WOROBONG SOUTH FOREST RESERVE

REPORT

OF

SOCIO-ECONOMIC SURVEY

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Prepared

For

THE FORESTRY COMMISSION

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TABLE OF CONTENTS

List of Tables

List of Figures

List of Acronyms

NTFP	Non-timber forest Product
NTFPs	Non-timber forest Products
PTFDWIC	Participatory Tropical Forest Development By Women In Indigenous Communities
ITTO	International Tropical Timber Organisation
DWM	31st December Women's Movement
JSS	Junior Secondary School
FP	Family Planning
NGOs	Non-governmental Organisations
DFID	Department for International Development
IUCN	International Union Conservation Networks
WWF	World Wildlife Fund
CWIQ	Core Welfare Indicators Questionnaire

Section 1 Executive Summary

It is almost seventy four years since the establishment of the Worobong South Forest Reserve with the view to protect and conserve natural and especially forest and wildlife resources. The reserve has undergone various changes during this period. Even though the continued depletion of wildlife and forest resources has always raised concerns among the various authorities including the Forestry Commission, recent increased rate of resource exploitation and destruction has renewed calls for a fresh look at the resource management approaches for the reserve. This is against the backdrop of the apparent failure of past approaches to reverse the over-exploitation and destruction of natural resources.

A necessary condition for an appraisal of these management approaches is the study of the socio-economic conditions of the forest reserve environs. This study provides evidence, which can assist in devising new and better management solutions of the problems of the reserve.

In summary the evidence or findings of the study can be listed to include the following:

- The conservation area has experienced extraordinary rapid population growth during the last two decades, whose rate of 7.3 percent far exceeds the national average of 2.4%. The consequences of this are an increased land pressure and also possible increase in agro-environmental problems.
- The average household size in Worobong is about 6 persons. Children in households constitute about 57.68 percent (1563) of the total population in the survey area, whilst spouses account for just 14.80 percent (401) of the total sample population. However, residents below 15 years of age account for over 40 percent of the total population. The mean age of the residents of the area is about 23.3 years. The age group of 26 and 45 years, which make up the strength of the labour force of the area, is only 25 percent. This suggests a young population structure (about 84 percent below 20 years of age) for the area with a high population growth potential and consequently imminent agro-environmental problems.
- The population structure of the forest reserve is predominantly settlers. About 91.3 percent and 93.2 percent of the total population or total respondents are settlers, with the Krobos, as the largest ethnic settler group, accounting for about 72 percent of the total respondents. Since migrants often come with conflicting traditions of land allocation and land use; settlers' tenurial rights and their implications for land resource conservation are of increasing concern.
- The majority of the residents regard themselves as permanent citizens and have no intention of leaving the forest reserve soon for another place. Any conservation programme for the forest reserve, therefore, would have to contend with permanent settlement of residents within the conservation area, even though a large proportion of the population consists of migrants.
- Land tenure systems of the conservation area conform essentially to the Ghanaian, particularly, the Akan, tenurial systems, under which the "allodial title" is vested in the wider community or the chief with the indigenous individuals and families holding 'customary freehold' in the land. There are both advantages and disadvantages associated with this land tenure system. However, the usual known inhibitions and obstacles of the communal land tenure towards increase agricultural productivity have been compounded by tenure

arrangements, that fall short of a number of good tenure organizations, and thus do not give incentive towards conservation.

- The residents are predominantly farmers in Worobong. About 89 percent of the respondents have farming as their primary occupation. The most widely practised secondary occupation is trading. About 17.7 percent of the respondents undertake this activity. Most farmers in the reserve operate about 2 farms with the average farm size of about 9.34 acres. Artisantry also plays a major role with regard to employment and income generation in Worobong, with about 16.6 percent of respondents engaged in this profession as their secondary profession.
- Foodstuff base agro-enterprise was identified in the area, with cassava being the largest in terms of income generation and employment. Cassava cultivation as a non-cash crop is very popular in Worobong Reserve and about 26.1% of the respondents were found to cultivate mainly this crop. Cash crops such as coconut, oil palm and cocoa were identified in the study area, but on low scale. Slightly over 5.1% (68) of the respondents in the study area cultivate oil palm, with 2.7% (36) and 3.9% (53) of the residents cultivating coconut and cocoa respectively.
- In Worobong South Forest Reserve the majority (53%) of the residents farm on individually owned land on the basis of annual rental payments as well as Abunu and Abusa sharecropping, but most of them (78%) believe, they have permanent right of use to the land. However, a large proportion of the respondents, 48.5% (229), claimed they cannot bequeath the land with only about 22.8% (114) of the respondents claiming to be able bequeath their landholdings in heritance, whilst only 38.5% claiming to possess the right to replant the fields without renegotiations with any body.
- There exists a high credit need among the respondent in the study area, but only a limited number of farmers have access to credit. Friends or relatives appear to be the main source of credit for the forest reserve dwellers. About 41.5 percent (39) received their credit from friends, followed by relatives, which accounted as source for about 24.47 percent (23) of the total credit recipients. Institutional credit sources including banks, in spite of their limited presence in the area, play important source of credit. They offer credit to about 12.77 percent (12) of the farmers. Local moneylenders and sharecroppers play equally vital role as sources of credit by providing credit for about 6.38 of the respondents respectively. The farmers believe the lack of access to credit has had not only negative consequences on their economic performance, but has also constrained investment in environmental innovation.

We believe that efforts at providing solutions to the environmental problems of the area should include *inter alia:*

- a significant reduction in population growth,
- a change from extensive to intensive farming practices via increased use of capital inputs,
- the introduction of high yielding agricultural varieties,
- the expansion of the palette of income generating agricultural produces,
- better government agricultural policies,
- increased community involvement in resource management and

- measures to enhance income earning capacity of local residents, especially in the non-farm sector, as well as the establishment of micro agro-processing industries.

We strongly recommend the following follow up studies to ensure long-term sustainable and successful conservation of the natural resources of the Worobong South Forest Reserve:

C'est vague

1. a detailed scientific study to establish the basis for a long-term sustainable resource management of the forest reserve with strong community involvement.
2. a detailed into possible measures to enhance the income and earning avenues available to the local residents, especially in the non-farm sector to reduce the dependency of the people on the forest reserve.

→ (Le rapport devait faire des propositions concrètes dans ce sens, après avoir analysé l'existant (identification et analyse des problèmes)

Section 2 Participatory Tropical Forest Development By Women In Indigenous Communities (PTFDWIC) Programme

2.1 Introduction

Over the last half century Ghana has experienced severe environmental degradation of resource base, which has raised serious concerns. This is against the backdrop of the fact that Ghana adopted its first Forest Policy over half a century ago that provided for the creation and management of permanent forest estates, for research in all branches of scientific forestry, maximum utilisation of areas not dedicated to permanent forestry, provision of technical advice and cooperation in schemes for the prevention of soil erosion and in landuse plans. By the nineties it became apparent that this forest policy was not adequate to deal with the spiral of population growth and thus increasing demand for forest land for agricultural purposes, advances in science and technology and growing ecological importance of the forest in terms of genetic biodiversity and wildlife. For this reason a new forest and wildlife policy was adopted in 1995 to reflect the new thinking of all relevant stakeholder groups involved in sustenable forest and wildlife development. This new policy enshrines the principles of conservations through sustainable development via active involvement of local communities and the private sector in the management of the reforestation programme and the generation of benefits including forestry resources, revenue and employment for the local residents and the nation as a whole. The main aims of this new policy are among others:

1. To foster constructive dialogue and promote increased public awareness about the importance of Forestry Commission in rural and urban livelihoods and encourage popular support as well as increased local responsibility for management of Forestry Commission resources.
2. To enable women to establish and sustainable manage nurseries for Non-timber forest product (NTFPs), timber and fruit trees to supply community – based and private sector tropical reforestation initiatives;
3. To create employment opportunities for women.
4. To encourage members to support and develop industrial tropical timber reforestation and forest management activities as well as rehabilitation of degraded forest land, with due regard for the interests of local communities dependent on forest resources.
5. To improve marketing and distribution of tropical timber exports from sustainably managed sources.
6. To enhance the capacity of members to implement a strategy for achieving exports of tropical timber and timber products from sustainable managed sources.

In line with the above principles the Forestry Commission of Ghana in collaboration with the 31st December's Women Movement (DWM), with financial support from International Tropical Timber Organisation (ITTO), in April 1995, initiated a project within the framework of Participatory Tropical Forest Development By Women In Indigenous Communities (PTFDWIC) with the view to deepening the intersection of gender poverty with environment. This socio-economic survey is part of a series of studies undertaken within the framework to contribute to the sustainable management of Worobong South Forest Reserves Resources through a participatory process. This is intended to ensure their biological integrity and address the conflicts of interest that arise from competitive land

use regimes. The study takes a closer look at the socio-economic status, as it pertains to the reserves, with regard to household incomes, expenditures and constraints to development in these Conservation Areas. It seeks to assess the importance of natural resources to the household economy with the view to identifying the priority areas which the Protected Areas Programme should consider in making recommendations for effective management systems both at the district and community level. It further attempts to assess the potential for the introduction of new economic activities to increase forest based incomes whilst supporting conservation objectives.

2.2 STUDY OBJECTIVES

The main aim of the study are summarised as follows:

- Demography: To identify the demographic status of the resident using the categories of itinerate, indigent, settler and other, to determine their duration of stay in the reserve, age, sex composition, ethnicity and religion their origin if not indigent: and the precise geographical location of the interviewed household.

- Land Tenure To document the type of land tenure pertaining to each household and note any differences between the different categories of resident and how this affect Household income.

- Household Expenditure: To document household expenditure according to spatial distribution and type of expenditure over time with specific references PTFDWIC/ITTO including medicinal.

- Household Incomes: To classify household according to occupation, note the perceived needs of the household and documents any differences in perceived needs by gender and by the different groups of residents. Also, to document household income overtime (off-farm income) with specific references PTFDWIC/ITTO including carving, artisantry.

- Credit To identify existing sources of credit open to the households and note the need, both real and perceived, for rural credit, especially any credit requirements over time. To document any constraints caused by lack of readily available credit to farmers and constraints to development in the reserve caused by lack of credit and to make suggestions as to how the authority might assist with credit schemes.

- Community Development Priorities To identify and examined the perceived development needs and those necessary for the long term utilization of PTFDWIC/ITTO, noting any differences in the perceived need by gender, and any perceived constraints to development.

Section 3: Methodology and Sources of Data

3.1 Study Area and Sample size

The study was conducted in selected communities around the Worobong South Forest Reserve. These communities included villages and towns with their several surrounding small settlements. The communities included in the survey are among others Akwansaram, Akwumu Kotoko, Feyiase, Mataheko, Peseator, Amokrom, Ahomahomusu, Kyrepong, Nyganyooya, Kronkronso, Ayigbetown, Bonsakor/Kumfere, Asare Kwow, Esaase, Akoradarko, Kukurutu, Apaah Opare and Bissibom. The mission of the study was to promote conservation and the sustainable and equitable use of tropical rain forest in a manner that will lead to lasting ecological economic and social benefits to the people of Worobong South Area and to the world as whole. This underscores the need for the study to have a degree of representativeness. For that reason a sample size that is about 33% of the total population was used as the basis of data collection.

3.2 Method of Data Gathering

The data for the analysis were gathered through field interviews conducted with respondents and administration of questionnaire conducted between April and June 2002, by a team of trained field survey crews, selected on the basis of knowledge of the local dialect and custom and command of the local language in the community. The interviews were conducted at the respondents' home to better ensure honest responses and to provide a safe and conducive environment for the interview. The sample was randomly selected, but the villages of the respondents were stratified to ensure the inclusion of villages of economic, historic and strategic importance within the reserves. Group Focus discussions were also used to gathered information from respondents and with political representatives in the District Assemblies, Chiefs, traditional and opinion leaders as well as unit committee members. Other secondary data about the areas were also collected from libraries, the Forestry Department and also from published sources.

3.3 Research Problem

The study encountered a number of difficulties, apart from the fact that the study had to be carried out with a reduced financial budget different from what was originally proposed. Other difficulties encountered included problems in quantifying revenues, costs (e.g. of assets), expenditures, output, land areas and values. Particularly the difficulty interviewees had in recalling revenue and income flows from sources other that cash crop sales and other off-farm activities resulted in wide differences in actual expenditures and incomes. The source of data collection on households in the study was the household head, which was usually a male. While operationally convenient, this approach can, however, be criticised as a perpetuation of the cultural bias prevalent in Ghana, the consequences of which can lead to underreporting of the important contributions of women to household and farm management. There was also a serious lack of existing information and

BURQUEL ? VERIFIER LES DOCUMENTS COMPTABLES

⇒ Quel a été l'influence de cette situation sur les résultats de l'enquête ?

materials in connection with historical setting and economic activities concerning the forest reserve, either from the people, the traditional council or the district assembly.

3.4 The Worobong South Forest Reserve

According to the broad classification of land use in Ghana about 20 percent of the country's land has been designated as forest reserves. Out of this wildlife Protected Areas, which are spread across the country, account for about five percent[1]. Even though recent intensified conservation efforts on the part of the government with financial and technical assistance from international donor agencies including Wildlife Society and International Tropical Timber Organisation (ITTO) have made some positive gains, intensive negative human activities appear to have degraded a large part of these forest reserves. One of these forest reserves that have suffered high degradation from human activities in the recent past is the Worobong South Forest Reserve.

The Worobong South Forest Reserve is located in the Fanteakwa District, and south of Begoro, some 52km from Koforidua, the regional capital of the Eastern Region of Ghana. The reserve lies within the moist semi-deciduous zone and between 4° 3' and latitude 8° in the southern part of Ghana. The mean annual rainfall ranges between 1250 – 1500 mm. The soils are of the Ochrosol type.

Important communities with regard to population size and economic potential in the Worobong South Forest Reserve include Akwumu Kotoko, Mataheko, Esaase, Peseator, Ahomahomusu, Nyganyooya, Kronkronso, Akwansaram, Ayigbetown, Feyiase, Bonsakor/Kumfere, Asare Kwow, Kyrepong, Amokrom, Kukurutu, Apaah Opare, Akoradarko and Bissibom.

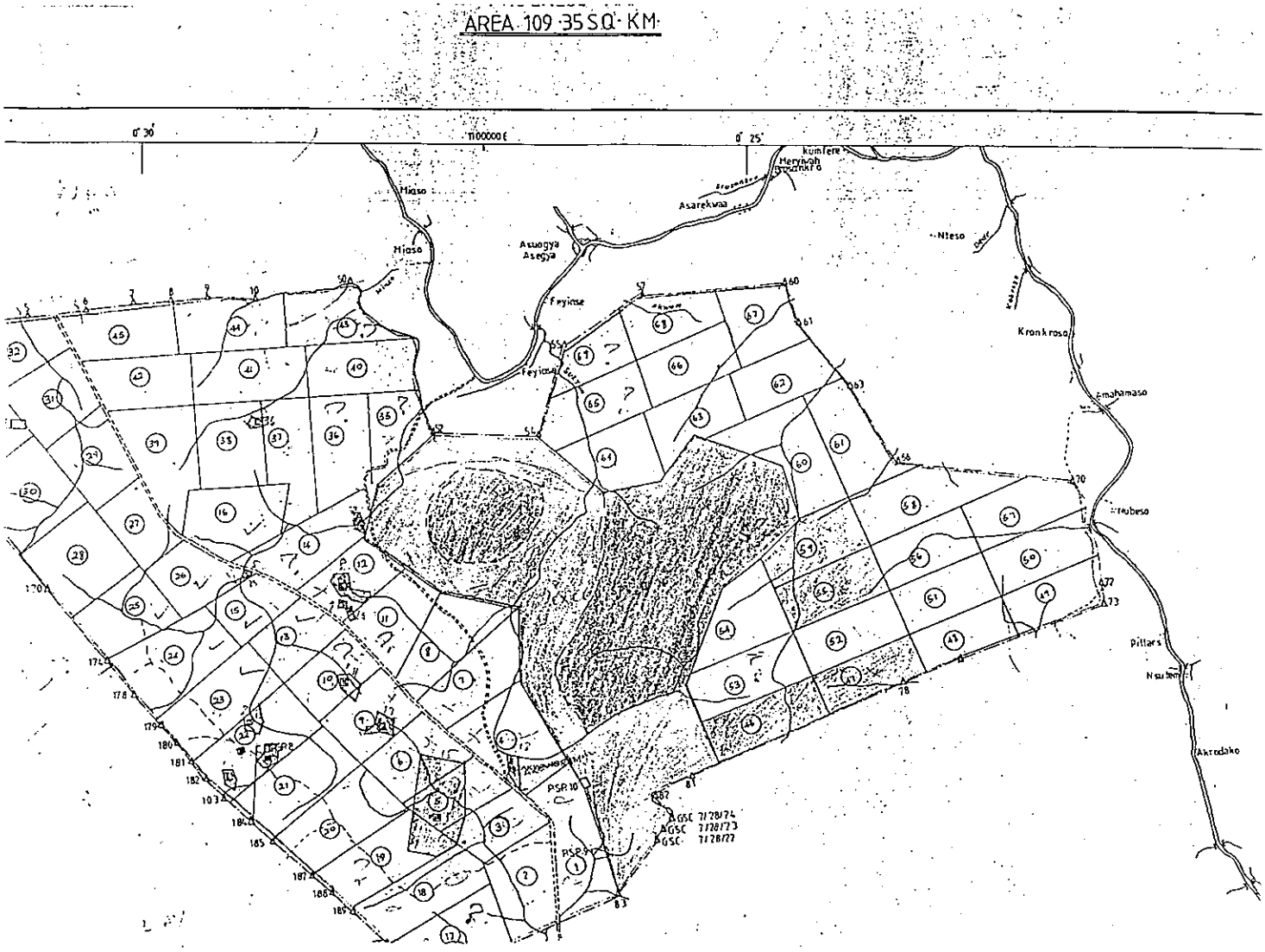
3.4.1 Historical Setting

Against the background of the fast depleting forest cover at the turn of the twentieth century the colonial masters thought it wise to reserve some of the forestlands in the country to conserve the environment, and at least for posterity. Worobong Forest Reserve, together with Atiwa Forest Reserve, Apedwa Forest Reserve, Boti falls and Southern Scarp, were therefore among the first in Ghana to be declared conservation areas and put under the then conservation authority, the Forestry Services, in 1928. This was done with the objective to protect the forest cover of the area and watershed system of the River Mia, which divides the forest into two distinct geographical areas: the North and South Reserve. The Worobong Forest Reserve consists of Worobong South Forest Reserve, which covers an area of the size of 109.35 sq.km and Worobong North Forest Reserve, also covering an area with the size of 14.66km (figure 3.1). Since its creation as a conservation area, the reserve has gone through different degrees of transformation in terms of exploitation of its resources and size. Rapid population growth, the high market demand for timber and non-timber forest products and immigration into the forest reserves in search for more and new fertile agricultural lands in recent times have resulted not only in serious encroachment on the reserve but also resulted in severe degradation of the resources in the forest reserve. Recent disasters stemming

from intermittent bushfires attributable to human and natural causes have also contributed massively toward severe depletion of the forest cover of the reserve. Indeed these intermittent bushfires have affected the whole reserve negatively to the extent that the North, for instance, scarcely has any forest cover presently. Moreover, the long climatic dry spell of the area coupled with its rough terrain and relatively poor, leached and stony soils makes it difficult for any proper environmental regeneration process to set in.

Other reserves around Worobong Southern are Atiwa, Apedwa, Boti falls and Southern Scarp. Unlike other forest reserves in Ghana like the Ankasa and Bia Wildlife Forest Reserves in the

Fig. 3.1 Map of Worobong South Forest Reserve



Western Region, which have a lot of communities inside them, the Worobong South Forest Reserve has only one community inside the reserve. This community called Peseator lies in the southern part of the reserve. However several villages surround the reserve including Nyganyooya, Esaase Akwa-nu Kotoko, Mataheko, Ahomahomusu, Kronkronso, Bissibom, Bonsakor/Kumfere, Akoradarko and Kyrepong, Amokrom, Kukurutu and that northern reserves includes Akwansaram, Ayigbetown, Feyiase, Asare Kwow, and Apaah Opare.

3.5 Literature Review

3.5.1 Existing State of Knowledge about the Conservation Area

An important determinant of the relationship between the local residents and the reserve area is the socio-economic status of the people. Socio-economic factors such as population growth, land tenure system, income and earning capacity as well as economic activities of residents affect the potential for natural resource conservation. The standard of living also determines the measures that can be taken and the extent to which these measures can go in protecting the environment and its resources. Stringent environmental protective measures that may be effective in a high-income socio-economic set-up, may not work or cannot, for different reasons, be implemented in a low income or traditional subsistence economy. These and other reasons, therefore, make a socio-economic survey necessary in the search for effective measure for the preservation of a protected area.

In the case of the area under study not much is known about the socio-economic setting. Indeed there exists no socio-economic survey known to the authors about the Worobong South Reserve. The only study about the forest reserves known to the authors and the local (Begoro) office Forestry Commission of the Ministry of Land and Forestry is a soil study, which was undertaken in in 2000 about the Worobong North Forest Reserve. This deficit should be viewed against the background of the abundant information about the natural resources – flora and fauna – about other forest reserves like Bia and Ankasa Forest Reserves (Appiah-Kubi 2001). This problem is also compounded by the lack of scientific documentation of the economic value of such non-timer forest products (ntfps) such as bush meat and the sociological and economic interactions in the conservation area.
The only source of information the forest reserve known the author happens to be from the statistical population census of 1960, 1970, 1984 and 2000. Even though the census data had always been comprehensive in their coverage, they have had the disadvantage of not dealing with the specifics and the socio-economic dynamics of the area under study. For this reason not much information concerning occupational structure of the residents, main cultivated crops, and other socio-economic indicators can be extrapolated. The population census of 1970, for instance, counted 24,443 people living in the Fanteakwa District, where the Worobong South Forest Reserve is administratively located. By 1984 the population size had increased to 35,064 and further 85,772 people in 2000. Farming was found in 2000 to be the main occupation of the residents and the number of persons in per square kilometers (density) as at each of the population censuses had moved from 36 in 1970 to 52 in 1984 and to 77 in 2000.

These data are, however, too generalised. Moreover, since census reports only about localities and districts comprising large areas it is difficult to get a real picture about a specific area, which covers just a small portion of a large locality to facilitate the creation of a realistic data base for planning for the area. The population density, for instance, can be seen to express the level of pressure the population exerts on land; and thus increasing density in time therefore indicates increasing pressure of the population on the land and its resources such as forests.

Deforestation, a common phenomenon in Worobong, is indeed an event occasioned by increases in numbers of human beings. There are now more mouths to feed than 50 years ago when the population of Ghana was less than 6 million. Farming activities have increased and demand for energy has also increased. It is estimated that farming and fuel wood (including charcoal) procurement accounts for 79 percent of all the removals from the forest. Indeed, the Ministry of Mines and Energy has it on official record that charcoal industry and fuelwood account for 15 million m^3 of trees removed annually from the forest. At the per caput consumption rate of about $1m^3$ of fuelwood and $0.2m^3$ of charcoal, this translates into an estimated production in 1980 of about 11.5 million m^3.

It is largely for these reasons, among others, that the PTFDWIC project has undertaken various activities not only about the socio-economic status of the Worobong Forest Reserve, but also in other areas of concern to gather enough data about the forest reserve for effective planning. This is supposed to be based on a framework similarly used by the Protected Areas Development Programme in South-West Ghana (Appiah-Kubi 2001, EGD 1991) to improve upon the management of wildlife and forest resources in and around the forest and game reserves in Southern Ghana. It is believed that this study, which in addition to providing information on the socio-dynamics and demographic set-up of the forest reserve, would contribute towards enhancing the existing sparse knowledge about the reserve and also help in creating a reliable databank of information to assist better effective planning for forest reserve and natural resource conservation.

Section 4 Socio-economic Infrastructure

In Ghana one important basic condition that facilitate economic development of urban and rural areas is usually the availability of basic infrastructure (Nsiah-Gyabaah 1994). Social amenities such as housing, sanitation health facilities and the provision of good drinking water do not only add value to the standard of living, economic infrastructural services like good transportation networks, markets, electricity, telecommunication services and other social amenities act as necessary conditions for large scale production, trade and exchange. As in general the education, health status and access to good drinking water determine the quality of life, level of productivity and life expectancy, so is the provision of these "basic needs" important factors, which influence human development of, especially, people in rural farming communities, where water borne diseases can result in many off-farm days and deaths. Moreover, the availability of such services, which in a way characterizes relative high living standard and existence of other alternatives of human dependency on natural and forest products, can enhance conservation efforts in a country.

Even though there has been some improvements in the provision of social and economic amenities in the Eastern Region, in which the reserve is located, it appears the conservation area has benefited less from these improvements. The only tiered road to the conservation area, which has relatively

eased accessibility to the area, however, ends at the Fanteakwa District capital of Begoro, thus making a number of villages – Amokrom, Konkronso, etc. - surrounding the forest reserve inaccessible by car, particularly, during the raining seasons of the year. The situation seems to be worse for villages like Peseator located inside the reserve. Even a strong four-wheel-off-road drive can hardly use the stony hilly footpath to these villages. Telecommunication facilities are not available and not even in the district capital of Begoro.

Table 4.1
Regional Comparison of Selected Social Indicators

Region	Total Nr. Of Facilities		Hospital bed Population Ratio (1991)	Poverty Incidence 1999*	Doctor Population ratio (1985)	Road Density Km^2	Gross Enrolment Ratio in Primary School
	Hospitals	HC/Clinics					
Greater Accra	11	249	1:476	7.3	1:400	0.17	73.21
Western	19	180	1:1016	25.6	1:800	0.06	76.15
Ashanti	64	226	1:925	37.6	1:500	0.06	86.12
Volta	26	450	1:612	37.8	1:150	0.07	84.75
Brong Ahafo	23	179	1:979	39.4	1:850	0.04	72.82
Eastern	25	128	1:780	48.4	1:800	0.09	76.03
Central	14	104	1:596	48.3	1:800	0.13	86.90
Northern	13	116	1:1503	69.5	1:110	0.04	45.06
Upper West	4	51	1:704	87.9	1:850	0.05	51.62
Upper East	5	75	1:1645	89.5	1:700	0.06	42.00
Total	204	1758		42.6			72.53

Source: Ministry of Health, The Health Sector in Ghana. Facts and Figures 1999, Nsiah-Ghabaah 1994, UNICEF 2000, GLLS4

* Poverty is defined as the standard of living with fewer less than ¢900,000 per equivalent adult per year.

Similarly the provision of other social amenities such as good drinking water, sanitation, education and health facilities, etc in the reserve environs are all below national average. The basic health facility around the reserve is the Ahomahomusu health post with only one nurse and poor service conditions. For a bit improved health facility – or a clinic, one has to make it to Begoro, at least a one hour hard bump drive or consider a journey to the Eastern regional capital of Koforidua. This situation concerning the sparse provision of social amenities in the area is, however, characteristic of Ghana- ian villages, which appear to be not adequately served with these services as compared to urban centres. This phenomenon of socio-economic rural-urban gap, dubbed "urban-bias" is due to the development strategies, that concentrate on the development of urban centres to the neglect of rural areas. As can be seen in Table 4.1 the Eastern Region generally does not fare well at all by regional comparison of social amenities. As pointed out earlier basic health facilities are only available in Begoro and Ahomahomaso, with the hospital with inpatient facilities located at Koforidua. Whilst on the average about 87 percent of all rural households live in communities with a primary school, that of the Eastern Region is only 86%. The percentage of rural households living communities with middle (JSS) schools in the region is just only 57% and far below the overall average of 64% in Ghana (Ghana Statistical Service 1993).

4.1 Demography

4.1.1 Population Growth in Worobong South Forest Reserve

The first population census of Ghana in 1960 gave the total of the Eastern Region, where the Worobong South Forest Reserve is situated, at about 1,044 million people. The population size grew to 1,261 million in 1970 and further to about 1,681 million by 1984. Data from the latest population census of Ghana in 2000 show that there are about 2,106 million people residing in the region, with a population density of about 147.6 inhabitants per km^2 as compared to national average of 79.3 persons per km^2. A look at the population trends indicates that the population has more than doubled in just about 40 years. Between 1984 and 2000, for instance, the population size in the Eastern Region grew by annual average rate of 1.42%[2]. The area under study appears to have experienced a higher rapid growth in population than that of the region. According to the national population census report for the Eastern Region the population size of the villages lying in the immediate vicinity of the forest reserve grew from 1,338 in 1970 to about 4,104 in 1984. This intercensal increase in the population size of about 206.73 percent between 1970 and 1984 translates into an annual population growth rate of about 7.3 percent and represents a more than three times the national average growth rate of 2.4 percent (Ghana Statistical Service 2002). Using this past growth rate to make a simple forecast for 2002, the total population for the area surrounding the forest reserve should be around 12,588. The implication reflects a rapid population growth above the national average.

Undoubtedly the rapid increases in the population in the forest reserve can be attributed to stable mortality rates and high fertility rates of 4.5 children per woman for the whole country (Ghana Statistical Service 2002), but the accelerated immigration trends from other regions, as a result of increasing scarcity of arable farming land in other areas, is a principal cause. The implication for this extraordinary high growth rate for the reserve can be seen in the synergies and causality chains linking rapid population growth and degradation of environmental resource base and ever increasing great pressure of the population on land, forest and non-forest resources.

4.1.2 Population Structure in the Worobong South Forest Reserve

Our survey in the Worobong South Forest Reserve analysed data from about 488 households with a total population of 2,711 persons. This gives an average household size of about 6 (5.5) persons, slightly above to the national rural household size of 5.2 as observed in the 1998 Ghana Living Standard Survey. The survey results indicate that one in 6 (5.74) households in the area has a female as the head of the household. This appears to be lower than the national average, which estimates one in every three households with a female as the head. The structure of the household as defined in terms of the relationship of members of the household to the one person they accept and recognise as head, is dominated by males. As can be seen in table 4.2 male heads of households account for about 30.09 (402) percent or 82.5 (not in the table) percent of total sample population respectively or total number of households, whilst female heads of households account for only 6.2 (85) percent of total sample population or 17.5 percent of total number of heads of households. The

[2] The calculation of the growth rate was based on this formula: $P_t = (^r/_{100} + 1)^n * P_{t-1}$

composition of the households in the area is representative of the Ghanaian household as can be observed anywhere else. Children constitute about 57.68 percent (1563) of the total population in the survey area, whilst spouses account for just 14.80 percent (401) of the total sample population. Besides these relationships it discerns from the table that a considerable number other people live in the various households.

Table 4.2
Structure and Household Composition of the Population

	Total		**Male**		**Female**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Head	487	17.97	402	30.09	85	6.19
Spouse	401	14.80	29	2.17	372	27.07
Child	1563	57.68	776	58.08	787	57.28
Parent	13	0.48			13	0.95
Grandchild	144	5.31	74	5.54	70	5.09
Relative	87	3.21	46	3.44	41	2.98
Domestic Help	9	0.33	5	0.37	4	0.29
Others	6	0.22	4	0.30	2	0.15
Total	2710	100	1336	100	1374	100

4.2 Ethnicity

The importance of ethnicity to resource conservation lies in the high relevance and contribution of ownership to the protection of property as against possession. Just as a person who owns a property is more likely to ensure its security and invest in it more than the one who possesses it, so high is the likelihood of people who hail originally from an area more prepared to accept and contribute to conservation programmes and efforts of the government than people who possess the property for limited period of time. It is claimed that people who have ancestral ownership over natural resources, i.e. indigents, are more prepared to ensure its long term sustainability and to avert any exploitative intrusions than settlers, into whose care the property has been entrusted for a short period. This lies in the fact that under the Akans Land tenure system indigent cannot be refused cultivation rights to 'idle' community lands, a privilege which does not apply to migrants. Moreover, unlike indigents, migrant tenants are more likely to operate under restrictions as regards land use, because they do not own the land and this can hinder investments in ecological improvement and adoption of ecological friendly farming practices. Furthermore, owing to social cohesion, indigents rather than settlers can assert the best claim of ownership over land and resources. For this reason it is important to know the ethnic composition of the area in order to address some of these problems. Moreover, ethnicity can give a clue to the likelihood of any possible encroachment on the land/reserve in the near future, since a forest reserve occupied largely by indigents can easily thwart encroachment from settlers than vice versa

From figure 4.1 it is evident that the forest reserve and its environs is predominantly occupied by settlers. The indigenous people of the area, the Akyems, constitute only 8.7 percent (236) of the

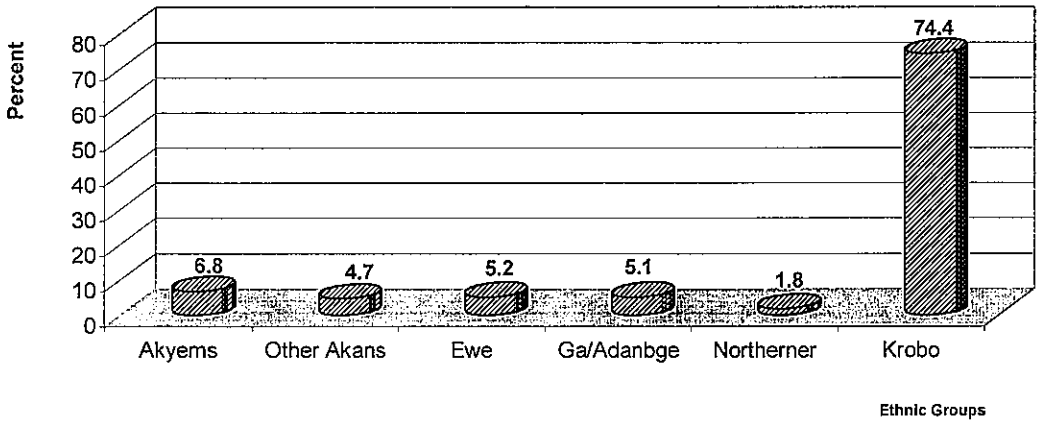
sample population or 6.8 percent (33) of the total number of heads of household (table A1), whilst settlers make up the rest. The largest ethnic settler group comprises the Krobos, who account for about 72 percent (1951) of the total respondents. In some settlements around the reserve, such as Akwamu Kotoko the Non-Akyems account for about 100 percent of the total population. Other groups of settlers who are fairly represented include the Ga/Adangbes, who make up third largest ethnic group of about 7 percent (196) of the total population. This is followed by the Ewes (5.5 percent (148)) and "other Akans" (5.3 percent (147)), which include the Ashantis, Akwapin, Fantes etc. The relative share of the various respondents and the ethnic backgrounds to the total number of respondents is similar to that of their relative shares in the total sample population, except that the Ewes occupy the third position.

Apart from data on the ethnic backgrounds of the people living in the area our survey collected information on ancestral backgrounds of the people so to be able to identify the proportion of the people who can really claim ancestral origin for the villages around the reserve. This was intended to enable us to test the validity of the ethnic representations of the respondents and also to verify the extent to which the present farmers around the reserve can use ancestral claims to encroach on the forest reserve, something, which migrants can hardly do. Timber merchants have used economic arguments on several occasions in the past to encroach on forest reserves. But indigents represent another potent group that can use ancestral claims to agitate in the political arena for encroachment on reserves. This is evident in the fact that under Akan customary land tenure indigents cannot be refused permission to till "uncleared idle" community owned lands (Kasanga 1988).

For this reason the heads of households were asked of their actual hometown and whether any of the ancestors of the respondents were born in the conservation area. The responses revealed that only3.2 percent(15) of the respondents were actually born in Worobong. This response also reflects the fact that over 96.8 percent (459) of the respondents cannot claim ancestral origin from the areas since none of their ancestors was born in the area

Fig. 4.1

Ethnic Composition Of Respondents of Worobong Forest Reserve (Percent)



4.3 Population and Age Structure of Residents

Analysis of the survey data reveals that the population in the study area is very young. As can be seen in Figure 4.2 a little over 40 percent (1100) of the total population of the area is below the age

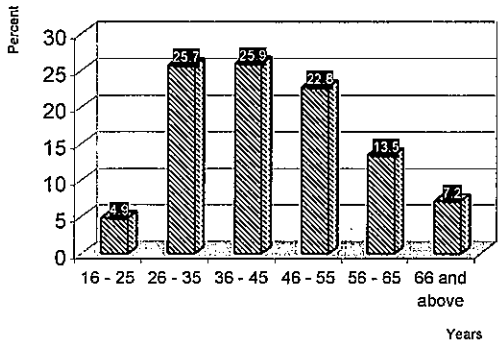
of 16 years. This proportion appears, however, to be almost the same as the national average of 41.8 percent (Ghana Statistical Service 1998). This applies to both females and males. Another indication of the youthful nature of the population is the estimated median age of 20 years, which splits the population into two equal halves. The average age of the population is slightly higher, about 23.3 years. The age group of 26 and 45 years, which make up the strength of a labour force of an area, accounts for only 25 percent of the total population. However, with regard to the heads of households, this age group accounts for about 52 percent (245) of total heads of households interviewed, which similarly underlines the youthful nature of the age structure of the forest reserve.

The effects of the youthful structure of the population of Worobong on the forest reserve are varied. As we shall find out later in the report, apart from farming other alternative employment avenues for the youth are limited in the area. Lack of vocational trade and educational infrastructure in the area would not either permit urban emigration of these people in the near future. And even if they go out the likelihood of their returning to Worobong in their mature age is very high. The consequences is an increased potential pressure not only on the household and natural resources (meat, food, fuel wood, NTFPs, etc.), but also an increased likelihood of higher demand for more farm lands for upcoming would-be farmers and consequently a high encroachment potential on the forest reserve. Moreover, the high dependency ratio may adversely affect the government's resource allocation indirectly, since increasing resources would possibly have to be diverted to meet the increasing needs, e.g. education, of the youth, to the detriment of the environmental protection in the forest reserve itself.

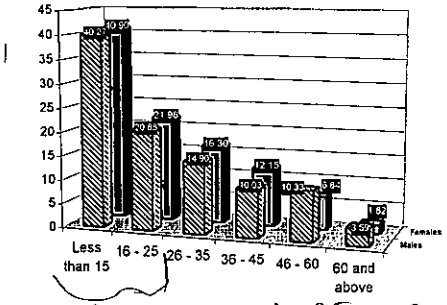
A look at the sex ratios in Worobong indicates a direction similar to the general trend in Ghana, with females slightly above males. We estimate a sex ratio of 50.70 percent (1374) for females and 49.30 percent (1336) for males for the forest reserve similar to the national sex ratio of 50.5 percent for females and 49.5 percent for males. Our estimated sex ratio for the reserve in favour of females, however, lies contrary to the high gender ratio of heads of households, which favours males. The survey found that about 82.1 percent of the households are headed by males, while only about 17.9 percent as opposed to the 64.8 percent of the national household population being headed by males and 35.2 percent by females (Ghana Statistical Service 1998).

Fig. 4.2

Age Composition of Respondents



Age Composition of Total Population



61% moins de 25 ans
Population très jeune.

4.4 Religion

Religious beliefs have an indirect influence on forest reserve in so far as certain religious faiths forbid the consumption of certain types of meat and especially bush meat, whose preparation does not conform to certain laid down spiritual rituals. Other forms of religious beliefs rooted partly in tradition noted for their treatment of thickness and grooves, rivers, certain forest plants and games as sacred can contribute immensely to environmental conservation. In many communities in Ghana small areas of forest have been protected. The spiritual use of some of forest plants and their medicinal properties by traditional healers (fetish) lends a sacredness to the grove, which is usually protected by the forest vegetation (Falconer,1992)

Traditional fetish beliefs, especially in southern Ghana, seem to place high value on forest vegetation and hence lend a helping hand to indirect reserve. Christianity and education, however, do not seem to influence people's beliefs in these traditional institutions and thus appear not to have any indirect contribution towards forest conservations. On the other hand since the various religious group meetings as media for environmental education and information dissemination on conservation issues concerning the protected Areas. In view of that, it is therefore necessary, to analyse the religious composition in the reserve area so as to ascertain how far religion can assist forest preservation.

Table 4.3
Percentage Distribution of Heads of Household and Population according to Religion

Religion	Heads of Household		Total Population	
	Freq	%	Freq	%
Christianity	444	91.2	2541	93.7
Islam	14	2.9	59	2.2
Fetish	5	1.0	25	0.9
Non Follower	23	4.7	84	3.1
Atheist	1	0.2	1	0.0
Total	487	100	2711	100

In terms of religious affiliation, the survey indicate that about 91% (444) of heads of household in the reserve are Christians; Catholic account for 12% (325) of total population, Pentecostals 48% (1301), Presbyterian 21% (569), and Methodist 15% (406) while the other Christian denominations account for 4% (108) of the population (see table 4.3).

About 2.9% of Heads of Households (14) are Muslims, and about 6% (29) hold traditional or animist beliefs. The implication from the above analysis is that almost everybody in the reserve area belongs to a religious organization. These organizations can therefore be used as possible media for preservation/conservation education and dissemination of environmental information to the people in the preservation area

4.5 Marital Status

The significance of marital status lies in the fact that females and their children account for a major source of family labour and provide also vital socio-economic function in the rural financial system. Our observation in the forest reserve was that people marry at very early age. A usual reason given was the great difficulty for a single household and particularly a man to combine effectively the daily household chore with farming activities in the rural areas. This suggests a high degree of division of labour as practised in rural households.

Our data show that more than 80% of our respondents indicated that they are living in a spousal relationship (see table 4.4). Approximately 77 percent (376) of all heads of households interviewed are married. On the other hand there were others who have children but have never entered into marriage relationship before. About 5.7% (28) of the currently married respondents were found staying apart from their husband. As pointed out earlier the study identified that quite a reasonable proportion of the respondents interviewed were living in households with females as heads. Some of these female heads were either widows or divorced wives or women who have never married before. Discussion with these indicated that for a large number of them the economic and social upbringing of the children lies primarily if not solely on their shoulder. About 10 percent (47) of the heads of households were also identified to be living in polygamous family structures with more than one wife.

Table 4.4
Marital Status of Heads of Household and Population

Marital status	Heads of household		Total Population	
	Frequency	%	Frequency	%
Single	83	17.0%	648	23.9%
Married	376	77.2%	949	35.0%
Separated	28	5.7%	63	2.3%
Underage			1051	38.8%
Total	487	100.0%	2711	100.0%

4.6 Educational Background

The practice or acceptance of environmental innovation and conservation of natural resources such as forest reserve is normally prejudiced by:

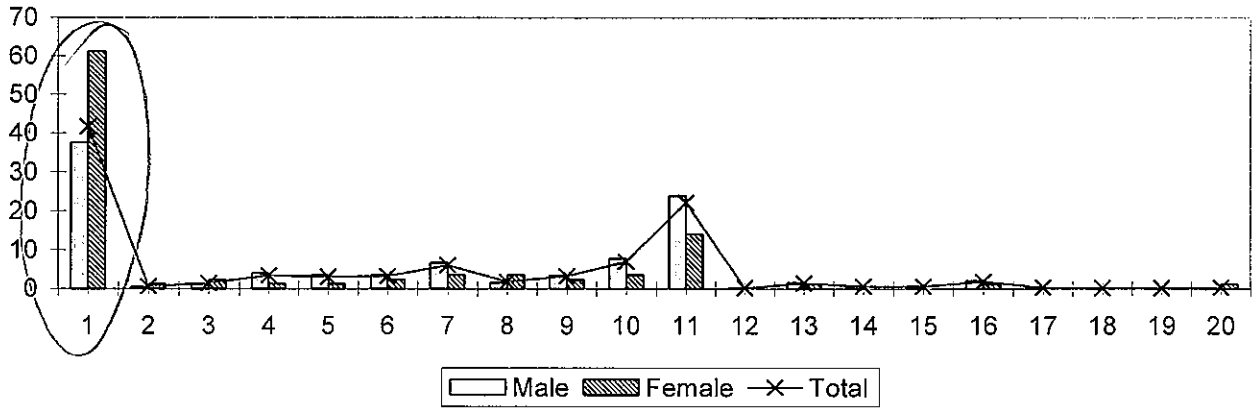
- peoples' degree of awareness of the dwindling endowment of today's natural resources,
- the benefits to be derived from an attitudinal change in the unscrupulous exploitation of these resources and
- the economic costs in the form of constraints to development due to deficient availability of these resources.

It is therefore essential to instil advances in knowledge and to diffuse new ideas especially to farmers to promote the human abilities and motivations that are more favourable to natural resources conservation.

The level of education can easily influence these advances in knowledge and the willingness to adopt environmental innovation. These qualities are, however, assumed to be more obvious the greater the number of years of education a person attained. Against this background attempts were made in the study to ascertain the level of education of, not only, the respondents, but also members of their households. This was done with the view to determine the ease with which conservation measures to be introduced would be understood and implemented by the people.

Figure 4.3 below depicts the educational background of the respondents in the reserve area. It can also be seen in table 4.5 that illiteracy is quite common in the forest reserve. The mean level of school attainment of heads of households and the total sample population is 4.9 years or 3.9 years respectively, which is far below the national average of 5.13 years (Appiah-Kubi 2002). About 42 percent (203) of the heads of households and 39.1 percent (1059) have never been to school before. This compares unfavourably to the national average of 34.3 percent of Ghanaians above 14 years without education (Appiah-Kubi *et.al.,* 2001). It was also observed that far greater proportion of the women, about 61.18 percent (52) of heads of households or 46.12 percent (634) of total sample population, have no education whatsoever (see table 4.6). The study also observed only four respondents with post secondary education, with the maximum of 19 year of schooling. These comprised some post-secondary teachers working in the area. The majority of the literate people, about 34.1 percent (166) of heads of households and 26.2 percent (711) of total population have, however, completed the basic of middle school leaving certificate level. From table 4.5 it can be seen that a higher proportion of the heads of households have relatively higher education attainment than the total sample population. This can be seen in the fact that while about 34.1 percent (166) share of the total heads of households claimed, during the interview, to have attained the middle school leaving certificate, only about 26.2 percent (711) of the total sample population asserted to that claim.

Fig. 4.3
Education Attainment of Respondents in the Worobong South Forest Reserve



The picture, which emerges from the above investigation of the level of education in the reserve area is that the average level of attained education by respondents and residents of the conservation area is far below the national average. Moreover the level of illiteracy among women in the study area is higher than that of their male counterparts and extremely above the national average.

Quelle leçon en tirer pour la bonne mise en oeuvre du projet ? → Réponse page suivante !

Table 4.5
Educational Distribution of Heads of Household and Population

Educational Status	Heads of Households		Population	
	Frequency	%	Frequency	%
No Education	202	41.5	1059	39.1%
Primary	92	18.9	848	31.3
Middle	166	34.1	711	26.2
Secondary	23	4.7	83	3.1
Post -Secondary	4	0.8	10	0.37
Total	487	100	2711	100

Looking at the educational background of respondents it is significant to note that no female head of household and female farmer had attained a level of education higher than the elementary school. Since women composition in the population are relatively high in the area, it remains to be emphasised that any future programme of development for the area should take a serious look at the issue of gender educational imbalance.

The low level of education in the reserve area makes it imperative to embark upon an intensive education of the residents about any re-forestation programme, in order to solicit the needed acceptance and support of the people for the execution of such any resource-preservation programme. This educational programme can take various forms including short video or film shows followed by informative discussions or focus group discussions and workshops on improved farming practices.

4.7 Duration of Residence

In accordance with the terms of reference data were also collected on the years of stay of the individual respondents in the forest reserve. Even though the reserve has been formally known over the past 74 years, it appears settlement around the reserve started quite recently. This is confirmed by our survey that showed a relatively low duration of stay of the people in and around the reserve (see table 4.7). An average duration of stay of about 12.8 years (with minimum and maximum periods of less than 1 year and 60 years) was recorded in the survey area. It was also discovered that a sizeable proportion of the respondents, about 41 percent (193), have lived in the ~~resource~~ environ for less than 15 years, with the male respondents accounting for about 33.12 percent (157) of the resident heads of households who have lived there for less than 15 (see figure 4.4). This thus confirms the argument that Worobong South Forest Reserve is a new settlement. The biggest group of heads of households was found to have lived there between 19 and 21 years, followed by 28 and 30 years. This applies to both males and females as well as settlers and indigents. This implies that the reserve area had not been farmed for a long time and that the massive environmental degradation of the reserve has occurred most probable in the last two decades, which coincided with the influx of settlers in search for arable farmlands.

Cette conclusion pourrait être biaisée

Durée d'occupation de l'individu et de ses parents.

Pas nécessairement. Cette conclusion peut être biaisée par la façon dont la question a été posée par les interviewers.

Une question subsidiaire relative à l'occupation par leurs parents aurait dû être posée.

Table 4.6
Distribution of Completed Years of Education of Respondents and Residents in Worobong South Forest Reserve
(Percentages and Frequencies)

Respondents

Years		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Male	%	37.56	0.5	1.24	3.98	3.48	3.48	6.72	1.49	3.48	7.71	23.88	0.25	1.49	0.75	0.75	1.99	0.5	0.25	0.25	0.25
	Frequency	151	2	5	16	14	14	27	6	14	31	96	1	6	3	3	8	2	1	1	1
Female	%	61.18	1.18	2.35	1.18	1.18	2.35	3.53	3.53	2.35	3.53	14.12	0	1.18	0	0	1.18	0	0	0	1.18
	Frequency	52	1	2	1	1	2	3	3	2	3	12	0	0	0	0	0	0	0	0	0

Total Respondents

Total	%	41.68	0.62	1.44	3.49	3.08	3.29	6.16	1.85	3.29	6.98	22.18	0.21	1.44	0.62	0.62	1.85	0.41	0.21	0.21	0.41
	Frequency	203	3	7	17	15	16	30	9	16	34	108	1	7	3	3	9	2	1	1	2

Sample Respondents

Male	%	31.81	6.66	4.79	4.87	5.39	3.44	6.36	3.82	3.22	13.55	11.15	0.52	1.5	0.67	0.37	1.27	0.22	0.07	0.22	0.07
	Frequency	425	89	64	65	72	46	85	51	43	181	149	7	20	9	5	17	3	1	3	1
Females	%	46.14	7.06	5.17	4.37	5.02	4	5.46	3.2	3.42	8.59	5.68	0.29	0.66	0.29	0.29	0.29	0	0	0	0.07
	Frequency	634	97	71	60	69	55	75	44	47	118	78	4	9	4	4	4	0	0	0	0

Total Sample Population

Total	%	39.08	6.86	4.98	4.61	5.2	3.73	5.9	3.51	3.32	11.03	8.38	0.41	1.07	0.48	0.33	0.77	0.11	0.04	0.11	0.07
	Frequency	1059	186	135	125	141	101	160	95	90	299	227	11	29	13	9	21	3	1	3	2

Fig. 4.4
Percentage Distribution of Duration of Stay of Respondents by Gender in the Worobong South Forest Reserve

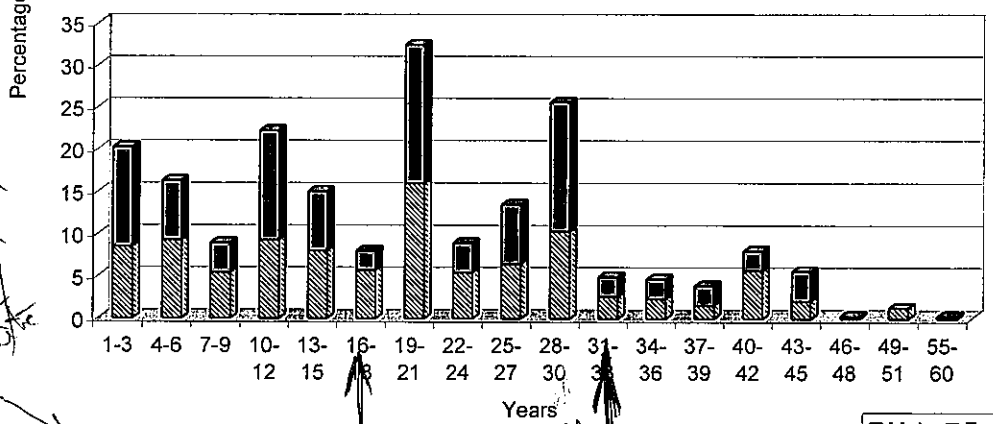
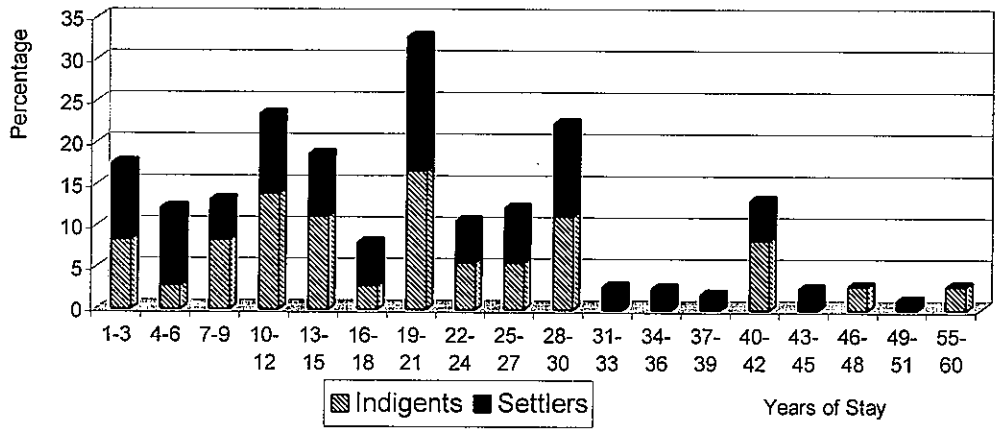


Table 4.7
Distribution of Duration of Stay of Respondents in Worobong South Forest Reserve by Tribes, (percentage and Frequencies)

Years	Akyem		Other Akans		Ewe		Ga/Adangbe		Northerner		Krobo		Total	
	%	Freq,	%	Freq,	%	Freq,	%	Freq,	%	Freq,	%	Freq,	%	Freq,
1-3	8.33	3	8.33	2	3.70	1	0.00	0	20.00	2	9.97	35	9.07	43
4-6	2.78	1	25.00	6	7.41	2	11.54	3	10.00	1	8.26	29	8.86	42
7-9	8.33	3	0.00	0	7.41	2	0.00	0	0.00	0	5.41	19	5.06	24
10-12	13.89	5	20.83	5	7.41	2	7.69	2	0.00	0	9.40	33	9.92	47
13-15	11.11	4	0.00	0	7.41	2	7.69	2	10.00	1	7.98	28	7.81	37
16-18	2.78	1	0.00	0	11.11	3	7.69	2	0.00	0	5.13	18	5.06	24
19-21	16.67	6	4.17	1	3.70	1	19.23	5	10.00	1	17.66	62	16.03	76
22-24	5.56	2	0.00	0	7.41	2	26.92	7	0.00	0	3.70	13	5.06	24
25-27	5.56	2	0.00	0	3.70	1	0.00	0	20.00	2	7.41	26	6.54	31
28-30	11.11	4	16.67	4	18.52	5	0.00	0	20.00	2	10.83	38	11.18	53
31-33	0.00	0	0.00	0	3.70	1	0.00	0	0.00	0	3.13	11	2.53	12
34-36	0.00	0	0.00	0	0.00		0.00	0	0.00	0	3.13	11	2.32	11
37-39	0.00	0	4.17	1	7.41	2	0.00	0	10.00	1	1.14	4	1.69	8
40-42	8.33	3	20.83	5	0.00		15.38	4	0.00	0	3.42	12	5.06	24
43-45	0.00	0	0.00	0	3.70	1	0.00	0	0.00	0	2.85	10	2.32	11
46-48	2.78	1	0.00	0	0.00		0.00	0	0.00	0	0.00	0	0.21	1
49-51	0.00	0	0.00	0	7.41	2	3.85	1	0.00	0	0.57	2	1.05	5
55-60	2.78	1	0.00	0	0.00		0.00	0	0.00	0	0.00	0	0.21	1
Total	100	36	100	24	100	27	100	26	100	10	100	351	100	474

However, as can be seen in figure 4.5, whilst the respondent with the highest duration of stay (60 years) is an indigent, it appears that quite a substantial number of settlers have lived on the average longer than the indigents in the reserve area. Notwithstanding the fact that our study identified a few settlers who have been in the area for more than 40 years, the majority of settlers appears to have come to the reserve area in the last thirty years, with the influx having intensified during the last 10-15 years, as a result of the massive redeployment exercise of the Ghana government since 1985 (see figure 4.5).

Fig. 4.5
Distribution of Settlers and Indigents According to Duration of Stay, (percentages)



4.8 Residential Status

In accordance with the terms of ref, part of our survey was devoted to identifying the residential status of the people within the conservation area and the duration of stay within the vicinity. The residential status classifies the residents into permanent residents, casual visitors and itinerants. It has already been established in chapter 4.2 that the majority of the residents in Worobong are settlers. A close look at the categories of residents with respect to residential status of the area, as presented in table 4.8, suggests that the people of the area are largely permanent residents. Casual Visitors and Itinerants form small proportion of the resident population.

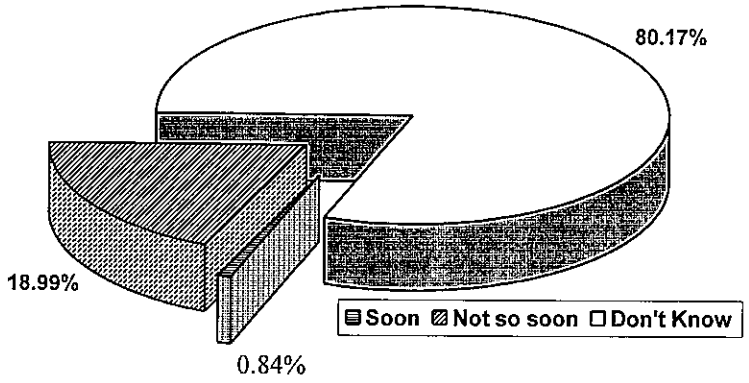
As can be seen in Table 4.8 about 95.15 percent (451) of the respondents in the reserve regard themselves to be permanent residents. This is equivalent to about 87.3 percent (2363) of the total sample population. This claim of a relatively high proportion of permanent residents was also con-

Table 4.8
Distribution of Residential Status of Respondents and Total Population

	Total Respondents		**Total Sample Population**	
	Frequency	**Percent**	**Frequency**	**Percent**
Permanent Residents	451	95.15	2363	87.20
Casual Visitors	13	2.74	291	10.74
Seasonal Worker/Itinerants	10	2.11	56	2.07
Total	474	100.00	2710	100.00

firmed by the intention of about 80.17 percent (380) to remain permanently in the reserve, hence they do not know when they would leave for the another place (see figure 4.6). Only about 0.8 percent (4) of the total respondents would want to leave very soon for another place in the near future, whilst about 19 percent do not even know when they would want to leave the reserve for a different place in the future. This is also underlined by the fact that a relatively small proportion of casual and seasonal workers or itinerants around (10.7% (291) and 2% (56)) live around the reserve, signifying a study influx of the migrants as opposed to emigration.

Fig. 4.6
Intended Departure from Study Area for Another Place



In order to verify the residential status of the whole people with their reported duration of stay in Worobong, we cross tabulated these two variables and presented the results in Table 4.9. As the table shows a large proportion of the residents have not been living in Worobong for long. It also indicates a relatively equal distribution of permanent respondents over the period. The relatively small number of the itinerants, unlike other areas in the Western and Ashanti Regions, can be attributed to the fact that Worobong does not have any cash crop like cocoa, whose planting or harvesting call for the need for more seasonal workers.

Table 4.9
Distribution of Residential Status of Total Population Classified According Duration of Stay (percent and frequencies)

	Permanent Residents		Casual Residents		Itinerants	
Years	Frequency	%	Frequency	%	Frequency	%
1-3	35	7.38	3	0.63	5	1.055
4-6	36	7.59	2	0.42	4	0.84
7-9	23	4.85	1	0.21	0	0
10-12	44	9.28	2	0.42	1	0.21
13-15	35	7.38	2	0.42	0	0
16-18	23	4.85	1	0.21	0	0
19-21	76	16.03	0	0.00	0	0
22-24	24	5.06	0	0.00	0	0
25-27	29.00	6.12	2	0.42	0	0
28-30	53	11.18	0	0.00	0	0
31-33	12.00	2.53	0	0.00	0	0
34-36	11	2.32	0	0.00	0	0
37-39	8.00	1.69	0	0.00	0	0
40-42	24	5.06	0	0.00	0	0
43-45	11	2.32	0	0.00	0	0
46-48	1	0.21	0	0.00	0	0
49-51	5	1.05	0	0.00	0	0
55-60	1	0.21	0	0.00	0	0

This implies that any future programme towards conservation of natural resources and preservation of wildlife and for that matter any re-forestation programme should reckon with permanent settlements

→ prévoir les voies et moyens de les impliquer dans les actions de conservation de la Réserve forestière.

around the area, from which interference not conducive to judicious conservation could be expected. The success of such conservation efforts would, therefore, depend on how far the residents of these settlements could calculate the potential benefits to be realised from the reserve as against without the reserve.

Section 5 Occupation and Livelihood of Respondents

5.1 The Farm Sector

A most important determinant of the socio-economic situation of a person is his or her economic activity. Indeed engagement in productive work is a principal means by which a person seeks to ensure a livelihood, whilst at the same time contributing to the reproduction and maintenance of the rest of the society. Determining the present pattern, character and magnitude of employment in Ghana is a complex web of factors including population distribution and density, resource endowment, climate, environment, soil and vegetation, access to social and economic infrastructure as well as colonial and post-colonial development policies. The place under study is faced with numerous spatial disadvantages. It lacks not only natural resource endowment to warrant any major exploitation to the benefit of the people in the form employment, rapid population growth and pressure, lack of social and economic infrastructure, serious environmental degradation of the land and other natural resources, and unfavourable colonial and post-colonial development policies have rendered the area unattractive for job creation apart from small scale farming.

Taking full account of the above limitations, available employment data reveal an interesting picture of labour market conditions in the area of the following nature:

- the dominance of agricultural self employment;
- the pervasiveness of informal sector employment;
- the relative scarcity of public sector and formal sector employment; and
- the high incidence of underemployment in the face of high employment ratio.

As is often the case in Ghana our survey found many people in more than one particular type of employment as our inquiry about primary and secondary occupation of the respondents revealed. The primary occupation, on the one hand, is here defined as one, in which the respondents or member of the households spends the bulk of his or her available working time. The secondary occupation, on the other hand, comprises all those income generating economic activities, which one does during his private time or on part time basis and which take less of ones working time.

The study of the data on the occupational distribution of the people in Worobong Forest Reserve suggests that agricultural is the major economic activity in the area. Farming alone employs about 89.1% (434) of the respondents in the reserve (see table 5.1) and thus accounts for the basis of the local economy as well as the main source of household income. About 90%of the active population above 15 years are employed primarily in this sector. More female (92%) than male (88%) respondents were found to be doing farming.

This underscores the importance of agriculture for the livelihood of the area. It must, however, be pointed out that the climatic conditions and the highly degraded level of the land in the areas allows the economical cultivation of only a few variety of crops, or a few food crops, thus making agriculture in the area rudimentary and largely subsistence in form. Among the remaining minor economic activities artisanal manufacturing including carpentry, mechanics, dressmaking, masonry, etc accounts for the most important source of livelihood or employment. Artisans account for about 2.7% (13) of the total respondents interviewed.

For a better understanding of the socio-economic set-up of the area, it may be useful to analyse the type of farming practised in the area This implies analysing the major crops of the farmers, which form the main source of income. It can be observed from the table 5.2 below that the majority of the

Table 5.1
Primary Occupational Distribution of Respondents

Occupational Status	Primary Occupation	
	Frequency	%
Farming	434	89.1%
Trading	9	1.8%
Clerical	1	0.2%
Artisan	13	2.7%
Teaching	10	2.1%
Student	12	2.4%
Gathering	3	0.6%
Police Officer	1	0.2%
Herbalist	4	0.8%
Total	487	100.0%

respondents 434 (89.1%) who indicated their primary occupation to be farming actually grow Cassava, Maize and plantain. As can be seen from table 5.2 almost 26.1% (350) of the farming respondents in Worobong South Forest Reserve cultivate cassava. Indeed our cursory observation of the weekly markets in the area confirms the relative importance of cassava in the local economy.

The widespread cultivation of cassava in the Reserve Area can be attributed to the existence of a high market demand for it. This can be seen against the background of the fact that cassava processing into gari appears to be the most popular secondary occupation in the area .The table indicate almost 46.3% (107) of the respondents in the agricultural processing sector are employed in gari processing. The widespread practice of gari processing in Worobong South Forest Reserve provides a ready market demand market for the raw material – cassava production. Palm oil processing sector, is also one of the popular secondary occupation especially for women. We found that about 13.4% (31) of people engaged in processing activities to be processing palm oil.

Table 5.2
Percentage Distribution of Crop Cultivators and Agro-Processors

Farming	Frequency	%	Processing	Frequency	%
Coconut	36	2.7	Palm wine Tapping	41	17.7
Maize	330	24.6	Distilling (Akpeteshie	28	12.1
Cocoa	53	3.9	Coconut Oil (Copra)	2	0.9
Oil Palm	68	5.1	Palm Oil	31	13.4
Cassava	350	26.1	Gari	107	46.3
Plantain	268	20.0	Fish	15	6.5
Pineapple	22	1.6	Rubber	2	0.9
Ginger	26	1.9	Other	5	2.2
Rubber	12	0.9	Total	231	100
Livestock	66	4.9			
Cabbages/Vegetables	111	8.3			
Total	1342	100			

Another important agricultural crop grown in the area is maize, which is grown by about 24.6% (330) of the farmers. It is interesting to note that the proportion of farmers engaged in cash crop (cocoa,

coffee, coconut, oil palm) production in the area is relatively small, compared to other farming areas, for instance, in the Ashanti Region. Cocoa farmers, for instance, accounted for only 3.9% if total crop cultivators in the area. This makes the area a predominantly foodstuff producing area and explains partly the high level of poverty in the area, since foodstuff farmers are known to have higher poverty incidence than cash crop farmers (Statistical Services 2000).

5.2 The Non-Farm Sector

Rural non-farm source of livelihood is very important because of the sector provides employment, household income diversification and security, market linkages for agriculture, and thus, the potential for reducing poverty and inequality. Newman and others (2000), for instance, in study of Ghana and Uganda provide evidence of a reduction in poverty in places where women and men have combined agriculture and non-farm activities. As Adams (2000) notes under conditions of limited availability and unequal distribution of land non-farm economic activities are very vital to poverty alleviation and environmental sustainability. Besides that non-farm activities characterize the extent of diversification and resilience in the rural economy to shocks, which may influence household behaviour and coping strategies to over-exploit the natural resources to mitigate the negative effects of the shocks.

Non-farm economic activity is here defined as all the activities that are associated with wage work or self-employment in work that is not in agriculture but located in study area. Our study found about 11% (53) of the total respondents earned their livelihood in non-farm activities as their primary occupation. About 2.7% (13) the respondents engaged in non-farm occupations were found to be artisans followed by students and teachers (table 5.1). Traders accounted for only 1.8% (9) of the total respondents. Our analysis of the joint determinants of participation in non-farm activities corroborates the main findings in the literature (Newman 2000). Higher levels of education lead to greater participation in non-farm activities and lower participation agriculture and that female heads of households are significantly more likely to work in the non-farm sector and significantly less likely to work in agriculture.

5.3 Agricultural Processing

Rural processing industry was still embryonic and covers the conversion of agricultural produces into finished and semi finished goods for local use or consumption. In the study area about 231 people or about 9% of the total population were found to be engaged in agricultural processing (table 5.2). This includes, among others, palm wine tapping, garri processing, palm oil processing and akpeteshie bier brewing. The majority of the people engaged in processing were found to be in garri processing (46.3%), followed by palm-wine tapping 17.7%) and palm oil processing (13.4) – see table 5.2.

5.4 Secondary Occupation

Even though the majority of the respondents are mostly engaged in one main economic activity, in the villages a relatively large number of the respondents have other secondary occupation in addition to the primary occupation. Over 56.1% (273) of the respondents have secondary occupation. About 43.9% of the respondents do not engage in any secondary occupation apart from their primary occupation. A large number of the respondents are engaged, besides their primary activity in trading

17.7% (86). The survey found that, large proportion of the women involve in trading as the secondary occupation 89.3%(435).

Other secondary occupation including gathering of canes, chewing sticks etc., whose raw materials does the people not cultivate and for whose market place demand may warrant intrusion into the reserve, were also identified in the study. The survey identified 4 herbalists who were practising this profession as a primary occupation; about 6 people who claimed to practise this as a secondary occupation. About 26 (5.3%)of the respondents are engaged in processing such as gari, palm kennel, palm oil, akpeteshie distilling comprising 20 (76.9%) women and the rest men. It appears artisanal manufacturing, owing to the limited market size, not much practised as a primary occupation by the respondents, 2.7% can best be pursued as a primary occupation. About 16.6% of the respondents are employed in an artisan profession as a secondary occupation.

Table 5.3
Secondary Occupational Distribution of Respondents

Occupational Status	Secondary Occupation	
	Frequency	%
No Secondary Occupation	214	43.9%
Farming	46	9.4%
Trading	86	17.7%
Artisan	81	16.6%
Hunting	3	0.6%
Health Worker	3	0.6%
Student/Pupil/Apprentice	5	1.0%
Unemployed/unoccupied	2	0.4%
Gathering eg.Canes leaves	7	1.4%
Forestry Worker	3	0.6%
Herbalist	6	1.2%
Unpaid Worker	4	0.8%
Processing	26	5.3%
Driver	1	0.2%
Total	487	100.0%

5.5 Other Potential Sources of Livelihood

The study area is a deprived area, where almost every person is engaged in farming as the first major economic occupation with some petty trading as the secondary occupation. Unlike other rain forest areas in Ghana, which can boost of cash crop production of cocoa, coffee and cola nuts, the area is noted only for the production of mainly food crops such as cassava and maize and to a lesser extent plantain and coco yams. High agricultural cash crop production in the area is seriously constrained by low soil fertility as well as the high degradation of the environment. This situation appears to be compounded by the rain fed nature of agricultural systems, population pressure and the reliance on burn and clear type of farming systems. This makes the introduction of other forms of farming and non-farm economic activities very important in the area. In the field of agricultural production it may be worthwhile to consider venturing into the following areas:

- Plantation farming (oil palm, cocoa, coffee, cola, coconut, rubber, sugar cane etc.

Le choix des essences forestières à utiliser devrait tenir compte de cet élément important qu'est la faible fertilité des sols

- Rice farming
- Non-traditional crops (citrus, ginger, black pepper, pineapple, snails mushroom)
- Palm oil and Palm kernel extraction
- Poultry and Livestock farming
- Vegetable farming

Agriculture, although essentially important, is not the only engine of growth, especially, for the rural economy. Particularly, in remote and low agriculture potential areas promoting the rural non-farm economy would not only generate positive effects beyond the individual enterprise, but can also be seen as being effective in reducing poverty through employment creation, income diversification, provision of safety nets, or indirect effects, e.g., on agricultural wage rates. Which non-farm economic activity seems appropriate for the under study may require further scientific research. However, a quick survey of the area reveals a number of possible local economic activities that could be developed for the people either as a primary or secondary employment and for which investment finance may not be all that high. These activities include the following:

5.5.1 Beekeeping:

As one of the economic activities that is widely practised in most rural areas, beekeeping for the production of honey is one activity that the people could be taught to embark upon to earning extra income in addition to their farming activities. It does not require much capital, easy to undertake, and can be undertaken after farm work in the evenings. Moreover the area appears to provide a conducive atmosphere for bees to thrive and there exists a ready market for honey both locally and outside the area. In one of our rounds in the area we identified only a woman who has started such a business, because she had attended a beekeeping course recently. Owing to the relatively early stage of her business it was not possible to assess the prospects. It appears, however, that entry into this business is hampered by lack of beekeeping expertise among the people.

5.5.2 Soap making:

Apparently many factors speak for soap making as one the local activities with immense potential in the area. Apart from the ready local market there is an available source of raw material – palm oil - in the area. Due to lack of local expertise and knowledge the people had in past sold their raw palm oil produce and extracts on the market. It appears the high level start up capital requirement might have made it unattractive to the poor people. However, this activity can be practised if the farmers could be organised into groups.

5.5.3 Snail keeping:

Even though snail keeping has become one of the part-time local activities of most communities in Ghana, it is yet to win recognition in the study area. Our interview with the population revealed that almost everybody has collected and traded in snails on the market before, which attests to the fact that the area is conducive to snail rearing and that it is a business with high potentials. It appears lack of skills and foresight have hitherto been the main impediment, since it one of the local activity with the least capital requirement.

5.5.4 Garri and palm oil processing:

Garri and palm oil processing appear to be one of the widely practised local activities in the study area, particularly, in relatively larger settlements. Many people, however, undertake them not as a

regular economic activity but only to process their own farm produces, which probably do not find ready market. Owing to the high demand for garri or oil in Ghana and the abundance of the raw materials – oil palm and cassava – and local processing expertise in the area we are inclined to give them a strong recommendation.

5.5.5 Animal husbandry:

It appears meat, the protein supplier of the people, is very expensive in the area and therefore accounts for a substantial share of the daily food expenditure, because almost every meat needs to be imported from far away urban centres like Koforidua, Accra and Kumasi. Notwithstanding the fact that there exists a ready market for meat in the area, animal husbandry seems to be limited to sheep and goat rearing on small scale. We believe that this local business could be expanded to include bush-meat husbandry of grass-cutter rabbits and guinea pigs. We also believe that this could easily be done, since the animal feed – grass - necessary for such a successful business in abundance in the area.

5.5.6 NTFP Production:

Non-timber forest products like cabbages and carrots oil palm or palm oil have a high demand in Ghana. On our rounds in the study area we identified a few production areas of cabbages along riverbanks in the study area. However, the producers complained about the lack of funds to buy sufficient insecticides. Oil Palm and palm oil production is also an activity that appears to be common among the women in the study area. Almost everybody appears to have done it before but not on regular basis. We think it is an area which needs to be looked at by way of enlightening interested women in groups to give it a serious thought.

5.5.7 Beverage Production:

Among the various local activities alcoholic beverage brewery appears to be very popular among males in the area. Everybody seems to have given it a thought before but had not undertaken it due to lack of capital. Since the raw material is to some extent available in the area, it seems appropriate also to give it a careful look as one of the local activities, which could be supported.

Section 6 Land Tenure

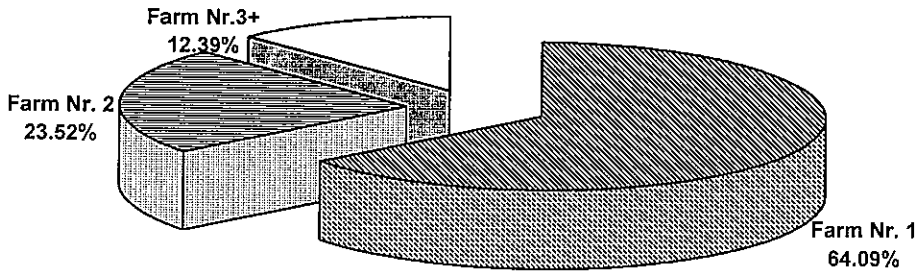
The Reserve Areas under study are located in the Akan speaking area (Akyem), occupying North – West of Begoro and Mia River. The Akans have, primarily, a communal land tenure system, which reflects a hierarchy of political authority, whereby religious and economic activities are decentralised to lower levels, while jural functions are more centralised (Migot-Adholla 1993). In line with this, the ultimate custody of the land is vested in the King or Omanhene, in Worobong, in the Begoro Kinship, in trust for the people, whereas various paramount and divisional chiefs oversee the land. Generally every member of the tribe has equal rights to the land. First occupation and investment of labour in land clearing and cultivation established initial rights of land tillage of families or clans. This allows subsequent family or clan members the permission to cultivate family or clan land anywhere, provided this is not already in use by another family member

As Ewusi (1990) has also pointed out that this traditional system of land allocation has proved to be far from a static set of customary rules. The introduction of cocoa and other cash crops in Ghana brought not only into greater prominence the important role of land and labour as sources of agricultural growth in Ghana. It initiated also major changes in the pattern of land ownership. It has created new relations (e.g. leasehold, abunu, abusa etc.) over land and labours, which have a large extent replaced the traditional communal system dominated by family production. Another aspect of it is that this together with rapid population growth and migration, has produced increasing signs of economic legal and social stress – land pressure – as existing land tenure adapts to current agricultural development and the general economic condition of the country.
This economic pressure coupled with bush fires can be witnessed in Worobong South Forest Reserve, where land scarcity has forced farms to be located directly inside as well as on the fringes of the reserve, resulting in massive degradation of the natural forest cover of the reserve. These pressures on land are complicated by diverse tenure arrangements and land transfers, which do not take cognisance of titles, or make any legal distinction between permanent and temporary possession. The consequence is the spread of land disputes and litigation in these areas, which can impede investment in land and resource conservation.

6.1 Patterns and Mode of Land Acquisition, Landholding And Size

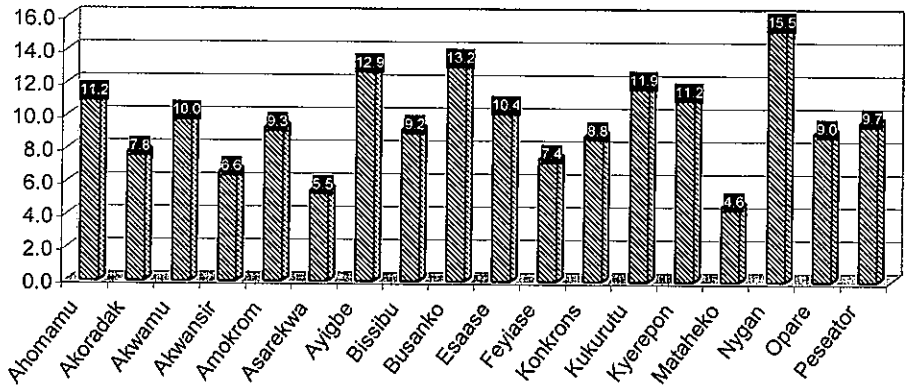
The average land size (median in parenthesis) was found to be about 9.34 (4) acres. This ranges from an average size of 4.6 acres in the Mateheko vicinity, 7.4 acres in the Feyiase area, about 11.9 acres in Kukurutu and 15.6 in the Nyganyonya area (see fig. 6.2). As can be seen in figure 6.1 almost 36% of the farmers operate more than one farm in different locations in the area, however, the majority of

Fig. 6.1
Size of Operated Farms in Worobong South Forest Reserve



them (64 percent) operate only one farm. It appears the firm farm on the list was always the largest of all the farms, with the majority located in their place of residence. Furthermore, a closer look at the

Fig. 6.2
Average Farm Size of Respondents in Worobong South Forest Reserve



farm sizes revealed larger farm or land sizes nearer to the border of the reserve than farther away. This implies a rush on the immediate off-reserve forests, which had until recently been maintained as the buffer zone against direct encroachment on the reserve.

The survey reveals that about 16.7% (93) of the respondents farmers to be working on their family land. Additionally more than half (53.4%), (297) of the respondents appear to be working on their owned individually acquired land, or assert to own the farm land (see Table 6.1)[3]. This suggests a relatively highly developed land market in Worobong, since a larger proportion of the respondents claim to individually own the land either through purchase or labour[4]. Ironically, despite a relatively high proportion of the respondents, who claim to either to be farming on family owned lands or individually acquired lands, quite a high percentage of them, almost 55.4% (308), believe that they have just temporary right to the farm land. This, on one hand, suggests the existence of a vigorous market for land leases in Worobong, which are operated mostly by people of other Akan tribes. On the other hand it also suggest that most of the farmers, who are largely settlers do not legally own the land, on which they farm. This fact is also underlined by the claim of a large proportion of about 42.8% (238) of the farmers that their land is not heritable. This is also confirmed by almost 45.9% (229) of the respondents, who believe they cannot bequeath the land in inheritance (see table 6.2). Moreover, a large proportion, almost 61.5 percent (342) (see table 6.2) of the respondents claim that they can only replant the farmland after renegotiation with a third party. This underlines, in any case, the emerged fact from the survey that the majority of the respondents were tenants, occupying stool/state or sharecropped lands. However, to about 38.4 percent (214) of the farmers, occupancy does not, in their opinion, make it difficult for the seasonal or annual replanting of the land, since they do not need any negotiation with any third party before replanting the land.

It appears that approximately all the acquired lands are now being operated as the study found only about 4.5 percent of the acquired land to be unoccupied. It seems that, however, be emphasized that, most farmers regarded acquired land, of which only a part is cleared, as wholly being used. It was, therefore, not possible to acquire information on the relative portion of the land., which was actually

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[3] We caution here against the uncritical interpretation of this evidence, since the distinction between ownership and possession, among many farmers, is not very much clear.

[4] Land acquisition through labour is possible in the Abunu/Abusa tenure systems, where a farmer after tillage shares the property and land owned by an absentee land owner.

Table 6.1

Selected Land Tenure Indicators In Worobong Forest Reserve (Percentages of Respondents)

Source of Land			Mode of Sharing			Duration Of Right		
	Freq	%		Freq	%		Freq	%
Stool Land	52	9.4%	Abunu	343	61.7%	Temporary	308	55.4%
Family Land	93	16.7%	Abusa	32	5.8%	Permanent	248	44.6%
Individually Owned	297	53.4%	Other	181	32.6%			
Sublet from another Tenants	102	18.3%						
State	12	**2.2%**						

planted. The practised form of sharecropping in the survey area was of the 'Abunu' or 'Abusa' types.

The survey reveals that about 32.6% (181) of the respondent farmers do not practise any form of sharecropping whilst about 61.7% (343) and 5.8% (32) practise 'Abunu' or 'Abusa' mode of share-cropping respectively. The non sharecroppers comprised the farmers, who owned the operated land themselves through private purchase and those who were making yearly cash payments in the form of rent to their landlords. This included about 28.3 percent (127) of the respondent farmers claimed to be receiving annual cash payments, whilst 71.7 percent (323) of the interviewed respondents also claimed to be making annual rental payments most probably from tenants of their sublet farms or lands.

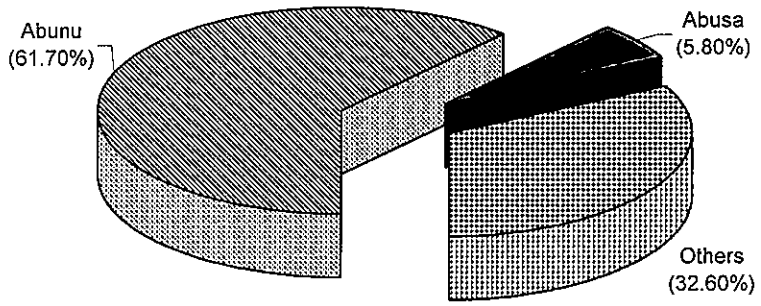
Table 6.2

Land And Property Inheritance In Worobong Forest Reserve (Percentages of Respondents)

Inheritance of Land and Property			**Replanting of Land**		
	Freq	**%**		**Freq**	**%**
Heritable Land	212	38.1%	**Renegotiations**	342	61.5%
Non-Heritable Land	238	42.8%	**Without Renegotiations**	214	38.5%
Non-Heritable Land but heritable property	83	14.9%	**Bequeath of Land and Property**		
Non-Heritable Land and property	16	2.9%		**Freq**	**%**
			None	229	45.8%
Heritable Land but Non-Heritable property	7	1.3%	**With Approval**	114	22.8%
			Without Approval	157	31.4%

Fig. 6.3

Mode of Sharecropping Worobong South Forest Reserve



6.2 Fragmentation and Inequality of Land holdings in Worobong South Forest Reserve.

Land tenure in Ghana exhibits some distinctive regional similarities, which tend to correspond with broad agro-climatic zones. In the reserve areas land fragmentations appears to be moderate but show increasing tendency. Even though the mean number of 1.5 parcels operated is not very high, compared with what prevails in other African countries (Migot-Adholla 1993), a close look at the survey data reveals that the sizes of the parcels diminish from number one upwards. The relative small size of the farmlands and the fact the farm sizes of households decrease as the number of farms increases indicates that fragment of land holdings in Worobong is on the increase. It must, however, be pointed out that it may be restrained probably by scarcity of farmlands, however, the increasing population growth of the area coupled with the matrilineal inheritance can change the face of fragmentation in the near future.

There seem to be wide variations in the average farm size across Worobong, an indication of high inequality of land in the reserve area. The survey revealed that the minimum land holding of one acre was held by about 13.3%(74) of the farmers. A further 23.9% (133) farmers have to cope with only two acres farmland size. Although the recorded maximum land holding of 250 acres, was held by one household, 20.1% (128) of the farmers have had to make do with 10 acres or less.

6.3 Patterns of Land holdings and Size

The average farm size of operated farms in the conservation area was 5.6 acres with a median size of 4 acres. About 85% (388) of the respondents were found to have a second farm, about 12%(56) with a third farm. The average size of the operated farms ranges from an average size of about 22.2 acre for the first farm to about 8.3 acres for the third farm as depicted in the table below. About 98% of the respondent farmers have their farms in or near the same village in which they resided.

Additional investigation of the data indicates that over 43.5% (242) of the respondents own the land themselves on which they operated. We caution, once again uncritical interpretation of this evidence, since the distinction between ownership and possession, among farmers, is not very much clear. The rest, who do not own their farmlands themselves should not, however, be regarded as sharecropping or lease–holding farmlands. As we observed in the course of the study, most of the farmers who had come by land ownership through sharecropping were still looking after the farm of their previous absentee landlords and sharecropping in the property. Our analyses also revealed that, almost 61.7%

Table 6.3
Location Of Respondents' Operated Farms
(percent of respondents)

Farm No,	1	2	3+
Same Land	71.9	85.4	89.2
Other Village	24.8	13.5	10.8
Other	3.2	1.1	0.0
Total	100.0	100	100

(343) of the tenants practises 'Abunu ' whilst 5.8%(32) had the 'Abusa' mode of sharecropping. It was also observed that about 17.1%(95) of the respondents were receiving cash payments for land they had given to other farmers, where as a greater percentage 82.9% (461) do not leased farmlands.

Table 6.4
Size of Operated Farms and Type of Land Ownership (Percent)

Farm No,	Freq	% of HH	Mean		Type of ownership	Freq	Percent
1	487	100	10.8		Own Land	242	43.5
2	200	41	7.6		Rented/leased Land	314	56.5
3	158	32.4	5.1				

6.4 Mode of Land Acquisition

One of our primary objectives of the study is to find out the mode of Land Acquisition in the reserve. The respondents were thus asked if they can bequeath the land with or without approval. It is realized from the study that majority of the respondents 48.5% (229) claimed they cannot bequeath the land whilst about 22.8% (114) of the respondents also claimed they can bequeath their landholdings inheritance. This corresponds with the percentage share of the respondents who assert to be owners of the land on which they farm. It is also observed that 14.9% (83) of the respondents say they can only transfer the property but not the land on which they have created the property. Majority of the respondents (61.5% (342)) claim they can only replant the field with renegotiation whilst 38.5% claim to possess the right to replant the fields without renegotiations with any body.

It is realized that a larger proportion of the respondents claimed to individually own the land through purchase or labour. Analysis of the data indicates that 16.7% (93) of the respondents were faming on family source of land together with their individually acquired land. It appears also that only small proportion of the farmer's respondent 2.2% (12) uses state land to cultivate the crops.

Further analysis of the data indicate that majority 56.5 (314) of the respondents claim to rent/lease farmland which indicate that a lesser proportion 44.6% or 245 hold permanent right to these lands with about 55.4% (308) of respondents holding temporary rights to the lands on which they farm. These temporary lease transactions were operated largely by 'Krobo's' 74.4%(363) and Other Akans 4.7% (23), but about two-thirds of the respondents holding temporary duration of rights to land comprise indigents.

6.5 Land Tenure Security in Worobong South Forest Reserve

From the foregoing analysis we can deduce a type of land use rights, which in the view of the farmers in the conservation area, are to a large extent permanent, but with a limited assurance of continuing replanting embodied in their tenure. This relatively implied land tenure security[5] is important, since the legal bundle of rights which it confers, where absolutely certain and assured (e.g. through land registration, or unquestionable guarantee by the local community) can theoretically enhance incentives for long term investment in agricultural and resources conservation. With regard to environmental conservation, the right to sell, grow annual and or perennial crops, bequeath the land, may include that of the farmer to prohibit a third person from exploiting any resource whatever on the farm land.

The robustness of the land tenure protection and its probable consequences on preservation were put to test in the conservation area. The results of the analysis are presented in the table 6.5 below. It can

[5] Following Place, *et.al.*, (1994) land tenure security can be defined as the perception of an individual that the rights he or she holds in the land is continuous, and free from imposition or interference from outside, as well as the right to reap the benefits of labour and capital invested in that land, wither in use or upon transfer to another holder.

be inferred from the table that the use right to grow annual and perennial crops and transfer rights (to bequeath, sell, mortgage etc) vary across the sample area. However, it appears rights of transfer appear to be the major problem in the survey, since majority of the respondents claim that they have no authority to register, sell, bequeath or give their holding in Abunu and Abusa tenures. Whilst, for instance, about 31.2% (156) of the respondents have the right to sell the land without approval from anybody, about 45.2% (226) of the farmers do not have this right, even though a higher proportion of about 49% (245) of the farmers claim that they have the right to grow perennial crops without approval. Right of transfer appear to be the major constrain in the survey,

The participation of third parties in decision making regarding use and investment in land constitutes limits to land rights, which have important implication for the success of any future conservation programme in the area. It, therefore, stands to reason that any future conservation programme for the area can achieve the desired success if all efforts are not only concentrated on the farmers alone but also all those connected with decision making such as stool land owners with regard to investments in environmental innovation.

Table 6.5
Measure of Land Rights And Tenure Security (percent of Respondents

Land Tenure	Freq	%
Right to sell		
• None	226	45.2%
• With approval	118	23.6%
• Without approval	156	31.2%
Right to legally Register		
• None	226	45.2%
• With approval	120	24.0%
• Without approval	154	30.8%
Right to Bequeath		
• None	226	45.2%
• With approval	118	23.6%
• Without approval	156	31.2%
Right to Grow Annual Crop		
• None	42	8.4%
• With approval	213	42.6%
• Without approval	245	49.0%
Right to Grow Perennial crops		
• None	8.4%	207
• With approval	42.6%	126
• Without approval	49.0%	167
Right to Give as Nwheso⊃		
• None	219	43.8%
• With approval	136	27.2%
• Without approval	145	29.0%
Right to Mortgage		
• None	248	49.6%
• With approval	89	17.8%
• Without approval	163	32.6%

Section 7 Income And Expenditure Profiles

The evaluation of income and expenditure is necessary in a socio-economic survey (besides the fact that the ToR request for it) because of the high link between income as direct determinant of standard of living and ability to undertake investment in environment innovation. The higher the level of income of the people and the standard of living, the less difficult it is to request their collaboration for achieving a micro – environmental conservation goal. Moreover people who have a higher standard of living and thus do not face the grim of poverty would not be forced to overexploit the fragile ecosystem for their daily survival.

It has often been asserted that poverty in Ghana is typically a rural phenomenon. Thus poverty manifest itself in lower absolute and relative levels of income and expenditure for rural dwellers, as well as in the lack of basic social amenities and economic infrastructure in the rural areas, as compared to urban centres. The consequences is a comparatively low level of economic status of the people in the rural areas, even though the rural forest areas are said to be better of than the urban poor, in terms of relative poverty, due to cocoa and other cash crops.

7.1 Expenditure Profile

Measures of economic status of a people are usually done with the help of household expenditure and income indicators. We begin first with the profile of expenditure indicators, and summarise in table below data on the average household expenses of various expenditure categories. The estimation of household expenditure was done through queries about Household expenses over the last 12 months.

We however, advise on the cautious use and interpretation of the figures, since the results of the estimation are marred by, in our opinion, inexact details or recall of expenditure and incomes of the respondents. The estimates might also suffer from underestimation of the contribution of the spouse. Even though attempts were made to get data from the housewife in particular, whenever she was present, the fact was that the head of household, usually the man, was at the centre of the interview. This tended to assume that the women in the family did not earn income for the household or incur expenditure on behalf of the family

In spite of that deficit with the survey data, the study estimates an annual average total household expenditure of about ¢2,496,938. The breakdown of total expenditure into its components is shown in table 6.1 below. This is equivalent to a monthly disposable income of ¢201,641.08 for the average household in Worobong. A comparison of the household expenditures with that of the national average shows an average expenditure far below the national annual average of ¢4,244,000 and also about 54.4 percent below the mean annual household expenditure of ¢3,736,000 for the Eastern Region (Ghana Statistical Service 2002), where the reserve is located. Although women heads of households were also interviewed attempts to document household expenditure by gender produced results, which did not make sense and cannot, therefore, be reproduced here, because of the wide differences in the relative values of data among the gender.

7.1.1 Expenditure on Food

As can be seen in table 7.1 food expenditure accounts for the largest relative share of household expenditure. Out of the average annual household average expenditure of ¢2.4 million, 30.9%

represented expenditure on food (market 11.73% and imputed own produce 19.17%). The remaining 55.6% of total expenditure represent other non-food expenditure. Unlike many urban households where food items are bought on daily basis, the majority of household in the reserve area acquire their food items on market days, which take place bi-weekly (66.1% (322)) or weekly (20.9% (102)) in most of the reserve environs. However, about 13.3 percent (65) of the households do shopping once a while when the need arises. Besides food expenditure, health care expenditure appears to be highest, non-food household expenditure item, accounting for about 13.57% of the average total household expenditure.

Table 7.1
Composition of Estimated Annual Average Household Expenditure

Items	Absolute	%
Food (Market)	294,618.00	11.73
Food(Own Produce)	481,018.00	19.17
Clothing	105,938.00	4.2
Toiletries (soap, etc)	76,886.00	3.06
Rent (actual or imputed)	236,215.00	9.39
House Utilities (Water.etc imputed)	63,687.00	2.55
Fuel (firewood, kerosene)	100,552.00	3.99
Health care	340,685.00	13.57
Transportation	37,735.00	1.43
Education (books, fees etc..)	65,423.00	2.58
Donations and Remittances	63,561.00	2.5
Farm input (seed other than Labour)	21,715.00	1.96
Farm machinery (Chain saw etc)	47,755.00	1.84
Farm Labour (cash & imputed)	53,600.00	2.06
Raw materials (artisanal producers)	55,640.00	2.22
Household durables (buckets,radio,utensila)	63,350.00	2.45
Immovable assets	203,142.00	8.09
Levies (including imputed)	4,366.00	0.09
Credit repayment	99,532.00	3.93
Other (specify)	81,520.00	3.19
Average Total Expenditure	2,496,938	100

7.1.2 Expenditure on other Non-Timber Forest Products

NTFPs, as the name indicates, include all products gathered from the forest for any purpose, apart from commercially exploited timber. They contributed to all aspects of rural life by providing food, fuel, building materials, fodder and other household items, besides serving, at times, as ritual artifacts and cultural symbols. All the households studied consume forest products regularly.

As part of our aim to document household expenditure according to type of expenditure over time with specific reference to NTFPs including medicinals, our study requested information from respondents on some selected NTFPs as to how much, when and why they spend on them. The selected NTFPs including firewood, honey, bush meat, mushrooms, canes snails, and chewing sticks, medicinals and others, which have high demand in the area and therefore lead to intrusions into the reserve.

a) Expenditure on Firewood

Almost all the respondents surveyed in the reserve area depend on firewood for their energy supply. Not only is fuel wood needed for home cooking, but it also plays an important role as energy source in rural processing activities. In Worobong South Forest Reserve, for instance, akpeteshie distilling, fish smoking, and palm oil as well as gari processing were identified as the principal processing activities that also depend largely on fuel wood for their energy supply. All these activities including home cooking require large quantities of fuel wood. Even though most of the fuel wood is collected from farms and fallow areas, an increasing quantity, especially, of preferred tree species is collected from the forest, due to increasing scarcity on the farms.

Table 7.2
Household Expenditure Estimates On Selected NTFPs

Item	Weekly Expenditure Estimates in Cedis			
	Mean	Median	Min	Max
Firewood	19,313	10,000	500	2,000
Mushroom	5,867	5,000	500	15,000
Bushmeat	11,186	5,000	1,000	100,000
Snails	8,450	5,000	500	5,000
Canes	4,966	4,000	500	4,000
Medicinals	6,763	5,000	500	120,000
Honey	13,164	10,000	500	100,000
Other	4,400	5,000	500	8,000

It is therefore not surprising that our survey revealed a median of ¢10,000 as an equivalent amount, which is spent by an average household in the reserve on fuel wood in a week as indicated in the table 7.2. The minimum and maximum weekly expenditures presented in the table reflect those on fuel wood for private household use and business consumption; for example, weekly expenditure on fuel-wood for gari, akpeteshie or oil palm processing. This high cost reflects, on the one hand, increasing scarcity of fuel-wood in the reserve. On the other hand, fuel-wood must be transported over long distances to the villages, which are farther away from farms. Hence, the Labour costs involved are as much higher

Table 7.3
Reasons for Household Utilisation of Selected NTFPs
(Frequencies and Percentage of Respondents)

	Firewood		Mushroom		Bushmeat	
Reasons	**Frequency**	**%**	**Frequency**	**%**	**Count**	**%**
1.00	320	75.3%	49	14.3%	54	14.5%
2.00	73	17.2%	19	5.5%	18	4.8%
3.00	-	-	196	57.1%	183	49.1%
4.00	32	7.5%	79	23.0%	118	31.6%
Total	425	100.0%	343	100.0%	373	100.0%

Legend:
Why do you rely on these things?
1 = No Alternative 2 = Because they are cheaper 3. = Taste better. 4 = Used to it

Regarding the reasons why the households rely on fuel-wood for their energy source 17% (73) of the respondents said it was cheaper than other sources. Most of the respondents in the reserve assign the low cost of firewood for their preference for this type of energy. About 74 percent (320) of the respondents use it because they have no alternative. This implies that many people would switch over if other forms of possible environmental friendly energy source were to be available. This, however, would have to be low priced since it would have to compete with fuel-wood, which is almost a free resource in rural Ghana, because the labour involved in gathering, particularly for household consumption, has economic cost, whose alternative use, as leisure, has zero economic price. To about 7.5 percent of the respondents fuel-wood has become a tradition; they consume, it is used because people are used to. The majority of the respondents use fuel-wood daily. For the rest who claimed to be using fuel-wood weekly or fortnightly, it could not be assessed which other forms of energy they had, since alternatives are extremely limited in the reserve area.

b) Expenditure on Bush meat

Wild game forms a very essential protein supply of most settlements around the reserve. More than 95 percent of Ghanaian rural dwellers claim to eat it regularly (Ntiamoa-Baidu 1992). The equally high demand for it in urban centres has also given rise to a lucrative trade, the consequences of which seems to threaten certain game species beyond sustainable levels (Falconer 1992).
Although people in the reserve areas do not eat bush meat daily, its share of expenditure in the area is relatively high. In the reserve areas, for instance, the mean weekly expenditure on bush meat was about ¢11,186, with ¢20,000 as the expenditure (mode) occurring most frequently.

It appears also that the reason behind the consumption of the bushmeat is basically rooted in psychology, rather than the need to satisfy the daily protein condition. Almost half of the respondents (118) eat bushmeat because, in their opinion, it taste better than other alternatives. A further 31.6% (118) of the respondents consume it out of tradition – they are used to it. The central factor underlying this high preference for bushmeat is actually the scarcity of bushmeat alternatives or knowledge of alternative protein supplier, such as beans, or custom and habit. This implies that any prospective programme to preserve the forest and its wildlife in the conservation area should embody educational measures intended also to change traditions and habits inimical to forest preservation.

Table 7.4
Reasons for Household Utilisation of Other Selected NTFPs
(Percentage of Respondents)

	Medicinal		Canes		Snails		Honey	
Reasons	Frequency	%	Frequency	%	Frequency	%	Frequency	%
1.00	52	19.8	140	38.1	80	33.1	19	8.4
2.00	67	25.6	97	26.4	97	40.1	5	2.2
3.00	12	4.6	9	2.5	28	11.6	179	79.2
4.00	131	50.0	121	33.0	37	15.3	23	10.2
Total	262	100.0	367	100.0	242	100.0	226	100.0

Legend:
Why do you rely on these things?
1= No Alternative 2= Because they are cheaper 3.=Taste better. 4= Used to it

7.1.3 Expenditure on Medicinal Plants And Canes

Forest are entered for rare products such as chewing sticks, medicines, honey, canes, building materials etc., unavailable on fallow lands. They are highly valued as sources of natural medicines for healthiness treatments, raw materials – canes –for household and for profit goods, for dental care, which the chewing sticks from the forest provide.

It is therefore not surprising that our survey revealed a mean expenditure of ¢4,966 and ¢6,763 as an equivalent amount, which is spent by an average household in the reserve area on canes and medicinals in a week or would have to pay for it, were it to be bought on the market respectively. According to Falconer (1992) the majority of the rural and urban dwellers 80% rely on wild plants as their main medicinal source and dental care. The high reliance on these forest products by both urban and rural people ensures a steady and strong market demand for the NTFPs in this category.

7.1.4 Expenditure on Mushrooms and Snails

Although most people in the reserve area do not eat mushrooms and snails for cultural reasons, they collect them regularly for sale on the market. According to the results of the survey, about ¢5,867 and ¢8,450 was spent on or received regularly from the sale of these mushrooms or snails respectively. About 57% (196) of the respondents claim either to eat or collect mushrooms because, in their opinion, it taste better and it is free in the bush. A further 23% (79) of the respondents in the reserve consume it out of tradition – used to it, and almost 40%(97) also assign low cost of snails. The relative availability of snails and mushrooms in the reserve is also reflected in the fact that consumption of them is spread evenly across the year. When these products are more available, the consumption is done largely, - about 69.1% (237) and 52.1% (126) of the respondents for mushrooms and snails respectively.

For both rural and urban households snails and mushrooms are among the most valued forest products. in diets. Because they can easily be found in the forest, their collection has always been a cause for intrusion into the forest. Seasonal snail picking in the reserve, for instance, is known to be among the activities, which have always had potential negative implications on resource management. However the Forestry Commission can take up the organization of such snail-picking

activities during the seasons and use them as fora to educate the people on sustainable resource preservation and to disseminate environmental information.

Table 7.5
Incidence of Household Utilisation of Selected NTFPs (Percentage of Respondents)
'How often do you use?'

	Firewood		Bushmeat		Snails		Canes	
How often do you use	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Daily	413	97.2	39	10.5	94	38.8	188	51.2
Weekly	3	0.7	22	5.9	3	1.2	29	7.9
Fortnight	0	0.0	4	1.1	1	0.4	3	0.8
Monthly	3	0.7	42	11.3	10	4.1	66	18.0
Seasonal	0	0.0	11	2.9	126	52.1	6	1.6
Once a while	6	1.4	255	68.4	8	3.3	75	20.4
Total	425	100.0	373	100.0	242	100.0	367	100.0

	Medicinal		Honey		Mushroom	
How often do you use?	Frequency	%	Frequency	%	Frequency	%
Daily	36	13.7	21	9.3	21	6.1
Weekly	14	5.3	4	1.8	2	0.6
Fortnight	5	1.9	2	0.9	0	0.0
Monthly	19	7.3	15	6.6	6	1.7
Seasonal	0	0.0	81	35.8	237	69.1
Once a while	188	71.8	103	45.6	77	22.4
Total	262	100.0	226	100.0	343	100.0

7.2 Income Profile

Just as we cautioned with regard to the exaggerated nature of the expenditures, so do we issue a similar caution against the uncritical interpretation of the data on incomes of the respondents. They were found to contain inexact details about actual incomes, since the data compilation was solely based on recollections of respondents of their earned incomes. Moreover, whilst we would not rule out exaggeration by some respondents, we observed the tendency on the part of the respondents to disregard other forms of irregular incomes earned from non-traditional cash crops and other petty sources of incomes, which tend to support households through lean seasons. Furthermore, contributions from the housewife were not adequately considered. We, therefore, advise on the acceptance of these estimates within their conceptual limitations.

7.2.1 Farm Incomes

Household income estimates in Worobong show an annual average farm-income of ¢2,261,141.45[6] (see table 7.6). This is equivalent to an average monthly income of ¢188,428.45. This amount seems to lie above the equivalence of the average nominal earnings of minimum wage of ¢5.500 (2002) of government employees. It should, however, be emphasised that nominal earnings of government employees normally excludes the numerous additional allowances and tips in-cash and in-kind, which government employees receive. Nevertheless, the incomes of the farmers are just a fraction of that of independent businessmen when one places these farmers on the same comparable level with other independent businessmen, as under normal circumstances should be the case. Moreover, the estimated income level reflects low levels of standard of living in Worobong when the income levels are analysed against the background of the average household size. With the estimated average household size of about six (5.5) persons, the annual average household income reduces considerably to an annual per capita income of about ¢376,856.91 (US$46.81), and far less than a quarter of the national per capital income of about ¢3,381,000 (US$420[7]). Using this as basis it thus suffices to conclude that the residents of the Worobong are very poor. This also lends credence to the well know fact that poverty is typically a rural phenomenon Ghana.

7.2.2 Income Distribution

It discerns from table 7.6 that income distribution in Worobong exhibits wide variations across the various income groups and gender similar to the observed income inequality. The estimated mean (median) income of males is about 34 percent (40.5%) higher than that of females. In other words whereas the average male in Worobong derives a mean income of about ¢2,380,019.12 from his farm annually, his female counterpart takes home only ¢1,774,657.44. Besides this gender disparity the incidence of poverty appears to be more pronounced among the lower income groups than the upper income groups. The top 10 percent, for instance, was found to be earning an annual average income of almost ¢13 million. This is equivalent to about 5.7 times that of the annual average. The lowest 10 percent was also found to earn annual income of only ¢225,600, which is less than 10 percent of all mean income of all respondents. From table 7.6 it can be seen that over 80 percent of the farmers earn below their annual mean income. Even though females are worse off than males as far as

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[6] This is equivalent to about US$ 280.89 when converted at the exchange rate of ¢8,050 to the US dollar.

[7] See World Bank (2002), African Development indicators, Washington, D.C., The World Bank.

Table 7.6
Sources and Distribution of Farm-Income of Respondents by Gender (¢ and percentiles)

Source	Total	%	Percentiles	Amount	Males	Females
Maize	313,087,280.83	29.25	10.00	225,600.28	161,510.54	254,650.53
Cassava	338,747,340.24	31.65	20.00	309,578.16	432,530.12	393,333.45
Yam	47,736,800.50	4.46	30.00	465,694.00	725,879.76	477,140.98
Cocoyam	104,529,380.65	9.77	40.00	707,607.21	1,044,924.25	648,581.76
Plantain	113,749,950.38	10.63	50.00	884,509.02	1,284,742.94	914,589.95
Rice	1,896,456.34	0.18	60.00	1,105,636.27	1,590,646.96	1,233,321.55
Cocoa	24,818,624.69	2.32	70.00	1,432,904.61	2,168,768.43	1,625,220.35
Oil Palm	60,648,673.77	5.67	80.00	2,030,832.70	2,997,733.51	1,911,911.43
Coconut	8,384,333.30	0.78	90.00	3,352,289.17	4,912,742.46	3,450,335.40
Coffee	1,297,575.39	0.12	100.00	12,958,057.09	17,925,222.85	11,273,964.95
Vegetables	42,236,078.97	3.95	Mean	2,261,141.45	2,380,019.12	1,774,657.44
Fruits	10,969,502.73	1.02	Median	1,000,000.00	1,284,742.93	914,589.95
Others	2,235,822.21	0.21				
Total	1,070,337,820.00	100.00				
Mean	2,261,141.45					
Median	1,000,000.00					

earnings are concerned the lowest 10 percent of females appear to earn about 37 percent higher than the lowest 10 percent males. The situation changes dramatically in favour of males from the second lowest 10 percent, with the top 10 percent of males earning about 59 percent higher than his females counterpart. Income distribution within both male and female groups are also unequal. As table 7.6 illustrates within the male group, whilst about 80 percent of total male respondents account for only 31 percent of all males earnings, just 20 percent of the male respective population control about 79 percent of the total male incomes. The same applies to females, where only 30 percent of the top female group control over 75 percent of the total females incomes. In section 7.1 an annual average total household expenditure of about ¢2,496,938 was estimated for the Worobong South Forest Reserve. A comparison with the annual average farm income realises a cash deficit of about ¢235,796.55, which is made good by remittances from relatives living outside the reserve and incomes from other off-farm activities.

Generally remittances are important to rural economies – as a source of consumption or investment. There is ample evidence that remittances represent a potentially important and untapped source of investment finance. Presently there is no general consensus on the impact of remittances on the environment. Several studies in Asia (Islam 1997) show that remittances facilitate less well to do farmers to diversify into environmental friendly agricultural activities like tree planting. On the other hand remittances facilitate other receipients to indulge in more extensive agriculture, which increases the demand for more land, particularly, where high-tech agriculture is not practiced. Remittances and transfers both cash and in-kind to residents in the Worobong Reserve is not all that high. The analysis of available data reveals that only 34.23% of the households received regular remittances from relatives living outside the reserve or from any other institution or government agency. The average annual amount of remittance is about ¢328.625. We would, however, like to warn against the

uncritical interpretation of this figure, since it is derived from the inexact recall of the head of household.

7.2.3 Sources of Income

The reasons for the high level of poverty in Worobong can be deduced from table 7.6. Unlike other rural forest areas of Ghana, which produce a certain kind of cash crop like cocoa or palm oil, the Worobong South Forest Reserve is a typical foodstuff producing countryside. Earnings from cassava, whose productivity depends extremely on the weather, account for almost a third (31.65%) of the incomes of the farmers in Worobong. Earnings from maize (10.63 percent) and plantain (29.28 percent) follow in that order. These indicators seem to confirm our previous finding on the relative proportions of the respondents engaged in the production of these crops. It also confirms our previous conclusion that non-cash crop production (i.e. crops apart from cocoa, coffee, oil palm etc.) provides the bulk of employment and income for the majority of the people in the area.

Ironically cocoa, Ghana's cash crop number one, appears to play no major role as far as earning sources or capacity are concerned. It provides the equivalence of only 2.32 percent of the earning capacity of the farmers in Worobong, even though the area had been a typical cocoa growing area not long ago. This evidence brings to bear the extent and consequences of environmental degradation that has taken place in the Worobong area over the last two to three decades.

The success of any conservation programme for the Worobong South Forest Reserve may depend upon how far a change from the exploitative to sustainable utilisation of forest resources can be effected, especially, among the rural poor, who are said to depend more on natural resources for their subsistence. The results of our study suggest that the extreme poor proportion of the population in the area accounts for about 50-70 percent of the rural population, which earn below 1.5 million a year. It is, therefore, necessary to identify this group for special attention in any future conservation programme designed to preserve the natural resources of Worobong South Forest Reserve, since their low economic status make them particularly more dependent on the forest and similtaneous vulnerable to any form of forest degradation.

Apparently there appears to exist an inverse relationship, in economic theoretical sense, between income and trespass on the reserve. Residents are less likely to trespass the forest during a good farming season than otherwise. Similarly there seems to be a high tendency on the part of farmers to trespass the reserve for other supplementary income, during lean seasons. Foodstuff production, which generates the bulk of the total income, is known to depend considerably on the vagaries of the unpredictable weather. Hence in order to stabilise income, and thereby, lessen encroachment on the reserve at any time of the year, conservation efforts in Worobong should include measures intended to diversify farm income generation. This should be done through the introduction of high yielding agricultural varieties and expansion of the palette of income generating agricultural products as well as non-farm economic activities.

7.3 Off-Farm Incomes

In addition to farming residents of Worobong undertake other economic activities, which also generate income for the respondents' households. These activities include trading, agro-processing gathering (e.g. of snails, mushrooms, leaves, canes, etc.), medicinal plants, and others such as driving and part-time teaching and office work). These activities are usually undertaken by the people in the rural

area in addition to farming in order to reap the advantages of diversification. As is already known people diversify into the non-farm sector in order to 1) smoothen income and consumption patterns, which would otherwise be seasonal; 2) increase their incomes; 3) reduce risk (by spreading income risk across several activities), and 4) improve their long-run prospects (by acquiring skills or assets, for instance). Thus the non-farm sector is important, in rural employment and income generation, in situations of both stagnant and buoyant agricultural sectors. It must, however, be pointed out that diversification in rural incomes and livelihoods has both positive and negative effects, for instance, on gender relations (women may become more marginalized if they are more constrained than men in their access to non-farm opportunities, or they may be empowered by new opportunities to earn income and develop skills and networks). Some types of diversification may reduce agricultural output (a significant exodus of males to take up work in mines, for instance), but there may be positive environmental effects from reduced pressure on the natural resource base, or the re-investment of non-farm income in farm ventures to enhance productivity and thus reduce the negative impact of extensive farming.

In our study area we found a few number of respondents, who undertook these activities as full time employment, whilst the majority practised these activities as a secondary occupation. This suggests the existence of relatively small non-farm rural economy in the Worobong Forest Reserve, offering a limited access to non-farm rural employment and livelihood. This might be due to constraints, which inhibits access to the non-farm employment opportunities in the Worobong area. These constraints may include the already known factors (Morton *et.al.* 1998) such as lack of finance or access to credit, poor educational achievements and health, poor access to infrastructure (particularly road, telecommunication and electricity), and lack of facilitating social networks. The situation of lack of access to non-farm activities is also compounded by the lack of any manufacturing, processing or mining factories that could provide non-farm livelihood on any significant scale.

Table 7.7
Sources of Non-farm Revenue in Worobong Forest Reserve

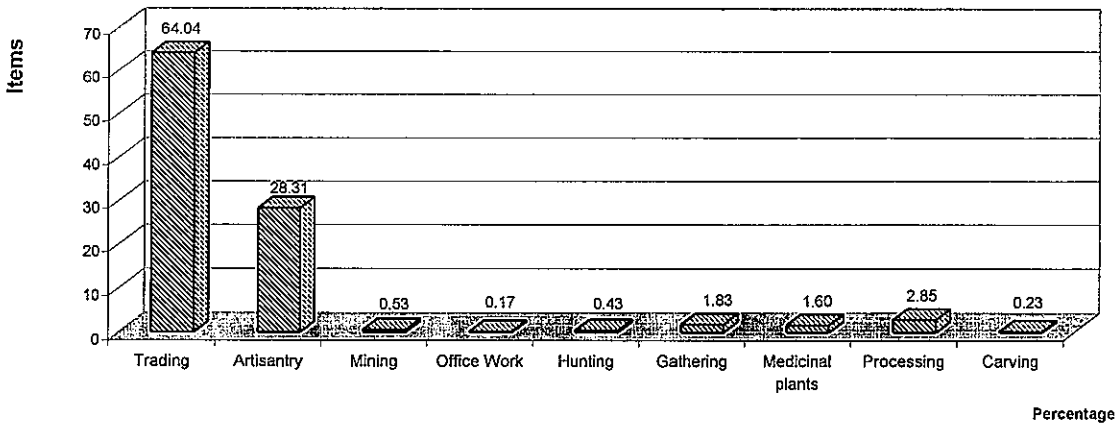
Source	Mean Non-Farm Income	%
Trading	1,212,276.83	64.04
Artisantry	1,638,043.54	28.31
Mining	1,060,000.00	0.53
Office Work	1,000,000.00	0.17
Hunting	1,027,500.00	0.43
Gathering	1,175,000.00	1.83
Medicinal plants	1,860,000.00	1.60
Processing	1,113,750.19	2.85
Carving	946,666.67	0.23
Mean	2,160,656.55	100.00

As can be seen in table 7.7 the few non-farm economic activities are small scale economic ventures largely in the informal sector that provide additional annual average income[8] of about ¢2,160,656

[8] Owing to the fact that data on household income from off-farm activities reflected total receipts (sales) not net income, the use of the word revenue would actually be appropriate.

(table 7.7) for the respondents of the area under study, who were engaged in them. However, it must be pointed out that it would be inappropriate to add this to the average farm earnings, since data provided by the respondents reflected total receipts including costs of production and not net income as expected.

Fig. 7.1 Sources of Non-farm Income in Worobong South Forest Reserve



A figure 7.1 illustrates the source of non-farm income in the Worobong conservation area were concentrated in very few economic activities, although quite a number of activities are carried out there. About 92.35 percent the farmers generate their non-farm incomes from two activities alone, i.e. trading and artisantry. It discerns from figure 7.1 that trading alone accounts for over 64 percent of the non-farm income. This is not surprising, since as stated earlier, about 89.3 percent of the respondents carry out this economic as secondary occupation. Artisantry such as carpentry, masonry, etc. follows as the second largest source of non-farm income, providing about 28.31 percent of total non-farm income. The high content of artisanal income stems from the fact that the area is a new settlement, hence a lot of artisanal jobs in the field of house construction are relatively available. It is of interest here to note that income from hunting is equivalent to just 0.43 percent of non-farm income. This economic activity together with income from gathering, medicinal plants, and carving activities whose source can directly be linked to the reserve itself, constitute an equivalent of about 4.10 percent relative to total non-farm income. Agro-processing, which are concentrated largely on gari, palm oil and Akpeteshie (gin) processing, is relatively common in the area and provides about 2.85 percent of the total income of non-farm income.

Considering the fact that non-farm activities enable rural people to reap the benefits of diversification of rural incomes and livelihoods, given that, on balance, the positive effects of diversification out-weigh the negative effects, it is thus right to side with Ellis (1999) that, the removal of constraints to, and expansion of opportunities for diversification emanating from the non-farm rural sector are therefore desirable policy objectives because they are likely to give individuals and households more options to improve livelihood security and to raise their own living standards. An expansion of the non-farm sector could be made to accommodate the suggestions made in section 5.5.

Section 8 Assessing Credit Needs

The availability or provision of credit provides an important source of additional finance for households, either to relieve a household during a difficult period or enable it to expand activities. To the preponderantly agricultural community the lack of access to credit facilities is compounded by, among other things, their distant location from banking centres.

Apparently the lack of credit facilities in Worobong seems to be acute. The acuteness is demonstrated by the fact that only 20.61 percent (94) of the respondents interviewed was found to have had access to any formal credit facility. This is against the backdrop of the fact that almost 87 percent of the farmers have the intention to borrow very soon in the near future. It must, however, be pointed out that a little over a quarter of all households (25.8%) surveyed reported that they had borrowed money or purchased goods on credit to or from other persons, institutions or businesses during the last twelve months (see table 8.1). This relatively low access to credit facilities can partly be ascribed to the low density of financial intermediaries within the vicinity of the forest reserve. Indeed almost all institutional financial services appear to be located in far away Koforidua. Even the district capital of Begoro does not have commercial bank apart from rural bank which is not all that effect. This constraints the farmers from making any monetary savings so as to be able to access institutional credit.

Unlike most urban business firms, which see credit or overdraft facilities as permanent revolving business practices, to the majority of farmers in Worobong, credit facilities are exceptional events in their business practises. Because only 3.8 percent of those who had previously received credit, claimed to have had access to subsequent or second credit. The degree of the need for credit on the part of the farmers and consequently of the lack of it expresses itself variously in effects on the business of the farmers and the respondents. To the majority the lack of access to credit had seriously (64.1 percent of respondents) or somehow (26 percent of respondents) affected their business and hence the economic activity of the forest reserve. Only about 9.9 percent of the farmers cannot discern any effect of the lack of credit on their economic activity.

A further indication of the acuteness of the lack of access to credit in Worobong is reflected in the fact that even among those who received credit during the last twelve months, only a few were believed to have received the full amount of credit requested. Almost two-thirds (62%) contended not to have received the full amount requested. The inability to obtain the full credit facility requested or credit at all was, to many, largely due to the sheer unavailability of sufficient credit. This was asserted by 66.67 percent (63) of the credit recipients, while about 11.5 percent (11) ascribed the cause to too high interest rates. 8.5 percent (8) of the recipient assigned the shorter repayment period as the cause for their inability to borrow (see table 8.1).

Table 8.1
Reasons for lack of Access to Credit Facilities

Reasons	Received part		Received no credit	
	Frequencies	%	Frequencies	%
I cannot pay back the money	7	7.27	32	8.05
No or not enough collateral or guarantor	5	4.85	18	4.60
I could not pay the cost last time I borrowed	1	1.21	5	1.15
There was no credit facility available	63	66.67	283	72.03
The interest was too high	11	11.52	33	8.43
The repayment period was too short	8	8.48	23	5.75
TOTAL	94	100	393	100

8.1 Respondents' Sources of Credit in Worobong South Forest Reserve

Friends or relatives appear to be the main source of credit for the forest reserve dwellers. As illustrated in table 8.2 about 41.49 percent (39) received their credit from friends, followed by relatives, which accounted as source for about 24.47 percent (23) of the total credit recipients. It was also found that institutional credit sources including banks also offered credit to about 12.77 percent (12) of the farmers during the year. Local moneylenders and sharecroppers play equally vital role as sources of credit by providing credit for about 6.38 of the respondents respectively.

Table 8.2
Sources of Credit in Worobong

Relatives	Frequencies	Percent
Relatives	23	24.47
Friends	39	41.49
Wife/Kids	1	1.06
Institutional Credit/Banks	12	12.77
Sharecropper	3	3.19
Local Money Lender	6	6.38
Credit Union	4	4.26
Purchasing Clerk	6	6.38
Total	94	100.00

As to the purpose for which the loans were used, more than 46.8 percent (44) of the respondents used the credit for business purposes (see table 8.3). This is underlined by the fact that a large number of the respondents borrowed during harvest times, when the need for extra cash to pay for labourers and transportation of harvested produce is most needed. Another peak season for credit is during off-harvest times, i.e. during land preparation. It was therefore no wonder that about 213. percent (20) of the farmers borrowed during this time to expand their businesses (such as to buy agricultural inputs). Typical of Akans, who treasure funerals, about 17 percent (16) of the credit recipients borrowed to celebrate funeral rites and about 18.1 percent (17) as a result of bereavement. Other reasons for borrowing included to cater for wife and kids expenses. This is reflected in increased borrowing by

Table 8.3
Selected Information on Borrowing Patterns of Respondents (Percent of Respondents)

How often			**Why did you borrow?**			**When did you borrow?**		
	Freq	**%**		**Freq**	**%**		**Freq**	**%**
Don't Know	5	5.3%	**Don't Know**	7	7.4%	**Don't Know**	8	8.5%
Monthly	6	6.4%	**For Funerals**	16	17.0%	**Off Harvest**	20	21.3%
2 x yrly	7	7.4%	**For Business**	44	46.8%	**During Harvest**	24	25.5%
1 x yrly	64	68.1%	**For Wife/kids**	10	10.6%	**During Funerals**	17	18.1%
Once a while	12	12.8%	**For Relatives**	5	5.3%	**During X'mas**	14	14.9%
			For Daily Upkeep	12	12.8%	**During Easter**	5	5.3%
						School Reopening	6	6.4%
Total	94	100.0%		94	100.0%		94	100.0%

about 14.9 percent (14) of the credit recipients during Christmas, when there is high need to buy gifts for family members. It can be seen in table 8.3 that most recipients borrowed once in the last 12 months.

According to the respondents the interest rate paid on these loans received range between 0 and 50 percent. From table 8.4, it discerns that almost 45.7 percent of the borrowers obtained their loans devoid of any interest payment obligation, while 23.4% and a further 30.9% of the respondents claimed to have paid about 50 percent and 20 percent interest respectively. In the opinion of most borrowers the interest rates were high, regardless of the fact that a great share of these loans was obtained from friends and relatives. About 44.7 percent (42) of the borrowers regarded their loans to be very expensive whilst a further 11.7 percent (11) regarded their loans to expensive, even though about 43.6 % believe the loan borrowed to reasonable. The apparent contradiction by a large proportion of the borrowers who pay no interest on loans but still regard the loans received to be expensive, can be explained by the non-pecuniary commitments that they were obliged to fulfil. All interest-free loans borrowed from friends and relatives carried these commitments, which in the opinion of the borrowers, make the loans expensive.

Table 8.4
Selected Information on Cost of Credit in Worobong

Was it expensive?			**What was the Interest Rate?**		
	Freq	**%**	**Percent**	**Freq**	**%**
Cheap	41	43.6	**20**	29	30.9
Expensive	11	11.7	**50**	22	23.4
Very much Expensive	42	44.7	**No Interest**	43	45.7
	94	100.0		94	100.0

8.2 Projected Credit Needs

On the basis of the above information concerning the period, source and access to credit of the respondents, it is possible to make an approximate assessment of the periodic credit needs of the respondents. By extrapolating the above picture on credit needs, as illustrated in table 8.1 to 8.3 into the future, we can estimate that farmers in Worobong would want to borrow between ¢300,000 and ¢2,000,000 at least once during the following year. These amounts represent the medians[9] of what the respondents actually borrowed during the previous 12 months and what would wish to borrow given the credit opportunity. These amounts would be required by the majority of 96.5% (315) of the respondents for business purposes as this accounted for the dominant reason for credits when respondents were asked about the purpose of their credit applications. According to the majority, 79.5 percent (249), of the farmers the desired duration of credit should range between a few months till next harvest and a maximum of two years. In contrast to their usual means of borrowing from relatives the farmer (about 93 percent) would prefer to borrow from banks. This might be due to the high interest rate costs and non-pecuniary commitments, which render the credit from relatives very expensive and more than from banks. The preferred modus of repayment among about 62.9 percent (197) of the farmers was found to be harvesting periods, with about 20.8 percent of the farmers choosing quarterly modus of repayment.

[9] Our choice of the median is based on the substantial variations in the survey data on actual borrowed credit during the past 12 months and what farmers would want to borrow given the opportunity.

From the analysis of the data it follows that most farmers would prefer to pay interest as low as possible. However, only a few farmers (about 7.2 percent) are looking for interest free loans. In the opinion of about 72.7 percent (221) of the farmers an interest rate up to a maximum limit of 20 percent would be deemed affordable by the majority of the potential credit seekers (see table 8.5).

Table 8.5
Desired Rate of Interest by Potential Credit Seekers

Interest rate	Frequency	Percent
Up to 20%	221	72.70
33%	20	6.58
50	8	2.63
75	1	0.33
100	31	10.20
200	1	0.33
No Interest	22	7.24
Total	304	100

Table 8.6
Borrowing Purpose and Interest Rate Patterns

Purpose			Interest Rate		
	Freq	%	Rate	Freq	%
Funeral	1	0.3	0.00	2	0.6
Business	304	96.5	1.00	16	4.4
Relatives	1	0.3	2.00	3	0.8
Daily upkeep	3	1.0	3.00	1	0.3
Others	6	1.9	5.00	12	3.3
Total	315	100.0	7.00	1	0.3
			10.00	299	83.1
			15.00	17	4.7
			20.00	9	2.5
			Total	360	100.0

From our calculations based on the cash flow budgeting technique we estimate a short term credit need of an average farmer in Worobong to be around ¢600,000. We thus recommend this figure as a possible amount with which the PTFDWIC can operate, should it embark upon a micro credit assistance programme for the farmer within the Worobong South Forest Reserve and its environs. This figure was arrived at using the cash flow budgeting analytical technique[10], which allows for forward planning for entire farms (see table AII in the appendix)

[10] The cash flow budgeting technique estimates possible short-term credit needs by comparing monthly cash expenses with monthly cash receipts, for example, from farm produce sales and other cash incomes. It does not include non-cash flows such inputted own produces consumed in the household or non-cash expenses such as family labour.

EN TANT QUE DESTINATAIRE PRINCIPAL DES RESULTATS ET RECOMMANDATIONS DE CE RAPPORT, QUELLES LEÇONS LE PIC TIRE-T-IL POUR AMELIORER LA MISE EN OEUVRE DU PROJET.

Section 9 RECOMMENDATIONS

A framework for Action

To manage , on a sustainable basis, the indigenous forests with the objective of conserving biodiversity and contributing to the economic, social and spiritual upliftment of the people in the area, with a special emphasis on poor the surrounding communities. Attempts at providing solutions to the environmental problems of the reserve area will require immediate actions in the following areas:

1. Significant reduction in the rate of population growth through efforts at bringing down to fertility and immigration rate to environmentally sustainable levels.
2. Adoption of farming systems and cultivation practices that bring about a change from extensive to intensive systems of agriculture to ensure long term sustainable resource conservation and soil fertility.
3. Introduction of high yielding agricultural varieties and expansion of the palette of income generating agricultural produces.
4. Implementation of better government agricultural policies that ensure fair remuneration for the labour of farmers and provision of social amenities that facilitate farmers to increase productivity and agricultural production at a rate, that exceeds population growth.
5. Increase government provisions of social and economic infrastructure-schools, better roads, micro-credit, etc.- in the forest reserve area to boost and facilitate economic activity.
6. Instituting local collaborative measures to improve natural resource management so as to ensure that the natural resource base and agro-ecological environment remain intact.
7. Introducing measures to increase income and earning capacity, particularly, in the non-farm sector.
8. The need to develop management plans for the forest, which sets out the long term vision for the management of these forests, and identifies the social, environmental and economic objectives for the future. In preparing these plans there is the need to consult all stakeholders, who have an interest in ensuring the successful implementation of these plans.

It must be pointed out that any strategy to conserve the forest should not loose sight of the plight of the rural poor. This is based on the account of the fact that any improvements in the well-being of the poor will only be possible through enhancement of their productive, social and environmental assets. This means increasing the productivity and growth of both the farm and non farm economies.

It appears that the apparent development need of the communities, as expressed by interviewed respondents and community leaders is the same in both areas. Better roads, schools, electricity, easy access to credit facilities and water, in that order of preferences, were the most widely expressed community need. Schools account for the highest priority for female respondents, whereas males give high priority to improved roads. Given the limited available resources for conservation of the reserve, we recommend that, apart from credit facilities, which should become a component of the program's effort to help improve living standards in the area, the programme should only lobby the government to provide such infrastructural amenities.

Need for Reduction in the Population Growth

The consequences, indeed, of the rapid population growths around the forest reserve are massive. To stem the tide efforts should be mobilized to bring down population growth in the area rates to environmentally sustainable levels. This can be done through placing greater emphasis on direct actions such as improving knowledge and availability of family planning (FP) service. In order to achieve maximum impact, these should be backed effectively, if not preceded, by efforts to improve education, especially of females. This will, however require determined efforts and commitment from the political leadership and all to shape public attitudes and implement policies and programmes to reduce population growth.

The PTFDWIC can assist here by embodying FP issues in its educational programmes and lobbying for more government attention for the Conservation Areas. It can also liasie with other specialised FP NGOs to provide the needed education campaign in the areas and get the people sensitised to the environmental and economic consequences of rapid population growth. Where the need arises, the programme can take up minor fixed costs such as monthly rent for office blocks of and perhaps donate a vehicle to the PTFDWIC, to encourage expanded FP activities in the areas

Access to small Farmer Credit Schemes

Access to credit for the farmers or inhabitants is essential, if they are to elevate their own economic status. Access to credit should, however, be measured as an instrument to achieving a target i.e., environmental conservation, and not a goal in itself. The programme can, therefore, facilitate increased access to small credit to identified poor farmers, especially those, whose activities for daily survival are inimical to resource conservation of the areas. The programme can introduce a revolving Small and Micro Credit and Loan Scheme to be administered through the rural banks, co-operative organizations and/or other micro credit specialized NGOs in the Conservation Area. This should have the chief objective to encourage environmentally compassionate farming through more intensive input use and, particularly, to encourage non-farming economic ventures in agro-processing.

Incentives and Compensation Schemes

Condition of incentives to the farmers or residents to conserve the environment should win the most important emphasis in any conservation programme. In this respect, subsidies for certain farm inputs (such as seeds of improved varieties) which are needed to introduce intensive sustainable farming techniques and preserve natural resources may be essential in the short to medium term. For instance, to reduce over-exploitation of wildlife in the area, it is deemed necessary to introduce other animal farming for meat in the area. Since this might be very new to the people, it may be vital for the success of such an experiment to distribute certain wildlife at subsidised rates or even free of charge to interested farmers.

Compensation to individuals should also be paid where there is the need to narrow – or eliminate – the gap between private costs and benefits of resource conserving production methods. For instance, if farmers who share direct borders with the reserves construct hedges, with plant species commonly used in urban housing, to prevent game from straying out of the protected

reserve, this would provide high economic returns to the forest reserve but low financial returns to the farmers or communities undertaking these works. It would then make sense for the programme to provide appropriate compensation.

This is a reflection of the question, which was many times asked at meetings and discussions with residents: Should farmers not be compensate, if they incur heavier private costs than reasonable in trying to protect the reserves? We recommend a payment of an appropriate compensation to the farmers, where the economic benefits of such a protection offered by the farmers far outweigh the costs of environmental degradation, particularly to wildlife resources, without such protection.

Transferring Management to the people

If the residents of the reserve area are to innovate and implement sustainable agriculture, production and resource management techniques for the sake of the reserve, they must be given more dependability. The responsibility towards the reserve can be ensured if, at least, the perception of ownership of the reserves or their resources is transferred to the inhabitants. Presently the reserves to the inhabitants, as echoed in meetings with residents, are pieces of government's confiscated land, which are secured by government employees (forest guards), whose duties are to ward off intrusions of the residents. The reserve management, on their part, conceives their duties more in terms of protecting the resources from exploitation by the residents rather than conserving the resources with the help of the residents. This lack of collaboration between the authority to the reserves and the residents has given rise to a situation where non-residents find it easier to trespass on the reserves than residents do. They will not be arrested unless caught by a game ranger. Because a resident who witnesses the trespass feels that he/she lacks the authority and responsibility to effect and arrest or avert degradation, perpetrated especially by a non-resident person. This emotion of a lack of power and dependability by the residents in the Conservation Areas was, particularly, echoed in meetings with the youth of the area and it environs. They vehemently requested for authority from us to enable them effect arrests of the many strangers who travel all the way from the big towns like Koforidua and others to look for non-timber products or hunt in the reserves.

A collaborative management approach should emphasize the perception of tenure of the whole reserve vested in the people. In each case, the people should be made to manage the reserves themselves with staff of the Forestry Commission offering only technical assistance. This can be done through watchdog committees in almost every relatively big settlement around the forest reserve. These watchdog committees should comprise the important representatives of the local community, including assembly and unit committee members, chiefs and other opinion leaders. A staff of PTFDWIC, preferably Community Liason Officer, could be assign to the watchdog committees in the various surrounding settlements. The operation of the committee should be based on the premise that members would operate on their own and on behalf of the entire population.

In the corporation of the masterpiece of the watchdog committee, it is assumed that, it would serve as communication channel between the local people and the management of the parks. It is also understood that such an established link would facilitate the needed education and awareness programme for the people to welcome the value and need for the conservation of the reserves. Experts of PTFDWIC should draw the constitution and operation rules for these watchdog committees, which should be simple to understand and general in content for all committees. These committees would meet frequently together with the PTFDWIC staff assigned to them to discuss all problems in relationship with the reserves and submit habitual reports to the head

office of the PTFDWIC. Since the transfer of supervision of the park would lead to cost reduction on the part of PTFDWIC of guarding the parks themselves, the saving hereby accrued could be paid the watchdog committee's members as honorarium incentives for their supervisory activities.

Protecting the forests from bushfires

Even though fire can be used as an ecological tool for regeneration, we recognise the importance of protecting forests reserve from the potential dangers of forest wildfires. Whether lightning-caused or human or other beings, wildfires have become common occurrences throughout the area and in also in the forest reserve in the recent past. Frequent fires have maintained an open forest structure in the forest reserve, prevented tree encroachment into meadows and grasslands, and in some areas replaced forested land with grassland or savannah. In the view of the people these fires are mostly started by human beings. As solution they proposed stringent sanctions and punishments to deter potential culprits. Other measures to mitigate the impact of bushfires may include the following:

- creation of community fire watch dogs and brigades to report potential culprits and also to initiate quick and effective action to contain bushfires from spreading.
- more education for the people on better land preparation systems through planned burning, and
- institution of a area-wide good communication system for reporting fire outbreaks for quick counter measures to be undertaken.

Improving the Economic Base of the People

One of the significant results of the survey is that every resident of Worobong South Reserve is primarily and secondarily engaged in agriculture. Conversely, there are severe restrictions on the capacity of the agricultural sector to absorb the rapidly increasingly supply of rural labour and satisfy even the minimum subsistence of the socio-economic necessities of a rising population. As population increases there is the likelihood of land devastation with consequent declines in agricultural productivity in the face of the inability on the part of the farmers to acquire and adopt capital-intensive methods of production. Thus the chief threat to the reserve is the result of the strong synergy and causality chains, which link rapid population to over -exploitation of natural resources for human survival. Rapidly growing numbers of people, barely surviving in land-extensive agricultural systems, have no option than to continue to overrun and destroy forests.

It is therefore, necessary to channel appropriate assets such as credit, education, and technology to raise the productivity of the agricultural activities, and markets to improve sales and purchases, improve the poor's 'exit options' that over time may also help them used conservation for their sustained benefit. Like the whole country productivity and thus income growth in agricultural sector in the area is hampered by factors including undercapitalisation, bad government policies, environmental constraints, lack of market for and others. This limitation on agricultural productivity growth is compounded by the fact that the people are largely foodstuff producers, which exposes them to high risks (vulnerability) or susceptible to variability in living standard over time as a result of shocks in income or consumption. Since the forest seems to be a "public good", there is the likelihood for the people to over-exploit it to mitigate the negative effects of any unfavourable shocks.

In order to prevent the occurrence of such situations it is necessary to introduce the farmers to alternative or additional sources of livelihood in the area. These additional sources of livelihood, particularly, in the non-farm sector, should be possible to practise during the free time or farming lean seasons. These may include the forms of potential economic activities discussed above: e.g. beekeeping, garri and palm oil processing, etc.

Need for further Research

For the determination of the appropriate additional source of livelihood for the area it further research may be needed to better understand viability of such economic activities in the area and the distributional implications of non-farm work by gender income inequality. We believe to be adequately equipped to undertake any such further feasibility studies.

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Appendix A

Table A1
ETHNIC COMPOSITION OF RESIDENTS IN THE WOROBONG FOREST RESERVE (absolute and Percent)

Ethnicity	Heads of Household		Total Population	
	Freq	%	Freq	%
Akyems	33	6.8	236	8.7
Other Akans	23	4.7	147	5.3
Ewe	26	5.2	148	5.5
Ga/Adanbge	25	5.1	196	7.
Northerner	9	1.8	37	1.4
Krobo	363	74.4	1951	72.0
Total	488	100	2711	100

Appendix AII

Table AII **Projected Estimates of Credit Needs of a Farmer in South Worobong Reserve using cash Flow Budgeting, in Cedis (Averages)**

Items	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Cash inflows													
1. Beginning Cash balance	0.00	105,000.00	150,000.00	-125,000.00	-115,000.00	10,000.00	40,000.00	-110,000.00	125,000.00	150,000.00	290,000.00	40,000.00	545,000.00
2. Farm sales	70,000.00	40,000.00	120,000.00	150,000.00	205,000.00	95,000.00	240,000.00	600,000.00	400,000.00	400,000.00	550,000.00	455,000.00	3,215,000.00
3. Wages in other jobs	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	3,760,000.00
4. Others	140,000.00	250,000.00	45,000.00	120,000.00	200,000.00	150,000.00	90,000.00	80,000.00	150,000.00	50,000.00	35,000.00	120,000.00	1,430,000.00
5. Total cash in flow(add1-4)	240,000.00	425,000.00	345,000.00	300,000.00	320,000.00	285,000.00	400,000.00	600,000.00	705,000.00	630,000.00	905,000.00	645,000.00	5,800,000.00
Purchases/Cash Outflows													
6. Seeds		0.00	80,000.00	85,000.00	0.00	0.00	0.00	0.00	0.00	80,000.00	60,000.00	0.00	140,000.00
7. Fertilizer/ Insecticides	0.00	60,000.00	60,000.00	90,000.00	40,000.00	30,000.00	0.00	0.00	45,000.00	0.00	60,000.00	0.00	385,000.00
8. Inputs for generating other incomes	0.00	30,000.00	50,000.00	0.00	0.00	0.00	0.00	60,000.00	30,000.00	20,000.00	100,000.00	0.00	290,000.00
9. Hired Labour	0.00	30,000.00	50,000.00	60,000.00	30,000.00	15,000.00	35,000.00	50,000.00	50,000.00	70,000.00	130,000.00	65,000.00	815,000.00
10. Principal and interest on Loans	0.00	0.00	0.00	80,000.00	120,000.00	40,000.00	125,000.00	135,000.00	80,000.00	50,000.00	100,000.00	200,000.00	850,000.00
11. Family living expenses and other family obligation	120,000.00	120,000.00	120,000.00	100,000.00	120,000.00	110,000.00	300,000.00	200,000.00	240,000.00	120,000.00	400,000.00	600,000.00	2,430,000.00
12. Costs of hired tools	15,000.00	35,000.00	30,000.00	0.00	0.00	50,000.00	50,000.00	30,000.00	50,000.00	0.00	15,000.00	30,000.00	305,000.00
13. Land Rents	0.00		80,000.00	0.00	0.00	0.00	0.00	0.00	60,000.00	0.00	0.00	0.00	140,000.00
14. Total cash outflow	135,000.00	275,000.00	470,000.00	415,000.00	310,000.00	245,000.00	510,000.00	475,000.00	555,000.00	340,000.00	865,000.00	895,000.00	5,355,000.00
15. Cash balance	105,000.00	150,000.00	(125,000.00)	(115,000.00)	10,000.00	40,000.00	(110,000.00)	125,000.00	150,000.00	290,000.00	40,000.00	(250,000.00)	0.00

Credit needs correspond to the negative cash balance. ¢600,000:00 = ¢125,000+¢115000+¢110000+¢250000

Underlying Assumptions:

Item 1: Beginning cash balance is the total amount of cash available to the farmer at the beginning of each month. In January, the farmer has projected that he will have no cash at hand.

Item 2: Farm sales results from the sales of maize and cassava. Growing of maize and cassava starts in March-April and harvest and sales occur in July and August. The second harvest is in November.

Item 3: Earnings paid to the farmer for working on part-time in other jobs are estimated at ¢80,000.00 per month.

Item 4: "Others" include all other cash inflows i.e. payments made in cash to the farmer.

Item 5: Total cash inflows to the farmer in each month is the total of item 1 to 4.

Item 6: Seeds purchase are done in March, April, October and in November.

Item 7: Fertilizer purchases are spread unevenly across the year beginning February.

Item 8: Hired labour expenses are for weeding, harvesting and other operations.

Item 9: Payments on principal of loan and interest. The first loan is received in March. It is assumed that the loan is obtained from relatives, friends, or moneylender. The repayment and interest rates differ from credit to credit and the interest can be as high as 50% in the village.

Item 10: Family living expenses and extended family obligations vary from month to month. This item includes school children's fees and books. The extended family obligations are a fundamental part of African culture in which the individual contributes to a collective action, which varies from time to time.

Item 11: Self-explanatory.

Item 12: Lands rents involve payments of an annual fixed sum of ¢140,000.00 payable in March and September to the clan elder or chief or the landowner where appropriate for the use of the land. This factor applies mainly for migrant farmers.

Item 13: All other cash outflows or cash expenses are listed under this item.

Item 14: Total cash outflows or cash expenses are listed here and are derived by adding up item 6 to item 13.

Item 15 Cash balance is the difference between total cash inflow and total cash outflow; it could be negative or positive. A negative cash balance implies credit has to be sought to fulfill the plan in that month or the plan has to be modified. A positive cash balance cash balance implies surplus.
Credit needs correspond to the negative cash balance.

PARTICIPATORY TROPICAL FOREST DEVELOPMENT BY WOMEN IN IDIGENOUS COMMUNITIES

FORESTRY COMMISSION / ITTO

2002 SOCIO - ECONOMIC SURVEY

OF

WOROBONG SOUTH FOREST RESERVE

HOUSEHOLD QUESTIONNAIRE

INTERVIEWER: .....

PLACE OF INTERVIEW: .....

DATE: .....

Researcher Dr. Appiah-Kubi
FMMS CONSULTING LTD

Household Roster

Serial No.	1 Names of all household members? (Respondent first)	2 Relationship of member to respondent?	3 Ethni-city	4 Gender Male -1 Female -2	5 Age (Years)	6 Years of education	7 Marital status	8 Religion	9 Primary occupation	10 Secondary occupation	11 What is the residential status	12 How long in present village or hamlet? (Years)
01												
02												
03												
04												
05												
06												
07												
08												
09												
10												
11												
12												
13												
14												

2. Relationship with Respondent
1. Respondent
2. Spouse
3. Child
4. Parent
5. Grandchild
6. Relative
7. Domestic help
8. Others(specify) .....

3. Ethnicity
1. Akyem
2. Other Akans
3. Ewe
4. Ga/Adanbge
5. Northerner
6. Non-Ghanaians
7. Krobo
8. Others (specify)

5. Landmarks*
.Yaa Asantewaa war - 1900 (102yrs)
.Cocoa hold-up - 1938 (64yrs)
.Earthquake - 1939 (63yrs)
.Eclipse of the Sun - 1947 (55yrs)
.Independence - 1957 (45yrs)
.Republic - **1960 (42yrs)**

7. Marital Status
1. Single
2. Married
3. Separated
4. Underage(under 16)

8. Religion
1. Christianity
2. Islam
3. Fetish
4. Non-follower
5. Atheist
6. Others (specify)

9. & 10. Primary and Secondary Occupation
1. Farming
2. Fishing
3. Trading
4. Clerical
5. Artisan
6. Teaching
7. Hunting
8. Health worker
9. Student/Pupil/Apprentice
10. Unemployed/unoccupied
11. Pre-school
12. Gathering eg. canes, leaves, chewing, etc.list
13. Police officer
14. Forestry worker
15. Herbalist
16. Unpaid family worker

11. Residential Status
1. Permanent
2. Casual visitor
3. Seasonal worker

Is this place your actual home town? Yes = 1 ; No = 2 ☐

Was any of your ancestors born in this place? Yes = 1 ; No = 2 ☐

When do you intend to leave this place for another place? Soon = 1 ; Not so soon = 2 ; Don't know = 3 ☐

Income by Expenditure Route

List the expenditures your household members have incurred either within thelast one day or last one week or last one month or last one year and when did you buy what?

Item	DAY	OR	WEEK	OR	MONTH	OR	YEAR	When do you buy what?
a. Food								
i. Market								
ii. Own produce								
b. Clothing								
c. Toiletries (soap, etc.)								
d. Rent (actual or inputed)								
e. House utilities (water, etc. inputed)								
f. Fuel (firewood, kerosene...)								
g. Health care								
h. Transportation								
i. Education (books, fees, etc)								
j. Donations, gifts & remittances								
k. Farm inputs (seeds, etc) (other than Labour)								
l. Farm machinery Chain saw, transpt, (rental)								
m. Farm Labour (cash & inputed)								
n. Raw materials (Artisinal producers)								
o. Household durables (buckets, radio, untensils ...)								
p. Immovable assets								
q. Levies (incl. inputed)								
r. Credit repayment								
s. Others (specify)..								

When do you buy what?

1. Weekly
2. Market Days
3. During X'mas
4. During Easter
5. Once a month
6. Once a year
7. Once a while
8. During harvest
9. Planting season
10. School reopening
11. During Funerals

Occupation

Refer to Household Roster

What is your occupation: Your Primary Occupation is your main work. For instance if you are a Teacher and also have a farm then tick Government Employee/Teacher as Primary and the type of farming you do as Secondary. Please also indicate your Wife's occupation using the column **H** for yourself the column **W** for your wife.

Occupation	**Primary**		**Secondary**		**How long have you been doing this e.g 1 year, 2 years, etc..**	
Farming	**H**	**W**	**H**	**W**	**H**	**W**
Rice						
Cocoa						
Oil palm						
Cassava						
Plantain						
Pineapple						
Ginger						
Beans						
Livestock						
Maize						
Cabbages & Vegetables						
Processing						
Palmwine Tapping						
Distilling (Akpeteshie)						
Coconut Oil (Copra)						
Palm Oil						
Gari						
Fish						
Rubber						
Other (Specify)						
Government Employee						
Teacher						
Agricultural Extension Worker						
Forestry Worker						
Lands Officer						
Health Worker						
Police Officer						
Customs Officer						
Other						
Herbalist						
Hunter						
Gathering e.g. canes, leaves, chewing stick, etc.,						
Labourer/Seasonal Worker						
Shopkeeper						
Trader						
Chopbar Owner						
Fisherman						

1. How do you spend on the following? (Take respondent through all items one by one)

1	2	3. How often do you use?	4 How much do you spent in a week? ¢	5 rely on these?
Firewood	1			
Mushrooms	2			
Bushmeat	3			
Snails	4			
Canes, chewing sticks...	5			
Medicinal plants	6			
Honey	7			
Others (specify)	8			

2. How often?

daily	1	monthly	4
weekly	2	seasonal	5
fortnightly	3	once a while	6

4. Why do you rely on any of these?

1 No alternatives
2. Becos they are cheaper
3. Taste better
4. I am used to it

Assets

1. Land and Land Tenure

1 Does household own Land?
Yes = 1 No = 2

2 Has Household given the land to somebody for which it receives cash payment yearly from him or her?
Yes = 1 No = 2

3 Has Household taken land from somebody for which it annually pays cash to him or her (the landlord)?
Yes = 1 No = 2

4 Has Household given the land to somebody with whom it shares harvested crop (with the tenant)?
Yes = '

5 Has Household taken land from somebody with whom it annually shares the harvested crop (with the landlord)?
Yes = 1 No = 2

6 How is the mode of sharecropping, if household shares harvested crop?
Abunu = 1 Abusa = 2

7 Give following information about your farm or land.

1 Farm or land No.	2 Size (acres, poles)	3 Locations	4 Source of land	5 State of Use	6 Mode of sharecrop-ping	7 Duration of Right	8 Is land and/or property heritable?	9 How is land replantable?

3. Location

1. Same village
2. Other village
3. Other (specify)

4. Source of land

1. Stool land
2. Family land
3. Individually owned
4. Sublet from another Tenant
5. State
6. Other (specify)

5. State of Use

1. Not in use
2. Cash yearly payment in
3. Cash yearly payment out
4. Sharecrop-ped in
5. Sharecropped
6. Currently not in use

6. Mode of sharecrop-ping

1. Abunwio
2. Abunsa
3. Other

8. Duration of Rights

1. Temporary/ how many years?
2. Permanent/how many years?

8. Inheritance

1. Heritable land
2. Non-heritable land
3. Non heritable land but heritable property
4. Non-heritable land and property
5. Heritable land but non-heritable

9. How is land replantable?

1. Replantable with Renegotiations
without Renegotia-tions

2. Use and Transfer

1. Do you have the right to:

1 Farm or land No.	2 Sell*	3 Bequeath*	4 Give it out in any form as column 5 above*	5 Nwhesoɔ*	6 Register*	7 Grow annual Crops (cassava, yams, plantain...)*	8 Grow perennial crops (cocoa, coffee, coconut...)*	9 Give it in awowa/ awooba*

* 1. None
2. With approval
3. Without approval

3. Animals Does your household own any animal? ☐

Yes = 1 No = 2

1 Animal	2 Animal Cod	3 Number	4 Estimated Price for one ¢	5 Purpose
Cattle	1			
Sheep	2			
Goat	3			
Pig	4			
Chicken	5			
Duck	6			
Turkey	7			
Others (specify)	8			

5. Purpose
01 For Sale
02 For own use
03 For Both

4. Ownership of Dwelling place

1 Type	2 Codes	3 No. of rooms	4 Ownership	5 If owned, year of construction	6 If owned, estimated replacement value ¢
Swiss (mud)	1				
Landcrete (brick)	2				
Sandcrete (block)	3				
Wood	4				
Raffian	5				
Others (specify)	6				

4. Ownership
Own 1
Rent 2
Family 3

5. Other Assets (Take respondent through all items one by one					
	1	2	3	4	5
Code	Type	Quantity	Year of purchase of newest one	Purchase Price of newest one (¢)	Estimated current total value of the asset(s) ¢
1.	Truck (push)				
2.	Processing Equipment				
3.	Chain Saw				
4.	Motor cycle				
5.	Spraying Machine				
6.	Bicycle				
7.	Sewing machine				
8.	Motor cycle				
9.	Tractors				
10.	Car\Bus\Truck				
11.	Others (specify)				

INCOME

1. Landowner 2. Tenant

6. Income and/or Sharecropping Income				
1	2	3	4	5
Crop	2. Crop Codes	Type of Sharecropping	Share of major season revenue ¢	Share of minor season revenue ¢
Maize	1			
Cassava	2			
Yam	3			
Cocoyam	4			
Plaintain	5			
Rice	6			
Cocoa	7			
Oil palm	8			
Coconut	9			
Coffee	10			
Vegetables	11			
Fruits (pineapples, pawpaw, etc.)	12			
Others (specify)	13			

3. Type of Sharecropping: **1. Abunu** **2. Abusa**

Forest, Conservation, Bush fires, and Social Responsibility

1. Does your area experience bush fires? 1. No 2. Often 3. Very Often
2. Who do you think cause these fires? 1. Hunters 2. Farmers 3. Nature 4. Herdsmen 5. Don't know
3. Would you report a neighbour if you catch him/her causing a bush fire? 1. Yes 2. No
4. Are you a member of any town fire prevention association? 1. Yes 2. No
5. Who should manage the Forest Reserve? 1. Community 2. Chief 3. Farmers 4. Government
6. Why?

8. Off-Farm Income

Has any Household member received any off-farm income within the last 12 months?

Yes = 1 No = 2 [ ]

If Yes, how often and what is the total off-farm income? (Use period most appropriate)

1	2	3	4	5	6	7
			Total off-farm income			Flow of income at what time of year
Activity	Activity Code	How often?	Weekly (¢)	Month (¢)	Year (¢)	
Trading	40					
Artisantry	41					
Teaching	42					
Mining	43					
Office Work	44					
Hunting	45					
Gathering (canes...)	46					
Medicinal plants	47					
Processing	48					
Carving	49					
Others (specify)	50					

2. How often:
1. once a week 2. twice a week 3. once a week 4. more than twice a month 5. After harvest

Flow of income at what time of year. Specify month with highest income
1. once a week 2. twice a week 3. month 4. more than twice a month 5. after harvest

9. Remittances received (cash and in-kind):

Has any household member received any remittances within the last 12 months?

Yes = 1 No = 2 [ ]

If Yes, what is the total remittances to the household? (use period most appropriate)

i. Week		ii. Month		iii. Year		
1. Cash	(Inputed Value ¢)	1. Cash	2. In-kind (Inputed Value ¢)	1. Cash	2. In-kind (Inputed Value ¢)	usually receive it

1. Off harvest
2. During Harvest
3. During Funerals
4. During X'mas
5. During Easter
6. School Reopening
7. Planting season

10. Transfers received (basically from government and NGOs)

Has any household member received any free goods or money from the government or NGO within the last 12 months?

Yes = 1 No = 2 [ ]

If Yes, what is the total value of the goods or money? (use period most appropriate)

i. Week		ii. Month		iii. Year		
1. Cash	(Inputed Value ¢)	1. Cash	2. In-kind (Inputed Value ¢)	1. Cash	2. In-kind (Inputed Value ¢)	usually receive it

1. Off harvest
2. During Harvest
3. During Funerals
4. During X'mas
5. During Easter
6. School Reopening
7. Planting season

Credit and Sources of Credit

1. Have you ever borrowed money within the last 12 months

   Yes = 1 No = 2

2. Did you get the credit facility and how much ?

	First Credit	Amount	Second Credit	Amount	Third Credit	Amount
In full			In full		In full	
Part			Part		Part	

3. If the answer to question 1 is Yes answer the following questions.

1 How often or many times did you borrow?	2 Why did you borrow?	3 When do you borrow?	4 From whom?	5 Was it expensive?	6 What was the interest rate?

1. How often or many times did you borrow?	2. Why borrow?	3. When did you borrow?	4. From whom?	5. Was it expensive?	6. What was the interest rate?
1. monthly	1. For funeral	1. Off harvest	1. Relatives	1. cheap	1. 20 percent
2. Twice a year	2. For Business	2. During harvest	2. Friends	2. expensive	1. 50 percent
3. Once a year	3. For wife\kids	3. During Funerals	3. Wife\Kids	3. very much	2. 100 percent
4. Once a while	4. For relatives	4. During X'mas	4. Bank/Governmen	expensive	4. No interest
	5. For daily upkeep	5. During Easter	5. Sharecropper		
		6. Reopening	6. Local Money Lender		
			7. Credit Union		
			8. Purchasing Clerk		

4. Do you intend borrowing money soon?

   Yes = 1 No = 2

1 How much?	2 Purpose	3 For how long do you intend to borrow?	4 From whom?	5 How do you intend to pay back?	6 How much interest can you afford?

2. Purpose	3. For how long?	4. From whom?	5. How do you intend to pay back?	6. What was the interest rate?
1. For funeral	1. For a few days	1. Relatives	1. Monthly	1. 20 percent
2. For Business	2. For a few mths.	2. Friends	2. Quarterly	2. 33 percent
3. For wife\kids	3. Till harvest	3. Wife\Kids	3. Harvesting times	3. 50 percent
4. For relatives	4. 2 years	4. Bank	4. Other	4. 75 percent
5. For daily upkeep	5. 3 years	5. Sharecropper		5. 100 percent
6. Others (specify)	6. 4 years	6. Local Money Lender		6. 200 percent
	7. Longer than 5 yrs	7. Credit Union		7. No interest
		8. Purchasing Clerk		
		9. Middlemen		

5. Given Credit opportunities how much would you wish to borrow?

6. Have you bought any of these items on credit during the last 12 months? ☐

Yes 1 ; No 2

7. If yes, then answer the following.

1 Items	2 Item Codes	3 How often or many times did you buy?	4 How much did it cost? (¢)	5 When did you buy?
Food	01			
Clothing	02			
Seedlings	03			
Machines	04			
Other (specify)	05			

3. How often or many times did you borrow?

1. monthly
2. Twice a year
3. Once a year
4. Once a while
5. None

5. When did you buy?

1. Daily
2. Weekly
3. Off harvest
4. During harvest
5. During Funerals
6. During X'mas
7. During Easter
8. School reopening
9. Planting season

8. If you have not borrowed or did not get any credit or only part of it, why ? (Tick appropriate box)

1 Reason	2 Receive Part	3 Receive no Credit
I cannot pay back the money	1	1
No or not enough collateral or quar	2	2
I could not pay the cost last time I b	3	3
There was no credit facility availabl	4	4
The interest was too high	5	5
The repayment period was too sho	6	6

9. Has lack of credit facilities affected you and your business negatively in any way? ☐

No 1 Somehow 2 Seriously 3

Miscellaneous

1. Are you, or any member of your Household, a member of any Association(s)? Tick

Tribal Association	_____	Hunting Association	_____
Farming Association	_____	Chop Bar Owners Association	_____
Fishing Association	_____	Women's Association	_____
Fire Prevention Association	_____	Others	_____

2. What in your opinion does your village need most to boost economic activity and welfare?

Award numbers (1, 2, 3,...) in order of necessity.

Water	_____	More farm lands	_____
Sanitation (Toilet, Bathhouse, etc	_____	Electricity	_____
Healthcare	_____	Schools	_____
Credit facility	_____	Community Centre	_____
Factories	_____	Better Roads	_____
		Others	_____

3. What and how do you want Authorities to assist you?

_____

_____

_____

_____

_____

_____