UNIVERSITY OF CAPE COAST

LOGGING AND THE ENVIRONMENT: THE SOCIAL AND ECONOMIC EFFECTS IN THE ADANSI EAST DISTRICT OF ASHANTI REGION-GHANA

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BY

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MAY 2010

DECLARATION

Candidate's declaration

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

Candidate's signature …… **Date**……

Name: Diana Darley Fiati

Supervisor's declaration

I hereby declare that 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 signature ……… **Date** …….

Name : Drs. N.K.T. Ghartey

ABSTRACT

The study examined the perceptions of the various stakeholders in the forestry sector on how logging has affected the environmental and socio-economic life of the communities living around the logging areas in the Adansi East District.

The following methods were used: field assessment, collection of field reports from the FSD District Office, aerial photographs of the Forest Reserves and administration of structured questionnaires. Forest Services Division staff in the District and communities living around logging areas.

It was observed from the results that the socio-economic life of the people in the communities was affected negatively as their annual income has reduced due to logging. There was unemployment, and compensation for the destruction of farmer's crops was not paid. The only positive socio-economic indicator was access roads where the loggers constructed roads from the communities to the bigger towns. However, their maintenance was left to the communities. Field visits revealed that logs were hauled through streams and even along the roads. The FSD staff had little funds and logistics to monitor the standards. The stakeholders were not aware of the standards set by the FSD. It was recommended that all stakeholders should be involved in monitoring the standards set by the FSD and also the management of the forest and wildlife resources to enable the nation's citizenry realize both the environmental and socio-economic benefits of logging.

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DEDICATION

To my husband Mr. E. N. W. Fiati, and my three kids.

TABLE OF CONTENTS

Content	Page
DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xii
LIST OF ACRONYMS	xiii
CHAPTER ONE: INTRODUCTION	**1**
Background to the study	1
Climate and vegetation of the study area	4
Statement of the problem	4
Objectives of the study	6
Research questions	7
Rational of the study	7
Limitation/delimitation	8
Organization of the study	8
CHAPTER TWO: LITERATURE REVIEW	**10**
Introduction	10
The tropical rainforest and the development problem	10
Historical background of forest management in Ghana	12

Timber resources allocation 16

Logging and the environment 17

Environmental audit and sustainable logging practices in Ghana 19

Socio-economic implications of logging 21

CHAPTER THREE: METHODOLOGY 25

Introduction 25

Description of the study area 25

Economic activities of the people in the area 25

Study design 27

Study population 27

Study sample and sampling procedure 27

Sample size selection 27

Data sources 30

Forestry field and operational report 30

Aerial photographs 30

Field assessment 31

Structured questionnaire 31

Data analysis 31

CHAPTER FOUR: RESULTS AND DISCUSSIONS 32

Introduction 32

Forestry field and operational report 32

Background information of respondents from the communities 37

Educational background of community members 38

Stakeholders and forest resources 41

Forest resource depletion 42

Environmental impact of logging 43

Environmental standards to be followed 44

Type of environmental problems created after logging 46

Action taken to solve the problems 52

Socio-economic benefit of logging 54

Benefits derived from logging activities 55

Social responsibility of companies 56

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 67

Summary of findings 67

Environmental standards of logging 67

Measures of compliance with environmental standards 68

Socio-economic implication of logging 69

Employment and income 70

Social responsibility agreement and access 71

Conclusions 73

Recommendations 74

REFERENCES 76

APPENDICES 84

Appendix I: Sample questionnaire 84

Appendix II: Questionnaire for the collection of data on the topic

logging and the environment, the social and economic effect in the Adansi East District 88

Appendix III: Questionnaire for the collection of data on the topic logging and the environment, the social and economic effects in the Adansi East District 92

Appendix IV: Field photographs 97

LIST OF TABLES

Table		page
1:	Total Number of respondents	28
2:	Number of community members interviewed	28
3:	Number of respondents from the timber companies	29
4:	Number of respondents from forest services division	29
5:	Sex distribution of respondents from the communities	37
6:	Residential status of community respondents	38
7:	Educational background of community respondents	39
8:	Annual income of community respondents	40
9:	Effect of logging on the income of the community	40
10:	Stakeholder involvement in forest resource management	41
11:	Activities that contribute to forest resource depletion	42
12:	Respondents awareness of environmental standards	43
13:	Environmental standards to be followed by the loggers	44
14:	Opinion on whether loggers adhere to environmental standards	45
15:	Difficulties encountered when monitoring the Standards	46
16:	Effect of logging on the communities and the environment	47
17:	Efforts being made by the FSD to rectify the problems	47
18:	Type of illegal activities rampant in the area	48
19:	How illegal activities can be minimized	49
20:	Operations during dry season rainy season or both	50
21:	Response on whether loggers ensure security on the roads	51
22:	Suggestion for industry sustenance & environmental conservation	52

23: Communities contribution to solve environmental problems 53

24: The district's current environmental conditions 54

25: Benefit community members derive from logging 55

26: Knowledge on SRA signed between loggers and the community 57

27: Type of SRA signed between the communities and the loggers 57

28: Number of community members employed 58

29: Conditions of employment 60

30: Type of forest resources accessible to the community 61

31: Effect of logging on resources accessible to the community 62

32: Response on whether logging generates dispute in the community 62

33: Strategies used to settle disputes 63

34: Respondent's awareness of the forest and wildlife policy 63

35: How the socio-economic life of the community has improved 64

36: Difficulties encountered by loggers during their operations 65

37: Those who contributed to the conservation and the socio-economic wellbeing of the communities. 66

LIST OF FIGURES

Figure		page
1:	Map of the Adansi East District	26
2:	Volume of trees felled inside and outside forest reserves (1991-2000)	33
3:	Number of companies that operated within 1991- 2000	34
4:	Aerial photograph of forest reserves in 1991	35
5:	Aerial photograph of forest reserves in 2000	36

LIST OF ACRONYMS

AEDA	Adansi East District Assembly
CFMU	Collaborative Forest Management Unit
EPA	Environmental Protection Agency
ERP	Economic Recovery Programme
FAO	Food and Agriculture Organization
FD	Forestry Department
FSD	Forest Services Division
GDP	Gross Domestic Product
GNP	Gross National Product
ILO	International Labour Organization
ITTO	International Tropical Timber Organisation
MLF	Ministry of Lands and Forestry
MOP	Manual of Procedures
NRCD	National Redemption Council Decree
NTFPS	Non-Timber Forest Products
RMSC	Resource Management Support Centre
SAP	Structural Adjustment Programme
SFM	Sustainable Forest Management
SRA	Social Responsibility Agreement
TEDB	Timber Export Development Board
TUC	Timber Utilization Contract
USA	United States of America
WP	Working Plans

CHAPTER ONE

INTRODUCTION

Background to the study

Forests are among the most important habitats of terrestrial biological life forms; they also habour aesthetic materials and are sources of ethical and religious values. Tropical, temperate and boreal forests offer diverse sets of habitats for plants, animals and micro-organisms (Barbier *et al*., 1994). The trees and shrubs in a forest play a vital role in the daily lives of rural communities. In many areas, they act as sources of timber, firewood, food, fodder, essential oils, gums, resins, latex for pharmaceutical use, and also provide cover for the conservation of soil and water (Roberts, 2003).

In the developing world, tropical rainforests are incredibly rich ecosystems that play a fundamental role in the basic functioning of the planet. However, these systems are among the most threatened on the planet earth (Rhett, 2003). Millions of people depend, to some degree, on forested land for their livelihood but nearly all is prone to degradation. These rural people usually have lineage rights to the natural resources on the land. In most cases like Ghana, the chiefs are the custodians of the land but the Government manages it in trust for the people.

The environmental, ecological and social functions performed by forests have led hardcore environmentalists to argue against the logging of forests. Some have argued that countries with tropical rainforest should be compensated for the preservation of these forests because they provide global

benefits and other forest products. The rate of logging in developing countries is unlikely to be slowed down significantly in the future due to the increased global demand for timber products. Timber harvesting is unquestionably an important development option for both public and private land in all countries since harvesting generates revenue. The proceeds from the sale and processing of timber are available for distribution among landowners, governments and the forest industry. They are also important potential sources of funds for improving infrastructure and social services as well as for investment in downstream processing and other enterprises to create further sources of income (Barbier *et al.* 1994). Export of timber as a source of foreign exchange for developing countries is a fact that cannot be ignored.

A world without forests is unthinkable, yet the world's forests are disappearing at an increasing rate. Forest dwellers, often the poorest and most vulnerable members of society, are deprived of their homes and livelihoods. Streams, lakes and dams are almost filled with silt, with fewer trees to prevent soil erosion and absorb carbon dioxide from the atmosphere. As these processes go on the global world is at a risk (FSD, 1998).

Over the past two decades, management of forests solely for wood has been a cause of worry to those affected by the loss of other benefits in the ecological, social, economic and environmental spheres (Ameyaw, 2000).

Due to demographic and economic pressures born of poverty, logging of trees in practical terms is unavoidable, for a great deal of it is carried out in ways that are needlessly destructive and self defeating (Dove, 1993). The positive economic effects of logging as stated by Barbier *et al*. (1994) can range from enhancement of social and economic development through the

provision of local access to resources, generation of employment, and creation of investment opportunities. Increased potential for industrial development, increased and stabilized export earnings, better access to enhanced infrastructure, educational opportunities and medical care can also contribute to improvement in rural life.

Nevertheless, Ameyaw (2000) states that the disruption of traditional land rights and patterns of land- use and the reduction of cultural values, low agricultural crop yield and health implications are some of the negative socio-economic impacts of logging. In every nation the causes and contributing factors for deforestation are many and varied.

There is notable evidence that the biggest threat to the tropical forests of the African region, which is about one third of the world's tropical forest resources, is commercial logging (Ganguli, 1995). Factors that contribute to deforestation include, government initiated projects, spontaneous population growth and development of settlements, bushfires, the construction of dams and roads, mining and industrial developments.

It was estimated that in the year 1998 the cost of environmental degradation resulting from natural resources exploitation and consumption in Ghana was 4% of the country's Gross Domestic Product (Tutu, 1991). Some of the logging companies appear to have maintained a reputation for providing social amenities and infrastructure such as access roads, schools, clinics and even portable water for the communities, but this is not enough.

The importance of logging in the socio-economic development of Ghana may be seen in terms of revenue from wood exports, supply of wood for domestic use and the number of jobs created. In pursuance of these

objectives, the government of Ghana has in recent years instituted several measures, including the publication of a logging manual and a hand book on timber harvesting (FD, 1992), promulgation of a new forest and wildlife policy (MLF, 1994), introduction of a forest protection strategy which prescribes various restrictions on logging (Hawthorn and Abu-Juam, 1995) and establishment of standards for logging (FSD, 1998).

Climate and vegetation of the study area

The climatic conditions of the study area are tropical with mean monthly temperatures ranging between 26 ºC and 29 ºC. Due to the presence of the forest reserves, there is a very good rainfall distribution with its peak in May, June and October. Average annual rainfall figures range between 160 cm and 180 cm. (AEDA, 2003).

The vegetation of the study district falls within the moist semi-deciduous southeast subtype (Hawthorn and Abu-Juam, 1995). There are eight forest reserves in the district most of which are shelter belts. The main purpose for their creation is to protect cash crops like cocoa from strong winds, and also to induce rain for the production of agricultural crops.

Statement of the problem

It has increasingly been the case that in the pursuit of sustainable development by international organisations has attempted to incorporate a system of effective broad-based participation in decision-making, with respect to the utilization of natural resources. Further, it is suggested that this is best secured by decentralizing the management of resources upon which local

communities depend, and giving these communities an effective say over the use of these resources. It is also evident as stated by Pulido (1996) that many state apparatuses take the position that the landless and resource poor groups have little interest in protecting the environment.

The questions are firstly, how can the peasants of the world participate when they do not possess the same technology, speak the same language of "progress", or have the respect of their children growing up in a world saturated with symbols of destruction of our natural resources. Secondly, when the peasants of the world are "allowed to participate", is it a meaningful activity that will enhance their wellbeing and at the same time protect the environment? The above statement is the question that is being asked all over the world especially in the developing world.

Although the forests are managed for many purposes, logging appears to be the only conspicuous activity within them. It is the main source of revenue and has a heavy ecological impact, yet the social and economic impact of logging and its effect on the environment is largely overlooked by many. In recent times however, policy makers and people generally are concerned about the rate at which the environment is being degraded due to logging, and its effects on the socio-economic life of the forest fringe communities.

In years past Ghana possessed forest reserves that are rich in prime timber species, which serve critical environmental functions uniquely in the West African sub region. Blessed with such a heritage, all segments of Ghanaian society should be enjoying the multiple fruits of this resource but that is not the case. The Forest Services Division is starved of funds, the

villages surrounding these priceless reserves are invariably poverty stricken, the timber industry is near to contraction and our dependency on foreign aid to support the sector seems to be never-ending (Smith, 1998).

The issue of equity in the distribution of benefits from forest resources has since 1994, been of priority to policy makers, social development experts and environmentalists. While timber royalties have been stipulated in the constitution of Ghana to be distributed to the land owners and district assemblies equitably, there is no legal provision to ensure that the timber revenue caters for community needs within the catchment's areas of exploited timber. Logging has impacted directly on the environment and socio-economic lives of people living around the logging areas; it has also impacted indirectly on Ghana's economy as a whole.

To fully comprehend the setbacks in forest management where logging has become the main focus due to its short term benefits, the environmental and socio-economic perspectives of timber logging must therefore be looked at, hence the formulation of the present study.

Objectives of the study

The general objective of the study is to determine from the perspective of the Forest Services Division, Timber companies and the local communities the social, economic and environmental effects of logging in the Adansi East District.

The specific objectives are to:

- Find out the impact of timber logging on the environment in the Adansi East District.
- Assess the impact of logging on the social and the economic lives of the people in the Adansi East District.
- Determine the extent of community involvement in forest management.

Research questions

The research questions to be answered are:

- To what extent has the environment been affected by logging activities in the District?
- Has logging impacted negatively or positively on the socio-economic life of the people in the Adansi East District?
- What are some of the benefits that the communities derive from logging?
- Are the community members involved in the management of the forest resources?

Rationale for the study

Ameyaw (2000) stated that the lackadaisical attitude of communities in the protection of Ghana's forest resources coupled with the inability of the Forest Services Division to properly manage these forest resources, has led to the destruction of the environment. Loggers amass wealth at the expense of the communities. The communities as well as land owners do not benefit from logging activities

It is hoped that the findings will contribute in general to policy formulation on the sustainable management of Ghana's forest resources.

Secondly, the study will provide an adequate understanding of the social and economic implications of timber logging in Ghana. It will also help policy makers to see the need to involve the major stakeholders like the local or forest fringe communities in the management of the forest resources through collaboration.

Limitations/ delimitations

The study was conducted in the Adansi East District in the Ashanti Region of Ghana. This District was chosen because the researcher is conversant with the area in terms of the terrain. This has facilitated easy access to information in terms of commuting among respondents. The study will not cover one hundred percent of the total population of the area under study due to time constraint and also lack of adequate funds, therefore sample sizes are reduced for convenience. Findings from the study can be applicable to other districts in the region because they are all in the same vegetation zone.

Organization of the study

The study is organized into five chapters. Chapter one consists of the introduction which gives the background to the study, climate and vegetation, statement of the problem, the objectives and research questions. Chapter two deals with the literature review on the topic.

Chapter three elaborates on the methodology which covers the project location, the population of the area and the sampling methods. Structured questionnaires were also used. The limitations and delimitations of the study were also stated. The fourth chapter gives details of how the results are

analyzed and the discussions. Aerial photographs of the forest reserves are also presented. Chapter five presents the summary, conclusions and recommendations.

7

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter is a review of the related literature bearing on the extent of environmental degradation due to logging and its socio-economic effects. The review is carried out under the headings of the tropical rainforest and the development problem, historical background of forest management in Ghana, timber resource allocation, logging and the environment, environmental audit sustainable logging practices in Ghana, and socio-economic effects of logging.

The tropical rainforest and the development problem

The International Tropical Timber Organization (ITTO), of which Ghana is an active member, launched its "Target 2000", policy document (1991) aimed at ensuring that trade in tropical timber will be sourced from sustainably managed forests by the year 2000 (Jepma, 1995). The global thinking concerning growth and development had changed, now the thinking is about development that will sustain the human environment. For instance sustainable forest management has become an important option adopted in the development processes.

At the beginning of the 21st century, about half of the original global area of forest has been lost and much of what is left is under intense pressure from the forces of deforestation and forest degradation (Roberts, 2003). It can therefore be said that the world's forests are really under threat, since about 32,300 hectares of forests are degraded daily (Rhett, 2003).

In the developing world, each country possesses a unique matrix of historical, political, economic, socio-cultural and environmental characteristics that have played interactive roles in shaping issues and problems relating to natural resources potentialities (Hurst, 1990). The concern is the large scale and rapid rate of deforestation and degradation of forest ecosystems which have occurred over the years.

By the late 1970s, it was recognized that industrialization and modernization policies had failed to promote socio-economic development (Peluso, 1993). The destruction of forests is a symptom of the development path chosen by poor nations as they strive to improve the living standards of their populations (King, 1989). But serious doubts are being expressed about the relevance of current development policies and approaches aimed at meeting the basic needs of the rural poor.

Historically, the evidence exists to show that "poverty" is not at all necessary for the people of a nation to engage in deforestation and secondly, it is clear that very few, except for those within the elite structures of social formations gain any benefit from turning forests into wood. Thus one of the main emphases of the Earth Summit negotiations was on the notion of interdependence between environment and development as tropical deforestation continued apace (Cicin-Sain and Knecht, 1995).

In 1992 at the United Nations Conference on Environment and Development, the Agenda 21 was adopted which recognized that indigenous people and communities have a vital role to play in environmental management and development because of their knowledge of local conditions and their cultural practices.

However, developed countries and state agencies often do not faithfully recognize or support the identity, culture and interests of the communities to enable their effective participation in the achievement of sustainable development (Peluso, 1993). Environmental, ecological and biological knowledge is among the most important knowledge possessed by any culture, but that knowledge has been largely ignored (Gadgil *et al.,* 1993). Forests have been leased as logging concessions and this has brought about environmental devastation on an astounding scale (Porter and Ganapin, 1988).

Forests are not degraded because those who live near the forest are impoverished; rather they are impoverished by the degradation of their forests and other resources by capital, with the assistance of government policy (Dove, 1993). The growth of human populations and the desire for rising living standards speed up the utilization and destruction of the natural resources which finally affects the profusion of bio-geographical life. Both government agencies and private enterprises are carrying out inefficient and wasteful practices of wood production with little regard for their effects on the environment (Brockmann *et al.,* 1996).

Historical background of forest management in Ghana

Political, social and economic changes that have taken place in Ghana's history have affected the country's policies on forest management and, for that matter, logging in Ghana (Agyemang *et al.,* 1999). Between 1895 and 1897, the enactment of forest laws sought to put forested lands and mineral resources under the control of the colonial government but such laws were opposed by the chiefs. A series of proposals for enacting such legislation

were seriously considered and in each case abandoned at the last minute (Aninakwa, 1998).

In 1900, a Concessions Ordinance was introduced and the right of the chiefs to grant concessions in timber and mineral lands was recognized. While in the 1890s the customary system of land tenure had been seen as an obstacle to progress, as early as 1868 the British recognized that indiscriminate felling of tropical forests was posing a threat to imperial cash crop production across the British Empire. The Colonial Office therefore devised a universal forest conservation strategy based on the reservation of forest lands carefully situated to avert the possibility of desiccation and climate change (Smith, 1998).

The ordinance establishing the Forestry Department had the aim of selecting and establishing a system of protective forest reserves. Despite an extensive propaganda exercise and assurances that the forest reserves would always be the property of their native owners, the general suspicion remained that forest conservation was an elaborate land-grabbing scheme by a landless government (Smith, 1998). An agreement was eventually reached with the Chiefs that not more than 15,540 km² of the total land area of southern Ghana would be permanently designated as reserved forest areas.

By 1927, progress on forest reservation was deemed slow and this was when a Forest Ordinance (CAP 157) was passed to allow compulsory constitution of forest reserves. Title to the reserves, whether created under Native Authority bye-laws or the Ordinance, remained with the owners (Mcleod, 1923).

Statutory rights were given to the chiefs and this included royalties on every tree felled, receipts from fines, the granting of timber concessions and

setting of royalty rates. Also, access to land for farming inside forest reserves was allowed. An annual bounty of one pound an acre for reserved land that was not generating timber revenues was paid to the owners by the Government. In addition to these, customary rights of access to forest produce were maintained and sacred sites respected (Agyemang *et al.*, 1999). It should be recognized that indigenous or informal conservation practices such as maintenance of tree cover along riverbanks and on the site of abandoned settlements were already in existence.

In 1948, the government published a Gold Coast's forest policy whereby the productive and protective potentials of the reserves were now emphasized. Gradually the state established its position, alongside the chiefs, as controller of access to forest resources. The chiefs in turn established mutually advantageous relationships with the timber trade including the granting of generous concession leases and the setting of low royalty rates, the sad consequences of which are still with us today (Ameyaw, 2000).

In order to maximize the productivity of forest reserves in Ghana, the Forestry Department decided to bring the reserves under scientific management. Manuals of Procedures (MOP) were prepared and Working Plans (WP's) were produced for each reserve that was to be logged (FSD, 1998). Stock surveys and selection fellings were introduced to regulate exploitation in concession areas. Low-yielding areas were converted to plantations or improved through enrichment planting and the application of the Tropical Shelter Wood System (TSS) initiated by a colonial silviculturist by name C. J. Taylor, was also introduced. Areas targeted for protective functions

such as steep slopes or watercourses were designated as Protection Working Circles (Ameyaw, 2000).

The Forestry Department began to use Working Plans as a way to demonstrate to the owners the actual costs of managing a particular reserve. Special Financial Agreements to cover the period of the working plan were often negotiated between the Department and the landowners. By 1939, an extensive system of forest reserves covering about 21% of the land area of southern Ghana had been established. As a system of protective reserves they were demarcated along river banks, headwaters, scarps and across the dry savanna (Smith, 1998).

By the end of the 1980s, the bulk of the remaining intact high forest estate was within the boundaries of 216 gazetted Forest Reserves covering 1,634 hectares (MLF, 1994). Through all the years of uncertainty and turmoil, the Forestry Department had succeeded in maintaining the boundaries of the permanent estate it had established in the 1930s. However, many reserves in the transitional zone were degraded and over 300,000ha were urgently in need of restocking (Pra, 1994).

To introduce dynamism into forest management practices and in tune with the realities of current developments, a new forest policy was promulgated in 1994 which aimed at the conservation and sustainable development of the nation's forest and wildlife resources for the maintenance of environmental quality and perpetual flow of benefits to all segments of society (Ameyaw, 2000).

The activities of the Forest Services Division include protection, development and management of Ghana's forest resources. Management plans

are drawn for each forest reserve, which show clearly whether the reserve is under protection, production or convalescence. Logging takes place when a harvesting schedule is prepared to show the compartments that are due for harvesting (Dei-Amoah, 2000).

Timber resources allocation

Until 1998, timber harvesting was undertaken by timber concession holders who were leased the land for a period between 3-99 years, logged under Forestry Department's regulation until the concession expired after which they had the option to renew the lease (Agyemang *et al,*. 1999).

According to Ghartey and Nolan (1992), the down turn of the Ghanaian economy during the period between the reservation phase and the first cycle logging of the 1970s saw a decline in forest management practices. It therefore became difficult to achieve sound environmental conservation at that time. The enactment of the new Timber Resources Management Act of 1997 (Act 547) replaced the concession system with a process of competitive tender under the Timber Utilization Contracts (TUC) system. (Agyemang *et al,*. 1999).

Loggers are obliged by the TUC system to work to prescribed environmental and resource conservation standards (FSD, 1998), which seek to address the minimization of residual tree damage during logging, minimization of logging residue, contribution towards the socio-economic development of communities in the logging areas, commitment to afforestation and protection of rivers, streams and biodiversity. Unfortunately

these prescribed environmental standards and resource conservation standards are not being adhered to by loggers.

Logging and the environment

According to ter Steege *et al.* (1996), logging can be defined as the felling and extraction of trees or the harvesting of timber from a forest and its transportation to a place of utilization. In the course of log ing, gaps are created in the forest canopy and this impact negatively on the surrounding ground vegetation, residual trees, river systems and the soil. Hendrison (1990) also states that the nature and extent of logging disturbances are greatly influenced by the way felling and skidding are done and the type of machinery used.

The process of logging which gives rise to round log production involves a number of tasks including felling, skidding, de-branching, measuring, loading and haulage. In all these activities some form of human labour for example chain saw operators, drivers, lorry boys, logging supervisors are required. Some aspects of logging that can be detrimental to the environment includes the use of heavy machinery for the removal of trees and their supporting root systems, and the extensive construction of roads which affects soil ecosystems.

One of the major causes of degradation of the forest environment is fire which is rampant and more intense in forests that have been logged. Due to the drier conditions that exist after logging, there is high surface fuel load mainly due to the creation of gaps that allow sun penetration to the forest floor and finally creation of dry matter that is a fire hazard (Hann *et al.,* 1997).

Logging also removes the cooling shade of trees leaving flammable debris that can ignite easily. Logging in the form of clear- cutting, thinning in plantations and other tree removal activities create both short and long term fire hazards to the ecosystem, thereby destroying the environment (Hendrison, 1990).

In a comprehensive survey of management practices throughout the tropical forest countries, Barbier *et al.* (1994) indicate that less than 1% out of an estimated total area of 828 million hectares of tropical forest remaining in the year 1985 was demonstrably under sustained-yield management for timber production. This occurs directly by the removal of trees during logging and this destroys the environment and indirectly impact negatively on the socio-economic life of people living around the resource. It can therefore be said that the extent of external environmental impacts from timber extraction or logging depends largely on the type and success of forest management practices.

The sustained-yield management for timber production is not being monitored well by the institutions that have been mandated to do so and therefore it had a negative effect on the socio-economic life of the people. Poorly designed and implemented management regimes for selective logging of natural forest which has progressively opened up more remote, hilly and ecologically vulnerable areas are likely to have serious implications on the environment (Babier *et al.*,1994). Careless use of equipment and inefficient logging practices according to Ameyaw (2000) is largely responsible for the first stage of opening up previously unexploited forest which then enables other economic uses of the forest resources that finally degrades the environment.

Dust pollution in the rural communities is mainly caused by convoys of vehicular movement that characterize logging operations. This in turn presents a threat to human, plant and animal life (EPA, 1999). Similarly, the exhaust fumes discharged by numerous machines, tractors, caterpillars, haulage rigs and timber jacks also pollute the air. Soil sediments, discharged oils and chemicals also affect water quality, fish and other aquatic organisms and wildlife. Water course obstruction, soil compaction and accumulation of leaf litter and logging debris all contribute to the pollution of the environment (Swift and Messer, 1971).

Environmental audit and Sustainable logging practices in Ghana

Wellford, (1996) defines Environmental Audit as a series of activities initiated by management to evaluate environmental performance in order to check compliance with environmental legislation and assess whether the systems in place to manage environmental improvement are effective. At the micro level, environmental audit is done at regular intervals to assess the environmental performance of a company in relation to the company's stated environmental policy. (Dei-Amoah, 2000).

Four major standards which are logging practice standards, environmental standards, social responsibility requirement, workplace health and safety standards are included in the guidelines for logging in Ghana (FSD 1998). One may ask whether the loggers are aware of these standards and whether they are being followed to help sustain the forest resources. It is an open secret that environmental auditing is not being done in Ghana.

Awusabo-Asare *et al*. (2002) states that both legal and illegal logging have contributed to the loss of biodiversity and also to the pollution and siltation of water bodies. The management of Ghana's forest resources has varied over time due to changes in the country's political, social and economic conditions. Logging policies have similarly changed over the last few decades with various measures adopted at different stages in an attempt to optimize the production potential base (Agyemang *et al.*, 1999).

Timber logging is permitted through long-term concessions and short-term licenses in pursuance of sustainable logging. In the 1970s there was a considerable decline in all the sectors of the timber industry, including log products, sawn lumber and processed wood products due to general economic depression in the country (Smith, 1998). Under the Economic Recovery programme (ERP) introduced in 1983, the timber industry was revitalized and timber production increased dramatically but at the expense of the environment. During that period there was over-exploitation of a number of timber species. Meanwhile, some measures were introduced to prevent over-exploitation and this included total ban on log export, requirement for special permit (TEDB, 1998).

At the dawn of the 20th century, Ghana had about 8.2 million hectares of high forest but today the country has less than 1.3 million hectares of forest left. (Sarpong, 1999). Various groups, including foresters, environmentalists, politicians, non-governmental organizations (NGOs) and other stakeholders have indicated the need for logging standards that will ensure that logging in all its different phases will conform to environmental standards and also

enhance the socio-economic wellbeing of the communities living around the resources, but that has not been the case in practice (Ameyaw, 2000).

Felling along river banks which obstructs waterways, decreases the vegetative cover which exposes the forest soils to erosion and create large gaps which encourage the growth of *Chromoleana odorata* (Acheampong weed) and *Panicum maximum* (Elephant grass) are some of the environmental problems created after logging (Ameyaw, 2000).

Socio-economic implications of logging

In many countries, economic welfare has historically been influenced by natural resources such as forests. Economists have tried to reflect on the role of forests in economic welfare by incorporating easily quantifiable values, which comprise the values from industrial activities directly sustained by forests (Fletcher *et al.*, 1991). Human beings have depended on forests for their livelihoods and quality of life for many centuries, and this dependence continues today. The role of any natural resource in the economic welfare of rural economies can be evaluated by its implication for equal income distribution to the local economy (Berry, 1996).

The rational view of the local people has led to both organized and spontaneous forms of protests by forest-dependent people. Other problems are lack of real political commitment and policy support to delegate management authority to communities, and the enactment of programmes without modifying, abolishing or coordinating old policies, laws and procedures (Fletcher *et al.*, 1991). Forest fringe communities who often bear the cost of

the devastating effect of forest destruction due to uncontrolled logging have not benefited from logging activities.

Indigenous people who inhabit the rainforest and national parks and are hunters and gatherers are now seeing their habitat diminished by logging companies. An influx of loggers and poachers is threatening their centuries-old way of life (Jones, 2002). People are seeing their habitat diminished by logging, which is leading to a decline in animal populations, yet governments in developing countries want to log and conserve at the same time.

According to Marchak (1983), timber-dependent communities for centuries have a reputation for high population turnover. Therefore, if not planned well, their socio economic wellbeing will become a big problem. Although timber loggers contribute to the economic and social welfare of communities where they operate, this cannot be compared to the environmental destruction that takes place after logging.

Logging is one of the three most hazardous occupations in all countries. It can therefore be said that even if the people are offered employment by the loggers, their safety cannot be guaranteed. The livelihoods of most forest fringe communities depend on the forestlands that provide an incentive for them to pose as the first reactionary force to inappropriate logging practices which are detrimental to their socio-economic development (Poshen, 1997).

Forest incomes in foreign currency also play an important role in the balance of payments in the export trade. The forest industry provides indirect employment in the areas such as equipment maintenance, transport, transit industries and local food markets (FAO, 1999). Forest road networks which

are provided by the logging companies are also a factor for socio-economic improvement as they provide easy mobility for the transportation of goods and services, especially agricultural products. Other areas of socio-economic contribution are training for workers, setting up of schools and clinics by the timber companies, which lead to a settling process of the local population and reduce the rural-urban migration of people (FAO, 1999).

In Ghana, the forestry sector contributes substantially to the economy. Timber from the high forest is the fourth largest foreign exchange earner after minerals, cocoa and tourism respectively. About 70,000 people are employed in the formal sector while several thousands of self-employed artisans are engaged in the non formal sector of the timber industry. Many rural families also derive a major proportion of their cash income from the sale of non-timber forest products (Obiaw, 1998).

According to TEDB (1998) there were 250 logging companies and 134 processing companies which include 110 sawmills, nine plymills,15 veneer mills and two chipboard mills in Ghana at the time. There also were about 230 tertiary wood processing mills, including 200 profile board firms, small-scale furniture and wood carving enterprises. All these entities relied solely on timber logged directly from the forest.

In summary, the factors that have contributed in one way or the other to the degradation of Ghana's forest are growing population, increasing demand for farmlands and forest products, lack of adequate controls and inadequate resource. Insufficient education and the absence of modern techniques of forest conservation can also be mentioned. But Obiaw, (1998), intimates that logging is the most prominent.

Forestry in many nations arose as a response by national governments, forest management agencies, non-government agencies and international aid organizations to a whole stream of growing problems like environmental degradation, poverty, landlessness, conflict over land and natural resource use, and government or market failure in land use (Repetto and Gillis, 1988).

The negative effects of logging on the socio-economic life of forest fringe communities are movement of heavy-duty vehicles leading to deterioration of public roads, dust and its health implications, disintegration of society due to conflict arising from improper logging, loss of traditional forest products due to logging, destruction of farms by loggers and their refusal to pay due compensation.

CHAPTER THREE

METHODOLOGY

Introduction

The discussions under this chapter cover the study area, the study population and the sampling methods used.

Description of the study area

The study was undertaken in the Adansi East District which is located in the high forest zone of the Ashanti Region. It lies within latitudes 5° 27' – 6° 14' S and longitude 1° 06' – 1° 23' W. The Kusa Scarp borders the northern part of the District and the River Pra borders the southern part. It also shares boundaries with the Akyem Oda District to the east and Obuasi Municipality to the West. The Adansi East District was chosen because it is one of the densely forested areas in the Ashanti Region where logging is a major commercial activity. (Fig 1)

Economic activities of the people in the area

The main crop cultivated in the District is cocoa. Other food crops produced are plantain, cassava and maize. The system of farming is shifting cultivation and bush fallowing with slash and burn method of land clearing.

About 79% of the population are farmers who are engaged in cocoa cultivation, 5% are into agro-based industries like gari processing and Akpeteshie distilling, 5% are involved in petty trading (commerce) and artisans like carpenters/wood-workers are about 7.9%. Only 3.8% of the population is employed in the public and private sectors (AEDA, 2003).

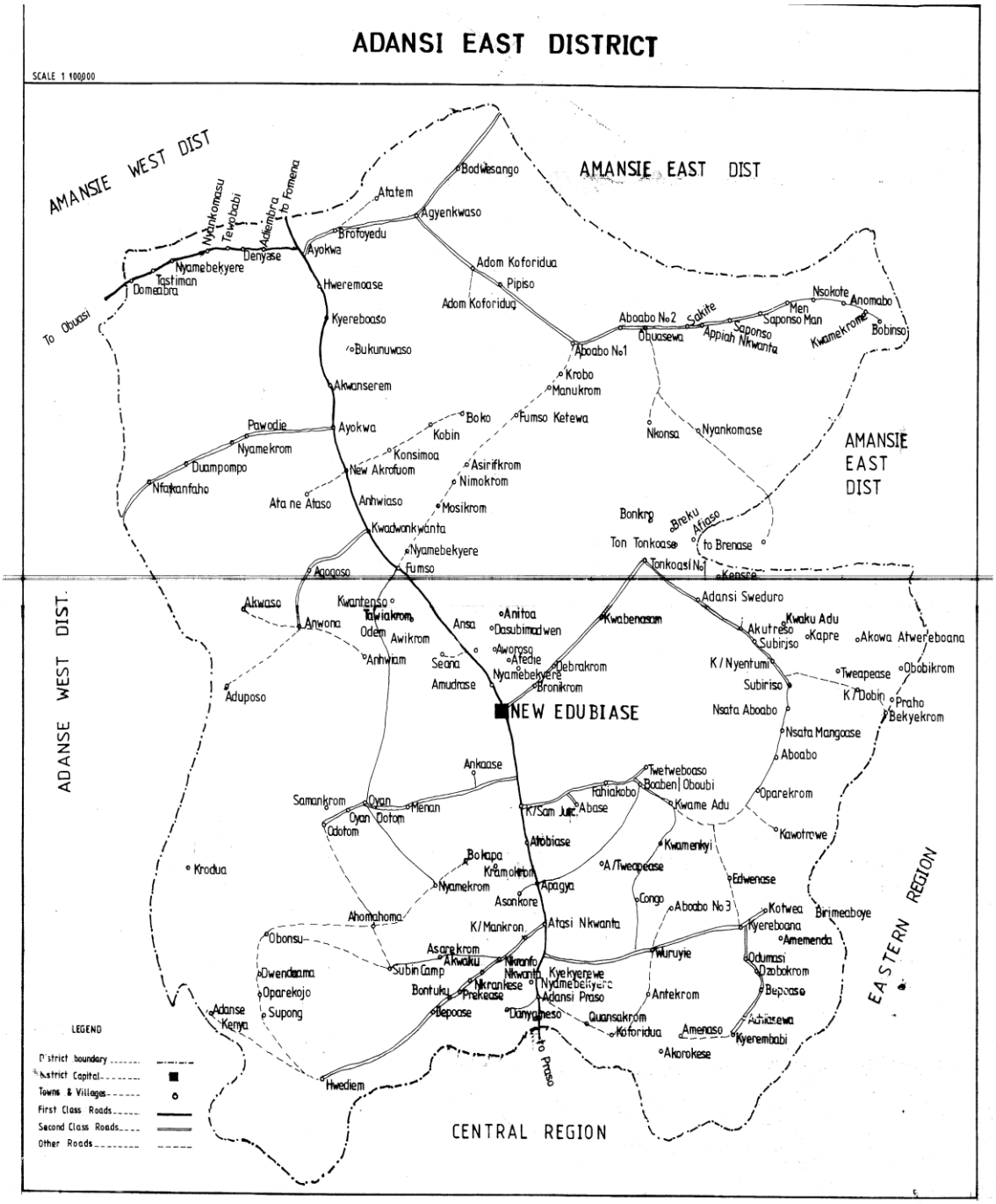

Fig 1: Map of Adansi East District

Source: AEDA, 2004

The study design

The study was a survey which included field work and interviews. Qualitative and quantitative methods of data collection were applied. This approach was used because optimum reliability could be assured (Ashley, 1998).

The study population

The research covered the Adansi East District with a population of 16,123 made up of eight communities, thirty-one workers from the 11 timber companies operating in the District and 40 forestry staff. These altogether constituted the study population.

The sample and sampling procedure

Sampling has to do with the selection of a determined portion from a sampling frame or population for detailed study. To achieve the objectives of the survey, both the probability and non-probability sampling techniques were employed. Different categories of members of the communities, FSD staff and the loggers were covered.

Sample size selection

The number of each group of the three different respondents is presented in Table 3. The total respondents was 172, with the community members representing about 68%, FSD Staff were 23 representing (13%) and the loggers were 31 (18%) of the total.

Table 1: Total number of respondents

Respondents	Frequency	Percentage
Community members	118	68.6
FSD Staff	23	13.3
Loggers	31	18.1
Total	172	100

Source: Field survey, 2004

Eight communities located near the forests and the logging sites were selected purposively. These were taken as one entity and out of them fifteen people, in terms of their occupation, were randomly selected and interviewed in each community. Only two public servants each were available at Kunsimoa and Bronikrom (Table 2).

Table 2: Number of community members interviewed.

Communities	**Popn**	**No. selected**	**Occupation**					**No. interviewed**
			Farmer	**NTFP Collector**	**Public Servant**	**Trader**	**Unemployed**	
Menang	1446	15	3	3	3	3	3	15
Amanokrom	710	15	3	3	3	3	3	15
Asifikrom	1467	15	3	3	3	3	3	15
Agogoso	703	15	3	3	3	3	3	15
Nyakumasi	1206	15	3	3	3	3	3	15
Kunsimoa	805	15	3	3	2	3	3	14
Brofoyedru	2775	15	3	3	3	3	3	15
Bronikrom	701	15	3	3	2	3	3	14
G.Total		120						118

Source: Field survey, 2004

Thirty-one different categories of people in the timber companies working in the district were interviewed as represented in Table 3

Table 3: Number of respondents from the Timber Companies

Category	Total No.
Manager	4
Bush manager	10
Siding clerk	5
C/saw operator	5
Hunter	5
Stump marker	2
Total	31

Source: Field survey, 2004

Twenty-three out of forty forestry workers were also selected according to their job statuses and interviewed (Table 4).

Table 4: Number of respondents selected from Forest Services Division

Category	Total No.
District manager	1
Assist district manager	1
Range supervisor	9
Forest guard	8
Labourer	4
Total	23

Source: Field survey, 2004

Data sources

Data collected were from five main sources namely, the forestry field and operational reports, aerial photographs showing the extent of existing forest reserves in the District, field assessment of logging activities, and structured questionnaires administered for the purpose of soliciting views on the subject matter of the study.

Forestry field and operational report

Various field reports written by field officers of the Forest Services Division were studied to identify:

- The extent of information on environmental and socio-economic issues relating to logging activities in the District, and the monitoring procedures available.
- The trends in the intensity of logging and their implications for the sustainability of the timber resources in the Adansi East District.
- Information on the number of Timber Companies (loggers) working both outside and inside the forest reserves and where they were operating was also collected from the Forestry District Office. Furthermore, the contractual obligations of the Timber Companies as detailed in the concession leases were studied.

Aerial photographs

Aerial photographs of the vegetation cover (particularly the forest reserves) of the Adansi East District for the years 1991 and 2000 were examined to assess the extent of degradation in the forest reserves.

Field assessment

Two locations inside the forest reserves were visited, assessed and photographs taken. Two other areas outside the reserves were also chosen randomly for assessment and photographs taken. Other active logging areas both on and off reserves were examined in this study. Similarly, logging and road construction practices were examined to determine compliance with official code.

Structured questionnaires

Structured questionnaires were administered to the following categories of people FSD staff, members of the communities and the loggers. Questionnaires were administered to FSD staff to find out whether the loggers were adhering to the environmental standards stipulated for logging and also how logging had affected the communities living around the logging areas.

Information collected from people living near the resources was meant to ascertain how logging had affected the socio-economic lives of the communities living around the logging areas. Questionnaire for loggers were also intended to find out whether the loggers themselves observed the environmental standards set by the FSD, whether they were fulfilling their social obligations to the communities, and the problems they were also facing.

Data analysis

The Statistical Package for the Social Sciences (SPSS) was used to analyse the raw data. Construction of tables, graphs and charts were done from both the primary and secondary data.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter gave the analyses of the data collected for the study and the discussion. The data were gathered from the forest fringe communities, the forest services division staff and the loggers. Most of the questions were similar and therefore were analyzed by comparing the three responses. The analyses were used to establish the impact of logging on the environment and the socio-economic life of some communities in the study area.

Forestry field and operational reports

These are the analysis of the field and operational reports. The amount of wood removed through logging in a particular area is dependent on the number approved by the forest services division. If the wood removed is more than the approved the environment will be affected.

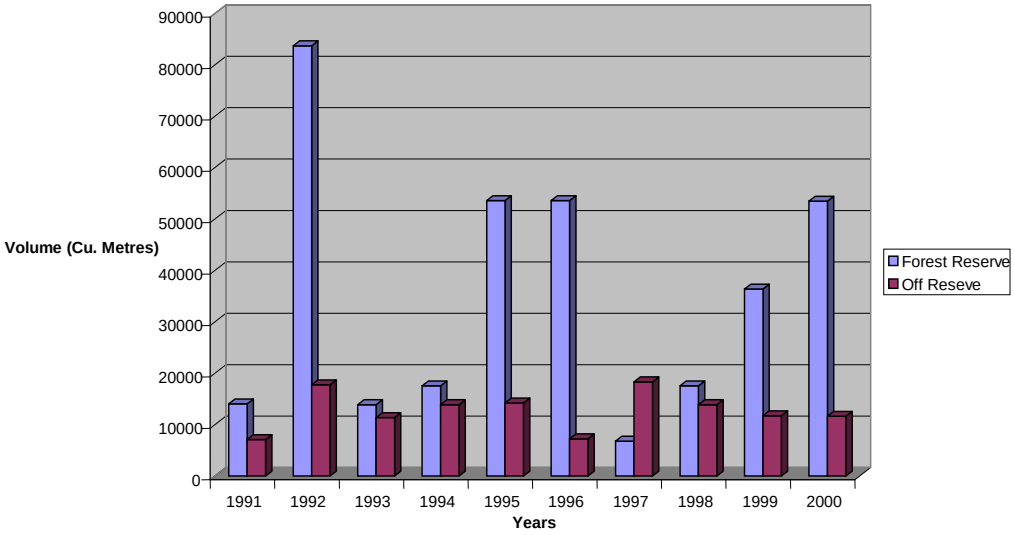

Figure 2: Volume of trees felled between 1991 and 2000

Source: FSD, 2004-Libary

Figure 2 shows the volume of trees removed within a ten years period. This period was chosen because the Adansi East District is relatively new and it was during this period that there was intensive logging of timber. Secondly, the aerial photographs available were for 1991 and 2000.

It can be realized from figure 2 that 1992 is the year that the largest volume of trees were felled both on and off reserves. The volume of trees felled inside forest reserve was 83,709m³ whilst the volume felled outside reserve was 17,750m³. This is followed by year 1995 where forest reserve was 53,590m³ whilst outside the reserve it was 14,200m³. The lowest volume of trees felled inside reserve was in 1997. Comparatively, the volume of trees removed inside forest reserve was higher than those from outside the reserve. This is due to the fact that trees and other resources in the forest are strictly and exclusively protected as compared to those outside forest reserve.

Lack of knowledge about forest management has resulted in the indiscriminate felling of trees by both the loggers and those who own land in the community. The total volume of trees removed within the period 1991 and 2000 was 478,382m³. The volume from forest reserve was 350,498m³ whilst that from off reserve was 128,183m³. The number of companies operating in a particular district also affects the environment and the social life of the people of the area.

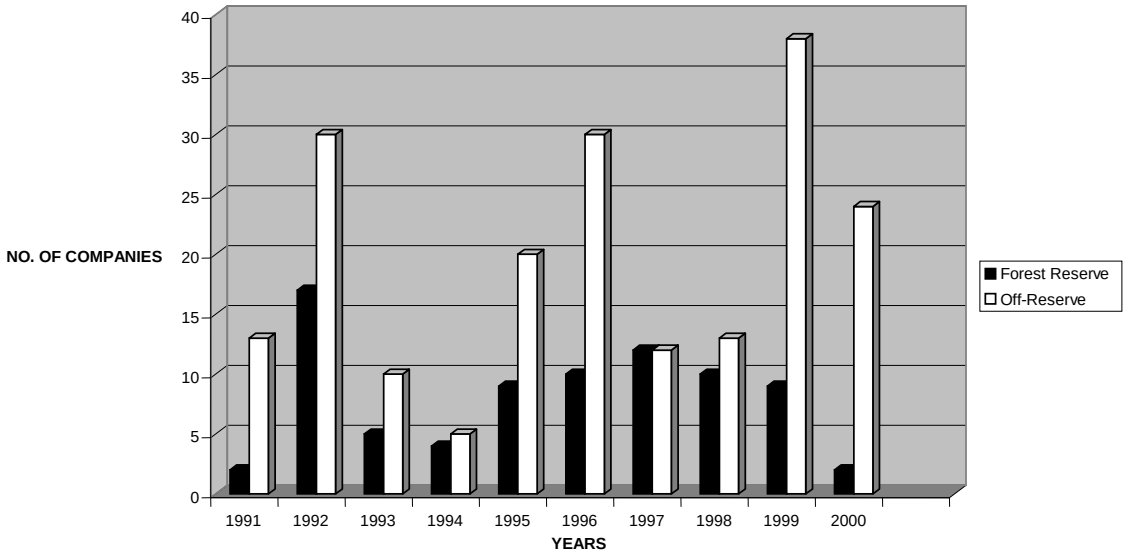

Figure 3: Number of companies that operated between 1991and 2000

Source: FSD- 2004-Library

The total number of companies that operated in the district between 1991 and 2000 was 275. Year 1999 recorded the largest number of companies whilst fewer numbers were recorded in 1994. Eighty companies operated inside forest reserves and 195 operated off reserve. It could be seen that inside the forest reserve fewer companies were allowed to operate but the volume of trees felled were higher than that of the off reserve.

Figure 4: Aerial photograph of forest reserves in 1991

Source: RMSC-Kumasi, 2004

The aerial photograph taken in the year 1991, (figure 4) shows that 16,430.42ha of forest was not degraded whilst 3,763.14ha was degraded.

In year 2000 as illustrated in figure 5, the forested area was 14,618 whilst the degraded area was 5,774.64ha.

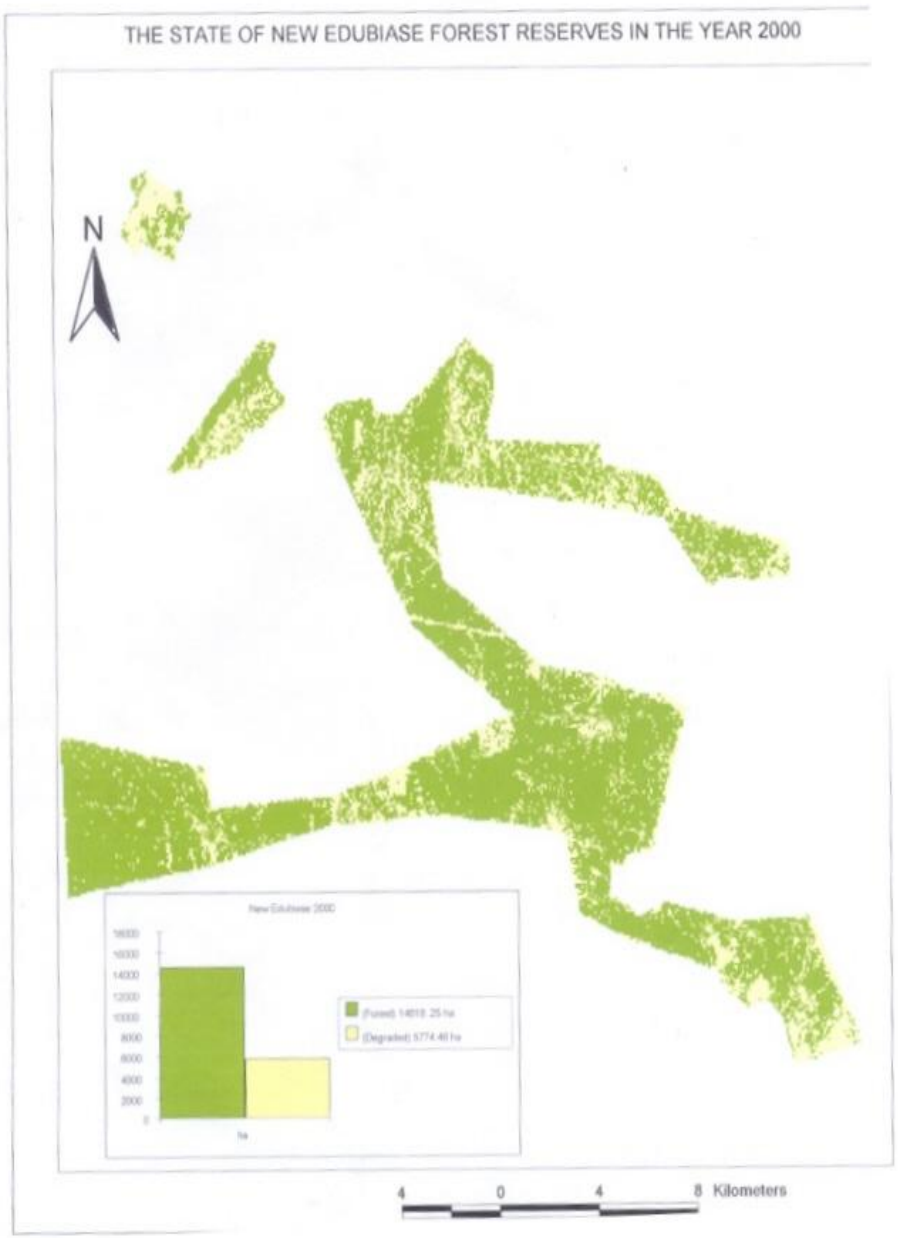

Figure 5: Aerial photograph of forest reserves in 2000

Source: RMSC-Kumasi, 2004

During the 10 years period there has not been any incidence of fire or any other natural disaster, it can therefore be said that this was due to logging which was the major activity in the forest reserves during the period. It is unfortunate that the aerial photograph could not cover the off- reserve areas but field inspection shows that the vegetation is gradually changing from trees to shrubs and weeds like *Chromolaena odorata* popularly known as *Acheampong*. Generally, the field and office reports suggest that there is a reduction in the vegetation cover over the past years.

Background information on respondents from the communities

Background information like sex, residential status, educational background and occupation of the communities was collected and analyzed.

Sex distribution

The sex distribution of the communities helps to identify how many females or males are in the communities.

Table 5: Sex distribution of respondents from the communities

Sex	Frequency	Percentage
Male	88	74.6
Female	30	25.4
Total	118	100

Source: Field survey, 2004

The number of respondents in the communities in terms of gender can be seen in Table 5. About 88 males responded, representing 74% whilst females were only 25%. More males than females were interviewed because

more males were willing to respond to the questions than the females. Also the females do not normally stay in the house.

Table 6: Residential status of respondents from the communities

Status	Frequency	Percentage
Immigrants	80	67.8
Native	38	32.2
Total	118	100

Source: Field survey, 2004

The knowledge of the residential status of the people is vital in determining their socio-economic status. It can be seen from Table 6 that about 67% of the respondents were immigrants and also 32% were natives. This shows that most of the people living around the forest reserves and the logging areas came from other parts of the country to farm to earn a living. It could be said that the land owners, especially the chiefs do not allow them to enjoy the royalties generated from timber resources. In practice the royalties go to the land owners who often do not reside in the communities and therefore never bother to contribute to the development of the communities.

Educational background of community members

The educational background of respondents could influence their perceptions of problems on the study. Many Ghanaians hold the view that issues concerning the exploitation of forest resources can only be expressed by the educated in society (Baffoe, 2007) but this view could not be supported by the findings. In Table 7, the illiterates are 34 which is about 29% but they were able to express their views very well.

Table 7: Educational background of community members

Educational background	Frequency	Percentage
Illiterate	34	28.8
Secondary school	18	15.3
Elementary school	39	33.1
School Drop-out	27	22.8
Total	118	100

Source: Field survey, 2004

The literacy rate in a community can be an indication of their socio-economic situation. Table7 shows that 33% of the respondents were elementary school leavers, about 23% were school drop-outs, i.e. those who could not complete elementary school, 15% had secondary school education.

The annual income of the respondents ranges from below GH¢100 to GH¢1,100. Twenty-seven percent of the respondents had annual incomes between GH¢350 and GH¢500, which was the highest yet is woefully inadequate for decent living, this is in table 8. According to the respondents, they found it difficult to provide for their basic needs with such meager income.

About 72% of the communities indicated that their annual income decreased after logging had taken place in their communities as shown in Table 9.

Table 8: Annual income of respondents from the communities

Annual income (in GH¢)	Frequency	Percentage
Below 100	20	17.0
150 - 300	24	20.3
350 - 500	32	27.1
550 - 700	15	12.7
750 - 900	19	16.1
950 - 1,100	6	5.1
Above 1,100	2	1.7
Total	118	100

Source: Field survey, 2004

Sometimes loggers refuse to pay the necessary compensation when people crops are destroyed after logging. The crop yield from the farm decreases when the crops are damaged and this invariably impact negatively on the socio-economic life of the farmers.

Table 9: Effects of logging on the income of people in the communities

Responses	Frequency	Percentage
Increased income	13	10.9
Decreased Income	86	72.2
Income still the same	19	16.9
Total	118	100

Source: Field survey, 2004

Stakeholders and forest resources

It was also important to find out the respondents opinion on the level of involvement of stakeholders in forest management with respect to their responsibilities and interest as well as their limitations. It is a fact that the value the community and other stakeholders place on a resource determines their commitment to its conservation which invariably affects their socio-economic status (Baffoe, 2007).

Table 10: Stakeholder involvement in forest resource management

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Communities	51	43.3	12	52.2	13	41.9
District assemblies	39	33.2	1	4.3	5	16.2
Government	19	15.9	1	4.3	1	3.2
Land owners	8	6.8	3	13.1	11	35.5
Loggers	1	0.8	6	26.1	1	3.2
Total	118	100	23	100	31	100

Source: Field survey, 2004

The landowners are to protect the resources and the environment, contribute to the allocation of land to timber companies and receive royalties/stumpage for development (Ameyaw, 2000). Government on the other hand is to develop policies and provide financial assistance for forest management, employ staff to manage the forest resources, award concessions, regulate timber harvesting, collect and disburse forest fees and address conflict concerns of stakeholders. On the other hand District Assemblies are to monitor

forest management practices and receive forest fees for development (RMSC, 2004). Timber companies harvest trees according to forestry rules and regulations, pay fees promptly and support communities to develop their areas.

The three groups of respondents were asked to mention those they thought should be involved in forest resource management. They mentioned the landowners, government, District Assemblies, loggers and the communities living close to the forest resources as represented in Table 10.

Forest resources depletion

It can be seen from Table 11 that all categories of respondents agree that the forest and its resources are reducing at a faster rate due to the combination of the following factors; over exploitation of forest resources, clearing of lands for farming and bushfires, but the most prominent is logging.

Table 11: Activities that contribute to forest resource depletion

Responses	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Timber logging	96	81.4	17	73.9	23	74.2
Clearing for farming	10	8.5	4	17.5	6	19.4
Bushfires	8	6.7	1	4.3	1	3.2
Animal grazing	4	3.4	1	4.3	1	3.2
Total	118	100	23	100	31	100

Field survey, 2004

Eighty-one percent of the community, 73% of the FSD Staff even 74% of the loggers intimated that logging has significantly contributed to the

depletion of forest resources in the study area. Respondents were also of the view that these resources can be restored by embarking on plantation establishment through participatory management processes though it will take a long time before the benefits are realized.

Environmental impact of logging

The forest and wildlife policy of 1994 is emphatic on the maintenance of environmental quality. Standards were set in the Manual of Procedures (MOP) of the Forest Services Division to be followed by the loggers to protect the environment. Table 12 therefore seeks to bring to the fore whether the respondents are aware of these standards and also in the Tables that follow, whether the standards are being adhered to.

In Table 12 eighty-nine percent (89%) of the community members were not aware of the standards set to maintain or conserve the environment. However 52% of the FSD Staff and 83% of the loggers were aware.

Table 12: Respondent's awareness of environmental standards

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Yes	13	11	12	52.2	26	83.9
No	105	89	11	47.8	5	16.1
Total	118	100	23	100	31	100

Source: Field survey, 2004

It is rather unfortunate that about 47% of the FSD staff who are supposed to implement the policies were not aware of these standards. Only

52% of them were aware of the environmental standards set by their own institution. Eighty-three percent (83%) of the loggers were aware of the environmental standards set by the Forestry Commission but whether they abide by them will be seen in the next Table.

Environmental standards to be followed

Table 13 intends to find out the standards set for the loggers to follow.

Table 13: Environmental standards/practices to be followed by loggers

	Community members		FSD staff		loggers	
Responses	Freq	%	Freq	%	Freq	%
Construction of roads to specification	10	8.4	4	17.4	24	77.5
Log dumps made to specification	18	15.2	1	4.3	1	3.2
No logging within 50m from rivers	39	33.2	12	52.1	5	16.1
Specified machines used for logging	51	43.2	6	26.2	1	3.2
Total	118	100	23	100	31	100

Source: Field survey, 2004

The respondents mentioned road construction and the creation of log dumps (where logs are gathered before loading them on the trucks). Logging not allowed within 50m from water ways was also mentioned and using specified machinery is another environmental standard that the respondents were aware of. There is the need to educate the communities on the logging standards, for if they are armed with this information they will be in a position to check the loggers and also contribute to the maintenance of the environment. Forty-three percent (43%) of the community respondents knew of the limit within which logging should not take place as relating to their

sources of water, that logging should not be done within 50 meters from rivers and streams. The same applies to the FSD Staff where 52% of them also knew of it. Most of the loggers, about 77% are of the view that the type of roads to be constructed is the most important. All these specifications when adhered to will help reduce the degradation of the environment.

Table 14: Respondent's opinion on logger's adherence to standards

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Yes	22	18.6	6	26.2	26	83.9
No	96	81.4	17	73.8	5	16.1
Total	118	100	23	100	31	100

Source: Field survey, 2004

It can be vividly seen in Table 14 that in the opinion of the communities and the FSD Staff, the loggers are not adhering to the environmental standards. About seventy-three percent (73%) of the FSD respondents and 81% of the community are of the view that the loggers do not adhere to the environmental standards set by FSD. This implies that the environment is being degraded in the District. Meanwhile 83% of the loggers intimated that they adhere to the environmental standards. There is the need for the FSD to ensure that the loggers abide by the standards or rules governing their operations.

Table 15: Difficulties encountered by FSD when monitoring the standards

Responses	Frequency	Percentage
No means of transport	16	69.6
No security	3	13.2
Loggers do not cooperate	2	8.6
No Response	2	8.6
Total	23	100

Source: Field survey, 2004

Means of transport (60%) was the main difficulty encountered by the FSD staff during monitoring as seen in Table 15. Thirteen percent (13%) expressed concern about the security on the roads. Due to the dusty nature of the roads when the big trucks are passing on the road it becomes unsafe to use motor bikes and even sometimes motor vehicle. According to the FSD Staff, there is no co-operation on the part of the loggers and this has become one of the problems that are impeding the smooth monitoring of the standards set by the Forestry Commission.

Type of environmental problems created after logging

All the respondents saw the problem of oil spillage, leftover debris which destroys seedlings and crops and destruction of water bodies as some of the problems that are created after logging.

The activities of the loggers have direct and indirect effects on the communities where they operate.

Table 16: Effect of logging on the communities and the environment

	Community member		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Reduced rainfall/soil fertility	36	30.5	8	34.8	14	45.2
Loss of plant cover/Wildlife	33	28.0	6	26.1	11	35.4
Weedy surroundings	20	16.9	4	17.4	-	-
Land degradation	18	15.3	2	8.7	2	6.5
Reduction in Wood products	11	9.3	3	13.0	4	12.9
Total	118	100	23	100	31	100

Source: Field survey, 2004

According to the community members, loss of plant cover, which has effect on the soil, land degradation and even poverty are some of the effects. This is evident in Table 16. The highest response mentioned by all the three respondents was reduced rainfall and soil fertility. These losses can lead to desertification which will finally affect the communities.

Table 17: Efforts by FSD to rectify the problem.

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
No logging near water bodies	37	31.4	6	26.1	10	32.2
Prosecution at the courts	-	-	2	8.7	7	22.6
Nothing has been done	-	-	9	39.1	8	25.8
Stoppage of company's operations	81	68.6	6	26.1	6	19.4
Total	118	100	23	100	31	100

Source: Field survey, 2004

According to most of the respondents in Table 17, stoppage of logging near water bodies helps to correct the problem. Prosecution in the courts is not an issue according to them because it wastes time although it is one of the strategies that the FSD is using. Sixty-eight percent of the respondents from the community intimated that the FSD always stops the operations of the loggers when they go wrong.

Illegal activities in general have a detrimental effect on the environment. The activities are done in a rush and therefore could not easily be detected and stopped. It is also important to note that the illegal activities rampant in the study area also have a cascading impact on the social and economic live of the people living in the area. Government and for that matter all stakeholders who are supposed to benefit from the extraction or removal of forest products, do not benefit in anyway from what is removed illegally as the proceeds are taken away free of charge.

Table 18: Illegal activities rampant in the district

	Community Members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Illegal logging	18	15.3	7	30.5	8	25.8
Illegal chainsawing	95	80.5	14	60.9	19	61.3
Illegal charcoal burning	4	3.4	1	4.3	3	9.7
Illegal farming in the forest	1	0.8	1	4.3	1	3.2
Total	118	100	23	100	31	100

Source: Field survey, 2004

In Table 18, the illegal activities rampant in the District include logging, chainsawing, charcoal burning and farming, but the most rampant is illegal chainsawing, with 80% of the community, 60% of FSD Staff and 61% of the loggers attesting to that. All these affect the environment and the people at large. Those involved in illegal operations, according to the respondents, are mainly the loggers and some of the people in the communities. It is surprising to note that it is the loggers that are involved in removing the trees illegally. It is worth noting also that the communities are ignorant of who is operating legally or illegally. When the loggers come to the communities they cannot be checked by the communities unless with the assistant of the FSD Staff. It is therefore very important that the communities are educated on issues relating to logging so that they can effectively check and monitor the logger's activities.

Table 19: Suggestion on how illegal activities can be minimized

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Strict adherence to the laws	71	60.2	14	61.3	8	25.8
FSD to be resources	8	6.8	3	12.9	9	29.0
Community Involvement	11	9.3	3	12.9	6	19.4
Use of dialogue	27	22.9	3	12.9	6	19.4
No Response	1	0.8	-	-	2	6.4
Total	118	100	23	100	31	100

Source: Field survey, 2004

Efforts to minimize illegal activities will also help in minimizing the degradation of the resource and the environment at large. In Table 19, the most mentioned suggestion is the strict adherence to the laws governing the management of the forest resources, which all the three categories of respondents mentioned. The issue of providing facilities for those who are mandated to manage the resources is very essential. According to the FSD Staff they did not have the means in terms of equipments, uniforms and even staff to do effective work. About 29% of the loggers did say that the FSD staff should be well resourced to enable them manage the forest resources.

Table 20: Loggers operation in rainy/dry season and protected areas

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Rainy season	19	16.4	9	39.1	2	6.4
Dry season	18	15.0	2	8.7	4	12.9
Both	81	68.6	12	52.2	25	80.7
Total	118	100	23	100	31	100

Source: Field survey, 2004

About sixty-eight percent (68%) of the communities, 52% of the FSD Staff and 80% of the loggers responded that the loggers operated in both the rainy and dry seasons, as represented in Table 20. Fifteen percent (15%) of the communities responded that the loggers operated during the dry season, only16% indicated that they operated in the rainy season only. Dry season logging is the best practice because when the place is dry the soil is compact so that the equipments can be used efficiently. This will reduce direct cost for

the loggers. In the rainy season the equipments get stuck in the muddy areas and sometimes in streams.

Streams and rivers normally take their sources from the forest and hilly areas and these are sources of drinking water for the communities. Rivers run through the forested areas and therefore there is the need for loggers to protect them so that the communities will not suffer unduly.

Table 21: Opinion on whether loggers ensure security on the roads

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Yes	20	16.9	6	26.1	18	58.1
No	96	81.4	17	73.9	13	41.9
No Response	2	1.7	-	-	-	-
Total	118	100	23	100	31	100

Source: Field survey, 2004

According to the respondents, security on the roads is a major problem in the area. Eighty-one percent of the community, 73% of the FSD Staff and 41% of the loggers themselves gave a response that the loggers do not ensure security on the roads, as illustrated in Table 21. Most of the people from the villages walk to the district capital and as the roads are not tarred, there is a lot of dust generated by the passage of the big trucks carrying the logs. Secondly, the few cars that ply the roads normally would veer off the road when they meet a truck carrying logs due to their size. About 81% of the respondents in the community said the loggers did not ensure security on the road.

Table 22: Industry Sustenance and environmental conservation.

	Community members		FSD staff		Loggers	
Suggestions	Freq	%	Freq	%	Freq	%
Reforestation by all stakeholders	35	29.7	6	26.2	19	61.3
Participation by communities	47	39.8	3	13.0	3	9.7
Loggers should follow forestry rules	22	18.6	11	47.8	1	3.2
Law enforcement by police and FSD	14	11.9	3	13.0	8	25.8
Total	118	100	23	100	31	100

Source: Field survey, 2004

Suggestions for the sustenance of the logging industry and environmental conservation as portrayed in Table 22 are community participation which is significant, observance of forestry rules, enforcement of forestry laws by the police and the FSD staff. If these suggestions are taken in good faith it will help in the socio-economic development of the communities.

Action being taken by the communities to solve environmental problems

The communities live close to nature. In other words, they interact with the environment every second and therefore what affects the environment affect them. There is therefore the need for individuals in the communities to be much concerned about what happens to the environment, and also in a way, make sure that the negative effects are minimized or rectified. Community members were therefore asked to indicate what action they could take to protect the environment. Their responses are presented in Table 23.

Table 23: Communities contributions to solve environmental problems

Responses	Frequency	Percentage
Use of communal labour	5	4.2
Education	31	26.3
Reporting to FSD Staff	20	17.0
Use of appropriate farming methods	9	7.6
Arrest and prosecution	1	0.8
Collaborate with government to stop destruction	12	10.2
Planting of trees	39	33.1
None of the above	1	0.8
Total	118	100

Source: Fieldwork, 2007.

From Table 23, it can be seen that education (26%) and tree planting(33%) are the major actions that they embarked on to help solve the environmental problems in the study area. Reporting to the FSD Staff (17%) is also appropriate as that is the institution mandated to manage the forest resources. Use of communal labour to correct environmental ills (4%) also needs commendation. Man's attitude to the environment over the years has not been good enough; it is therefore encouraging that the communities are making efforts to correct the ills that affect the environment.

Table 24: Responses on the District's current Environmental condition

Response	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Better	18	15.0	4	17.4	2	6.5
Worse	81	68.6	15	65.2	23	74.0
Has not changed	19	16.4	4	17.4	6	19.5
Total	118	100	31	100	31	100

Source: Field survey, 2004

In Table 24, it is also clear that about 74% of the loggers, 65% of FSD Staff and 68% of the communities were of the view that the environment at the District has become worse due to logging, whilst 19% stated that it had not changed. Those who said the environment had become better said it was due to reduced logging, some attributed it to the good policies of the FSD and also afforestation. Those who responded that the environmental condition has become worse attributed it to illegal logging, chain sawing, charcoal and firewood production. Illegal logging and chainsawing have become a canker that the forestry commission could not tackle. It is therefore the responsibility of policy makers to help solve the problem.

Socio-economic benefits of logging

Article 11 of the International Convention on Economic Social and Cultural Rights, to which Ghana is a signatory, enjoined all countries to recognize the rights of everyone to an adequate standard of living for himself and family, including adequate food, clothing and housing and to the continuous improvement of living conditions. For that matter, communities

living around areas where natural resources are exploited have the right to live adequately. These natural resources include timber and other forest resources. Socio-economic indicators as stated in the review of literature includes employment, income, assess to good health, education and even the resources for domestic use and for sale.

Benefits derived from logging activities

Respondents were also asked for their opinion on the benefits derived from logging. As the loggers are allowed to remove trees from the forest the community members also get access to NTFPs like snails, mushroom, firewood and *Maranthacea* leaves (anwonomo). These products are sold to earn some money and also some is consumed by the communities. Meanwhile, the community as a whole also benefits.

Table 25: Benefit by the community Members

Benefits	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Maintenance of road	63	53.4	14	60.9	23	74.2
Provision of hospitals and schools	24	20.3	4	17.4	1	3.2
Building of chief's palace	16	13.6	3	13.0	1	3.2
Money from rent and stumpage	15	12.7	2	8.7	6	19.4
Total	118	100	23	100	31	100

Source: Field survey, 2004

From Table 25 it can be seen that significant number of all the three categories of respondents indicated that the most important benefit derived

from logging by the communities as a whole is road construction. Fifty-three percent (53%) of the community, 60% of the FSD Staff and 74% of the loggers indicated that. In the study area it was established that most roads from the remote areas to the District capital were constructed by timber companies.

Even maintenance of roads which is the responsibility of the District Assembly is being partnered by the loggers. Building of the chief's palace, money from rent and stumpage are other benefits mentioned in Table 25. Some few hospitals and clinics are being maintained by the logging companies to enhance the socio-economic status of the communities.

It appears that the communities encounter a lot of problems when getting these benefits from the loggers. Some of the problems mentioned are delays on the part of the logging companies in providing assistance, while some of the loggers would promise but would never deliver.

Social responsibility of the timber companies

The Social Responsibility Agreement concept introduced by the Forestry Commission deals with what the timber companies can do for the communities in which they operate. The main contention is whether after signing the agreement, the loggers would fulfill it.

The community members who are aware of the SRA as stated in Table 26 are about 33%. Sixty-four percent responded that they were not aware. About two percent did not respond. Looking at the trend it suggests that most of the people in the communities are ignorant about the SRA concept.

Table 26: Knowledge on signed social responsibility agreement (SRA)

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Yes	39	33.1	12	52.2	22	71
No	76	64.4	11	47.8	9	29
No Response	3	2.5	-	-	-	-
Total	118	100	23	100	31	100

Source: Field survey, 2004

It is therefore necessary that the Forest Services Division create awareness through educational campaigns to let the communities know their right. Again in Table 26, 71% of the loggers and 52% of the FSD Staff were aware of it. It is very sad that 47% of the FSD Staff were not aware of this social responsibility concept which was introduced by their institution.

Table 27: Type of SRA signed between communities and loggers

Responses	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Receipt of 10% of stumpage	26	22	3	13	4	13.0
Supply of iron sheets& cement	10	8.5	2	8.7	2	6.5
Digging of boreholes	24	20.3	2	8.7	2	6.5
Repair of roads	27	22.9	9	39.1	12	38.6
All the above	31	26.3	7	30.5	11	35.4
Total	118	100	23	100	31	100

Source: Field survey, 2004

Repair of roads was the most prominent as seen in table 27, About 22% of the community members, 39% of the FSD Staff and 36% of the loggers mentioned that. Other activities under the SRA are receipt of 10% stumpage by the community members, supply of building materials and provision of portable water.

Fulfillment of the SRA can raise the standard of living of the communities but the opposite happens when it is not fulfilled. In the Manual of procedures and forestry laws, every logger is supposed to enter into a social responsibility agreement with the community in which he operates. This responsibility is to be fulfilled to the letter within a specified period. Majority of the respondents are of the view that some loggers enter into these agreements mostly with the chiefs who are residing in towns far away from the communities.

Table 28: Number of community members employed by loggers

Responses	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
0	95	80.5	-	-	21	67.5
1-5	18	15.3	19	82.6	6	19.5
6-10	4	3.4	4	17.4	2	6.5
11-15	1	0.8	-	-	2	6.5
Total	118	100	23	100	31	100

Source: Field survey, 2004

From the statistics in Table 28, it is glaring that the people who are engaged in the logging activities are not employed from the communities, the

first reason being that they are not skilled. About 15% of the respondents from the communities, 82% of the FSD Staff and 20% of the loggers knew of only between 1-5 people employed by the loggers. The rest in terms of the community members ranges between 6 and 15. It is also important to note that about 80% of the respondents have no knowledge of any employment. The community members intimated that the loggers do not employ people from their ranks. This is due to the fact that they are unskilled. Employment which is one of the socio-economic indicators could be seen not to favour the people of the area.

Kantola and Virtanen (1986) maintain that a safe and healthy working environment offers a good opportunity for high productivity. They also observed that a trained worker perform forest work with less effort more safely, faster with greater quality of results than an untrained worker. Management of timber firms may thus maintain high productivity if they can ensure a good working relationship with workers, and also offer training opportunities for the workers. In the study it was realized that just a few people are employed from the community and those who are employed are not offered any training. There is therefore the need for the loggers to offer training for the workers for efficiency. Furthermore, people from the communities who have basic education can also be employed and offered on the job training to improve their socio- economic status.

One thing worth noting is that when the loggers leave the operational area after logging and the people are laid off they indulge themselves in illegal logging and chainsawing to earn a living. As stated by Marchak (1983), Lucas (1971), forest dependent communities tend to have higher population and

therefore if they are laid off after the completion of logging they are forced to indulge themselves in illegal operations to enable them survive with their families. Due to the fact that the jobs are temporal and the number of people depending on one person for survival is high when the people are laid off almost the entire community is affected.

Table 29: Respondent's knowledge of the conditions of employment

Response	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Casual workers	18	15.3	7	30.5	17	54.8
Permanent workers	1	0.8	1	4.3	1	3.2
Both	4	3.4	2	8.7	3	9.6
No response	95	80.5	13	56.5	2	6.4
Total	118	100	23	100	23	100

Source: Field survey, 2004

Eighty-one percent (80.5%) of the community respondents and 56% of the FSD Staff did not know of either casual or permanent workers that were employed by the loggers. Only 0.8% of the community members knew of permanent workers as presented in Table 29. This is unfortunate as casual workers appointment can be terminated at any time. This result reveals that in terms of employment the loggers have not contributed much to the socio-economic development of the communities.

Farming, hunting and fishing are allowed to some extent in the forest. Table 30 demonstrates that only about 1% of the community respondents and 8% of the FSD Staff could say that there is timber for local use like building

and other uses. Cultural symbols, artifacts and herbal medicine could also be accessed. If the communities get access to these forest products it will enhance their socio-economic life. As the communities are the custodians of the land there is the need for them to have free access to some of the forest resources. The effect of logging on the forest resources collected could be felt only by the communities who live near these resources. This could be seen in Table 31.

Table 30: Forest resources accessible to the communities

Type of Resources	Community members		FSD staff	
	Freq	%	Freq	%
NTFP/farms	57	48.3	15	65.3
Hunting/fishing	14	12.8	3	13.0
Timber for local use	2	1.6	2	8.7
Artifacts& Herbal medicine	45	38.1	3	13.0
Total	118	100	23	100

Source: Field survey, 2004

In Table 31, 5% of the respondents indicated that there was increase in the amount of forest products after logging, but interestingly 64% were of the view that the amount decreased after logging. Only 12% of the respondents, claimed logging has no effect on the amount of forest produce they could collect. Although, logging opens up the forest for the people to get access to the place, most of the resources available to the community are destroyed after logging.

Table 31: Effect of logging on resources accessible to the communities

Responses	Frequency	Percentage
Amount increased after logging	6	5.1
Amount decreased after logging	76	64.4
Amount did not change	12	10.2
Missing Value	24	21.3
Total	118	100

Source: Field survey, 2004

Basically disputes can have a negative effect on the social and economic life of the community. In Table 32 it can be seen that disputes due to logging is often common in the community.

Table 32: Response on disputes due to logging in the communities

Responses	Community		FSD staff	
	Freq	%	Freq	%
Yes	107	90.7	12	52.2
No	11	9.3	11	47.8
Total	118	100	23	100

Source: Field survey, 2004

According to them where loggers do not fulfill their social obligation or where loggers destroy farms belonging to community members there is always dispute. The youth sometimes block roads leading to the operational areas of the loggers, loggers vehicles are seized for days and released when they are able to fulfill the social obligation. In situations like this the community and the loggers are affected.

Table 33: Strategies used to settle disputes arising from logging activities.

Strategies	Frequency	Percentage
Court settlement	13	11
Settlement by compensation	37	31.4
Out of court settlement without compensation	28	23.7
Arbitration by forestry staff	40	33.9
Total	118	100

Source: Field survey, 2004

The forestry staff arbitrates in the addressing of the negative effects as portrayed in table 33. This is a healthy development as they are the people that have been mandated to manage the forest resources in trust for the people. Although court settlement is the legal process to be followed the respondents complained that they are frustrated by the police and the courts.

Table 34: Respondents awareness of the Forestry & Wildlife Policy

	Community members		FSD staff		Loggers	
Responses	Freq	%	Freq	%	Freq	%
Yes	13	11.0	17	73.9	2	6.5
No	105	89.0	6	26.1	29	93.5
Total	118	100	23	100	31	100

Source: Field survey, 2004

Being aware of the policy of the Forestry Commission is a good sign as this will enable the communities to monitor logging activities. It is therefore unfortunate that 89% of the community and 93% of the loggers are not

familiar with or aware of the Forestry and Wildlife Policy of the Commission. Invariably 73% of FSD Staff are aware of the policy. This is clear in Table 34.

From the perception of the FSD Staff the Forest and Wildlife Policy takes care of environmental conservation. This is true because the policy states among other things that all the activities of the Forestry Commission should be geared towards the protection of the environment for the benefit of all segments of society. The Commission's policy acknowledges that consultations among all forest resources stakeholders should be encouraged. Consultation with all stakeholders can bring peace and harmony as everybody will be involved. Environmentally, mountainous places and places near streams should not be logged. Commitment to social responsibility agreement is also equally important.

Respondents were also asked whether the socio-economic life of the members of the community had improved or not, and their responses are captured in table 35.

Table: 35. Opinion on the socio-economic life of the community members.

Responses	Community members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Yes	5	4.2	3	13.1	14	45.2
No	113	95.8	20	86.9	17	54.8
Total	118	100	23	100	31	100

Source: Field survey, 2004

It can be seen that only 4% of the communities, 13% of the FSD Staff and 45% of the logger respondents indicated that the socio-economic life of

the community had improved. The rest claimed it had not improved as shown in Table 35. If the loggers could testify that the socio-economic life of the workers has not improved then it really needs much to be desired. The loggers have the mandate to ensure that wherever they operate the people should benefit but that has not been the case in the study area.

Table 36: Difficulties encountered by loggers during their operations.

Difficulties encountered	Frequency	Percentage
Operation becomes expensive	19	61.3
Political interference	3	9.7
Delay by landowners	1	3.2
All the above	8	25.8
Total	31	100

Source: Field survey, 2004

Political interference, delay by both FSD and landowners are some of the obstacles encountered by the loggers as presented in Table 36. All these should be looked at by the policy makers to enable the loggers operate effectively. It could be seen in responses that the operations of the loggers are becoming very expensive and this could have negative effect on their whole operations and also the establishment of plantations.

Table 37: Those who contributed to forest conservation and the socio-economic well-being of the communities

Responses	Communities members		FSD staff		Loggers	
	Freq	%	Freq	%	Freq	%
Odikro	27	22.9	6	26.2	1	3.1
Forestry staff	24	20.3	11	47.8	18	58.2
U/Committee Members	26	22.0	3	13	8	25.8
Loggers	10	8.4	-	-	3	7.7
Assemblyman	31	26.3	3	13	1	3.1
Total	118	100	23	100	31	100

Source: Field survey, 2004

All the categories of people mentioned in Table 37 had contributed to forest conservation and socio-economic wellbeing of the community. It is evident that the forestry staff had contributed in a way to the socio-economic wellbeing of the communities living in the logging areas. 26% of the respondents from the communities are of the view that the Assemblyman has also contributed to the socio-economic wellbeing of the communities living in the logging areas. Only 8% of the community could attribute it to the loggers. It is unfortunate that the loggers had not contributed much to that effect. Some of the reasons given were that the loggers destroy their crops and also do not employ people from the communities. In their opinion the FSD staff also does not allow them to get access to the forest resource and also they condone with the loggers to destroy their farms.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of findings

The results are summarized under two main headings namely, the environmental implications of logging and the socio-economic implications of logging. People in the resource area were questioned about the environmental and social impacts of the logging operations. Evidence shows that the activities of the loggers had negatively affected the environment which invariably affected the social and economic life of the people in the communities. It can also be seen from the aerial photographs that there has been a reduction in forest cover between 1991 and 2000.

Environmental standards of logging

Logging generally has a lot of negative effects on the environment and these negative effects have to be addressed to protect the environment. Standards are therefore prescribed by the Logging Manual of Ghana to minimise these negative effects. Results from the study showed that the prescribed standards are not being adhered to by the loggers.

During the field visits it was observed that water bodies are destroyed which also affect the fish stock in the streams and thereby affecting the protein source of the communities. Logs are hauled through streams instead of constructing a bridge, this destroy the source of drinking water which brings about social tension. Logging sanitation was poor as seen during the field visit, logging debris were not cleaned, left over oils were not properly disposed off,

loose soils and left over debris are pushed into rivers after rains causing pollution and siltation which eventually reduces the water quality and volume of streams and rivers.

All the three categories of respondents indicated that the loggers don't adhere to environmental standards. Majority of the FSD Staff complained that they had difficulty in monitoring the standards as they had no means of transport and therefore they could not monitor the environmental standards effectively. The roads were also not safe. The worst of all is that the loggers do not cooperate with the FSD staff. Although most of the environmental and ecological problems identified cannot be totally avoided by the loggers, they can be minimized. Laxity on the part of some Forestry Officers appears to be another factor in terms of lack of motivation to report on malpractice that the loggers engage in.

Measures for compliance with environmental standards

Certain measures are prescribed for keeping environmental standards, for example logging should be done 50m away from rivers and 25m away from streams. All the three categories of respondents indicated that the loggers felled trees very close to streams, the photographs taken illustrate how logs are hauled through streams and rivers without bridges thereby destroying the community's source of drinking water. Non-compliance with forestry regulations was real. Reeks blocked by debris from the operation are evident in the district. Compliance with the approved Ghana government's code of practice is virtually non existent in the current logging areas. Evidence

gathered showed systematic disregard for environmental standards in the Adansi East District by logging companies.

The respondents suggested that a flat terrain should be considered for logging, resilient trees should also be left for future productivity. The failure of loggers to adhere to the code of practice has led to major destruction of fauna and flora in the area. The large quantities of soil sediments washed away from the areas into streams and rivers caused high turbidity levels and siltation, combined with run-off of diesel oil used by logging machinery into streams, causing dramatic declines in fish stocks. Logging during the raining season also destroys the land which could be used for farming.

Socio-economic implications of logging

The forest reserves were constituted to ensure adequate water supply, prevention of erosion, protection of crops, maintenance of rainfall for cocoa cultivation and supply of timber. The forest and wild life policy categorically states that the resources are to be managed sustainably for the benefit of all segments of society.

Majority of the respondents from the communities and FSD interviewed attested to the fact that the socio-economic life of the people in the community has not improved. The communities have access to market due to availability of roads but the roads are in a deplorable state. The social impacts of logging have been felt by many communities throughout the Adansi East District. Resource owners have now questioned the logging company's method of consultation and negotiation concerning logging in the District in general. Allegations were made that resource owners are not

consulted when it comes to the allocation of concessions, even the sub-chiefs are not consulted except the paramount chief who lives in town. Furthermore, the Assemblyman is co-opted to sign the pre-felling inspection form after trees on farmlands have been counted for the logging companies. The farmer on whose farm the trees are situated is not consulted in any way.

The local communities indicated that the availability of wild/bush meat has declined in the logging areas as the wild animals are migrating to other places due to logging. Fish, another vital source of protein, have also been severely affected by logging due to the destruction of water sources. Another major social impact arising from logging is the potential for conflicts between loggers and landowners in the area. Landowners have caused damage to logging company's property in the form of vehicles and equipments. Young men are often compelled to take violent action in their attempt to prevent loggers from entering their farms or even sometimes a forest reserve. Non-payment of compensation by loggers also brings about social conflict within the community.

Employment and income

It can be realized from the responses that majority of the respondents attested to the fact that it is just a few people that are employed by the loggers with most of them employed as casuals. The casuals are employed as loading boys, tree hunters who are conversant with the terrain and topography of the area, or watchmen who will watch over their equipments for them in the night or during taboo days. A few are employed as concession guards. After the completion of the logging operations in the area these casual workers are laid

off and this brings a lot of hardships to the people. In the Adansi East District, most of the people are farmers and the main crop in the area is Cocoa. Logging has really impacted on the income of the people in the area. The small income accrued from legal and illegal logging activities in the District have made many people, especially the youth, more dependent on the cash economy. Royalties are only enjoyed by the traditional authorities that own land, the individual farmer on whose farm the tree is situated does not benefit.

Traditional food sources like mushrooms, snails, bushmeat, etc., that are collected and sold for an income and also for domestic use, are getting extinct due to logging and this really has affected their income. The loggers have negligently damaged their land and reduced the ability of the local communities to find sufficient food in the forest thus necessitating further dependency on the cash economy as they have to buy everything.

Social Responsibility Agreement (SRA) and Access

Majority of the loggers indicated that they have signed a Social Responsibility Agreement with the communities but, it was indicated by the communities that the agreement is not fulfilled. As indicated in the responses, social needs, cultural norms, social order in the District are being adhered to by the loggers as taboo days are observed, sacred sites are left intact. Nevertheless, loggers do not generally adhere to the consultation process for TUC identification and pre-felling inspection as demanded by the Timber Resource Management Regulation(LI 1649 of 1998), a situation which creates conflict between loggers and farmers, especially in the off reserve areas.

The fact that this norms are adhered to provides opportunity for Collaborative Forest Management. It was realized that the people in the communities do not get easy access to forest products. It is rather those who are involved in commercial activities from the big towns that are given permits to collect products like pestles and firewood for sale, trees for carving like tweneboa and even for charcoal burning.

In terms of the Social Responsibility Agreement (SRA), the loggers provide the communities with roofing sheets, cement, iron rods, etc. There are also instances where chief's palaces, schools, clinics, roads, etc., are constructed for the communities. The concept of SRA also satisfy one of the major principles in the forest certification standards which addresses the need for a resource that produces benefits to satisfy the basic needs of the communities living around the resources. It is therefore imperative on the part of the communities living in the logging areas to present SRAs that are within reasonable cost limits. This is not practiced effectively in the Adansi East District. In terms of compensation the respondents from the communities complained that loggers do not consult them before felling trees in their cocoa farms, after felling the trees they are crosscut and hauled which destroy a lot of the farmer's crops.

Although road standards are uniformly poor it has brought relieve to the communities as they can convey their products to the market centers for sale. Most of the roads surveyed remain trafficable but all are the source of substantial sediment inputs into streams and ultimately nearby estuarine areas.

Conclusion

The Adansi East District has a good stock of timber which, when sustainably managed, can support a viable logging industry. Although most of the access roads were constructed by the logging companies their maintenance has become a problem as the loggers are not interested in their maintenance meanwhile they also patronize these roads. Logging activities have contributed little to the development of desirable infrastructure in the rural communities visited.

Few people from the communities were employed by the logging companies. It can therefore be concluded generally that logging in the Adansi East District has impacted negatively on the environment as well as the socio-economic wellbeing of the forest fringe communities. Also from the statistics the hypothesis is accepted as logging has affected the socio-economic life of the people. Answer to the objectives of the study have revealed that

- Logging has affected the environment in the Adansi East District. From the perception of the communities and the FSD staff, streams and rivers which is their source of drinking water has been polluted by logging. Aerial photographs, field visits and reports have also confirmed this fact.
- The Socio-economic life of the people living around the forest reserves have also been affected in terms of reduced income, destruction of crops and even the creation of social tension.

Regarding the research questions, it can be concluded from the answers to the objectives that, the environment has been affected negatively. The socio-economic life of the people has also been affected negatively. According to the three different categories of respondents, the communities

were not involved in the management of the forest resources although the forest belongs to them.

Finally, with all the negative impacts on both the environment and the socio-economic life of the people, logging companies had provided some infrastructure to the communities in terms of boreholes, roads, roofing sheets, etc. Nevertheless, the negative impacts outweigh the positive impacts. There is therefore the need for policy makers to look at the logging activities carefully and formulate policies that will benefit all stakeholders especially the landowners.

Recommendations

Knowledge and understanding of the logging manual prescriptions are pre-requisites for the adoption of environmentally sound logging as well as for effective monitoring of logging operations. Public education and staff training of both forestry and logging company's staff on these standards will help create the necessary public awareness and sensitize the general public. Forest Services Division should be adequately resourced financially and logistically to be able to monitor the prescribed logging standards. Simplified versions of the logging manual should be made available to all stakeholders to enable them have a basic knowledge and information on environmental issues which will help all stakeholders to collaboratively monitor the environmental performance of the loggers.

The training and employment of qualified logging crew is thus a necessity. Timber companies should also try and employ people from the

forest fringe communities to help raise their socio-economic status which will intend help in poverty reduction.

Land owners and farmers should therefore be consulted before logging is allowed. Loggers should also be made to pay the necessary compensation to farmers whose crops are destroyed to enhance their socio-economic status. On economic viability requirements, it is recommended that the development of accurate predictions of income and budgeting for social, environmental and operational costs amongst others should be a priority for consideration as the bane of industry. Finally it is recommended that for future studies the views of the members of the District Assembly should be considered.

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APENDIX I

Sample Questionnaire

DATA COLLECTION FOR THE TOPIC LOGGING AND THE ENVIRONMENT, THE ECONOMIC AND SOCIAL EFFECTS IN THE ADANSI EAST DISTRICT IN THE ASHANTI REGION OF GHANA

TARGET GROUP--- *FOREST FRINGE COMMUNITIES*

1. BACKGROUND INFORMATION

1.1 Name of community---------- 1.2 Status----------

1.4 Sex---M/F 1.5 Residential status---a. Immigrant b. Native c. others

1.6 Educational background------a. Illiterate b. Secondary school c. Elementary school d. School Drop-out----------

1.7 Occupation---a. farmer b. public servant c. self-employed d. unemployed e. Trading f. Collection of NTFPS for sale g. Others----------

1.8 What is your annual income---a. Below GH□ 100 b. GH□ 150-GH□300

c. GH□ 350-GH□500 d. GH□ 550-GH□ 700

e. GH□ 750-GH□900 f. GH□ .950-□1,100

g .Above GH□1,100

1.9. How has logging affected your income? a. Decreased b .Increase c. Same

LOGGING STANDARDS AND ENVIRONMENTAL PROTECTION

2.1. Give the name of the forest reserve near you ----------

2.2. Name the stakeholders who are involved in forest resource management.

a.----------b.----------c.----------

2.3.Mention the activities that contribute to forest resource depletion in the district. A.----------b.----------c.----------

2.4. Are you aware of the environmental standards set by the forest services division? a. Yes b. No

2.5 Do the loggers adhere to these standards. a. Yes b. No

2.6. List the commonest environmental problems associated with logging in your community and how they can be solved.

No	Problem	Solution to the Problem
1. 2. 3.		

2.7 Mention the efforts being made by FSD to rectify the problem.

a.----------b----------c----------

2.8 Give the illegal activities rampant in the district.

a. c. Illegal logging b. Illegal chainsawing c. Illegal charcoal burning d. Illegal farming in the forest.

2.9 Suggest how the illegal activities can be minimized.a----------

b.----------c.----------d.----------

2.10. Indicate whether the following standards are being adhered to by the loggers

a. Rainy/Dry season logging----------Yes ☐ No ☐

b. Security on roads and logging tracks----------Yes ☐ No ☐

c. Logging in protected areas ----------Yes☐ No ☐

2.11 What do you think should be done, and by who in order to sustain the logging industry and at the same time conserve the environment

What to be done	By who

2.14.What are some of the actions taken by the community to solve the environmental problems? a.----------b.----------

2.15. What is the current environmental condition in the district after logging? A. Has become better. B. Worse c. the same.

3.0 THE SOCIAL AND ECONOMIC EFFECTS OF LOGGING

3.1. What direct benefits have come to the community as a whole from logging activities in the district? a. Maintenance of roads b. Hospital and school buildings. c. Provision of water d. Building of chief's palace

e. Physical money from rent and stumpage (royalties) e. Others----------

3.2 Did you sign any social responsibility agreement with any timber company? Yes☐ No☐

3.3 Has any of the community members been employed by the logging companies Yes☐ No ☐

3. 4 If yes how many people are you aware of ?----------

3.5 What are the conditions of employment? a. Casual workers.

b. Permanent workers c. Both

3.6 List the forest resources that you have free access to–

a. Non-Timber forest products (NTFPs b. Admitted farm c. Hunting

d. Fishing e. Timber for domestic/traditional usage

f. Collection of cultural symbols and ritual artifacts and herbal medicine

3.7 How has logging affected the amount of forest resources accessible to you? a. Amount increased after logging. b. Amount decreased after logging. c. Amount did not change.

3.8 Are there any disputes in the community due to logging? a. Yes b. No

3.9 Are you aware of the Forest and Wildlife policy? A. Yes b. No

3.10 In your opinion has the socio-economic life of the community improved after logging? a. Yes b. No

3.11 If yes, how has it improved? a.----------

b.----------c.----------

3.12 Mention those who have contributed to forest conservation and the socio-economic wellbeing of the community.

a. Odikro b. Forestry staff c. Unit committee members d. Loggers

e. Assemblyman.

APPENDIX II

QUESTIONAIRE FOR THE COLLECTION OF DATA ON THE TOPIC LOGGING AND THE ENVIRONMENT, THE SOCIAL AND ECONOMIC EFFECT IN THE ADANSI EAST DISTRICT

TARGET GROUP--*FOREST SERVICES DIVISION STAFF*

1 GENERAL INFORMATION

1.1Name of institution----------

1.2 Position in the institution---a. District manager b. Assistant district manager c. Service officer d. Range supervisor e. Forest guard f.Other.

2.0 LOGGING STANDARDS AND ENVIRONMENTALPROTECTION.

2.1 Name the stakeholders who are involved in forest resource management.

a.----------b.----------c.----------

2.2 Mention the activities that contribute to forest resource depletion in the district. a.----------b.----------c.----------

2.3a Are you aware of the environmental standards set by the Forest Services Division? Yes/No

2.3b If Yes, mention the standards that you know a----------

b.----------c.----------

2.4 In your opinion do the loggers adhere to these environmental standards? Yes/No

2.5 List the difficulties you encounter when monitoring the standards.

a.----------b.----------c.----------

2.6 What suggestions would you offer to improve upon the logging standards

a. ----------

b. ----------

2.7 What are some of the environmental problems created after timber logging

a.----------b.----------

c.----------d.----------

2.8. What are some of the effort being made by your institution to rectify the problem?----------a.----------b.----------

2.9. Give the illegal activities rampant in the district.

a. c. Illegal logging b. Illegal chainsawing c. Illegal charcoal burning d. Illegal farming in the forest.

2.10 Suggest how the illegal activities can be minimized. a----------

b.----------c.----------d.----------

2.11 Indicate whether the following standards are being adhered to by the loggers

a. Rainy/Dry season logging----------Yes ☐ No ☐

b. Security on roads and logging tracks----------Yes ☐ No ☐

c. Logging in protected areas ----------Yes ☐ No ☐

2.12 What do you think should be done, and by who in order to sustain the logging industry and at the same time conserve the environment

What to be done	By who

2.14. What is the current environmental condition in the district after logging? A. Has become better. B. Worse c. the same.

3.0 THE SOCIAL AND ECONOMIC EFFECTS OF LOGGING

3.1. In your opinion, what direct benefits have come to the community as a whole from logging activities in the district? a. Maintenance of roads b. Hospital and school buildings. c. Provision of water d. Building of chief's palace e. Physical money from rent and stumpage (royalties) e. Others------

3.2 Do you have any knowledge about any social responsibility agreement signed between loggers and the communities? Yes☐ No ☐

3.3 If Yes, mention the type of agreement? a.----------b.----------

c.----------d.----------

3.4 Do the loggers fulfill the Agreement to the latter? Yes☐ No☐

3.5 Has any of the community members been employed by the logging companies Yes☐ No ☐

3.6 If yes how many people are you aware of ?----------

3.7. If no why?----------

3.8 What are the conditions of employment? a. Casual workers.

b. Permanent workers c. Both

3.9 Are there any disputes in the community due to logging? Yes/No

3.10 Are you aware of the Forest and Wildlife policy? Yes/No

3.11 In your opinion has the socio-economic life of the community improved after logging? Yes/No

3.11 If yes, how has it improved? a.----------

b.----------c.----------

d.----------

3.12 Are you aware of any afforestation project being carried out by the loggers? Yes/No

3.13 Mention those who have contributed to forest conservation and the socio-economic wellbeing of the community.

a. Odikro b. Forestry staff c. Unit committee members d. Loggers

e. Assemblyman.

APPENDIX III

QUESTIONAIRE FOR THE COLLECTION OF DATA ON THE TOPIC LOGGING AND THE ENVIRONMENT, THE SOCIAL AND ECONOMIC EFFECTS IN THE ADANSI EAST DISTRICT.

TARGET GROUP---*LOGGERS/TIMBER COMPANIES*

1. BACKGROUND INFORMATION

1.1. What is the name of your company? ----------

1.2. What is the size of your operational area----------

1.3. Does your company own a processing plant/mill/----

Yes/No

1.4. Where does your company sell her products?

a. Local market only.

b. Foreign market.

c. Both7

2.0 LOGGING STANDARDS AND ENVIRONMENTAL PROTECTION

2.1 Name the stakeholders who are involved in forest resource management.

a.----------b.----------

d----------c----------

2.2 Mention the activities that contribute to forest resource depletion in the district. a.----------b.----------

d----------c----------

2.3a Are you aware of the environmental standards set by the Forest Services Division? Yes/No.

2.3b If Yes, mention the standards that you know a----------

b.----------c.----------

2.4 Do you adhere to these environmental standards Yes/No

2.5 What suggestions would you offer to improve upon the logging standards

a. ----------b.----------

c. ----------d.----------

2.6 What are some of the environmental problems created after timber logging

a.----------b.----------

c.----------d.----------

2.7. What are some of the efforts being made by the Forest Services Division to rectify the problem?

a.----------b.----------

c----------d----------

2.8. Give the illegal activities rampant in the district.

a. Illegal logging b. Illegal chainsawing c. Illegal charcoal burning d. Illegal farming in the forest.

2.9 Suggest how the illegal activities can be minimized.

a----------b.----------

c.----------d.----------

2.10 Do you use standard equipments?

Yes ☐ No ☐

2.11 Indicate whether the following standards are being adhered to by your company?

a. Rainy/Dry season logging----------

Yes ☐ No ☐

b. Security on roads and logging tracks----------

Yes ☐ No ☐

C Logging in protected areas ----------

Yes ☐ No ☐

2.12 What do you think should be done, and by who in order to sustain the logging industry and at the same time conserve the environment

What to be done	By who

2.13 What is the current environmental condition in the district after logging?

A. Has become better. B. Worse c. the same.

3.0 THE SOCIAL AND ECONOMIC EFFECTS OF LOGGING

3.1. In your opinion, what direct benefits have come to the community as a whole from logging activities in the district?

a. Maintenance of roads b. Hospital and school buildings. c. Provision of water d. Building of chief's palace e. Physical money from rent and stumpage (royalties) e. Others------

3.2 Do you have any knowledge about any social responsibility agreement signed between you and the communities?

Yes ☐ No ☐

3.3 If Yes, mention the type of agreement? a.----------

b.----------c.----------

d.----------

3.4 Have you fulfilled the Agreement to the latter? Yes ☐ No ☐

3.5 If no why? ----------

3.6 Has any of the community members been employed by your company?

Yes ☐ No ☐

3.7 If yes how many people have you employed ?----------

3.8 If no why----------

3.9 What are the conditions of employment? a. Casual workers.

b. Permanent workers c. Both

3.10 Are you aware of the Forest and Wildlife policy?

Yes/No

3.11 In your opinion has the socio-economic life of the community improved after logging? Yes/No

3.12 If yes, how has it improved?

a.----------b.----------

c.----------d.----------

3.13 If no why a.----------b----------

c----------d----------

3.14 Mention the difficulties you encounter during your logging operations

a.----------b.----------

c.----------d.----------

3.14 Mention those who have contributed to forest conservation and the socio-economic wellbeing of the community.

a. Odikro b. Forestry staff c. Unit committee members

d. Loggers e. Assemblyman.

APPENDIX IV

. Field photographs

A typical natural forest (Kokotintin Forest Reserve)

A chainsaw operator felling and crosscutting a tree in the forest

Release of smoke from the chainsaw being used for felling the tree. The smoke that goes up pollutes the atmosphere which can intend affect human, animal and plant life in the forest.

Hauling of the log to siding before it is loaded onto the truck.

A community protesting against hauling the logs through the swampy area.

The main access road leading to the community was destroyed by hauling logs along the road.

A stream through which logs were hauled.

A house belonging to a community where logging takes place

The dilapidated nature of this structure speaks of the situation in which the community finds itself. In the previous pictures one will see how the source of water has been destroyed and also how the cocoa farm and plantain has been destroyed.