid the risk of uncompensated damage.

Although the "Interim Measures"³ introduced by the FD in 1995 have improved the situation slightly, at least in respect of payment for damage, fair compensation is still very patchy, and farmers still have no share in the value of timber trees despite being the main managers of the resource (Richards and Asare, 1999). Following a 60% deduction by the FD (for management costs), the remaining 40% of royalties which accrue to timber exploitation are split between the traditional council/authority (20%), the stool land owners (25%) and the local district assembly (55%). Although one can argue that the stools obtain part of timber royalties, little, if anything filters down to the local farmers who protect the trees. Most local people are not even aware that the stools receive a portion of the royalties.

In order to encourage farmers to protect or preserve timber trees, they should benefit directly from timber trees harvested from their farms/land. Thus the sharing of timber royalties should be reviewed to ensure that part of the benefit accrues directly to them. In a study of economic incentives, which encourage cocoa farmers to tend timber trees in Ghana, Richards and Asare (1999) estimated that the FD should pay farmers 10 per cent of the stumpage value of timber trees (although farmers demanded 33 per cent of the stumpage value). They noted that 10 per cent of the stumpage value as well as full

³ These are a set of felling procedures introduced in 1995 which require the participation of both forestry authorities and affected local populations in pre- and post-felling operations off-reserve, as well as the payment of compensation to the affected farmer for the destruction to property and farm crops.

compensation for damage to cocoa, including yield loss compensation, should be enough to encourage farmers to preserve timber species.

Unless farmers receive a percentage of timber revenue, they are unlikely to preserve timber species and will probably continue to destroy valuable timber species on their land.

9.6.3. Involvement of local communities in forest management schemes

The strategy of forest sector policy reform in Ghana has focussed mainly on changes in revenue policy (to increase the price of timber, raise rents and fees, and encourage efficiencies in the industry), and institutional reform of the FD to become a self-funding, service-oriented agency, the Ghana Forest Service. A new long-term area-based concession arrangement, the 'Timber Utilisation Contract' has also been introduced to cover natural timber exploitation both on-reserve and off-reserve (Brown, 1999).

In the area of co-management, the FD has, since 1993, embarked upon an initiative to work collaboratively with local communities in the management of forests. The programme was initiated out of the recognition that "all segments of society" had to benefit from the nation's forest estate. The collaborative thrust is aimed at "increasing forest values to farmers, landowners and rural communities from both on- and off-farm resources" through the management of both timber and non-timber products (Mayers and Kotey, 1996). However, there has been no single legislative or tenurial change to fuel the process of community involvement in forest management (Brown, 1999). Reform has been piecemeal and the authorities are still reluctant to relinquish control over the management of forest resources. For example, the FD is seeking to impose a complete ban on chainsaw logging in the informal sector, despite the effects that this is likely to have on rural livelihoods (Brown, 1999).

Ghana might well look to joint management experiences from India, Nepal and elsewhere in Asia. Many foresters around the world have accumulated experience about joint forest management - in India and in community forestry in Nepal. In India, recognition by forestry officials in the 1970s and 80s that forest resources could not be protected effectively without the participation of local communities led to the formation

of Forest Protection Committees in the three Indian States of West Bengal, Gujarat and Haryana. These committees were tasked with protecting degraded forest land from illegal activities in return for access to a wide range of NTFPs (Campbell, 1992, in Matose, 2002). By 1992, as many as nine states across India had passed regulations leading towards the development of partnerships with local communities as a result of the successes enjoyed by the pioneer states (Campbell, 1992, in Matose, 2002).

In Nepal, the trigger for the introduction of community forestry came in the late 1970s when serious flooding in Bangladesh resulted in rapid depletion and degradation of the forest resources in upstream Nepal. At the time, the Nepalese government recognised the Forestry Department's limited capacity to handle the problem alone and, in 1978, introduced a community forestry policy (Brown *et al.*, 2002). While the state maintained ownership of the land, local communities were given control over the biotic resources and the benefits flowing from them, providing that a percentage was used to improve the resource. Today, there are over 10,000 Forest User Groups in Nepal (mainly in the mid-hills), each consisting of an average of around 100 households and managing an average of 50ha of forest (Brown *et al.*, 2002).

Among others, the main features of joint management as exemplified by the Indian and Nepalese experiences are:

- Recognition that forest dependent communities cannot be excluded from the care and control of forests that surround them, regardless of the legal ownership that may rest with the government.
- Development of partnerships that are based on evolving joint management objectives in which communities share responsibilities and proceeds with state forest departments.
- Passage of enabling legislation as a prerequisite to joint management initiatives.
- Fundamental changes of attitude amongst tradition-bound forest department officials and field staff, as well as among communities suppressed for many generations.
- Collaboration of various stakeholders including forest departments, local community members, NGOs, policy-makers and academic researchers, in the protection and management process (in Matose, 2002).

In Ghana, the challenges for community involvement in forest management include tackling issues of forest tenure, the passage of appropriate and realistic legislation to protect local communities' rights to forest resources, and placing much less restriction upon the kind of forests where community management may be applied. Forest managers have paid little attention to the fact that rural populations cannot adopt guardianship roles wholeheartedly without gaining an equivalent degree of jurisdiction over the resource. Indeed, addressing structural inequities and inequalities in the ownership and control of forests is a key challenge facing the FD. Because local communities are primary users of forest products, and create rules that significantly affect forest condition, their inclusion in forestry management schemes is essential. It is only when they are involved in forest management that they will take responsibility for the resource.

9.7. Recommendations and suggestions for further research

An important issue of particular relevance to the FD of Ghana relates to the supply and availability of NTFPs. This study has revealed that the major factor responsible for reduced availability of forest products is over-harvesting or the unsustainable exploitation of the resource. Therefore, interventions that explore potential management solutions to this problem and investigations of ways to increase supplies through cultivation would appear to be appropriate. Indeed, NTFP cultivation can be incorporated into existing plantation and rehabilitation programmes. These programmes should encourage the cultivation of NTFPs in newly established plantations and in areas where forest rehabilitation is taking place.

The study also highlights the importance of the farm and fallow areas in the supply of forest foods and other NTFPs such as firewood, building materials (poles, palm leaves, bamboo, etc.), *Marantaceae* leaves, medicines and raw materials for many activities, especially palm wine tapping and palm gin (akpeteshie) distilling. At the same time, clearance of these areas for cultivation was found to be one of the important reasons for the decline in availability of forest products. Agricultural expansion clearly has a great influence on forest product availability. Research into means of integrating NTFP production into agroforestry systems along with suitable agricultural extension to encourage the cultivation of trees in farming systems should therefore be considered. Although the majority of farmers retain important NTFPs during land clearance, most

people were not aware that NTFPs such as canes and 'nsorkor' (*Garcinia sp.*) could be cultivated. They attributed this to the lack of technical support from the FD. The FD therefore has an important role to play in encouraging farmers to cultivate NTFPs, especially those (such as 'nsorkor') that are in serious decline.

Another area that may be of relevance to both the FD and the Wildlife Department pertains to the domestication of wild animal species. Throughout the study area people highlighted the importance of bushmeat to their livelihoods, along with the declining availability of wild animals. Many have tried to bring the source of supply under closer control through attempts to domesticate wild animal species such as the grasscutter (cane rat), the duiker, the giant rat and the tree squirrel, but so far these animals often do not do well in captivity. Research into various aspects of the biology and ecology of these species - leading to their effective domestication - should be considered. Such studies should involve the development of cheaper methods of production and extension services to enable the transfer of the technology to small-scale farmers.

Widespread complaints about the reduced availability of NTFPs throughout the area shows that forest resources outside reserves are significantly depleted. Therefore access to resources inside forest reserve areas is an issue that needs to be re-considered by the FD. Research into ways of developing effective alternatives to the present NTFP permit system is therefore appropriate. Such studies should investigate the extent of NTFP exploitation and which NTFPs are becoming scarce, so that measures to limit and control exploitation might be limited to those NTFPs which are believed to be under serious threat from over-exploitation. With such a high proportion of households relying on NTFPs for both subsistence and income, and with NTFP supplies being one of the most important problems that households are currently facing, the FD has an important role to play in supporting the livelihoods of such forest margin communities.

It is clear from this study that forest resources contribute to sustainable livelihoods and the reduction of poverty in many rural communities. However, while some forest-based activities (such as palm gin (akpeteshie) distilling, medicines, wood carving, etc.) offer high returns and therefore appear to represent more viable sources of livelihood for rural communities, others (such as snail gathering, chew sponge production, etc.) are characterised by low returns to labour. Although the study has revealed variations in the profitability and development potential of forest-based income activities, more product-

specific studies are required for an accurate picture of the economic viability of different enterprises and the potential role they can play in sustaining the livelihoods of the rural poor. Such studies should include an analysis of the potential of these activities to deliver long-term profitable employment and should identify cases where technical, marketing, management and financial assistance may be beneficial.

Finally, it is very important to realise that the assets that are the building blocks of livelihoods are not only natural (such as forest resources), but also physical, financial, social and human capital (see Figure 1.1). A range of assets is needed to achieve positive livelihood outcomes – no single category of assets sufficiently provides all the many and varied livelihood outcomes that rural people seek. Those with more assets have a greater range of options and an ability to shift emphasis in their livelihood strategies (Warner, 2000). The ability to move out of poverty is therefore critically dependent on access to assets. Further research is therefore essential to investigate the role of these other livelihood assets in supporting the livelihoods of the rural poor and how these can be improved to offer viable livelihood outcomes.

9.8. Limitations of the study

The study was mainly constrained by the widespread fear among the study communities that the study was being conducted for the purpose of taxation or in order to apprehend those who were illegally obtaining products from forest reserves. In particular, questions concerning incomes from forest-based activities raised fears among households that the data provided was to be used for income tax assessment. Apparently, these fears in the local communities were in response to arrests and certain actions that have been previously taken by the FD after similar interviews. Although the purpose of the study was explained to village authorities and community members at an introductory meeting held in each of the villages, and subsequently to each interviewee during the data collection process, it is possible that such fears were still present. This might have led to the concealment of some important information. Other people refused to speak out altogether. In particular, women were much more reluctant to answer questions since they did not want to say anything to conflict with their husbands.

The fear that the information provided would be used for taxation purposes is likely to have affected responses to questions on income. Similarly, responses relating to the

sources of NTFPs are likely to have been affected by fear that the study was intended to identify those who were illegally gathering from reserved forests. In all likelihood this has led to an underestimation of the numbers of households that obtain income from forest-based activities, the proportion of households' income from forest-based activities, and also the numbers that obtain their NTFP supplies from forest reserves.

Another possible limitation relates to the seasonality/periodicity of forest-based activities. As mentioned above, the majority of forest-based income activities display considerable seasonal fluctuations, mainly due to the seasonal availability of NTFPs, changes in farm labour requirements, and fluctuations in demand. The period during which the fieldwork was conducted did not coincide with the season for a number of forest foods and non-food NTFPs. Nor did it coincide with the season for involvement in all forest-based income activities. It is therefore possible that those NTFPs and activities, which were out of season during the period of the fieldwork, might have been missed by the household survey and hence unrecorded.

A related problem concerns the reliability of recall information gathered from respondents. In some cases, respondents had to recall what they had done in the past, especially for those activities which were out of season during the fieldwork. In addition, respondents were required to compare the present situation to the situation that existed ten years previously, particularly with regards to the consumption of forest foods and availability of NTFPs. It is therefore likely that respondents could not accurately recollect past information and events.

These limitations notwithstanding, the multiple methodology employed in this study helped to build triangulation into the data collection process. This ensured that biases are significantly reduced, if not completely eliminated.

9.9. Concluding remarks

This study has shown that forest and tree resources have, and continue to play an important role in household food and livelihood security of forest communities in Ghana, especially during seasonal and emergency hardship periods. Very large numbers of households continue to draw a wide range of foods from the forest and generate some of their income from forest product activities. The economic buffer provided by forest

resources helps to tide households through hardship periods, to keep their children at school, and to support farming. However, the major significance to village communities of 'minor' forest products is often barely recognised by the trustees of the forests. Customary rights to forest products, promulgated at the time of reservation, have largely been eroded. While stools and local communities regard forest reserves as a valuable legacy, there is growing local resentment at the low level of benefits that they receive. Indeed, local people are seeking better access and increased benefits from the forests. As policing and regulation are increasingly the only strategies used to maintain and protect forest resources, local communities feel increasingly alienated from reserve management.

The question is, how is it that local communities seem to have accepted state management of forests without some action to bend it to their own advantage? Does this suggest that community participation in forest management is not community-driven at all but government or state-driven? The answer to this seems to lie in the depth with which command and control norms over forests were entrenched over the 20th century (Wily, 2002). The influence of 'law' and what is 'lawful' cannot be underestimated in this context. As Wily (2002: 7) notes, "over three or more generations since the advent of introduced state paradigms of forest management, millions of rural dwellers appear to have been persuaded that it is not correct for them to own, control or manage significant forests themselves - or at least to tolerate and accept the laws which have dictated this". Indeed, throughout much of Africa, community-initiated networks or lobbying associations do not yet characterise community participation in forest management in the way they do elsewhere (such as in Nepal where it is well developed) (Wily, 2002). However, current indications in Ghana are that FD-led regulatory systems on their own will not secure the resource. The challenge is to combine the FD's systems of regulation and control with community-based activities, which enhance rather than antagonise forest management.

The worldwide growth of environmental consciousness has been accompanied by the gradual realisation that conventional, top-down and purely technical approaches to natural resource conservation have often been detrimental to the people most dependent upon those resources for their livelihoods (Geoghegan and Renard, 2002). As a result, debates and actions have focused on reconciling conservation and development objectives, and integrating people and their institutions into processes of development

and natural resource management (Geoghegan and Renard, 2002). It is now widely recognised that local people have a central role to play in protected area management, especially those that are reliant upon the natural resources contained in these areas (Borrini-Feyerabend *et al.*, 2000; Kothari *et al.*, 1996; Western and Wright, 1994). Thus, forest reserves cannot simply be viewed in isolation from the communities within and near them. The old paradigm of exclusion is no longer tenable. The knowledge, management systems and innovations of local people are crucial to the sustainability of the resource.

Indeed, an equitable distribution of incentives, benefits and responsibilities associated with forest management - between the FD, landowners, local communities, and concessionaires, as well as other stakeholders seems to be the way to (re)gain the confidence and commitment of local authorities and communities for sustainable forest management in Ghana. This might ensure that the forests are conserved whilst at the same time continuing to support rural livelihoods. This study therefore underscores the importance of natural resource tenure in rural livelihoods and natural resource management. It is only through secure rights to a given resource, and secure control over the benefits from it, that individuals and groups may be encouraged to undertake long-term investments in environmental management or enrichment. In sum, the study highlights the need to strengthen local institutions that will respond to people's needs for livelihood security, and to strengthen local claims-making capacity in relation to the institutions of the State.

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APPENDIX 1

Medicinal uses of wild animals among communities living around forest national parks in southwestern Ghana

Species	Part Used	Ailment/Condition	Mode of application
African civet	Faeces	- Gonorrhoea - Keloids - Bad body odour	- Added to pepper and used as enema. - Smearred over affected part. - Mixed with shea butter and used as body cream.
	Anal gland	- Spiritual powers	- Used in body creams to drive away evil spirits.
Leopard	Skin	- Convulsion - Kwashiorkor - General body weakness	- Worn as talisman around the waist. - Worn as talisman around neck. - Used with herbs as body ointment.
	Bone	- Weak child	- Put in water for bathing
Lion	Skin	- Convulsion - Weak child - Vanishing powers	- Worn as talisman around waist. - Put in water for bathing. - Worn as talisman.
Ratel	Bone, skin, and hair	- Spiritual powers	- Burnt, mixed with herbs and used as body ointment; used by hunters for fortification.
	Bone	- Weak child	- Put in water for bathing.
Mongoose	Faeces	- Barrenness - Spiritual powers	- Mixed with herbs and used as body ointment.
Chimpanzee	Bone	- Abdominal pain	- Ground into a powder and sprinkled on food.
Black & White colobus monkey	Meat	- Purification and strengthening of widow/widower	- Used in food.
	Faeces	- Spiritual strengthening after birth of tenth child - Miscarriage	- Mixed with herbs and used as body ointment. - Mixed with herbs and used as enema
Olive colobus monkey	Hair	- Diseases in children associated with close births	- Used as talisman.
Red colobus monkey	Skin	- Bruises and rushes on new-born babies	- Used to wrap up medicines used as talisman.
Bosman's Potto	Hair	- Burns	- Mixed with honey and smearred on the affected part.
Maxwell duiker	Hooves	- Antenatal care	- Used with herbs in palm-nut soup.
	Meat	- Purification and strengthening	- Used in food.
	Skin & horns	- Magical powers to catch thieves	- Used in food.
Black duiker	Horn	- Magical powers to catch thieves	- Used with incantations to catch thieves.
Royal antelope	Brain	- Magical powers to catch thieves - Diseases resulting from evil spirits	- Used with herbs. - Used with herbs.
	Horns	- Childhood illnesses associated with close births	- Used as talisman.
Bush buck	Skin	- General body pains	- Used in ointments.

Elephant	Dung	- Childhood diseases associated with close births - Bone fractures, oedema, elephantiasis	- Used as enema or smeared on body of sick child. - Mixed with herbs and smeared on affected part.
	Molar tooth	- Toothache	- Boiled in water and liquid used as mouthwash.
Giant rat	Head	- Fertility improvement	- Used with other herbs in food to promote pregnancy.
Palm squirrel	Faeces	- Removal of thorns	- Applied to affected part.
Tree Pangolin	Scales	- Cough	- Burnt, ground and added to stews/soups.
Brush-tailed porcupine	Stomach contents	- Breast abscess	- Dried contents mixed with ground tree bark and smeared over breast.
Grasscutter (cane rat)	Faeces	- Weight loss in children	- Used as enema.
Tortoise	Testes	- Stammer in children	
Crocodile	Bile	- Poisoning	
Snake (vipers)	Head	- Snake bites	- Ground with herbs and applied.
African python	Fat	- Swellings - Rheumatism	- Smear on affected part. - Smear on affected part.
	Bone	- Removal of thorns	- Rub on affected part.
Chameleon	Whole	- Antenatal care - Diseases in new-born babies - Convulsions	- Used with herbs as enema by pregnant women - Worn as talisman on wrist - Mixed with herbs and smeared over body
Mud fish (Clarias sp.)	Head	- Fertility improvement	- Used with herbs in food to promote pregnancy.

Source: Ntiamoa-Baidu (1992)

APPENDIX 2

HOUSEHOLD QUESTIONNAIRE

Date of Interview.....Questionnaire Number.....

Name of Village.....House Number.....

Interviewer's Name.....

A. Background Data

1. Sex of respondent (please circle): (1) Male (2) Female

2. Age of respondent (in years) (please record):.....

3. Marital status of respondent: (1) single (2) married (3) divorced (4) widowed

4. Respondent's educational level: (1) none (2) primary (3) middle (4) secondary – JSS, SSS, 'O' & 'A' Levels (5) post-secondary (6) other (please specify).....
.....

5. How many persons are there in this household?:Children Adults Old
(< 18) (18 – 60) (> 60)
Males
Females

6. What is your tribe?: (1) Ashanti (2) Fanti (3) Wassa (4) Nzema (5) Brong (6) Kwahu (7) Krobo (8) Akuapem (9) Akim (10) Northern (11) Ewe (12) Ga-Adamgbe (13) other (please specify).....

7. Religion: (1) Christian (2) Moslem (3) Traditionalist (4) Other

B. Agricultural Production System

8. The land that you farm on is: (1) family land (2) individual land (3) rented (4) other (please specify)

9. How many hectares do you cultivate? (note: total farm size):hectares

10. Which of the following crops do you grow and what was the output of each crop last year? Please fill the table below (note: if respondents are not willing to declare their income, do not insist)

Crop	Farm size (Area cultivated) (acres)	Output (Quantity of crop obtained last year) (state units)	Income from the sale of crop (¢)
1. Cocoa		bags	
2. Oil palm			
3. Maize		bags	
4. Rice		bags	
5. Cassava		bags	
6. Plantain			
7. Cocoyam		bags	
8. Yam			
Other crops (specify)			
9.			
10.			
11.			
12.			

11. Which of the following animals do you keep?

<u>Animal</u>	<u>Number</u>	<u>Used for</u> (1.selling; 2. home consumption; 3.both)
1. Cattle
2. Sheep
3. Goat
4. Pig
5. Poultry

12. What proportion of your household's income (e.g. last year's income) comes from agriculture? (1) less than 50% (2) 50% (3) more than 50% (4) none (5) don't know

13. Apart from farming what is your most important economic/livelihood activity in terms of its contribution to household livelihoods?:
 (1) fishing (2) forest product gathering and/or processing and sale (3) hunting
 (4) petty trading (5) casual labourer (6) formal employment e.g. teaching (7) other: please specify (8) None

C. Household Food Security

14. Was last year's harvest enough for the needs of your family? (1) Yes (2) No

15. When did you last fail to harvest enough food for your family's needs?
 (1) last year (2) 2 years ago (3) 3 years ago (4) don't remember (5) other

16. What did you do when you failed to harvest enough food for home consumption?
 (note: response may be more than one. Please rank the methods starting from: 1 = very often; 2 =.....; 3=.....4=..... etc.)

- (1) borrowed food
- (2) bought food
- (3) was given food
- (4) collected food from the forest/bush
- (5) other ways, please specify.....

17. What will you do if this year's harvest fails? (please rank methods:1,2,3...as above).

- (1) will look for food in the forest or in the bush
- (2) will borrow food
- (3) will buy food
- (4) will ask for food
- (5) other ways, please specify.....

D. Collection of wild foods and Patterns of Collection/Use

18. Do you or any member of your household use uncultivated foods such as green leaves, fruits, mushrooms, etc? (1) Yes (2) No

19. If yes, what kinds of food from the forests (both reserve and off-reserve forest), farm bush, fallow fields, etc. do you use? Please fill the table below:

Food / Product	How often do you use/ collect them? 1. Daily 2. Weekly 3. Occasionally 4. Seasonally (please state period, e.g. Feb-Jun, etc.	Do you eat or sell when you collect them? 1. Eat 2. Sell 3. Both	Is it an important food item in your household? 1. Yes 2. No	Who is involved in its collection? 1. Males 2. Females 3. M and F 4. Children 5. F and C	Where do you usually collect the product? 1. Res. Forest 2. Off-res. forest 3. Fallow fields 4. Farm	Availability of product now compared with 10 yrs before: 1.more availab. 2.less available 3.no change 4.don't know
1. Green leafy vegetables						
2. Tubers e.g. wild yam						
3. Fruits						
4. Honey						
5. Mushrooms						
6. Snails						
7. Bushmeat						
8. Spices e.g. <i>misowa</i>						
9. Kola						
Others (please Specify)						
10.						
11.						
12.						
13.						
14.						
15.						

20. Which of these areas is your most important source for collection of wild/ uncultivated foods? (state one only): (1) reserved forest (2) off-reserve forest (3) farm bush/fallow fields (4) farm (5) don't know

21. When did you last consume any kind of food from the forest/bush? (1) today (2) yesterday (3) the day before yesterday (4) last week (5) last month (6) don't remember (7) other

Mention the type of food (interviewer to record)

22. Are you able to collect enough to meet your needs? (1) Yes (2) No

23. How does the consumption of forest and tree (uncultivated) foods compare with 10 years ago?

- (1) today people eat more forest foods → (Go to question 24 and skip 25)
- (2) no change → (Go to question 26)
- (3) today people eat less forest foods → (Go to question 25)
- (4) don't know → (Go to question 26)

24. Why do you think people eat more forest foods today? Because

- (1) forest foods are more available today
- (2) forest foods are cheaper
- (3) forest foods are palatable and are of good quality
- (4) yields of cultivated foods have reduced
- (5) Other, specify

25. Why do you think people eat less forest foods today? Because

- (1) forest foods are less available today
- (2) forest foods are expensive
- (3) forest foods are considered inferior today
- (4) availability of better varieties of cultivated foods
- (5) people have more money to purchase food from shops
- (6) today people don't know the different types of forest foods
- (7) other - specify

26. Do you think that the availability of forest foods such as leaves, fruits, mushrooms, snails, bushmeat, etc. and other forest products has changed during the last 5 to 10 years?

- (1) today forest foods are less available
 - (2) today forest foods are more available
 - (3) no change
 - (4) don't know
- } → go to question 28

27. Why do you think forest foods (such as fruits, leaves, snails, mushrooms, bushmeat, etc) and other products (such as firewood, medicines, raphia, cane, etc.) are less available today? (note: response may be more than one reason, you may tick more than one).

- (1) over-harvesting of forest resources
- (2) destructive harvesting practices
- (3) fires
- (4) forest guards restricting access
- (5) logging operations damaging resource
- (6) logging workers harvesting the resource
- (7) clearance of source areas for agriculture
- (8) invasive weeds (e.g. akyempong weed)
- (9) other - please specify.....

E. Collection of other forest products

28. Do you or any member of your household usually gather products other than food in the forest or fallow areas? (1) Yes (2) No
If yes, please fill table below

Product	Uses: 1. House hold use 2. Sell 3. Both	Who usually collects the products? 1 Males 2. Females 3. M & F 4. Children	Important Source of the product: 1. Reserve forest 2. Off-res. forest 3. fallows 4. farm	Time of year that you collect product: 1. Year round 2. Occasional 3. Seasonal	Availability of product now compared with 10 years before: 1. more available 2. less available 3. no change 4. don't know
1. Firewood					
2. Medicines					
3. Pestles					
4. Wrapping leaves					
5. Chewstick					
6. Chew sponge					
7. Washing sponge					
8. Canes					
9. Bamboo					
10. Raphia thatch					
Others (please Specify)					
11.					
12.					
13.					
14.					

29. How many times per week do you or members of your household usually collect firewood/fuelwood? (1) once a week (2) twice a week (3) three times a week (4) four times a week (5) everyday (6) other (please specify).....

30. Do you pick and eat or bring back home any other product together with the firewood? (1) Yes (2) No
If yes - please specify

31. Do you use any medicines from the forest? (1) Yes (2) No
If yes, for what kind of diseases?

<u>Plant / Product</u>	<u>Disease</u>
.....
.....
.....
.....
.....

F. Income from forest-based activities

32. Do you or any member of your household obtain any income from forest products or forest-based activities? (1) Yes (2) No (Please fill the table below).

(Note: Ask the respondent if they make any money from the gathering/collection and/or the processing of each product, no matter how small the income or how short the period in the year when household members are working with a product activity).

Forest Product / Forest-based activity	Name of household member	Gender of household member engaged in the activity 1. Male 2. Female	Is it an important source of income to your HH? 1. Yes 2. No	Period of year engaged in the activity: e.g. 1. Year round 2. Occasionally 3. seasonally (please state period e.g. -May-Aug; -Sep-Dec; -Mar-Jun, etc.)	Source (s) of the product/raw material: 1. Reserve Forest 2. Off-res. forest 3. Fallows 4. Farm	Availability of product /raw materials now compared with 10 yrs before 1. more availab. 2. less available 3. no change 4. don't know
1. Green leafy vegetables						
2. Fruits						
3. Honey						
4. Mushrooms						
5. Snails						
6. Hunting (Bushmeat)						
7. Palm oil						
8. Palm wine						
9. Akpeteshie						
10. Medicines						
11. Wrapping leaves						
12. Chewstick						
13. Chew sponge						
14. Washing sponge						
15. Canes						
16. Baskets						
17. Mats						
18. Firewood						
19. Charcoal						
20. Pestles						
21. Carpentry						
22. Wood carving e.g. mortar						
23. Bamboo						
24. Raphia thatch						
25. Kola						
Others (please Specify)						
26.						
27.						
28.						

If only one activity, skip question 33

33. Which of the activities you have mentioned above is your most important source of income?

34. What particular stage of the activity are you involved? (1) gathering (2) processing or manufacturing (3) trading (4) transporting (5) other, specify

35. Which of these areas is the most important source of raw materials needed for

this enterprise? (1) reserved forest (2) off-reserve forest (3) farm bush/fallow fields (4) farm

36. How does the availability of the raw materials for this enterprise compare with 10 years before?: (1) more available (2) no change (3) don't know (4) less available → Why? (Note: Responses may be more than one)

- (1) fire
- (2) clearance of source areas for agriculture
- (3) invasive weeds (e.g. akyempong weed)
- (4) over-harvesting of the product
- (5) destructive harvesting practices
- (6) forest guards restricting access
- (7) logging operations damaging resource
- (8) logging workers harvesting the product
- (9) other

37. Who is your major customer? (1) local individuals (2) local traders (3) outside traders (4) processing enterprises (5) government institutions, schools, etc. (6) other

38. What is your most important problem with this business at the moment?
(1) financial problems (2) government legislation and regulations (3) lack of tools/equipment (4) labour availability (5) marketing problems (6) raw material availability (7) transportation problems (8) no problems (9) other

39. Do you belong to any co-operative or association or forest product collecting group? (1) Yes (2) No. If yes, specify

40. What percentage of your household's income (e.g. last year's income) comes from forest product activities? (1) less than 20% (2) 20 - 39% (3) 40 - 59% (4) 60 - 79% (5) 80 - 100% (6) None (7) Don't know

G. Access/Use Rights and Local People's Perception of Forest Resources

41. Do you have the right to harvest NTFPs such as snails, pestles, etc. from the reserve forest?(1)Yes (2) No

42. Do you need a permit to harvest NTFPs from the forest reserve? (1) Yes (2) No

43. Have you ever been arrested by a forest guard for harvesting any product from the forest reserve before? (1) Yes (2) No

44. Do you have the right to harvest timber trees from your own land or farm?
(1) Yes (2) No

45. If no, who owns the timber trees on your land or farm? (1) my family head (2) the local chief (3)the government/forestry department (4) don't know (5) other

46. Do you get compensation (e.g. money) if timber trees on your land or farm

are harvested? (1) Yes (2) No. If yes, how much do you get from each tree harvested? ₦ per tree.

47. How do you describe the condition of the forests today? (please state clearly)
.....
.....
.....
.....
.....

H. Forest and Tree Management

48. Do you plant or have you planted timber trees on your farm? (1) Yes (2) No.

49. Do you tend or protect timber trees on your farm? (1) Yes (2) No.

50. Do you plant, tend or protect trees other than timber trees on your farm?
(1)Yes (2)No

51. If your answer to either 48 or 49 or 50 is yes, what motivates you to plant, tend or protect trees on your farm? (1) Environmental protection (2) income generation (3) subsistence needs, e.g. food (4) other, specify.....

52. How should the forests and trees be protected or conserved or managed? (response may be more than one).

- (1) put more forest under reservation
- (2) plant more trees
- (3) prevent local people from harvesting NTFPs from reserve forests
- (4) prosecute those who enter the forest reserve illegally
- (5) allow local people to harvest NTFPs but harvesting should be regulated
- (6) outright prevention of timber harvesting from the forests
- (7) involvement of local people in forest management/protection
- (8) prosecute those who set fire in the forests
- (9) prevent farming in the forest reserves
- (10) don't know
- (11) other

53. Please mention any factors that you think hinder you or prevent you from planting or protecting timber trees on your farm.

- a.
- b.
- c.
- d.
- e.

APPENDIX 3

A sample of Ghana Forestry Department's permit for harvesting NTFPs from forest reserves

Permit No.....

FORESTRY DEPARTMENT PERMIT
(Under Section 21 of Cap. 122 or rules or by-laws constituting the forest reserves)

Name and Address:.....
Reserve:..... Compartment:.....

DESCRIPTION OF FOREST PRODUCE OR RIGHT GRANTED AND CONDITION OF ISSUE

Number	Species	Rate	¢	p
.....
.....
.....
.....
.....

Fee Paid
Receipt No.
Date of Issue
Date of Expiry Issued by
Approved by

Source: Asankrangwa Forest District Office, Forestry Department (2001)

APPENDIX 4

Local people's views and perception on the value and condition of forest reserves

In order to gain a general picture of local people's views on the state and condition of forest reserves, respondents were asked to describe the condition of the forests. People gave various views about the reserved forests. These views provide an indication of the degree of pressure on forest resources in the area, as well as the poor relations between local forest users and the FD. The following are those I found interesting:

- Forest products are declining because more people are using the resource.
- All the logs are taken away, we don't see anything.
- We call the reserve Government grassland because there are no trees there.
- The Forestry Department (FD) intimidates those who report offenders and illegal operators by questioning them as to what they were doing in the reserves when they saw the illegal operators. We cannot help in monitoring timber harvesting.
- The forests help us to get rain. It is full of timber trees. Wild animals are also in it.
- The forest reserve is too big. It is too close to the village. The government should release some to us for farming. We will plant trees in return.
- The community is not responsible for the degradation in the reserve; it is rather those who issue permits.
- The forest has changed. At first we could get whatever we wanted from the forest but now we do not. We have to travel long distances before we can get bushmeat and other forest products.
- The condition of the forest reserve is very bad because there is no protection. Forest guards take bribes from offenders and let them go free of charge. Therefore anyone can go into the forest and harvest any product. Some people even go into the forest at night when forest guards are away.
- The forest reserve is more or less a desert without any forest products. The forest has lost all its products due to the activities of local people. The forest reserve is shrinking due to encroachment by local people.
- The forest reserve is not useful to us because we are not allowed to go there and take what we want. Timber contractors have destroyed the forest. Everything in the forest is dwindling.
- The forest is for the government and so we have no stake in it. Forest guards prevent us from harvesting important NTFPs from the forest reserve. We don't even benefit from trees that we protect on our farms. This discourages us from protecting timber trees.
- We feel cheated because the teak in the reserve was planted by us but we cannot have any for our electrification programme...meanwhile loggers have been given concessions to log in the reserves.

The FD plays no role in protecting forests on our lands, or in fighting fires. All the FD does is arrest a few encroachers.

- All the off-reserve forests have been destroyed. What is left is the reserve forest but we are not allowed to go there.
- I am much concerned about bushmeat. When we first settled here it was as if we were living with the animals. We could find bushmeat species right in our backyards. Now we don't get bushmeat. We have to travel deep into the forest before we can make a catch. We now depend mostly on smoked fish, which is very expensive.
- The reserve has been changing since 1983 because of over-logging and bushfires. The reserve has become colonised by 'akyempong' weed and elephant grass...there are no big trees left and much of the game have vanished. As a result there are fewer mushrooms, pestles, building poles and medicines and there is more sickness now.
- It is difficult to believe the forest is a reserve. It has lost all forest characteristics. Most trees are gone and elephant grass has become the dominant vegetation in most parts of the reserve.
- The condition of the forests has changed drastically. There is more degradation because when we harvest trees and other forest products we don't replace them. Don't we replace cassava when we uproot it from our farms? Can't we do the same to our forests?
- Formerly, forest products were more available but now have reduced considerably due to pressure on the resource. Our numbers are increasing and many people are using the resource. Forest areas have also reduced because forestlands have been sold to cocoa farmers.
- It is good that the forest is there. We get a variety of products from the forest. It is full of wild animals such as chimpanzees. The reserve is a good place for hunting. The forest helps the local people when crops fail and during bushfires.
- Timber contractors have felled all the trees. They fell both big and small trees. The streams and the rivers in the forest have dried up due to logging.
- If we were not poor, we would fight the government in the law courts to stop logging in the reserve.
- I do not agree to strict restrictions on entry into the forest reserve in the name of protection. We should be allowed to enter the reserve for herb medicines and other non-timber forest products (NTFPs), which supplement what we collect from our land. These restrictions deny us the right to enjoy the fruits of the natural gift of our land.
- We are always told the forest was preserved for posterity; this was told to our grandfathers, they told our parents the same, and now they are telling us. Who is this posterity then, if it is not those of us who have no place to farm now?
- The FD is planting teak but it has no value for our children or us; they should plant indigenous species and economic species too.
- I do not know the condition. I cannot describe the condition of the forest because we are not allowed to go into the forest.

APPENDIX 5

Stumpage fees for common timber species in Ghana

Trade/Local Name	Scientific Name	Stumpage fee (cedis per cubic metre)
High Demand Species		
Asanfina	<i>Anigeria robusta</i>	65,660.00
Efuobrodedwo/Utile	<i>Entandrophragma utile</i>	84,420.00
Omu/candollei	<i>Entandrophragma candollei</i>	63,780.00
Hyeduanini	<i>Guibourtia ehie</i>	84,420.00
Dubin/mahogany	<i>Khaya ivorensis</i>	48,870.00
Odum/iroko	<i>Milicia excelsa/regia</i>	79,730.00
Kusia/opepe	<i>Nauclea diderrichii</i>	46,900.00
Baku/makore	<i>Tieghemella heckelii</i>	74,100.00
Penkwa/sapele	<i>Entandrophragma cylindricum</i>	69,410.00
African walnut	<i>Lovoa trichiloides</i>	55,340.00
Kokrodua	<i>Pericopsis elata</i>	112,560.00
Moderate Demand Species		
Papao	<i>Azelia africana</i>	35,170.00
Awiemfosamina/okoro	<i>Albizzia ferruginea</i>	18,760.00
Aprokuma	<i>Antrocaryon micraster</i>	18,760.00
Bediwonua	<i>Canarium schweinfurthii</i>	18,760.00
Onyina	<i>Ceiba pentandra</i>	14,070.00
Akasa	<i>Chrysophyllum albidum</i>	30,480.00
Hyedua	<i>Daniella ogea</i>	19,230.00
Bonsamdua/anyan	<i>Distemonanthus benthamianus</i>	24,150.00
Edinam	<i>Entandrophragma angolense</i>	24,250.00
Kwabohoro	<i>Guarea</i> spp.	28,140.00
Nyankom/niangon	<i>Heritiera utilis</i>	36,580.00
Kaku/ekki	<i>Lophira alata</i>	25,790.00
Oprono	<i>Mansonia altissima</i>	35,170.00
Kyere/koto	<i>Pterygota macrocarpa</i>	28,140.00
Onyinakoben/Bombax	<i>Rhodognaphalon brevicuspe</i>	14,070.00
Emire	<i>Terminalia ivorensis</i>	31,420.00
Ofram	<i>Terminalia superba</i>	16,410.00
Wawa	<i>Triplochiton scleroxylon</i>	16,410.00
Apapaye/Avodire	<i>Turreanthus africanus</i>	31,330.00
Low Demand Species		
Esa	<i>Celtis</i> spp.	9,380.00
Danta	<i>Neosogordonia papaverfera</i>	13,600.00
Otie	<i>Pycnanthus angolensis</i>	10,080.00
Potrodum	<i>Erythropheleum ivorense</i>	10,050.00
Denya	<i>Cylicodiscus gabonensis</i>	12,900.00
Wawabima	<i>Sterculia rhinopetala</i>	10,550.00
Wonton	<i>Morus mesozygis</i>	7,030.00
Kyenkyen	<i>Antiaris africana</i>	9,260.00
Dahoma	<i>Piptadeniastrum africanum</i>	10,550.00
Other species		7,030.00

Note: These stumpage fees took effect from 1st September 1999.

Source: Asankrangwa Forest District Office, Forestry Department (2001)