UNIVERSITY OF CAPE COAST

SOCIO-ECONOMIC EFFECTS OF PRESIDENTIAL SPECIAL INITIATIVE ON FOREST PLANTATION ON THE FARMERS IN THE BIRIM NORTH DISTRICT

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Name**:** Joseph Bempah

Signature: ..... Date: .....

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Name**:** Prof. J.V. Mensah

Signature: ..... Date: .....

ABSTRACT

Forest Plantation Development has been given special attention by the Government of Ghana to restore the degraded forest cover of the nation and to create employment with the aim of reducing poverty. This study set out to examine the socio- economic effects of the Presidential Special Initiative (PSI) on Forest Plantation on the lives of the participating farmers of the Birim North District in the Eastern Region.

In the study, 106 respondents comprising farmers and non farmers were interviewed from the 1st to 30th July 2007. Multi-stage sampling technique made up of cluster, accidental, and purposive sampling, was used to select the respondents to ensure representativeness of the study population.

The main findings of the study were that constitutional arrangements existed to ensure smooth implementation of the project, and the level of forest restoration since the inception of the project in the district was above 80 percent. Food production levels have increased among the forest fringe communities, and employment status and the associated incomes of the farmers have increased since the inception of the PSI on forest plantation. However, there were various challenges facing the implementation of the project in the district.

The recommendations included provision of adequate funding and logistics by the government to the project, sustained education to the communities and their involvement in the decision-making process, prompt allocation of plots of land to farmers, and ensuring improved condition of roads linking communities and project sites.

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DEDICATION

Dedication to Forest Services Division and my family

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LIST OF ACRONYMS

DA	District Assembly
FAO	Food and Agriculture Organisation
FPDC	Forest Plantation Development Centre
FSD	Forest Services Division
GNA	Ghana News Agency
GPRTU	Ghana Private Road Transport Union
GSS	Ghana Statistical Service
GTZ	German Technical Cooperation
HIPC	Heavily Indebted Poor Countries Initiative
JICA	Japan International Cooperation Agency
MLFM	Ministry of Lands, Forestry and Mines
MMDAs	Metropolitan, Municipal and District Assemblies
MTS	Modified Taungya System
NFPDP	National Forest Plantation Development
NGOs	Non- Governmental Organizations
NRCD	National Redemption Council Decree
NTFPs	Non-timber forest products
PSI	Presidential Special Initiative
RMSC	Resource Management Support Centre
SPSS	Statistical Product and Service Solutions
TUC	Timber Utilization Contract
WCED	World Commission on the Environment and Development

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CHAPTER ONE

INTRODUCTION

Background to the study

The forests of the world have over the years been taken for granted based on an uninformed notion that it is ever present like the sun and the moon. From the beginning of time, human beings have found in wood the answer to many of the problems of their existence. Even though academics and scientists have from time immemorial linked the perpetuity of life on earth to the availability of flora, the average human's conscious efforts are scarcely tempered by the issues of forest improvement or generation and we tend to place forest issues on the back burner. This explains why in many parts of the world forests are subjected to all forms of unbridled exploitation for the ever increasing wants of humankind. We fail to realize that without the forests everything else comes first to a standstill and die later.

Population growth is a major reason behind biodiversity destruction. Increasing population, all other things being equal, puts pressure on the environment in terms of resources consumed. Unless other fundamental factors change, more land is needed for agriculture to support growing population. There is greater demand for traded species and more degradation of the land. Other factors responsible for forest disturbance include logging, fire, clearance for agriculture and mining (Forest Services Division, 2002).

There are now only 9 million square kilometres of tropical rainforest compared to an original 15 million square kilometres in the world (FAO, 1990).

Conservative estimates put the annual rate of tropical rainforest destruction at around 76,000 square kilometres, which means that all such ecosystems will disappear in the next 120 years unless the destruction is stopped (FAO, 1990).

It is therefore crucial that remedial measures must be designed to address the fast dwindling of our forest resources. Of all the measures that can be adopted to minimize forest depletion, reforestation is the most important. If we are able to increase the forest quantitatively and qualitatively, we would be able to meet our needs with less difficulty. Forest plantation is defined as a community of tree crop or stands raised artificially either by sowing or planting.

In Ghana, efforts at plantation development have been on the agenda since 1960s but it was not until year 2001 that the issue was pushed into a high gear. The Ministry of Lands, Forestry and Mines (MLFM, Formerly Ministry of Lands and Forestry) has completed a national plantation development programme which was launched as the Presidential Special Initiative (PSI) on Forest Plantation at Ayigbe near Wenchi in the Brong Ahafo Region in September 2001. Under the plan, the government is developing 200,000 hectares of plantation forest within the next 20 years in partnership with individuals, companies, non-governmental organizations (NGOs) and forest fringe communities.

Since 2001, the President of the Republic of Ghana has given special attention to certain sectors of the economy as PSI to help accelerate industrial development, create jobs, and enhance export earnings with the overall aim of reducing poverty. Funds from the Heavily Indebted Poor Countries Initiative (HIPC) accounts and other donor sources have been channelled into the PSI by

the government. The components of the PSI are oil palm, cassava, garments and Forest Plantation Development. Under the PSI on oil palm, the initial target was to put under cultivation 100,000ha of oil palm. The ultimate aim is to put under cultivation 300,000ha of oil palm. The PSI on cassava is to produce industrial starch for export and create jobs for 100,000 farmers in the country. PSI on garments is to give support and facilitate the garment industry and create 270,000 direct jobs (GNA, 2006).

In order to restore the forest cover of the nation and to create employment for the rural and depressed urban communities, the government of Ghana in recognition of the extent of the problem of forest degradation, has initiated various strategies including the establishment of National Forest Plantation Development Centre, the Forest Service Divisions plantation programme, the Ghana Armed Forces afforestation/plantation programme and the Presidential Special Initiative on forest plantations. The Ministry of Lands, Forestry and Mines is implementing six forest plantation projects namely;

1. The modified Taungya system (implemented by the Forestry Commission);
2. Government Forestry Plantation Development Project, funded under the HIPC initiative;
3. Community Forest Management Project, funded by African Development Bank;
4. Participatory Forest Management Project in the Transitional Zone of Ghana, funded by Japan International Cooperation Agency (JICA);

5. Forum Project, funded by German Technical Cooperation (GTZ); and
6. Private Sector Plantation Development, partly supported by the Forest Plantation Development fund established by the Ministry.

As at December 2006, the total area planted under the various forest plantation projects was approximately 81,000ha and has provided employment for 46,058 people on full time bases and 1,049,833 on part-time. Altogether, the various plantation projects have made significant achievement in the area of:

1. Food production in the various project areas, thus providing all-year-round food security and enhancing the farmers' lifestyles; and
2. Securing water catchment areas such as Tano, Birim and Densu (MLFM, 2006).

Problem statement

Ghana has lost about 70 per cent of its forest cover within the past five decades (MLFM, 2002). According to FAO (1990), the forests of Ghana are now diminishing at a rate of 1.3 per cent per annum. The Ministry of Lands, Forestry and Mines (MLFM) has therefore completed a plantation development programme which is aimed at developing 200,000 hectares of plantation forest within the next 20 years to restore the forest cover.

Plantation development is an expensive exercise and therefore tends to be unattractive to investors. It costs about $350 per hectare per year to develop forest plantation and when you take a minimum gestation period of 35 years with

regard to the cost outlay then one can understand why investors shy away from forest plantation ventures (Daily Graphic, 1999).

Though a good number of timber companies and individuals have already begun plantation projects, yet on a limited scale, the greater proportion of the programme is through the modified taungya system by the Forestry Commission in partnership with the forest fringe communities. During the era of the old taungya system (i.e. in the early 1970s), farmers were given parcels of degraded forest reserves to farm and intercrop them with trees. Farmers left the forest after three years of farming when the tree canopy had closed and rendered cultivation impossible. Farmers neither enjoyed any benefit from the tree crops nor financial rewards in the clearing, pegging, planting and tending of the plantation (FSD, 2002).

The old taungya system was discontinued in 1985 as there were problems with the tending operations which led to large pockets becoming unsuccessful and therefore large gaps taken over by weeds. Other reasons included the following:-

1. Some farmers also deliberately oppressed the growth of the tree crops to give way to their food crops; and
2. Illegal farming of other degraded and virgin areas that were not earmarked for taungya within forest reserves.

The Forest Services Division's component of the National Forest Plantation Development (NFPDP), which was launched as PSI, on forest plantation, has replaced the old system. It is now referred to as Modified Taungya System since 2001. The new system provides opportunities for farmers' involvement in the

establishment and maintenance of the plantation in which monetary rewards are given at any stage as well as their eligibility for share of the profit, accruing from the plantation at maturity or final harvesting.

These modifications notwithstanding, there are still some skepticism and questions about the success of the new system because of the unpleasant history that characterized the old system and the legal implications of the new system. Can forest plantations development really help to eradicate or reduce poverty levels in Ghana? There is a school of thought which contends that the communities should be replaced with private business people. Therefore, there is the need to study the forest plantation development against the background of the philosophy under the PSI and its socio-economic implications such as employment, income, wages, and land tenure and ownership issues.

Objectives of the study

The general objective of the study was to examine the socio- economic effects of the PSI on Forest Plantation on the lives of the participating farmers of the Birim North District.

The specific objectives were to:

1. Describe the existing institutional arrangements to ensure the smooth implementation of the project;
2. Assess the level of forest restoration since the inception of the project in the Birim North District;

3. Determine the level of employment, and the associated incomes since the inception of the PSI on Forest Plantation;
4. Examine the contribution of the PSI on forest plantation to living conditions of the farmers;
5. Discuss the constraints facing the PSI on Forest Plantation in the district; and
6. Make recommendations for the smooth implementation of the project.

Research questions

The research questions that guided the study were:

1. What institutional arrangements exist for the implementation of PSI on Forest Plantation?
2. How far has the PSI on Forest Plantation restored the depleted forest in the Birim North District
3. What is the level of employment, and the associated incomes since the inception of the PSI on Forest Plantation?
4. What is the contribution of the PSI on forest plantation to living conditions of the farmers?
5. What constraints faced the PSI on Forest Plantation in the Birim North District?

Justification of the study

It is imperative to examine the forest wood resource situation and how it relates to poverty reduction and sustainable development of the country. Forest

plantation development has the potential to create jobs for the rural communities, thereby improving their standard of living.

It is anticipated that, the research will provide a scientific basis to forest resource managers and national development planners. It will guide them to decide on either to consolidate and sustain the past forest plantation scheme as one of the options to reduce poverty levels in the rural areas or to continue with the current arrangement for implementing the modified Taungya System among other viable alternatives or abandon it entirely.

The study will contribute to the district and for that matter national planning and policy formulation on plantation development programmes. It will also form the basis for future research into the PSI on forest plantation development.

Organisation of the study

The study is organized into five chapters. Chapter One is the introduction which covers background, problem statement, objectives of the study, research questions and justification of the study. Chapter Two looks at the literature review. It focuses on both the global and local trends on forest resource depletion, the major sources of forest degradation in Ghana and attempts towards forest restoration and conservation. Also reviewed are the socio-economic and environmental importance of the forest and the justification of forest plantation development in Ghana. Policy and legal issues with respect to forest plantation development as in Ghana and how the modified taungya system is being used to

improve the forest cover in Ghana are also looked at. Chapter Three looks at the research methodology, which covers the study area, study design, study population and sampling techniques, data collection and data analysis. Results and discussion are the subject matter of Chapter Four. Chapter Five is devoted to summary, conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter reviews both the global and local trends in Forest resource depletion in terms of the causes and effects of forest degradation, and attempts being made to halt or replenish what are being destroyed. The major source of forest degradation in Ghana and attempts towards forest restoration and conservation is discussed. Also reviewed are the socio- economic and environmental importance of the forest and the justification for forest plantation development in Ghana.

The issue of policy and legal perspective in respect of forest plantation development and the collaborative forest management approach in forest plantation development as being practised by the Forest Services Division in Ghana are also discussed. Finally, the issue of modified 'taungya' system being used to improve the old 'taungya' system by introducing new benefit sharing schemes to reduce tensions and contradictions in the implementation of community forestry projects is reviewed.

Global and local trends in forest resource depletion

Forests are of a major economic, social and environmental importance contributing to all aspects of rural life, especially in the tropical countries. The forests provide food, fodder, fuel, medicine, building materials, and household

items as well as many more intangible benefits such as cultural symbols, ritual artefacts and sacred sites (Falconer, 1987).

Trade in non-timber forest products (NTFPs) is an important economic activity involving a great number of people including gatherers, producers, and wholesale and retail traders often operating within complex trading channels. Some of these NTFPs are food, snails, bush meat, mushroom, spices, chewing sticks, chewing sponge, fuel wood, and medicine (Falconer, 1987).

Besides financial benefits to be gained, forests can render positive external effects: protecting rivers, streams and catchment areas, providing both windbreak and aesthetic benefits along roads and public highways for the benefits of society, recycling nutrients, protecting soils, stabilize hydrological systems, and are active in carbon sequestration. Forest also protect nature and maintain natural processes in an undisturbed state in order to have ecologically representative samples of the natural environment available for scientific study, environmental monitoring, and education and for the maintenance of genetic resources in a dynamic and evolutionary state (Dixon & Sherman, 1990).

Globally, forested land of all types range up to 4400 million hectares, or about one third of the earth's surface, but much of this higher figure includes very poorly stocked woodland with only small volumes of timber per hectare. Persson (1978) estimated the area of closed forest in the World to be 260 million hectares. The total amount of wood in the world's forest is estimated at 300,000 million cubic metres (FAO, 1978a). The estimated annual timber harvest, including

firewood, for the mid-1970s is about 2800 million cubic metres or about one cubic metre per hectare of forest.

By 1995, world consumption of wood was about 2300 million cubic metres of industrial wood and 1700 million of fuel wood (FAO, 1978b), a 75 per cent increase over 1976. At this level of consumption (4000 million cubic metres per annum) it would take 75 years to use up the world's resource of wood, and this assumes no increment, no regeneration, and no planting at all. Humankind has found in wood the answer to many of the problems of his existence. For a long time, natural forest has been exploited, cleared, and suffered man-made damage and has gradually declined in extent. In some countries, loss of forest has gone on steadily over thousands of years, but in others it is a recent occurrence. However, only in the last 150-200 years has net destruction of forest taken place in almost every country and, in recent years, the rate of disappearance has increased sharply. Though forecasts vary, it is estimated that in developing countries, forests are disappearing at a rate of 15-20 million ha per annum (FAO, 1990).

Examples of decline in forest cover abound. In the last 200 years Haiti has changed from being the richest French Colony to the poorest country in the Western hemisphere largely because nearly all the once extensive forest and most of the top soil are gone. In 1973, only 9 percent of the land was forested (Anon, 1977). In Ethiopia, forest cover has declined from 40 per cent to just 4 per cent since 1950. Between 1965 and 1975 percentage forest cover in Thailand dropped from 55 to 38 per cent. In Peninsula Malaysia, rain forest would disappear in the next 12 years if present exploitation continues (Rowley, 1977).

Similar reports can be cited for many other tropical countries including Ghana. Ghana covers an area of about 23.9 million hectares of which 33 percent is covered with forest. At the beginning of the 20th century, the closed high forest covered an approximate area of 8.2 million hectares. By the turn of the 20th century, the forest had diminished to about 1.6 million hectares (Ministry of Lands, Forestry and Mines, 2002).The ministry also indicated that the country has lost about 70 percent of its forest cover within the past five decades. According to FAO (1990), the forest of Ghana is now diminishing at a rate of 1.3 per cent per annum.

The forest zone of the country has a higher proportion of reserved land (20 per cent) than any other country in the West African sub-region and the integrity of these forest reserves has been preserved for over half a century. Forest reserves stand out on satellite imagery as areas of high canopy density in a matrix of farmland (Hawthorne, 1990; Swaine, Agyeman, Kyere, Orgle, Thompson & Vcenendaal, 1997). Ghana has established 266 forest reserves, 216 of which occupy 1,634,100ha in the high forest zone. Based on the 1986 - 94 forest inventories, forest reserves in the high forest zone have been classified according to the condition of the estate. Apart from timber production areas (762,400ha) and protection areas (352,500ha), 32 percent of the forest reserves is in a degraded state and needs both rehabilitation (by natural convalescence of 122,000ha) and reforestation (by conversion of 397,000ha) to timber plantations to enhance their productive capacity (Ministry of Lands and Forestry, 1996).

Major sources of forest degradation in Ghana

Generally, much of the forest destruction experienced any where in the world, has come from human activity in the pursuit of some economic ventures for survival (Oteng-Yeboah, 1996). In Ghana, the factors responsible for forest disturbance include logging, fire, clearance for agriculture and mining (Daily Graphic, 2005).

A consequence of logging is the removal of trees which produce large numbers of seeds and concern about the loss of seed source for regeneration is widely expressed (Swaine *et al*., 1997). The impact of logging equipment is from the biological point of view disastrous and a setback to natural regeneration (Jacobs, 1974). Common features with uncontrolled heavy bulldozer extraction are severely eroded slopes in hilly terrain and creation of artificial swamps by cutting off natural drainage. All these factors hinder natural regeneration.

Logging, as is generally practised in Ghana, is not very damaging to the residual forest. Destruction due to logging is localized in particular forest reserves. There is however, synergism between logging and fire in that logged forests are more likely to burn and to suffer greater damage as a result than unlogged forests (Swaine *et al.*, 1997).

The traditional view of tropical rain forest is that it does not burn because the vegetation and its environment are too wet and the potential fuel is concentrated above ground in the forest canopy, in contrast with savanna which has a prolonged dry season and an abundance of fuel in the grass layer. This view

probably arose because the early studies on tropical forests were published during the relatively moist decades of the 1950s and 1960s (Swaine *et al.*, 1997).

In the 1970s, however, it became clear in Ghana that fire occasionally spread in forest from nearby savannah along the northern margin of the forest zone (Hall & Swaine, 1976). These ground fires which burnt the litter layer and killed small trees as well as plants in the ground layer, but did not kill the trees of the main canopy were rare enough that the forest could recover in the intervening years. The drought of 1982-83, however, was so severe that the accompanying fires caused substantial loss of canopy cover rendering the forest more exposed, drier and susceptible to further fires.

In many of the forests in the dry zone and the moist semi deciduous zone, fire damage has been severe and recovery is uncertain because of the recurrence of fire. Fire damage in Ghana following the drought of 1982-83 has been widespread and has significantly altered the structure and composition of 30 per cent of the semi-deciduous forest. More than 14 million cubic meters of exploitable timber has been lost to fire. Burnt forest is dominated by pioneer trees of little economic merit, and is prone to burn in the future. Fire is now the greatest, single threat to the long term survival of about half of the forests in Ghana (Hawthorne, 1994).

Forest destruction through agriculture is mainly by conversion into arable lands to grow food and cash crops. Two categories of people are associated with forest reserve destruction in Ghana. The first group is the squatters or intruders who sneak into forests and make temporary farms. After a few years of food

cropping, the site is abandoned and becomes dominated by Acheampong weed (*Chromolena odorata*) or grass (*Panicum maximum*). The second group is farmers who have exercised rights in the form of admitted farms. These farmers destroy the pillars demarcating their farms and extend into the adjacent forest causing widespread destruction of vegetation as is happening in the Desiri Forest Reserve in the Goaso Forest District and some forests in the Western Region.

Mining, especially surface mining, has contributed substantially to the removal of vegetative cover in both off reserve and on reserve areas in Ghana. Illegal mining popularly referred to as 'galamsey' has destroyed woodlands and even forest reserves in parts of the Western, Ashanti, and Eastern regions and recently in the northern parts of the country (Daily Graphic, 2005).

Some licenced miners have also contributed to deforestation as a result of their surface mining activities. In the Birim North District, for example, while illegal miners are operating extensively and clearing vegetative cover around Noyem and Nwinso off reserve areas, Newmont Ghana Limited is also prospecting extensively for gold in the Ajenjua Bepo Forest Reserve and its surrounding off reserve areas with the digging of trenches and construction of access routes. All these are contributing to the destruction of the vegetative cover. It is a recent phenomenon in the sense that Gold Mining in Ghana as is being practised by Ashanti Goldfields now Anglogold is deep underground mining. Such operations have been done at Obuasi, Konongo and Prestea with minimal damage as compared with recent surface mining operations in Esaase in

the Eastern Region, Kenyasi in the Brong Ahafo Region and Wassa Darmang in the Western Region (Daily Graphic, 2005).

The technology being employed by some of the small scale miners (surface miners) has been adopted by some workers who are no more working with the mining companies. They have adapted and transferred the technology and with the help of some crude implements are practising illegal mining in almost all the mining areas in the country including the Northern and Upper East regions.

Justification for Forest Plantation Development in Ghana

The size of the country, its forest cover and the rate of forest depletion had already been described in chapter one. Forest plantation development works towards the concept of sustainable development. Sustainable development is the development that meets the needs of the present without compromising to the ability of the future generations to meet their own needs (World Commission on the Environment and Development, 1987: 43). The argument is that a healthy and peaceful society cannot be achieved with widespread poverty and environmental degradation. It is therefore imperative to take remedial measures to address the fast dwindling of the forest resources.

Of all the measures that can be adopted to solve or minimize forest depletion, reforestation is the most important. If we are able to increase the forest quantitatively and qualitatively, we will be able to have human needs met with less difficulty. Plantation development has the potential to create jobs for the

unemployed youth in the rural communities and thereby improve their standard of living. The existing productive government forest plantations of 19,000 hectares are capable of supplying the installed timber industry capacity for only four years while that of the 18,000 hectares private plantations are capable of providing a supply for only 2-3 years due to its poor quality (FSD, 2002).

The early plantation experiences date variously from the 1920's to 1960s. They were undertaken by the British Colonial Forest Service in Ashanti and the northern territories. During the same period, the Germans did the same in the then Trans-Volta Togoland (Volta Region) and parts of Yendi District in the Northern Region. From the 1970 - 1980, the government of Ghana through the then Forestry Department embarked on forest plantation development with the dual aim of generating rural employment and replanting degraded forest lands. About 50,000ha was established in the high forest zone and 41,189ha of forest plantation were also established in the Northern Savannah. Resources for expanding and managing the plantation were not available. The existing plantation stands were therefore poorly managed and in 1983, bushfires destroyed about 60 per cent of them (FSD, 2003).

Since that time, efforts at further development have been on the agenda but it was in 2001 that the issue was given more serious attention. The Ministry of Lands, Forestry and Mines (MLFM) has recently completed a plantation development programme which was launched under the Presidential Special Initiative (PSI) on forest plantation at Ayigbe in the Brong Ahafo Region in September, 2001. The project purpose is to increase the nation's forest cover by

20,000ha per annum for the next 10 years and beyond. A comprehensive proposal has been placed before African Development Bank for funding. Though a number of timber companies have already begun plantation projects yet on a limited scale, the greater proportion of the programme is through the modified taungya system by the Forestry Commission with the forest fringe communities.

Collaborative management in Forest Plantation Development

Forest Services Division is the main agency for the implementation of forest plantation development. It collaborates with other agencies and departments such as MOFA, Fire Service and MMDAs as well as farmers and other stakeholders in the local communities. Forest Services Division (2002) uses collaboration to describe any form of interaction between Forest Services Division and the local people, and other agencies and departments, which enhances the management of the resources and improves the flow of benefits to the local communities.

Another area in which the Forest Services Division (2002) has suggested community involvement is industrial plantation development on degraded reserves. The importance of plantation development has been highlighted by the Ministry of Lands, Forestry and Mines Master Plan: 1996 – 2000 for development of the forest sector (Kotey, 1998)**.** The involvement of forest fringe communities in taking forestry related decisions is of paramount importance. The objectives of Ghana's forest and wildlife policy, indicate that, there should be promotion of public awareness and involvement of rural people in forestry and wildlife

conservation so as to maintain life sustaining systems, reserve scenic areas and enhance the potential of recreation, tourism and income-generating opportunities. Hence there is that urgent need to involve the rural people or the forest fringe communities in the management of the forest and wildlife resources (MLF, 1994).

It has become apparent that throughout the developing nations including Ghana, forest fringe communities greatly influence the fate of forests since they depend on these forests for most of their livelihoods, live very close to the forest resources, and sometimes own them . Since the dawn of this knowledge, almost all forestry programmes have embraced some form of community involvement such that today the practice of community forestry has come to be synonymous with forestry all over the world (Evans, 1987).

A number of persons and institutions have benefited from the forest. There are others with legal power (traditional and morally) to control or regulate the conduct and behaviour, which have effects on the forest and others whose act or omission impact on the forest. All such persons and institutions may be said to have a stake in forest and may be considered to be stakeholders (Kotey, 1998).

In Ghana, stakeholders include traditional land and forest-holding authorities, forest fringe communities, farmers, the state and its (forest-sector) agencies and the timber industries. However, civil society groups in the universities, labour movement, churches, journalists and environmental NGOs have interest and even the global community may be considered stakeholders (Kotey, 1998). The contribution of various stakeholders is of paramount

importance in developing the forest since the stakeholder factor has also accounted in part for the declining trend in the forest resources.

Policy and legal perspectives

The key aspects of government plantation policy are that plantations are better land use option for economic development of the country for both off and on reserve areas, because they satisfy the need for projected future demand of wood, rehabilitate unproductive land, and reduce pressure on natural forest, provide jobs and additional livelihood options for rural people and private investors and help alleviate poverty within forest fringe communities. Government policy also requires that plantation development must be environmentally and socially acceptable. While the government's primary focus is to facilitate private sector investment in forest plantation development, it is embarking on the modified taungya approach with local communities around forest reserves as the institutional structures that would support private sector investment (MLFM, 2002).

The Forest and Wildlife Policy of 1994 sought to address certain limitations in the previous forest policies which could not adequately enhance forest development. Between 1948, when a forest policy was adopted, and the early 1980s, Ghana's stance has been remarkably consistent. The 1948 forest policy provided for the creation and management of permanent forest estates, research in all branches of scientific forestry, maximum utilization of areas not dedicated to permanent forestry, provision of technical advice and co-operation in

schemes for the prevention of soil erosion in land use plans. However, with increasing demand for forest land for agricultural purposes due to population pressure, advances in science and technology, growing ecological importance of the forest in terms of genetic biodiversity and wildlife, institutional changes, and the increasing need for popular participation in resource management, the underlying justification for the earlier policy no longer appeared applicable (Ministry of Lands and Forestry, 1995).

It became obvious that most of the provisions in the old policy could not adequately deal with the totality of the emerging issues. Consequently, the government introduced remedial measures to strengthen forestry sector institutions and to reform policies. Though these measures have in part, reduced the scale and frequency of environmental losses, there is still the need for a new forest policy that provides a new set of principles for sustainable forest management and establishes key priorities for its future development for example farmer's rights to natural resources (trees) on farms (Ministry of Lands and Forestry, 1995).

The 1994 forest policy offers an additional basis to develop national forest estate and timber industry that provide the full range of benefits required by society in a manner that is ecologically sustainable and that conserves our environmental and cultural heritage. The new policy promotes public participation in the share of benefits and responsibilities in forest management.

Relevant legislations have been enacted to provide legal basis for the implementation of forest plantation development project. For example, Timber

Resources Management Act, 1997 – Act 547 makes it mandatory for prospective Timber Utilization Contract (TUC) applicants to make an undertaking to execute reforestation plans during the period of the Contract. MLFM (2002) has placed levy on export of lumber and the money accrued from the levy used for the development of forest plantations.

Early attempts at Forest Plantation Development using the Taungya system

Various attempts have been made to restore degraded or depleted forest cover. Several options exist which can be employed to restore the forest cover such as natural regeneration, enrichment planting, the tropical shelter wood system and the taungya system. The climate, topography and soils in Ghana, when compared with those in other tropical countries suggest that there is considerable scope for successful commercial forest plantation. Moreover, the productivity of timber per unit area in plantations is greater than in natural forest and the high volume per hectare result in cheaper harvesting cost per cubic meter (FSD, 2002). Commercial forest plantation using the taungya system was then adopted as the best option to restore forest cover.

"Taungya" is a Burmese word for hill cultivation. The Taungya System is a plantation establishment method where farmers are given parcels of degraded forest reserves to produce food crops and to help establish and maintain trees. This system is usually practised in areas where there is a land shortage**.** According to Evans (1987), this was proposed in Burma in the 1830's to arrest the damaging effects of shifting cultivation in the forest. The system was introduced in Ghana in

the early 1920's with sole aim of obtaining a mature crop of plantation timber in a relatively short time (MLFM, 2002).

The system was started in Ghana when it was realised that some communities bordering forest reserves were facing land scarcity for their farming ventures whereas portions of such reserves were poorly stocked in terms of commercial timber trees. The species planted included *Terminalia ivorensis* (Emire), *Mansonia altissima* (Oprono), *Tectona grandis* (Teak) and *Cedrella odorata* (Cedrella). Food crops such as plantain, cocoyam, vegetables and other annuals were normally cultivated for about three years after which the overcast shades from the trees prevented any cultivation of the food crops. Farmers quit the plot permanently to allow the trees to grow. Given the type of arrangements governing the Taungya Scheme, farmers were not entitled to any rights of benefits accruing from the planted trees, apart from the produce from the food crops at the initial stages of the plantation establishment.

The tendency for farmers to pay attention to their food crops to the neglect of the tree crops made the system unreliable resulting in its discontinuation in 1995. According to FSD (2002), several reasons accounted for the abuse of the system by farmers and these included the inability of the Forestry Department (now FSD) to provide effective supervision, and the lack of equitable benefit sharing framework among the key stakeholders. Some of the abuses included:

1. Farmers deliberately kill planted seedlings to extend their tenure over portions of land since a successful plantation meant for discontinuance of cultivation of the planted plot;

2. Farmers fail to weed around the tree seedlings, thereby retarding their growth;
3. Illegal farming of other degraded and non-degraded areas that were not allocated for Taungya within the forest reserves; and
4. Farmers were planting food crops, which were not ecologically compatible with the tree crops (MLFM, 2002).

The Modified Taungya System

In spite of the problems faced with the Taungya System, forest fringe communities still view the Taungya system as one of the most beneficial forest tenure systems and requested the government to re-introduce it with some changes (MLFM, 2002). Accordingly, the government has re-introduced the Taungya System as a component of the PSI on forest plantation and modified it to be more efficient. The key change in the modified Taungya system is that farmers are now fully involved in the establishment and maintenance of the plantations.

The farmers tend food and tree crops that are planted in a mixture on the same plot until such a time that the canopy closure of the growing trees makes it impractical to continue with food crop cultivation. After canopy closure, the farmer continues to tend the tree until maturity. The farmers are therefore eligible for a share of the benefits accruing from the plantation according to the benefit sharing framework, which ensures greater benefit flow to participating farmers.

The farmers are also eligible for payment of selected activities such as seedling production, cutting of pegs, pegging and planting of the seedlings (MLFM, 2002).

Cabinet approved a new benefit sharing scheme in the early part of 2002 for parties involved in the modified Taungya system in the proportion of 40 percent for farmers, 40 percent for the Forestry Commission, 15 percent for landowners and 5 percent for the local community guarantee (FSD, 2002).

Forest fringe communities take advantage of the plantation establishment to access the degraded areas for firewood, fodder, and other non timber forest products in the course of site preparation. Farmers are paid ¢900,000 per one hectare for cutting pegs and pegging, raising seedlings, site preparation and planting.

Tensions and contradictions in the implementation of community plantation projects

Farmers and foresters have different perspectives on the forest. Foresters are concerned with forest species of economic value while farmers' focus is on pioneer species of much less economic value. This phenomenon has the tendency of bringing about tension between officials of government forestry agencies and forest fringe communities in the implementation of community forestry projects.

Until recently, the tree ownership situation, which was exclusively vested in the state, meant that it was not surprising to see farmers actively destroying or preventing the growth of timber trees on their farms (Kotey, 1998). Furthermore, some legal provisions for example, the Forest Protection Decree, NRCD 243 of

1974, which extends to the prohibition of the collection or extraction of non timber forest products by communities living near forest reserve is a constraint in the management of the forest resources. The communities often resent their legal exclusion from resource use and largely disregard the rules.

These frictions have generally had a detrimental effect on the forest. However, recent policy has widened the space for farmers and community participation in forest management and this is seen as a step in the right direction (Kotey, 1998). The trend has the potential of providing a boost for the implementation of the forest Plantation Development Project. This is because the forest fringe communities are a major force to contend with as far as sustained provision of labour for the execution of various forestry operations is concerned

National Forest Plantation Development Programme as PSI

More than 77,500 hectares of degraded lands were replanted between 2002 and 2005. This was done through an aggressive programme initiated by the government through the use of HIPC funds and modified taungya system to restore lost forest cover, improve the availability of wood, create jobs, generate income and reduce poverty among rural communities (Daily Graphic, 2005). The National Forest Plantation Development Programme, which is one of the Presidential Special Initiatives, was launched in September 2001 by the former president J.A. Kuffour. It aimed at encouraging the development of a sustainable forest resource base that would satisfy future demands for industrial timber and enhance environmental quality.

With the modified taungya system, communities or groups of people were offered degraded land, seedlings of some timber species and assisted to plant and intersperse them with non-permanent food crops. While the farmers took care of the timber species to reclaim the degraded land, they also had the full benefit of their food crops. This system has so far benefited 32,000 farmers. The HIPC plantation is another component of the PSI on forest plantation. The programme which was being implemented by the Ministry of Local Government and Environment is now under the Plantation Unit of Forest Service Division. The programme is being run alongside the Modified Taungya System (MTS), where under the MTS farmers are collaborators in the development of the plantations. That is under the HIPC component workers (who may not necessarily be farmers) are recruited for the programme. By the end of September 2006, ¢44.9 billion had been spent on the taungya system. More than ¢202.1 billion had also been expended on the other component of the PSI which is funded from the HIPC fund since its inception in 2002 till September 2006 (Daily Graphic, 2006).

Institutional arrangements for project implementation

The Forest Services Division of the Forestry Commission is the main implementing agency responsible for the execution of the project and also the main facilitator with the support of the District Assemblies, Traditional authorities (chiefs) and farmers of the selected forest reserve (Forest Services Division, 2002). The Ministry of Lands, Forestry and Mines and the Forestry Commission

give Policy directions and coordination of the project. The FSD is responsible for the execution of the project and also the main facilitator.

A Project Directorate with membership drawn from the Forestry Commission, Forest Services division Operations Department and the Resource Management Support Centre (RMSC), would be set up to oversee the implementation and monitoring of the project activities and report on progress of work to the Chief Executive of the Forestry Commission, and to liaise with the Forest Plantation Development Centre (FPDC).

A Director of Plantations is appointed at the Forest Services Division. An assistant Plantations Manager is also appointed to assist the Plantation Manager at the RMSC. A Forester (Graduate or Diplomat) or an Assistant District Manager equivalent will be selected in the Regions to be appointed to take charge of Plantation duties. Also at the district level, the District Manager or the Area Plantation Manager is detailed to undertake specific roles to ensure smooth monitoring of the project at the grassroots level.

Technical Officer or graduates from the School of Forestry (College of Renewable Natural Resources) are given orientation to become Plantation Supervisors to supervise the plantations and also supervise and provide extension services to the Private Plantation developers. The supervisor may have two or three plantation assistants depending on the volume of work at each plantation area.

The District Assemblies as well as Regional Coordinating Councils assist in extension education and security. Traditional Authorities also assist in the

provision of periodic labour and congenial atmosphere for operation. The farmers, who collaborate with Forest Services division in the planting Programmes, are normally formed into taungya groups (that is community by community) with groups headed by Taungya headmen who are the liaisons between the communities and the forest Services Division. Besides, the project is being monitored both at the national and regional level.

Potential losses and side effects of the PSI

There is huge transport cost of seedlings to the field because contracts are awarded to individuals and groups to raise seedlings that may be far away from the project site. Inputs like mattocks, pickaxes, rakes, watering cans, shovels, axes and chainsaws are normally supplied from a single source and transported to all parts of the country where the project is being carried out making the transport cost higher.

Due to the poor nature of roads to and from project sites, transporting food stuffs and other products from the field to marketing centres are relatively high. Where there is a break in the release or flow of the HIPC funds, there is a corresponding break in the funding of the project making inflows of money unreliable hence delays in payments of services rendered by farmers and allowances to government staff (especially, FSD staff). Frequent wildfires by farmers in land preparations may destroy young seedlings planted in the previous years. There are huge post harvest losses of food crops due to poor storage facilities, poor road network and unreliable means of transport.

Forests converted into plantations (mono cropping) may not return to the original diverse nature or state hence there is a huge loss of biodiversity and medicinal values of forests. All these are potential losses which are difficult to quantify or measure as far as the PSI is concerned.

CHAPTER THREE

METHODOLOGY

Introduction

The chapter discusses the methodology used in the study. It describes the study area before presenting the study design, the study population, the sample and sampling techniques used for the study. The techniques of data collection and procedures for data analysis are also discussed.

Study area

The Birim North District is located in the north- western part of the Eastern Region in Ghana (Figure 1). The district is bordered on the north by the Kwahu West District, Ashanti Akim South District on the west, the Birim South District on the south, and the Atiwa and Kwaebibirem districts on the east. It has New Abirem as the district capital. The district covers an estimated area of 1,250 square kilometres, constituting 6.7 per cent of the total area of the Eastern Region (Figures 1 and 2).

According to the 1970 census, the population of the district was 8,519 and by 1984 the population had grown to 68,525, giving growth rate of 2.9 per cent. The district's population in 2000 was 123,579 which depicted annual growth rate of 3.4 per cent between 1984 and 2000 (Ghana Statistical Service, 2002). Currently, there are 140 settlements in the district and out of these only six can be described as urban (i.e., settlements with population of at least 5,000) and these

are Ayirebi, Akuase, New Abirem, Old Abirem, Afosu and Akokoaso (Birim North District Assembly, 2002).

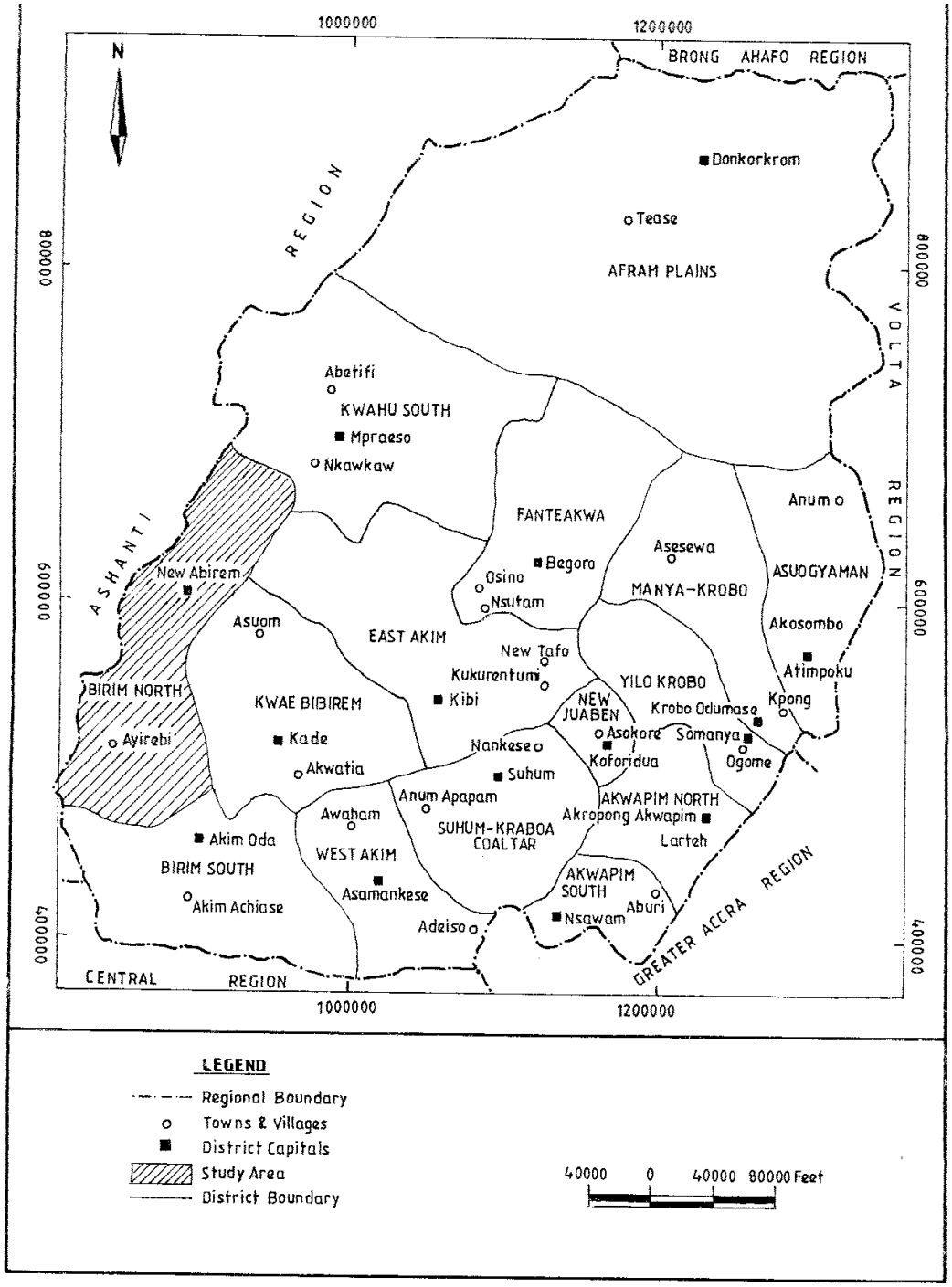

Figure 1: Birim North District in regional context

Source: Birim North District Assembly (2006)

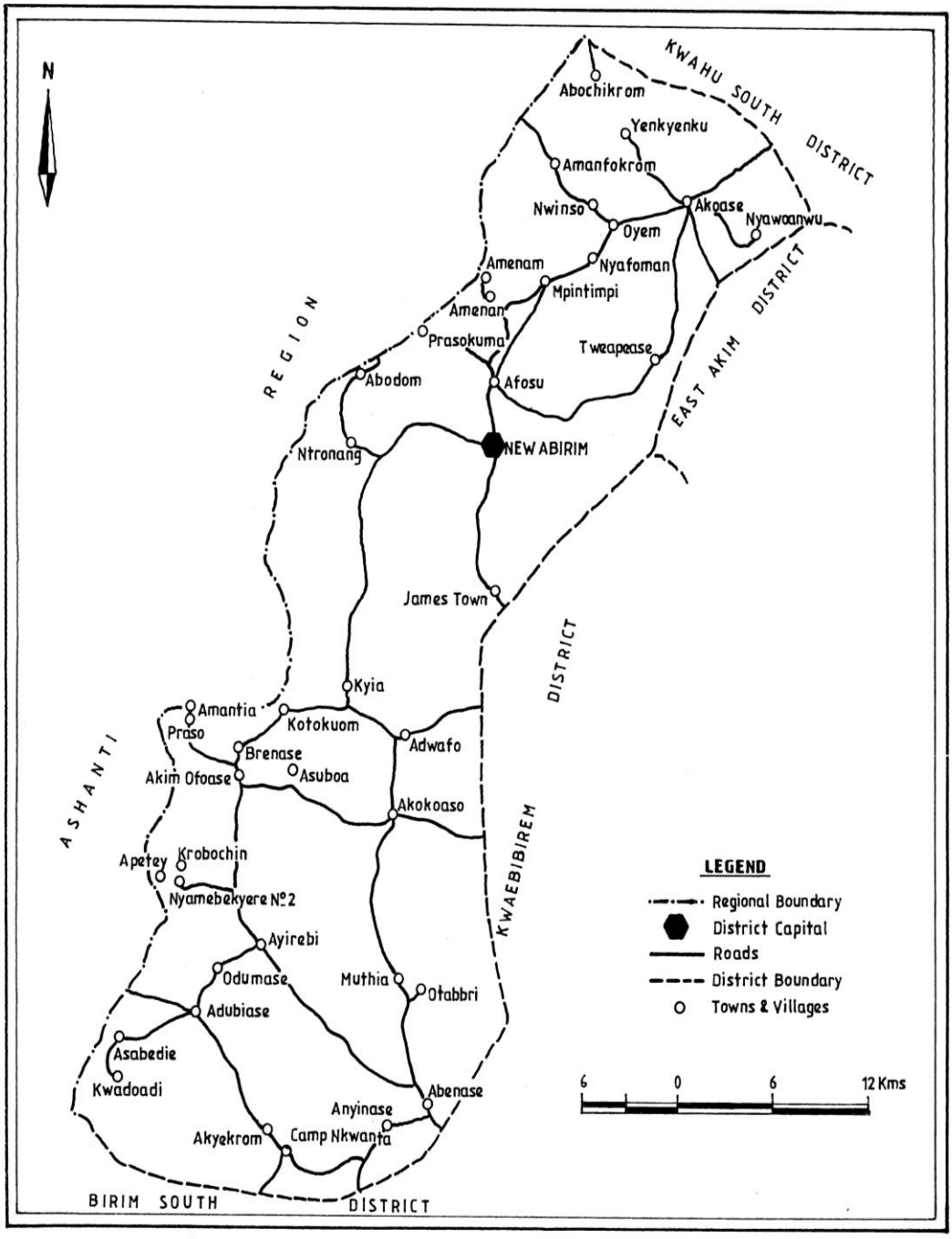

Figure 2: Map of Birim North District

Source: Birim North District Assembly (2006)

The district lies within the wet semi-equatorial climate zone, which experiences substantial amount of precipitation. It is characterised by a bi-modal rainy season with rainfall between 1,500mm and 2,000mm reaching its maximum during the two peak periods of May-June and September – October yearly. Temperatures range between an average of 25^{o}.C and 28^{o}C. Relative humidity ranges between 55 and 95 per cent and these are usually attained during the dry and rainy seasons respectively.

The Birim North District falls within the semi -deciduous rain forest zone of the country. The vegetation is mainly characterised by tall trees with evergreen undergrowth and has an abundance of economic trees like *Triplochiton scleroxylon, Ceiba pentandra, Terminalia superba* and *Celtis mildbreadii* (Hawthorne, 1990). The district has suffered forest degradation as a result of excessive logging and chainsaw activities. Currently, it is under the siege of both illegal (galamsey) and licenced miners who do surface mining.

The district is mostly undulating and mountainous or distinctly hilly. The area is drained mainly by the Pra River which forms the western boundary and the Birim River which is a major tributary of the Pra River, which forms the southern boundary. Into these two major rivers flow several smaller tributaries. These tributaries flow generally from north-east to the south- west to join the Pra River which flows southward to enter the Atlantic Ocean near Shama in the Western Region.

Farming is the principal economic activity in the district. Land use practices comprise mixed crop farming and the cultivation of tree crops such as

cocoa, oil palm and citrus. Other economic activities include mining, logging, palm wine tapping and petty trading. The forest supports the economic activities of the communities in the Birim North District by providing food, fodder, fuel, medicine, building materials and household items, which are harvested for domestic use as well as for sale to traders. Most raw materials like seeds, fruits and clay are obtained to support agro-processing industries in the district. The forest supports employment creation through logging, plantation development and eco-tourism.

There are ten forest reserves with various sizes in the Birim North District as shown in Table 1. Mamang River Forest Reserve is the largest while the Jade Bepo Extension reserve is the smallest. Plantation development is executed in the Ajenjua Bepo, Jade Bepo, Kwekaru and Mamang River forest reserves since the inception of the PSI on Forest Plantation in 2001(Forest Services Division, 2004).The objective of the PSI on Forest Plantation is to rehabilitate all the degraded forest reserves in the district in particular and the off-reserve areas affected by excessive logging, chainsaw activities, encroachment and surface mining.

The Kade Forest District, which has jurisdiction over the reserves, is headed by a District Forest Manager assisted by an Assistant District Manager and a Customer Services Officer. The reserves are manned by Range Supervisors assisted by Forest Guards. There is also a Cartographer at the office who prepares maps and schedules for field operations (Kade Forest District, 2004). Like all the other closed forest zones in Ghana, human activity in the pursuit of some

economic gains for survival has adversely affected the forests in the Birim North District. The major factors responsible for forest disturbance include logging, clearance for agriculture and mining.

Table 1: Forest reserves in the Birim North District

Forest Reserve	Area (Square kilometre)	Percent
Nsuensa	62.60	28.8
Mamang River	54.29	25.0
Aiyaola	33.90	15.5
Kajease	26.71	12.3
Kwekaru	11.65	5.4
Auro River	8.47	3.9
Bediako	7.07	3.3
Ajenjua Bepo	5.80	2.7
Jade Bepo	4.42	2.0
Kwasi Anyinama	1.69	0.8
Jade Bepo Extension	0.58	0.3
Total	217.18	100

Source: Forest Services Division Kade (2007)

Excessive logging accompanied by chainsaw activities have rendered most of the forest reserves (both off-reserve and on-reserves areas) in the district degraded. Forest destruction through agriculture is mainly by conversion into arable lands to grow food and cash crops. Squatters or intruders do sneak into the forest reserves and make non-permanent farms. Other farmers who have exercised

rights in the form of admitted farms may extend their farms beyond the demarcated boundaries and extend into the adjacent forest reserve causing widespread destruction of vegetation as happened in the Mamang Forest Reserve in Old Abirem (Kade Forest District, 2002).

Surface mining has also contributed substantially to the removal of vegetative cover in both off- reserve and on-reserve areas. Illegal miners also operate extensively and clear vegetative cover around Noyem and Akuase. Newmont Ghana Limited, a mining company in Ghana, has been prospecting for gold in the Ajenjua Bepo Forest Reserve and its surrounding areas.

Study design

The descriptive survey design was used for the study. One of the merits of the descriptive survey design is that it makes it possible to generalize from a sample of a population so that inferences can be made about some characteristics or behaviour of the population (Babbie, 1990).

Since this study aimed at examining the socio-economic effects of PSI on the farmers in the Birim North District, it lend itself to the descriptive survey design. Such survey design was however, susceptible to distortions. For instance, errors due to the use of interviews, observations and questionnaires for data collection might distort the research findings. To minimize such distortions in this study, the data collection instruments were pre-tested for clarity and the necessary revisions were made.

Study population

The study population comprised all stakeholders of the Presidential Special Initiative (PSI) on Forest Plantation in the Birim North District, staff of facilitating agencies (FSD and MOFA), heads of the Birim North District Assembly and occupational groups (e.g. GPRTU) and farmers in the district who were directly involved in the programme constituted the population for this study.

The farmers were the main expected respondents (Table 2) since the project depended on them and was designed to compare their standard of living before the inception of the project and now (four years after the project). The traders would also benefit through the distribution channels by buying and selling the products (food crops) thereby enhancing their living conditions. Therefore, interviewing their representative (market queen) was in the right direction. The GPRTU were also involved in the transportation of the food crops and hence their representatives were also interviewed.

Forest Services Division being the main implementing agency formed part of the study population to provide an insight into the success or otherwise of the project. The range supervisor in charge of New Abirem area and the Plantation Supervisor in charge of the Birim North could offer first hand information on the impact of the project (both negative and positive) on the farmers of the Birim North District.

The MOFA and Extension Service representatives were also considered as collaborating agencies. They could provide technical advice to the farmers and also collect data on food production in the district. They were the personnel to

provide accurate figures on the increased food production and hence increased sales which would translate into improved standard of living of the farmers. The District Chief Executive and the District Coordinating Director being the core staff of the District Assembly might offer useful information.

Table 2: Target communities and their sample

No.	Community	Population	Target Population	Sample	Response Rate (%)
1	New Abirem	6.850	5	1	0.2
2	Old Abirem	5,400	102	20	0.2
3	Amuana Praso	6,000	65	13	0.2
4	Amenam	2,000	29	6	0.2
5	Pankese	4,540	25	5	0.2
6	Akuase	5,030	47	9	0.2
7	Adawsena	2,000	55	11	0.2
8	Oseikrom	80	39	8	0.2
9	Mpintimpi	1,200	105	21	0.2
10	Sakapia	150	9	2	0.2
11	Institutional Representatives	10	10	10	1.0
	Total	33,255	486	106	

Source: Field data (2007)

Sample and sampling procedures

All adults aged 18 years and above and who were participating farmers in the ten communities, and institutional heads from FSD, MOFA, GPRTU, Extension Service, Traders Association and the Birim North District Assembly constituted the population for the study (Table 2).

In order to make the study a representative one, ten fringe communities participating in the Forest Plantation Programme were randomly selected from the district. In each selected study community, there was a cluster sampling based on the areas in the community. The simple random sampling was employed to select areas for the study.

A list of all the households in the selected areas was made. Based on the available households, systematic sampling was used to identify the households to be used for the study. An adult above 18 years of age and who was a participating farmer was selected and interviewed in each household. Purposive sampling was then employed to seek the views of the institutional heads connected with the PSI in the Birim North District. Therefore, the District Chief Executive and the Coordinating Director of the Birim North District Assembly were selected in order to get the Assembly's view point on the project. Efforts were also made to interview the heads of MOFA, GPRTU, Traders Association, Forest Services Division and the Extension Services since they are the main partners in the implementation of the project. Their inputs would help in making informed decisions on the success or otherwise of the project. Thus, 10 respondents were selected at this stage.

In all, 106 respondents were selected for study. The data collected covered issues such as property rights ownership, socio-economic status of the people, success in plantation establishment, economic activities and attitudes towards the PSI on forest plantation development. With the assistance of the plantation supervisors and taungya headmen, one fifth (0.2) of the farmer population in each of the ten communities presently partaking in the plantation development projects were administered with the interview schedules (Table 3). The size of the sample was taken due to the cost involved in undertaking the study and the time available for the entire study to be completed.

Table 3: Number and types of respondents

Respondents	Number	Percent
Farmers	96	90.6
Traders	2	1.9
GPRTU	2	1.9
Institutional Representative (MOFA, FSD and Extension Service)	4	3.8
District Chief Executive	1	0.9
District Coordinating Director	1	0.9
Total	106	100.0

Source: Field data (2007)

Types of data

The research employed both primary and secondary sources of data. The primary data collection instruments were interview schedules and questionnaire. The primary data were supplemented by secondary data from operation reports compiled at Kade Forest District as well as books, journals and newspapers.

Data collection techniques

Interviewing was employed as the major technique for data collection. The interview schedules and questionnaire (Appendices 2-4) used for the study were pre-tested at Old Abirem, one of the forest fringe communities involved in the plantation programme. This helped in the identification of potential problem areas in the schedule. The final schedule was therefore revised based on the findings of the pre-test. This technique offered the respondents the opportunity to express themselves as much as possible. The technique also made it possible for questions to be explained very well to respondents for the right responses. Ten days was used for the entire field work which involved four interviewers who were trained purposely for the data collection exercise. The two-way communication between the interviewers and the respondents made it possible for the administrators of the instrument to closely observe both explicit and implicit expressions of the respondents.

Data processing and analysis

The data that were gathered from the field of study were edited to ensure that all interviewing schedules were complete and contained accurate information. The data were then coded and computerized using Statistical Product and Service Solutions (SPSS) version 14. Descriptive statistics including frequencies, percentages and cross tabulations as well as chi-square were used to present the findings of the study.

Problems encountered during data collection

It was sometimes difficult to get precise tonnage of food production from the MOFA therefore, estimates of food production figures were made from the farmers' responses. The traders association and the GPRTU also gave estimates of tonnage of food stuffs transported and marketed to the urban centres. Access to some of the project areas (sites) was quite difficult due to poor nature of the roads making the usage of vehicles impossible. The researcher and the field assistants had to resort to the use of motor cycles and bicycles hence 10 days used for the data collection was relatively longer compared to the use of vehicles which could have enabled the work to be completed within five days. However, the integrity of the results was not compromised as the estimates of the food production figures were only a small part of the indicators for the assessment of the effect of the PSI on the lives of the farmers of the Birim North District.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter discusses the results of the study. It sums up the findings obtained from primary and secondary data. The chapter is organized under five main headings that include:

1. Socio- demographic characteristics of respondents;
2. Partnership among agencies in project implementation;
3. Restoration of forest covers under the Presidential Special Initiative (PSI) on forest plantation;
4. Level of employment and incomes of the farmers with the introduction of PSI;
5. Contribution of the PSI on forest plantation to living conditions of the farmers; and
6. Constraints to the project implementation.

Socio-demographic characteristics of respondents

In all, 106 respondents were interviewed for the study. Efforts were made to gather information on the socio-demographic characteristics of the respondents such as sex, age, marital status, level of education and place of origin. These characteristics provided vital information to the understanding of the study.

Analysis of the sex reveals the number of males and females in the study. Basically, plantation operation is a very strenuous and energy sapping exercise

hence more males than female would be preferred for the programme. Out of the total respondents of 106, 60 were males while the remaining 46 were females. The females were usually involved in the project to undertake less strenuous operations such as nursery work and fetching of water. Nursery work is repetitive and requires a lot of patience to handle.

The age structure of the respondents was important for a study like this. Analysis of the age of the respondents reflects the age structure of the respondents. The ages of the respondents ranged from 2l to 72 years as shown in Table 4.

Table 4: Age distribution of respondents

Age group (years)	No. of respondents	Percent
21-30	22	20.8
31-40	37	34.9
41-50	28	26.4
51-60	10	9.4
61-70	7	6.6
70 and above	2	1.9
Total	106	100.0

Source: Field data (2007)

The majority (91.5%) of the respondents were up to 60 years. This implies that 8.5 percent of the respondents were above the retiring age of 60 years. The general notion in the country is that farming is mainly handled by the elderly. The absence of many secondary and tertiary occupations in the area coupled with the

remoteness of the area has accounted for the high rate of rural-urban migration of youth. Incentives therefore needed to be provided for the youth (21-35 years) since they formed the energetic age group who could best provide the labour for plantation operations and to check the rural-urban migration.

The marital status was important in the study as the female partners are a vibrant labour force whose responsibility tends to complement that of their husbands in land clearing, preparation and planting of materials. The women also normally harvest the crops and sell them at the local markets hence a vital force in the local farming systems. The marital status would also give an idea of the dependency ratio and hence a wider spread of the benefits accrued from the PSI which would go a long way to reduce poverty levels in the area.

Table 5: Marital status of respondents

Marital status	Frequency	Percent
Married	88	83.0
Widowed	7	6.6
Separated	5	4.7
Divorced	4	3.8
Single	2	1.9
Total	106	100.0

Source: Field data (2007)

The majority (83.0%) of the respondents were married as against only 1.9 percent who were single (Table 5). Thus, married people dominated the respondents covered. The most probable motivation for these groups of farmers'

involvement in the PSI on forest plantation is to use the benefit from the programme to support their families. However, there is the need for family life educators to educate them on the need to maintain manageable family sizes that will be commensurate with their families' income levels.

The educational background of farmers could influence their perception, attitude to change and use of modern technology among others. In Ghana, many people have the notion that farming as an occupation is mainly done by people with low educational background. An investigation into the educational background of the respondents also confirmed this notion as illustrated in Table 6.

Table 6: Level of education of respondents

Level of education	Frequency	Percent
None	22	20.8
Primary	14	13.2
Middle / JSS	53	50.0
Secondary	12	11.3
Tertiary	4	1.8
Others	1	0.9
Total	106	100.0

Source: Field data (2007)

About 21 percent of the total respondents had no formal education. Also, 50 percent of the respondents had Middle / JSS education. Notwithstanding the fact that not all the respondents were full time farmers, it was realized that 84 percent of the respondents fell within the no formal education and the Middle

School / JSS range. This clearly shows that despite their generally low level of education, the rural people are eager to collaborate in the development and management of the forest resources, therefore education is no barrier to participation hence FSD should package information in the simplest form to facilitate understanding. However, efforts should be made by the District Assembly to educate those semi literate farmers through the non-formal educational system and also to use some of their income earned from the project to educate their children. This would go a long way to break the vicious cycle of the high rate of illiteracy in the fringe communities and also enhance their acceptance of scientific information and use of modern farming technologies.

Experience in the PSI on Forest Plantation

The issue of experience is essential, especially among the farmers. The level of experience would influence the rate of work since those who were already in it would work faster with less supervision. The experience of the people would also affect the level of technical assistance and types of inputs that would be put into the programme. Those with a good track record could be entrusted with bigger portions or quota and appreciable quantity of materials and inputs.

An attempt was therefore made to find out the number of years the respondents (mainly farmers) had been engaged in the PS.I on forest plantation. Table 7 shows the responses. About 55.2 percent of the 96 farmers in the respondents have been in the PSI for three years while 15.7 percent of them had been in the programme since its inception. One quarter had been involved in it for

two and only 4.2 had been in it for only one year. Further analysis showed that 51 percent of the respondents were migrants while 49 percent were indigenous people.

Table 7: Number of years farmers have been engaged in the PSI on Forest Plantation

Number of years	Number of respondents	Percent
1	4	4.2
2	24	25.0
3	53	55.2
4	15	15.6
Total	96	100.0

Source: Field data (2007)

Partnership among agencies in project implementation

As indicated in Chapter Two, the Forest Services Division of the Forestry Commission is the main implementing agency responsible for the execution of the PSI on Forest Plantation with the support of the District Assemblies, Traditional authorities and farmers of the selected forest reserve.

It was observed from this study that two collaborating agencies involved in the project implementation were the Forest Services Division and the Extension Service of the Ministry of Food and Agriculture (MOFA). The respondents were asked about the level of co-operation between the farmers and the two agencies.

From Table 8, it could be seen that 90 percent of the farmer respondents indicated the high level of co-operation between Forest Services Division and the farmers. The reason for that high level of co-operation is the regular technical advice provided by staff of the division. The level of co-operation between the agricultural extension service of the Ministry of Food and Agriculture and the farmers was however low as indicated by 52 percent of the respondents.

Table 8: Farmers' co-operation with project implementing agencies

Agency	Level of Co-operation		Total
	High	Low	
FSD	86 (90.0)	10 (10.0)	96 (100.0)
MOFA	46 (48.0)	50 (52.0)	96 (100.0)
Total	132 (68.7)	60 (31.3)	192 (100.0)

Note: Row percentages are in parentheses

Source: Field data (2007)

The majority (52%) of the respondents could not assign any reason for that low level of co-operation between them and the MOFA staff. From the respondents view the level of co-ordination, monitoring and supervision by FSD was good and this is also good for the implementation of the project. However, the co-operation from MOFA is just moderate. There is therefore, the urgent need for the Extension Service of the MOFA to extend their services to cover the project implementation as a statutory responsibility. Local FSD staff should be

encouraged to forge a much closer collaboration between them and MOFA since the latter's role is of much importance in exposing the farmers to various forms of farming practices to increase food crop yields, reduce post harvest losses and come out with proper statistics of food production from the project.

Restoration of forest cover under the PSI on Forest Plantation

Forest regeneration, whether natural or by enrichment planting in natural forest or by plantation on cleared land, depends first on the production of seeds (seedlings), seed germination, tree seedling growth and survival (Swaine *et al.*, 1997). If the forest is to be restored and exploited sustainably, which is regarded as essential to a healthy forest management policy, and then the pattern of regeneration is as important as the increase in volume of the unexploited forest.

The study therefore, inquired about the success or survival of the rate of tree seedlings that were planted during the inception of the forest plantation from secondary source of data from the Kade Forest District. The results as shown in Table 9 indicate that 360 hectares had been actually planted or restored over four year period (2002 – 2005). In 2003, 150 hectares of land were planted with 80 percent success as against 70 hectares each in the other years with success rate ranging from 85 to 100 percent. Indeed, all targets were duly met.

The finding support the assertion of World Commission on the Environment and Development (1987) and FSD (2002) that forest plantation development works towards the concept of sustainable development. It is therefore, a solution to the earlier argument that a healthy and peaceful society

cannot be achieved with widespread poverty and environmental degradation. It is also consistent with FAO's (1978) estimate that it would take 75 years to use up the world's resource of wood at the current trend of wood usage (4000 million cubic metres per annum).

Table 9: Area planted and its success

Year	Proposed Target (ha)	Area Actually Planted (Ha)	Area Successful (%)	Remarks
2002	70	70	100	Target was duly met
2003	150	150	80	Target was duly met
2004	70	70	85	Target was duly met
2005	70	70	90	Target was duly met

Source: Kade Forest District (2007)

The study went further to probe the methods used in arriving at the various planting success rates. The methods employed in assessing the regeneration success in the area under the plantation were sample plots and transects.

Loestsch, Zohrer and Haller (1978) distinguished three levels of sample plots:

1. The simple plot - Is a non-composite plot;
2. The combined plots: Consist of two or more concentric circles or other shapes with different types of observations being carried out in each plot. For example, regeneration could be counted on the smaller plot. The

German forestry mission to Liberia used combined circular plots as recording units (Sachtler, 1968); and

3. The satellite sample plot: Consists of a systematic arrangement of relatively small plots around a central point. Satellite sample plots were also used in the Liberian inventories (Sachtler, 1968).

According to FAO (1978b), for a given area actually inventoried, a large number of small plots are more efficient than a few large plots. Synott (1979) observes that the most efficient plot size in any particular situation would depend on the objectives, the precision required, the variability of the forest and the present and future cost. The recommendation was 1 hectare plot for permanent sampling plots.

Longman and Jenick (1974) also found out that because of the patchy character of the horizontal structure of the Tropical High Forest, the minimum area which is theoretically desirable is about 4 ha. They maintained, however, that samples of the theoretically desirable minimum area of 4ha are difficult to manage in the course of normal ecological studies and one generally has to rely on extrapolation from smaller enumerations. Based on the above theories from Loestsch *et al.,* (1978), the FAO Manual and Synott (1979) a simple plot (circular) of radius 20m was recommended for the forest plantation assessment in the PSI. The layout of the plot is as indicated in Figure 3.

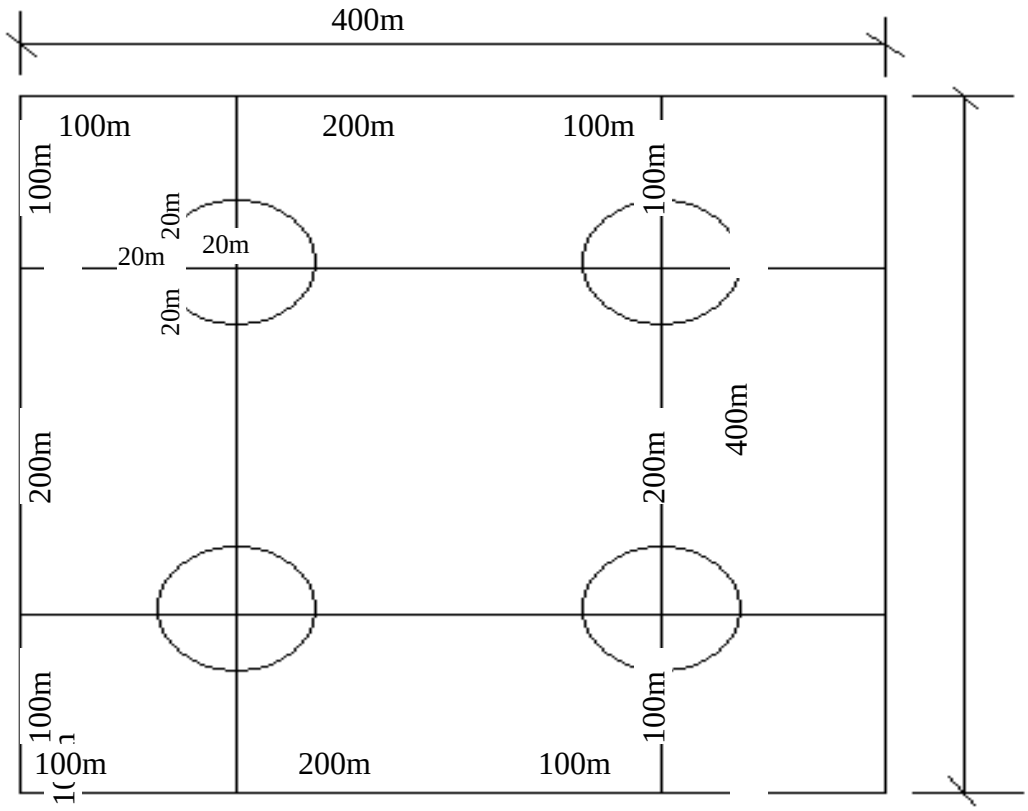

Figure 3: Enumeration plots in a plantation compartment

Source: Forest Services Division (2002)

The assessment method also took into consideration Longman and Jenick's (1974) theory on forest sampling. Forest plantation compartments (coupes) are laid out as 16ha blocks. From the point of commencement of a typical plantation compartment a strip is cut at 100m interval at both sides to meet at a common point. All the four corners of the compartment are treated the same way.

At the point of intersection of the two strips, a circular plot of 20m radius is then laid and all plants in the plot are booked. With the help of the assessment form the data is collected from the field and unweighted means model analysis of

variance is used to determine significant differences between the regeneration of the different plantation (plot) sites.

Level of employment and incomes of the farmers with the introduction of PSI

This objective of the study is discussed in terms of jobs created and farmers' incomes. The programme has created jobs for the forest fringe communities as shown in Table 10. Most of the farmers in the various communities were engaged for three or four successive years. In 2002, two communities participated in the project where 242 farmers were engaged. In 2004, the number of communities increased to nine and 350 farmers were engaged. However, the number participating communities reduced to four in 2005 and 329 farmers because the distance to the plots became longer to some communities than the previous years. It could be observed that the cumulative number of farmers engaged by PSI in the district over the four years was 1276.

Table 10: Farmers employed under the PSI on Forest Plantation

Year	Number of communities	Number of farmers engaged
2002	2	242
2003	8	355
2004	9	350
2005	4	329
Total		1276

Source: Kade Forest District (2006)

Table 11: Yearly incomes of respondents before and after the PSI on Forest Plantation

Income Level	Before PSI		After PSI	
(Million cedis)	Frequency	Percent	Frequency	Percent
Below 0.5	30	31.3	17	17.7
0.6 – 1.0	37	38.5	27	28.1
1.1 – 1.5	8	8.3	16	16.7
1.6 – 2.0	8	8.3	15	15.6
Above 2.0	13	13.5	21	21.9
Total	96	100.0	96	100.0

Source: Field data (2007)

The yearly incomes of the respondents before and after the introduction of the PSI on forest plantation are presented in Table 11. The data indicates that the percentage of respondents reduced at the lower income level of less than or equal to one million but increased at higher income levels after the introduction of PSI on forest plantation. The implication is that incomes of the farmers increased with the introduction of PSI.

The finding is in agreement with that of Falconer (1987) that forests are major economic, social and environmental resources that contribute to all aspects of rural life, especially in the tropical countries. FSD (2002) observes that forest plantation development has the potential to create jobs for the unemployed youth for improved standard of living in the rural communities.

Living conditions of farmers after introduction of the PSI on Forest Plantation

Generally, socio-economic effects of a project such as this on the lives of any community could best be measured by using some indicators that aim at improving the general living conditions of the people. The indicators used here were income for children's education and family upkeep, food security, improved shelter, spending on medical expenses, provisions for clothing and transportation as presented in Table 12. Respondents were asked how the PSI on forest plantation has improved their living conditions.

Table 12: Indicators for improved standard of living

Indicators	Number of Respondents	Percent
Money for children school fees and family upkeep	37	37
Food security	19	19
Provision for clothing	17	17
Improved shelter	13	13
Money for medical expenses	13	13
Procure a vehicle	1	1
Total	100*	100

Number of respondents = 96; Multiple responses

Source: Field data (2007)

Respondents indicated areas they had experienced improvement in their living conditions. About 37 percent of the responses indicated an improvement in

financial provision for children's education and for the upkeep of the family while one respondent has even acquired a vehicle. The implication of the result is that generally some farmers indicated improved living conditions with the introduction of PSI on Forest Plantation.

Table 13 shows that there was no significant difference between male and female respondents as indicated by the chi-square value of 5.75 at 0.45 level of significance. Similar results were observed with respect to age, marital status, family size, religion and educational level of respondents.

Table 13: Indicators for improved living condition by sex of respondents

Indicators	Male (%)	Female (%)	Total (%)	χ^2	DF	Sig
Provision of shelter	12.1	12.4	12.2			
Money for children	12.6	8.3	10.9	5.747	6	0.452
School fees	22.5	30.6	25.7			
Money for medical expenses	15.4	10.6	13.5			
Clothing	17.6	17.4	17.5			
Availability of food	18.7	20.7	19.5			
Procure vehicle	1.1		0.7			
Total	100.0	100.0				

Source: Field data (2007)

Constraints to the implementation of the PSI on Forest Plantation

The constraints identified by resource managers (FSD staff), the collaborating agencies and the participating farmers are as presented in Table 14. According to the plantation and range supervisors, the plantation supervisors had no reliable means of transport for regular and effective supervision. Public transport to some plantation sites was also irregular and that impeded regular and effective visits. For effective supervision the forest district may need another vehicle for the plantation work and motor bikes or bicycles for the plantation supervisors.

Allowances for staff (supervisors) were either not paid at all or delayed. For instance, instead of monthly or quarterly payment of night allowance and travelling and transport allowances it might be done bi-annually and might not be enough to cater for the actual expenses made in course of the supervision.

Logistics, farmers' allowances and seedlings for the project were funded by the government through donor support; hence delays in donors support also affected government inflows. This sometimes led to farmers' threat of strike action or farmers demonstrations. Some trees like Odum, Emire and Ofram are left as standards whose shade also protect the young seedlings that are planted on the field. Chainsaw operators fell and saw these standards which destroy planted seedlings.

Table 14: Constraints identified by stakeholders

Stakeholder	Constraints Identified
Plantation & Range Supervisors	• Unreliable means of transport • Not enough motorbikes • Irregular public transport to some project sites • Inadequate allowances • Irregular flow of funds causing delays in project execution • Chain sawing of trees left as standards • Overambitious and unrealistic targets leading to overload of work
Collaborating Agencies Like MOFA, District Assembly	• Difficulties in financial inflows • Land tenure problems hampering the release of public lands • Insufficient education on tree planting schemes • Road network not extended to plantation areas • Higher post harvest losses • Fuel and transportation cost higher than budgeted
Participating farmers	• Delayed demarcation and allocation of plots • Delays in supply of inputs and planting materials • Delays in payment for services provided • Lower cooperation from extension service • Erratic rainfall patterns leading to crop failures • High mortality rates in planting materials • Unstable food prices

Source: Field data (2006)

The national tree planting target for a year was set between 10,000ha to 20,000ha (MLFM 1996) and the Forest Services division also shares the target for

the regions and the districts according to the number and types of degraded forest reserves. Some of the targets were over ambitions and unrealistic considering the number of staff to supervise and logistics or inputs supplied for the work. This may result in overload of work and hence failure in the execution of the work to meet set targets.

With regard to collaborating agencies, the District Assembly and the Ministry of Food and Agriculture faced the same difficulties in financial inflows by the government. Therefore, the part they were supposed to play in supporting the project was virtually absent.

Apart from government reserves which were degraded, other degraded lands meant for the project were not released due to land tenure problems. Tree planting programmes were seen as long term projects, thereby making people feel reluctant to invest in it. Public education on the project was found to be inadequate. Roads were sometimes unavailable to some plantation sites or were in deplorable conditions making supervision and carting of inputs to the site difficult. Produce from the field to marketing centres also became a problem leading to post harvest losses. Fuel prices were increased based on world market prices

Another constraint was related to the participating farmers. Farmers faced delayed demarcation and allocation of plots by Forestry officials due to bureaucratic procedures. These in turn affected land preparation and planting stages. Planting often could not meet the May and June rains leading to crop failures.

Farmers also faced delays in the supply of inputs, logistics and planting materials. Sometimes food crops were planted four to five months before planting materials were delivered which made planting of the seedlings difficult and some food crops were destroyed in course of planting the tree crops.

Delays in government financial inflows also affected payment of services provided by farmers. Allowances given to farmers from pegging and planting, land clearing and seedling production delayed. Cooperation from the Extension Service of the MOFA was low hence farmers receive inadequate technical advice from the extension service personnel which affected the quality and quantity of food production negatively. There are some years where rainfall patterns become erratic hence planting is affected negatively leading to failures.

Planting materials faced high mortality rate at both the nursery and at the field hence losses were recorded at the nurseries and beating up operations were done more than once at the field making the project cumbersome and expensive. Farmers faced unstable food prices hence losses were incurred at the bumper harvest season and prices became high at lean seasons. This made budgeting difficult and unreliable.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents summary, conclusions and recommendations as well as areas for future research. The summary covers what the study set out to do, methodology used to conduct the study and the main findings of the study.

Summary

The study set out to examine the socio- economic effects of the PSI on Forest Plantation on the lives of the participating farmers of the Birim North District. The study covered 96 participating farmers in ten communities and 10 institutional representatives who were selected. Systematic random sampling was used to select the farmers while purposive sampling was employed to select the institutional representatives. The data collection instruments were largely interview schedule (for farmers and chiefs) and questionnaires (institutional representation). SPSS version 14 was used to facilitate data analysis.

The main findings of the study are as follows:

1. Forest Services Division was the main agency for the implementation of forest plantation development. It collaborated with other agencies and departments such as MOFA, Fire Service and MMDAs as well as farmers and other stakeholders in the local communities;

2. The majority of the farmers indicated high level co-operation with the staff of FSD and low level of co-operation with agriculture extension officers in the district;
3. Forest restoration over four year period (2002 – 2005) totalled 360 hectares with success rate ranging from 80 percent in 2003 to 100 percent in 2002. However, 150 hectares were planted in 2003 as compared to 70 hectares each in the other years;
4. The number of communities that participated in the project increased from two in 2002 to nine in 2004. However, the number participating communities reduced to four in 2005 because the distance to the plots became longer to some communities than the previous years. Meanwhile, there was slight reduction in number of participating farmers. The cumulative number of farmers engaged by PSI in the district over the four years was 1276;
5. The incomes of the farmers increased with the introduction of PSI;
6. Some farmers indicated improved living conditions with the introduction of PSI on Forest Plantation; and
7. The PSI faced several constraints as identified by various key stakeholders. The constraints included late allocation of plots to farmers, inadequate and late release of funds, unreliable means of transport for supervision, insufficient awareness on project implementation, erratic rainfall and high prices of fuel.

Conclusions

The government's aim of launching the Special Initiative on Forest plantation Development was to replant degraded forest reserves, create employment and increase food production in the rural areas to halt the rural-urban migration. This was a critical component of the Ghana Poverty Reduction Strategy. The modest achievement made in the study area coupled with the commitment of both farmers and FSD staff to the modified Taungya System was quite encouraging. There were some increase in employment and incomes of participating farmers as well as restoration of degraded forest. However, various stakeholders faced several constraints in the implementation of the project that need to be overcome to ensure sustainability of the interventions introduced in the district.

Recommendations

Based on the findings and conclusions drawn from the study, the following recommendations are made:

1. Government and District Assembly (DA) should provide adequate logistics and funds at the right time for the project;
2. The implementation agencies, especially, FSD and DA should sustain community education, consultations and discussions to iron out differences and address grievances;
3. FSD should allocate land to the farmers on time in order to meet the rains;

4. The DA should improve road conditions to allow easy transportation of goods and services to and from the project site;
5. Extension staff of MOFA should actively get involved in the implementation of the project to provide technical advice, on basic agronomic practices to farmers and also gather statistics on the level of food production; and
6. The parliament should speed up with the passage of the bill to give taungya farmers a certain percentage of the final crop to motivate farmers take maximum care and protection of species planted.

Areas for further studies

Primary data for this study was collected in 2007 so there is the need for further studies to gather data on the current status of the PSI on Forest Plantation in the study area as well as other areas in Ghana. There is also the need to investigate how the initiative has impacted on the living conditions of participating farmers and the society at large.

REFERENCES

Anon, J.E. (1977). *A study on environmental destruction in Haiti*. Washington, D.C.: The Conservation Foundation.

Babbie, E. (1990). *Survey research methods* (2nd ed.), New Delhi: Prentice Hall of India Ltd.

Birim North District Assembly (2002). District Profile, New Abirem: Birim North District Assembly.

Daily Graphic (September 2006). Employment under PSI.

Daily Graphic (December 1, 2005). 'Galamsey' menace is terrible, p. 17, Issue No. 149600.

Daily Graphic (November 19, 2005). The focus of AngloGold Ashanti and the mining debate in Ghana, p. 39, Issue No. 149590.

Daily Graphic (October 22, 2005) Impact of environment on poverty from state of Ghana Population Report: 2004, p. 19, Issue No. 149566. 0

Daily Graphic (October 20, 2002). Sustainable Development, pp. 7. Issue No. 1486476.

Daily Graphic (February 8, 1999). Forest certification: Its nature and implication. Daily Graphic, 1999, p. 23, Issue No. 147523.

Dixon, J. A., & Sherman, P.B. (1990). *Economics of protected areas: A new look at benefits and costs*. London: Earthscan Publications Limited.

Evans, J. (1987). *Plantation Forestry in the Tropics*, New York: Oxford University Press.

Falconer, J. (1987). Forestry Extension: A review of ODI Social Forestry Network paper 4, p. 4.

FAO (1978a). *The World's Forest: FAO fact sheet*. Rome: FAO.

FAO (1978b). *Forestry for Rural Communities,* Rome: FAO.

FAO (1990). *The World's Forest: FAO fact sheet*. FAO, Rome.

Forest Services Division (FSD) (2002). Forest Plantation Development Project. A report Submitted by FSD to Forestry Commission.

Forest Services Division (2003). Overview of the NFPDP - Benefit Sharing, Accra: Forest Services Division.

Ghana News Agency (GNA) (2006), Creation of jobs under PSI, Accra: GNA.

Ghana Statistical Service (2002). *2000 Population and Housing Census,* Accra: Ghana Statistical Service.

Hall, J.B. & Swaine, M.D. (1976). Classification and ecology of closed canopy forest in Ghana. *Journal of Ecology,* 64: 913-951.

Hawthorne, W.D. (1990). Field Guide to the Forest Trees of Ghana, Chatham: Natural Resources Institute.

Hawthorne, W.D. (1994). Fire damage and forest regeneration in Ghana, *ODA Forestry Series*. No. 4, Chatham: ODA and Natural Resources Institute.

Jacobs, M. (1974). Botanical Panorama at the Malaysian Archipelago (vascular plants), In *Natural Resources of Humid Tropical Asia* (pp 262-294), Paris: UNESCO.

Kade Forest District (2002) District Plantation Report, Kade: Kade Forest District.

Kade Forest District (2004). Kade Forest District Business Plan for the period 2004-2006, Kade: Kade Forest District.

Kade Forest District (2006) District Plantation Report, Kade: Kade Forest District.

Kade Forest District (2007) District Plantation Report, Kade: Kade Forest District.

Kotey, K.R. (1998). Falling into places: A policy that works for Forests and People, No. 4, Accra: IIED.

Longman, K.A. & Janik, J. (1974). *Tropical Forest and its environment*, New York: Longman Inc.

Ministry of Lands and Forestry (1994). *Forest and wildlife policy*. Accra: Ministry of Lands and Forestry.

Ministry of Lands and Forestry (1995). *Ghana forest and wildlife policy*, Accra: Ministry of Lands and Forestry.

Ministry of Lands and Forestry (1996). Forestry Development Master Plan.1996 - 2020. Accra: Policy Planning and Evaluation Division, Ministry of Lands and Forestry.

Ministry of Lands, Forestry and Mines (2006). Bulletin on Forest Plantation, Accra: Ministry of Lands, Forestry and Mines.

Oteng-Yeboah, A. A. (1996). Recruiting Indigenous Species in the Forest Plantation Industry in Ghana, Proceedings of Workshop on Forest Plantation Development in Ghana 27th -29th February 1996 Akyawkrom, Ejisu, Ashanti Region, Forestry Commission of Ghana.

Persson, R. (1978). The need for continuous assessment of the forest resources of the world, Proceedings on 8th World Forestry Congress, Jakarta: FID I / 16-10

Rowley, A. (1977). Forests: save or squander, *Far East Economic Review*. Dec 1977: 46-66.

Sachtler, M. (1968). General report on National Forest Inventory in Liberia, Technical report No.1. German Forestry Mission to Liberia.

Swaine, M.D., Agyeman, V. K., Kyere, B., Orgle, T.K., Thompson, J., & Vcenendaal, E.M (1997). Ecology of forest trees in Ghana. *ODA Forestry series* No.7, London: ODA and OFI.

Synott, T. J. (1979). A manual of permanent plot procedures for Tropical Rain Forest Paper No .14

World Commission on Environment and Development (WCED) (1987). *Our common future,* Oxford: Oxford University Press.

APPENDICES

APPENDIX 1

PLANTATION SEEDLINGS – ASSESSMENT FORM

Forest District …… Forest Reserve /Area …….

Compartment Number …… Assessment Date ……

Block Number …… Booker…….

			LIVE		DEAD			
Plot No	Species	Spp Code	Tally	Total	Tally	Total	Planting Distance (m)	Remarks

Block Number	Block Shape	Block Length (m)	Block Breath (m)	Remarks

General remarks

……

……

…….....

.....

APPENDIX 2

INTERVIEW SCHEDULE FOR THE COMMUNITIES

Introduction

This questionnaire is meant for a research into effects of the Presidential Special Initiative (PSI). On forest Plantation on the people of the Birim North District. It is intended to solicit your views on the project in this district hence your candid opinion is much desired. This is purposely for academic work hence your confidentiality is much assured.

Code…….

Date……..

Section A: Personal Particulars

1. Name of community.....
2. Status of respondent……..
3. Sex Male ( ) Female ( )
4. Age (years) …….....
5. Origin: Migrant ( ) Indigene ( )
6. If migrant, how long have you lived in the community? ……
7. Marital Status: Married ( ) Single( ) Divorced ( ) Widowed ( ) Separated ( )
8. Family Size (including dependents) ……....
9. Level of Education: None ( ) Primary ( ) Middle/JSS ( ) Secondary ( ) Tertiary ( ) Others (specify) …….....
10. Religion: Christian ( ) Muslim ( ) Free Thinker ( ) others (specify)…….
11. Main Occupation ……

Section B: Involvement in the PSI on Forest Plantation Development Programme

12. Name of Forest Reserve ……
13. How long have you worked under the PSI on Forest Plantation?.....

14. How many of your family members are involved in the plantation project? …….....

15. How many members of the community are involved in the plantation project?.....

16. What is the level of cooperation between you and the institution in the table below?

Institution	**Level of Co-operation**			**Reasons For Ranking**
	Low	**Moderate**	**High**	
Forest Services Division (FSD)				
Agricultural Extension Service				
Fire Service				

17. What types of species are planted ……

Section C: Land Use, Land and Tree Tenure

18. Do you have access to land: Yes ( ) No ( )

19. If yes, how was it acquired? Freehold ( ) Leasehold ( )

Others (specify) ……

20. Who acquired it? Self ( ) Parents ( ) Others (specify) ……

21. Location of land: In forest reserve ( ) of reserve ( )

22. Who owns land? Family Heads ( ) Traditional Authorities ( ) Government ( ) others (specify) ……

23. Land tenure systems operating in the area: Abunu ( ) Abusa ( ) outright sale ( ) Others (specify) ……

24. What types of farming do you practice? Food crops ( ) Tree crops ( ) Vegetable ( ) Livestock ( ) Others (specify) ……

25. Do you practice land rotation bust fallow system? Yes ( ) No ( )

26. If yes, what is the length of fallow? ……
27. Do you practice crop rotation? Yes ( ) No ( )
28. Do you leave trees on you farm land? Yes ( ) No ( )
29. If yes, list the type of trees ……
30. Reason for leaving tress on the farmland ……
    Shade ( ) Windbreak ( ) Firewood ( ) Soil fertility ( ) Medicinal ( )
    Poles ( ) Fruits ( ) Fodders ( )
31. Do you plant trees on your farmland? Yes ( ) No ( )
32. If yes, list the type of trees ……
33. Reasons for planting trees on farmland? ……
34. Can trees be harvested for own use? Yes ( ) No ( )
35. If no, give some reasons for not being able to harvest trees on your farmlands. Like to retain them ( ) Tree tenure issues ( ) others (specify)……
36. Indicate the resources you obtained from the woodland/forest ……

Section D: Assessment of the PSI on forest plantation impact on food security and poverty reduction

37. Total degraded area earmarked for rehabilitation at the inception of the PSI on forest plantation……
38. What is the area planted so far? ……
39. What is the percentage (percent) survival of species planted? .....
40. What is the area remaining? ……
41. How many people are involved? ……
42. How many permanent workers are employed? ……
43. How many casual workers are involved? ……
44. What are the benefits (short term)? .....
45. What are the benefits (long term)? .....
46. What is the level of food production during the inception of PSI on forest plantation? Low ( ) Medium ( ) High ( )
47. List the type of food stuffs you produce……
48. What quantity of food produce is sold domestically? ..... percent

49. What quantity of produce is consumed domestically?.....percent
50. In which of the following ways has the project improved your standard of living? Provision for shelter ( ) Money for children school fees ( ) Money for medical expenses ( ) Clothing ( ) Availability of food ( ) Provision of means of transport ( ) Others (specify)……
51. What was your yearly income before the inception of the programme?
    I. Above ₵ 500,000.00
    II. ₵500,000.00 - ₵1 million
    III. ₵1 million - ₵1.5 million
    IV. ₵1.5 million - ₵2 million
    V. Above ₵2 million
52. What is your yearly income since the inception of the project?
    I. Above ₵ 500,000.00
    II. ₵500,000.00 - ₵1 million
    III. ₵1 million - ₵1.5 million
    IV. ₵1.5 million - ₵2 million
    V. Above ₵2 million
53. What is your general perception of the project? .....

Section E: Constraints to the Project Implementation

54. In your view which of the under listed issues put constraints to the implementation of the PSI on forest plantation?
    a. Delays in demarcation and allocation of plots
    b. Delays in the supply of logistics and planting materials
    c. Delays in payment of services provided
    d. Inadequate technical advice from FSD/MOFA/GNFC
    e. Erratic rainfall pattern
    f. High mortality rate at both the nursery and the field due to erratic rainfall, insect attacks, bush fires.
    g. Transportation problems
    h. Post-harvest losses
    i. Unstable food prices

j. Others (specify)…… …….

55. In what ways can these problems be solved? .....

56. Any other comments.....

APPENDIX 3

QUESTIONNAIRE FOR STAFF OF DEPARTMENTS AND AGENCIES

Introduction

This questionnaire is meant for a research into effects of the Presidential Special Initiative (PSI) on Forest Plantation on the people of the Birim North District. It is intended to solicit your views on the project in this district hence your candid opinion is much desired. This is purposely for academic work hence your confidentiality is much assured.

Code……

Date…….

Section A: Personal Particulars

1. Name of institution……
2. Name of respondent…….
3. Rank ……

Section B: Knowledge about the Project and Participation in its implementation

4. Are you aware of the National Forest Plantation Development Programme? Yes ( ) No ( )
5. If yes, does your outfit cooperate in any way with other stakeholders involved in the project implementation? Yes ( ) No ( )
6. If no, has any special reason accounted for your non-involvement? ……..……
7. What is your general perception of the project? .....
8. In what special areas of the programme implementation is your outfit most likely to be of help?
    a. Land preparation technique
    b. Post-harvest management
    c. Basic agronomic practices
    d. Fire prevention education

e. Establishment of fire rides
f. Fire suppression technique
g. Provision of transportation to the farmers to their farms
h. Other assistance? ……

9. What is your assessment of the PSI on forest plantation impact on food security and poverty reduction? …….
10. What potential constraints can impose a limitation on your active involvement in the project implementation? ……
11. In your estimation, how best can the above constraints be addressed? …… ……

APPENDIX 4

QUESTIONNAIRE FOR FORESTRY OFFICERS

Introduction

This questionnaire is meant for a research into effects of the Presidential Special Initiative (PSI) on forest Plantation on the people of the Birim North District. It is intended to solicit your views on the project in this district hence your candid opinion is much desired. This is purposely for academic work hence your confidentiality is much assured.

Code…….

Date……..

Section A: Personal Particulars

1. Name of respondent ……
2. Gender male ( ) female ( )
3. Rank …….
4. Marital Status: married ( ) Single ( )

Section B: Technical Details of Project implementation

5. Name of forest reserve……
6. Total degraded area earmarked for rehabilitation during the inception of the project ……
7. Area planted so far …….
8. Percentage survival ……
9. Area remaining

   ……

Section C: Community participation in project implementation

10. Number of communities/individuals involved……
11. How many permanent workers are employed? ……
12. How many work casual workers are involved? …….....
13. What is the procedure for engagement? ……

14. What is your roles and responsibility under the Modified Taungya System? ……
15. What are the short term benefits? ……
16. What are the long term benefits? .....

Section D: Constraints to Project Implementation

17. In your view, which of the following issues pose as constraints to the implementation of the project?
    a. Unreliable means of transport for regular and effective supervision.
    b. Delays in payment of staff allowances.
    c. Over ambitious target leading to overload of work on the range
    d. Supervisor/resources managers. e. Lack of protective clothing.
    e. High mortality rate at both the nursery and the field due to erratic rainfall, insect attack, bushfire etc.
    f. Others (specify ……
18. What are the threats posed to the plantation project?
    a. Illegal chainsaw operators sawing the trees left as standards
    b. Persistent wildfires
    c. Persistent threat of industrial unrest by the farmers due to delays in the payment of other allowances.
    d. Others specify .....