

UNIVERSITY OF CAPE COAST

ASSESSMENT OF GLOBAL ENVIRONMENT FACILITY BIODIVERSITY
PROJECTS AT GOMOA OKYEREKO AND GOMOA ADAM IN THE
CENTRAL REGION OF GHANA

ISAAC QUANSAH

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ADAM IN THE CENTRAL REGION OF GHANA

BY

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Legal Studies, University of Cape Coast, in partial fulfilment of the
requirements for the award of Master of Philosophy degree in
Geography and Regional Planning.

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis 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 Name: Isaac Quansah

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

Supervisors' Declaration

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

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ABSTRACT

The biodiversity conservation projects that were implemented at Gomoa Okyereko and Gomoa Adam in Gomoa East and Gomoa West Districts in the Central Region were to conserve degraded forests in the two communities. The main problems had to do with using chemicals in hunting of wildlife, regular bush fires, pollution of water bodies, indiscriminate cutting of trees and frequent wind damages. This study therefore assessed the impact of the project intervention in the light of the problems and the objectives set before the implementation of projects and how they were able to solve or reduce the problems identified.

Purposive sampling method was used to select the communities involved in the study. Proportionate allocation was done to each category of the target population to get the views of the people who were engaged in the various activities. Simple random sampling method was used to select the respondents. The allocated number to each stratum was subjected to the lottery technique until the required sample size was obtained. Data was analysed using Statistical Product and Service Solutions (SPSS) version 17 for frequencies and percentages.

The results revealed that there was an extensive awareness creation in all the participating and nearby communities on environmental conservation and the ecological training centre which was built has been abandoned.

It was recommended that, the Okyereko Co-operative Afforestation Society and the Global Habitat for Homeless with the help of the sampled communities should develop their own demonstration and teaching farms to teach farmers since the agro-forestry demonstration farm was never done.

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DEDICATION

To my wife Mrs. Comfort Quansah, our children, Smart Nhyira Quansah and Evelyn Akyerem.

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LIST OF ACRONYMS

AIDS	Acquire Immune Deficiency Syndrome
CBC	Community-Based Conservation
CBD	Convention on Biological Diversity
CBOs	Community-Based Organizations
EA	Ecosystem Approach
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GHAF	Global Habitat for Homeless
NGOs	Non-Governmental Organizations
OCAS	Okyereko Co-operative Afforestation Society
PAs	Protected Areas
SGP	Small Grant Programme
SLA	Sustainable Livelihoods Approach
SPSS	Statistical Product and Service Solutions
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United State of America
WRI	World Resource Institute

CHAPTER ONE

INTRODUCTION

Background to the Study

Biodiversity continues to be lost at a rapid rate across the planet. The Global Biodiversity Outlook-3, published in 2010 by the Convention on Biological Diversity (CBD, 2010) points to multiple indicators of continuing decline in biodiversity in all three of its main components; genes, species and ecosystems. Natural habitats in most parts of the world are shrinking with 35% of all mangrove swamps worldwide, 40% of forests and 50% of wetlands have been lost over the last century (CBD, 2010). The abundance of vertebrate species fell by nearly one-third globally between 1970 and 2006 and nearly a quarter of plant species are estimated to be threatened with extinction (CBD, 2010).

The reasons for the loss are complex and locally specific but frequently, they are related to the processes of habitat conversion and agricultural intensification brought about by demographic and market-driven pressures (Pagiola & Kellenberg, 1997). The pressures are inflated by the 'public good' characteristics of biological resources and difficulties of internalizing values in land-use management. The immediate land managers in the developing world are commonly the millions of livestock farmers and other sets of rural people, both men and women, whose livelihoods are closely dependent upon the availability and productivity of biological and other natural resources.

However, stakeholders have different interests in the way the resources are exploited and managed. Some have livelihoods which are closely related to

conservation and the sustained use of wild resources while others are driven by market opportunities and investment in the conversion of natural systems for different uses than to use the area for productive agriculture (Baker, 2000).

In Ghana, the conservation and the use of biodiversity take little consideration to its existence and values. This has resulted in the growing demand of people to satisfy present socio-economic needs by exploiting resources at rates and levels that jeopardize the system's ability to sustain their production. Floral biodiversity loss as experienced in Ghana may be attributed to a number of factors including permanent conversion of natural forests into other land use forms such as crop cultivation, grazing, mining, infrastructure and settlement development. Since these activities increase with rising population, the rate of biodiversity loss accelerates (Amoako-Atta, 1998). Though plant domestication (for instance, agricultural and forest plantation mono-crops) may bring tremendous benefits to communities and the nation as a whole but its effects on the country's biodiversity may be disastrous as indigenous species are threatened, displaced and replaced with most often fast-growing and genetically inferior species and varieties (FAO, 2000).

In 1992, the UNDP/GEF/SGP as an organization started uniting 182 member governments in partnership with international institutions, NGOs and the private sector to address global environmental issues. The UNDP/Global Environment Facility Small Grant Programme (UNDP/GEF/SGP), popularly known as Global Environment Facility (GEF) provides grants to developing countries and countries with economies in transition for projects on biodiversity conservation and serves as a financial mechanism for implementation of the Convention on Biological Diversity (GEF, 2008).

The Global Environment Facility (GEF) also recognizes the importance of sustainable management of landscape and seascape mosaics that include protected areas as well as a variety of other land resource uses. GEF sees the work of protecting an area as complementing its investments in strengthening the sustainability of protected area systems. The Global Environment Facility activities of mainstreaming work promotes sustainability measures to help reduce the negative effects that productive sectors exert on biodiversity particularly outside protected areas while highlighting the contribution of biodiversity to economic and human well-being development (GEF, 2008).

According to Little (1994) there is positive legacy if community biodiversity is conserved by involving local people in the planning and implementation of biodiversity project. In Little's view, the main aim of biodiversity conservation is with the assumption that when done in the right way biodiversity is of automatic benefit to the local people (p. 23). Conservation practitioners now advocate the involvement of local communities in their programs because of limited evidence of local people's views being sought and incorporated in the planning, management and implementation of biodiversity projects (Brandon, 1993; IIED, 1994; Little, 1994).

From the issues raised above, it means that biological resource management and people's livelihood systems are thus complex and intricately inter-connected. The link between conservation and development interests has been developed and reiterated in many documents important to biodiversity conservation. Most notable amongst them is the Biological Diversity

Convention signed by some 182 nations at the United Nations Conference on Environment and Development in 1992. Since then numerous attempts have been made to operationalize the approach including UNESCO's Man and Biosphere program (which promoted buffer zones around Protected Areas (PAs) in an attempt to meet the needs of both local communities and the PAs themselves) by integrating conservation and development projects. Understanding the interdependence of nature and local people has since been taken further. For example, the theme of the African Regional Biodiversity Forum held in Mombassa in February 2000 was "Using Biodiversity to Strengthen Livelihoods". The aim of the forum was to "explore ways to integrate poverty alleviation considerations into local, national and regional action plans aimed at conserving, using sustainably and sharing equitably the benefits of biodiversity" (Tsikata, Attuquayefio, Ofori-Sarpong, & Adomako, 2005, p. 54).

The assessment of the UNDP/GEF Small Grants Programme biodiversity projects at Gomoa Okyereko and Gomoa Adam stems from the critical role that biological resources play in sustaining human life which in the last two decades has received considerable attention. In 1992 a broad framework for the conservation and use of the world's biological resources by the Convention on Biological Diversity (CBD) was agreed upon by the United Nations Conference on Environment and Development (the Earth Summit). Despite increasing recognition, the world's biological resources continue to be lost at an alarming rate. This is particularly so in developing countries including Ghana where many of the remaining resources are concentrated (CBD, 2010).

It was important to assess the impact of the efforts put out by the United Nations Development Programme Global Environment Facility Small Grant Programme (UNDP/GEF/SGP) because in Ghana, it is one of the main organizations responsible for the protection of Ghana's biodiversity and the environment as a whole. Also, other environmental Non-Governmental Organizations (NGOs) may learn from their project implementation strategies for sustainability of the environment.

Statement of the Problem

Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) were the two Non-Governmental Organizations (NGOs) which presented a proposal to the UNDP/GEF/SGP for funding and secured funds for biodiversity projects at Gomoa Okyereko and Gomoa Adam respectively. The projects were completed in 2006 and 2008 at Gomoa Okyereko and Gomoa Adam respectively. The problems presented by these NGOs which engaged in these two community projects were as follows;

At Gomoa Adam, Global Habitat for Homeless which is the Community-Based Organisation for the biodiversity project had the intention to achieve Sustainable Utilization of Community Protected Areas at Onyeeku and Sumurum forests to enhance livelihood development and wealth creation for the people of Gomoa Adam in the Gomoa West District. In their project proposal it was stated that the wildlife habitats at Gomoa Adam were being threatened by the indigenous people through indiscriminate felling of trees and cutting shrubs without replacement, illicit group hunting as well as annual wildfire outbreaks. Furthermore, the proposal indicated that, the structure and

composition of the trees in the forest (kyenkyen, onyina, odum etc.) have also been altered, which the project sought to address (GHAF, 2006).

The two forests serve as protection of the watershed of the only stream (Onyeeku and Sumurum stream) in the area that provides all year round water for the surrounding communities. The continuous destruction of the forest has led to pollution of water and drying up of the stream during the harmattan seasons. It was stated that the pollution of water and drying up of the stream had greatly affected the people who had to travel several kilometers to fetch water in the harmattan season (GHAF, 2006).

The final issue raised in the proposal had to do with the hunters in the area who use chemical to hunt for wild animals by placing poisoned foods in the forest for wildlife to feed on so that they can be trapped. The project also identified the use of chemicals for farming and hunting as having incremental negative impact on both vegetation and health of the people (GHAF, 2006).

On the other hand, the Gomoa Okyereko project also presented its problems which include; unsustainable farming practices, annual bush fires, group hunting of wild animals and indiscriminate cutting of indigenous trees for commercial and domestic purposes which have the tendency of destroying the forests in the area (OCAS, 2005a).

Even though the people of the two communities still have respect for local taboos and regulations, the chiefs and the people expressed great concern about the condition of the forests in Gomoa Adam and Gomoa Okyereko. In this regard, the people of these two communities were encouraged to conserve and protect all the forests in the area, especially the traditionally protected lands in order to protect biodiversity and community resources. It is for these

reasons that Gomoa Adam and Gomoa Okyereko biodiversity projects were sponsored by the UNDP/GEF/SGP to conserve the forests and protect them from total destruction (OCAS, 2005a).

Purpose of the Study

This research work sought to assess the impact of the projects by taking into consideration the extent to which the problems presented by the Global Habitat for Homeless and Okyereko Co-operative Society have been addressed and how stakeholders and beneficiaries were involved in the execution of the projects.

Research Questions

Research questions that guided the study were:

1. What were the major activities undertaken by Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) in these communities?
2. Were the community members involve in the planning and implementation of the projects activities?
3. What were the achievements of the projects with respect to the biodiversity conservation activities done by OCAS and GHAF?
4. What were the strategies put in place by OCAS and GHAF in conserving biodiversity in these communities?

Research Objectives

The main objective of the study was to assess the impact of UNDP/Global Environment Facility's (UNDP/GEF/SGP) community-based biodiversity conservation projects at Gomoa Okyereko and Gomoa Adam in the Central Region of Ghana. Specific objectives were to:

1. Examine the major activities of Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) towards the biodiversity conservation projects;
2. Determine whether the community members were involved in the planning and implementation of OCAS and GHAF projects activities;
3. Assess the achievements of OCAS and GHAF projects in the study areas in terms of biodiversity conserved; and
4. Assess the strategies put in place by OCAS and GHAF in the implementation of the biodiversity conservation projects.

Significance of the Study

Investing time, money and effort in assessment of project effort have been justified in terms of the difference these make to policy and programme success (Argyrous, 2009). In order to ensure value for money and time used on biodiversity projects sponsored by UNDP/ Global Environment Facility Small/ Grant Programme Projects at Gomoa Okyereko and Gomoa Adam an impact assessment was conducted.

Also, the assessment of the projects was done to bring out the gains of conserving biodiversity at these project areas and the actual impact for which the projects were intended to make.

Finally, a study of this kind will provide information which will serve as baseline for further studies by academicians, researchers, students and development practitioners on impact of biodiversity conservation and development projects in different locations. This will in the long run contribute to the existing knowledge and literature on biodiversity conservation practices and framework within the Ghanaian context.

Scope of the Study

Geographically, the study was conducted at Gomoa Okyereko and Gomoa Adam in the Central Region of Ghana. Contextually, the study looked at what went into conserving biodiversity in the study areas. The study also considered the activities of OCAS and GHAF towards the biodiversity conservation, achievements of OCAS and GHAF in terms of biodiversity conservation in the project areas, community involvement in these projects and the strategies that were put in place by the OCAS and GHAF in implementing the biodiversity projects.

Limitations

The study was intended to count all the species of the trees planted in the conserved areas but due to time and inaccessibility to all the trees planted, the study relied on the numbering of the trees during implementation stages by the surveyor to ascertain the trees planted. The study also had difficulty in getting the respondents who engaged in the various activities to comment on the projects but due to timely intervention of the project executives at Gomoa

Okyereko and Gomoa Adam this challenge was quickly resolved and the required sample was obtained.

Organization of the Study

The thesis was divided into five chapters and each of the chapters had specific sub-topics that were discussed. Chapter One is an introductory chapter to the research. Sub-topics discussed under this chapter include the background of the study, statement of the problem, purpose of the study, research questions, research objectives, significance of the study, scope of the study, limitations and organisation of the thesis.

Chapter Two includes the review of relevant literature on definition of impact evaluation and types, history of impact evaluation, reasons for doing ex-post evaluation of development projects, community based strategies to biodiversity conservation projects, involvement of indigenous people in biodiversity conservation projects, poverty-biodiversity linkage in biodiversity conservation, ecological concepts, principles and their applications in biodiversity conservation projects, social norms and their linkage to efficient biodiversity conservation and the current paradigm on improving biodiversity conservation projects among others. This chapter also discussed the conceptual framework that guided the study.

Chapter Three outlined the research methodology employed for this study. Sub-headings include the study area, research design, sources of data, target population, sampling procedures, data collection and instruments, pretesting of the instruments, data collection procedures, data processing and analysis, problems encountered on the field as well as ethical considerations.

Chapter Four discussed the findings from the study. The discussion and analysis were based on the research objectives and questions for the study. The final chapter was Chapter Five which dealt with the summary of the key findings, conclusions and recommendations. Possible areas for future studies were also suggested.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter presents theories on biodiversity conservation, reasons for biodiversity conservation, concepts and ideas on biodiversity conservation, types of evaluation and the conceptual framework.

Theories on Biodiversity Conservation

During the 1980s, the concept of 'sustainable development' evolved and centered on the 'wise use' of natural resources. The work culminated in the Rio Declaration in 1992, Agenda 21 and a global action plan for their implementation. A number of different approaches to integrating environmental and developmental goals have since been developed which fall within the framework of sustainable development. At the country level, comprehensive development frameworks, national strategies for sustainable development and poverty reduction strategy papers were designed to provide strategic guidance to biodiversity conservation (CBD, 1992). Condensed within these strategic papers are the national strategies that seek to balance economic, social and environmental objectives for biodiversity conservation.

Scoones (1998); Ashley and Carney (1999) commented that, the Sustainable Livelihoods Approach (SLA) is a way of thinking about poverty elimination and the needs of the poor that rests on core principles of people-centered, responsive and multi-level approaches to development. Unlike other sustainable development concepts, the SLA has multiple interpretations but is essentially a holistic and systems-based approach to development that

incorporates the key ideas of participation, wise-use of natural resources and economic stability. The SLA thus, aims at meeting the developmental needs and aspirations of the poor in a socially and environmentally sensitive way (Scoones, 1998; Ashley & Carney, 1999).

Whereas the SLA is first and foremost people- centered, the Ecosystem Approach (EA) works from the opposite side by addressing conservation issues and ecosystem integrity in a way that is sensitive to local communities. The central idea of EA is the need to manage ecosystems as entities, but recognizing that they cut across jurisdictional and other boundaries. While essentially aimed at maintaining ecosystem integrity and productivity over the long term, the approach emphasizes the importance of local people and acknowledges a place for "appropriate human modification" of these systems (WRI, 2002).

Neither the SLA nor the Ecosystem Approach is strictly new but rather syntheses of lessons learnt from earlier approaches. In effect, they represent a convergence of development and conservation principles, with both adopting the same integrative and systems-based stance by looking at the same issues from opposite sides. The current challenge is to find ways to operationalize these approaches that take full account of practical realities. In most situations there are considerations among short and long term objectives and conflicts of interest between multiple stakeholders (Grimble & Wellard, 1997). For example, decisions regarding matters such as the clearance or protection of forested land often have to be made where development or conservation initiatives are contemplated. Addressing decisions on protection of forested land is a big challenge given the major gaps in our understanding of people-

ecosystem interactions, the methodological difficulties of assigning economic values to unmarketed goods and services as well as the political, social and institutional barriers to participatory approaches to biodiversity conservation (Grimble & Wellard, 1997).

Reasons for Biodiversity Conservation

There are five types of reasons for biodiversity conservation and these are economic, indirect economic (protection against epidemic pathogens), ecological, aesthetic and ethical considerations (Ehrenfeld, 1988; Ehrlich & Ehrlich, 1992).

Economic consideration

Grieg-Gran (2006) argues that economics are the most commonly heard in the discourse of development. Broadly speaking, there are two elements; 'unmined riches' (i.e. undiscovered genetic resources that can be used by the society) and relative outputs from land use systems. In the case of undiscovered potential, it is pointed out that 25% to 50% of the drugs in our pharmacopoeia were originally extracted from plants and thus there is the possibility of discovering new drugs to cure a disease such as AIDS in the untapped rain forest. This, though very emotionally attractive, is a dangerous argument, since it depends both on the probability of discoveries which cannot be transparently estimated and on a technology of screening naturally-occurring compounds whereas many drugs can be built from 'molecule-upwards' (Jonish, 1992).

This consideration for conserving biodiversity also depends on consumer preferences and their expression through markets. If people refuse to eat particular food stuffs that are abundant in an area, the overall biomass of that area becomes largely irrelevant. The calculations of exploitable biomass can be made to work more convincingly in some environments than others; equatorial forest will always have an advantage over dry lands. What this argument is putting forward is the likelihood that in the near future herbs from these conserved areas will be useful in curing diseases that human beings now find difficult to control or cure (Grieg-Gran, 2006).

Indirect economic benefits: Evolving pathogens consideration

One of the most difficult questions for this type of biology is understanding why biodiversity occurs, in other words why organisms and genes appear to diminish at such frantic rates in certain circumstances and why habitats evolve to support this diversity. One significant underlying cause may be the defense against pathogens; the more genetically uniform a population is, the more vulnerable it is to pandemic diseases. Pathogens evolve rapidly and plants and animals must adapt constantly to their attacks. Speciation is one obvious result; the more biologically diverse a population is the less likely it is to be eliminated when a powerful pathogen evolves (Fry, 1993).

This argument is about how different pathogens, insects and organisms co-exist in an environment because they depend on each other for survival. But if one group of pathogens exists in an area, it is easy to be attacked by external viruses and because of this it is important to conserve everything found in an area.

Aesthetic consideration

The third of reason suggests that biodiversity has a value in itself, that it is aesthetically desirable to human beings. Strangely enough, there is little or no resistance to this type of argument when presented in terms of the diversity of human culture. The argument for biodiversity can be associated with the biological environment which should not impoverish any more than the attempt to preserve the culture of a country (Grimble & Wellard, 1997).

However much of this aesthetic view has to be recommended to the Western middle-classes, who simply do not seem to be uphold this view. In many places in the world, biodiversity is being destroyed either through habitat destruction or intentional pinpointing of resources such as large mammals by individuals too absorbed by financial gain to notice or households too poor to care (Pearce, 1994). The aesthetic argument is suggesting that it is important to conserve biodiversity because of the beauty it gives to the environment.

Ecological consideration

The ecological consideration is of the view that, biodiversity is essential to the normal functioning of the planet (Ehrlich & Ehrlich, 1992). The evapotranspiration of tropical forests, the maintenance of the chemical balance of the atmosphere, the phyoplankton layer in the oceans and the fertility of soils are related to current levels of biodiversity. In this sense, the status quo will depend on biodiversity being maintained at current levels. However, if biodiversity is reduced and the balance of the planet changes (warmer climates, rising sea levels, catastrophic soil erosion) then the response

will be technological solutions. Species richness may also develop to survive extreme shocks, especially climatic conditions. Studies of grasslands have shown that where greater levels of biodiversity have been conserved, recovery from subsequent drought is much more rapid (Tilman & Downing, 1994).

This argument may not immediately seem to be applicable to equatorial forests where the climate would seem to be more stable, but this is only a matter of time-scale. For example, at certain periods during the last 12,000 years the West African rainforest has been reduced to a tiny fraction of its original size and is likely that this type of expansion and contraction has occurred regularly in prehistory (Ehrlich & Ehrlich, 1992).

In summary, the ecological consideration for conserving biodiversity point to the fact that the normal functioning of the planet earth depends on effective biodiversity conservation.

Ethical consideration

Ethical approaches to nature and the environment have a long history in human society: animals and plants must not be destroyed because they are part of a larger spiritual web. Generally, the ethical argument is the argument that applies human culture to non-human entities as human rights have been extended to slaves and children. The argument is that rights should be extended to animals and even the environment as a whole. From this perspective, people on this earth are 'stewards' of earth's biological resources and have no right to destroy them and deny future generations the opportunity to experience and interact with them. Ethical arguments have a strong emotional appeal but remain extremely culture-bound; presenting such a case

to someone who does not accept their cultural presuppositions will only be rewarded with more burning of forests (Oaths, 1999).

The relevance of these theoretical arguments to the study is that it gave the researcher opportunity to ask questions on the rationale for conserving the biodiversity at the study areas. From the arguments above, it is evident that people have their own understanding and benefits of conserving biodiversity and for that matter any effort to fund their projects should look at why the people in the area want to undertake such project and the benefits the efforts used will bring to them. Thus, in doing impact evaluation of projects of this nature, it is important to take into consideration views (why the areas were conserved) of the people in the project areas by interviewing both beneficiaries and non-beneficiaries of the projects to get their views on the projects.

Concepts and Ideas on Biodiversity Conservation

Biodiversity as a concept is open to multiple interpretations and meanings and as such is vaguely defined and understood. The most widely accepted definition is set out in the Convention on Biological Diversity (CBD, 1992) in terms of the variety and variability of life. This is broken down into its genetic, species and (generally) its ecosystem components with secondary reference to the ecological complexes of which they are part. The emphasis on variety and variability in scientific interpretation leads to questions concerning its local (as well as global) validity and what place and scale diversity is necessary and should be assessed. The focus on variability also underplays the practical importance of quantity and abundance. One bee is hardly important

by itself but its value to pollination is the fact that there are many millions of them to carry out this function of pollination (CBD, 1992).

Moreover, the variability focus leads to an emphasize on physical attributes (particularly genes and species) and underplay the values associated with its less tangible functions such as pollination and nutrients cycling on a wider scale, its contribution to watershed protection and ecosystem resilience.

These dilemmas move us from biology into the world of social science and the values and benefits derived by humankind from nature. Some authors have argued the need to separate the value of biodiversity from the wider attributes of biological resources (Aylward, 1992). Others have stretched the concept of biodiversity in such a way to encompass not only diversity but to include ideas not associated with variability alone. The term biodiversity is used more or less as a synonym for nature in general and the terms nature and biodiversity conservation are used interchangeably (Pearce, 1994).

There are two distinct ways of considering the value of biodiversity and the case for their conservation that can give rise to major differences in understanding (Pearce, 1994; Grimble, 1998). The ecocentric paradigm suggests that all living species have a moral and equal right to exist. In this argument all species are deemed to have an intrinsic value irrespective of any value that human beings derive from or attribute to them. The anthropocentric paradigm on the other hand, views biodiversity as a collection of goods and services that support the maintenance and enhancement of human life.

Conservation of biodiversity is necessary where their loss reduces the stock of natural capital and the resource base available for current or potential future use. Their loss may also endanger local and global life-support systems

and ultimately threaten the future of humankind. For both theoretical and practical reasons the study looked at an anthropocentric position in this study. The anthropocentric approach to biodiversity conservation is aimed at reducing poverty and improving the welfare of people, particularly the poor (Yibeltal, 2008). In this case, the provision that development should be sustainable and people-centered objective takes precedence over other considerations.

In taking people-centered position, conservation is given central consideration to distribution as well as global aspects of biodiversity and particularly the values ascribed to them by different sets of local people. The people who are directly dependent on biodiversity for their livelihoods are commonly under-represented in society both economically and politically. In both development and conservation planning, it is vital to ensure that the social groups who dependent on biodiversity are not harmed by development or habitat change but they are properly compensated. In this vein, the research considered the livelihood activities that were introduced by the projects at Gomoa Okyereko and Gomoa Adam.

Linking Social Norms to Efficient Biodiversity Conservation Projects

Social norms are shared understandings of how individual members should behave in a community under a given circumstance and how members within the community reward or punish people for their behaviors in following or breaking the norms. More generally, social norms may also be sustained by feelings attached to the reputation and self-esteem earned by conforming to

social norms or the shame and guilt received by detaching from the norms even in the absence of third-party punishment (Ntiamou-Baidu, 1991).

According to Ntiamou-Baidu (1991) both economic incentives and social norms are important in an individual's behavior in terms of common resource management. Individuals whose land-use decisions differ from the majority in the community may be exposed to social pressures from the community. Studies of individuals' participation in payment for ecological service programs have focused on the incentives provided by conservation payments. Little is known about the impacts of social norms at the neighborhood level on the sustainability of conservation, although substantial conservation benefits (e.g., through land enrolled in conservation contracting programs) may be produced with a relatively small change in policy or other exogenous factors due to social norms (Ntiamou-Baidu, 1991).

This research looked at how social norms and bye-laws were used to sustain the self-enforced psychological feelings and third-party-enforced punishment in the project areas. Specifically, the examination of when an individual's behaviour is directly influenced by the behaviour of other members in the community and substantial change in aggregate behaviour of the community can change an individual's behaviour.

On the impacts of social norms and bye-laws on the implementation of biodiversity conservation, the study looked at how social norms and bye-laws enacted helped in conserving biodiversity at Gomoa Okyereko and Gomoa Adam in the Central Region of Ghana.

Strategies and Approaches to Conserving the Environment

The word 'biodiversity' is relatively a recent one that has become widely used only since the mid-1980s. Prior to this, most of the approaches to biodiversity conservation referred to nature or wildlife conservation. Though many of the issues and challenges remain the same, the considerations have moved well-beyond the scope of earlier approaches (Rhodes & Odell, 1992). This section of the research reviews historical developments that have led to the current situation and considers the issues that guide conservation practice today.

Historical trends

Reference to environmental degradation date back to Egyptian and Grecian times, notably Plato's description of an over-grazed landscape in Attica as being "like the skeleton of a sick man, all the fat and soft earth having been wasted away and only the bare framework of the land is left" (Rhodes & Odell, 1992).

According to Rhodes and Odell (1992) early attempts by authorities to protect the environment were generally undertaken for utilitarian or recreational reasons, particularly for use by the powerful people in the society. In Lower Egypt, for example, the Pharoes retained areas for hiking and hunting. In England, William the Conqueror extended forest law to large tracts of land (including the present day New Forest) "to protect and provide for sports and the provision of game" for his followers (p. 67-85).

The rise of modern conservation consciousness in Britain gathered momentum in the late 19th century with urbanization and the disappearance of

wild lands. State involvement in the regulation of natural areas for the public good began in the 1860s when legislation was passed to widen public access to common lands (e.g. the London parks such as Clapham Common). Running parallel to this was a growing romantic interest in nature and also a scientific concern (Rhodes & Odell, 1992).

In 1869, the philosopher and economist, J. S. Mill advanced arguments for the preservation of species for their own sake, independent of their economic utility (Western & Wright, 1994). Out of this developed the notion of a nature reserve managed for its wild and diverse species. On a much greater scale, conservation movements developed in the United States, led by John Muir; founder of the Sierra Club, and other spiritualists and romantics. The dominant theme was the attempt to reserve nature for its intrinsic value and in separation from humans. The fact that most environments are shaped by human activities was not recognized and the economic interests of local communities were entirely discounted. Thus Yellowstone, the first in a series of national parks, was established in 1872 to preserve the pristine wilderness, evicting the native Shoshone, Crow and Blackfoot Indians in the process. Only later were developing tensions such as those between preservationists and forest logging interests were publicly acknowledged (Western & Wright, 1994).

In the Roosevelt era, stand-offs arose over plans to flood a valley in the Yosemite National Park for the provision of water to San Francisco, followed in the post-World War II period by a series of water conflicts. The split later widened when the animal rights and deep ecology movements surfaced and

began to champion the interests of species and nature on ethical and moral grounds (Western & Wright, 1994).

Fortress conservation

In developing countries, early conservationists were similarly motivated by the desire to protect wildlife and nature in their pristine and undisturbed condition (Brockington, 2002). The main focus was the establishment and management of protected areas (PAs) in the form of forest reserves, nature reserves and national parks. Early initiatives included the establishment of forest reserves in the West Indies and a botanical garden in South Africa around the 1820's. The momentum to preserve forest and game in various parts of the colonial empires built up towards the turn of the century, and there was renewed activity after World War II (For example, in East Africa). During this period the colonial focus on hunting and game management merged with a growing international interest in wildlife conservation, and many controlled hunting areas and game reserves were reclassified as national parks (Adams & Hulme, 1997).

From the study conducted by Brockington (2002) the process of identification, establishment and management of conservation areas were top-down and politically-led with selection taking place centrally and implementation by government ministries. Emphasis on conserving an area is mostly given to protecting areas of high species-diversity or those where high-profile animals or natural habitats were threatened. Selection criteria were based on the need to protect features of global importance and local interests were barely recognized or taken into account. The management's aim was to

minimize human disturbance within PA boundaries so that natural, ecological processes would maintain the environment and continue to provide habitat suitable for wildlife. As in the early years of conservation experience in the USA, this followed a protectionist or fortress conservation approach in which local people living within the park were evicted and excluded from use of the natural resources on which they had previously been dependent (Brockington, 2002).

The outcome of this was often ongoing confrontation between the PA authorities and local people. In East Africa the Maasai and other pastoralists continued to graze their livestock, hunt game (or poach, depending on perspective) and cultivate land within newly established park boundaries. In an effort to prevent such practices, the authorities were forced to commit greater resources to maintaining and patrolling boundaries and enforcing regulations (Western & Wright, 1994). Problems became more serious over time, brought about by increasing population pressure on PAs and surrounding areas, and the escalating cost of protection. The fencing of areas sometimes also had a deleterious effect on the wildlife for which the PAs had been established, particularly where fences crossed migratory routes.

The problems of fortress conservation with its top down and centralized approach to PA management generally failed to protect the wildlife as fully as intended and often caused hardship to local communities. The attempt to separate conservation from development concerns was increasingly challenged and the approach was ultimately overtaken by another discourse often termed community-based conservation (Western & Wright, 1994; Adams & Hulme, 1997).

Community-based initiatives

In contrast to fortress conservation, Community-Based Conservation (CBC) is based on an improved understanding of the linkages and mutual dependence between conservation and local people and the need for people to participate in conservation activities (Duffy, 2001). Duffy, (2001) commented that, it is the decisions and actions of local people that bring about biodiversity loss and the best approach is to work with them, and get them on management's side, as being a key importance to conservation. Development of the CBC narrative runs alongside improved understanding of the economic rationality of poor rural people and growing recognition of the depth and value of indigenous knowledge in biodiversity conservation is key (Duffy, 2001).

Conservation outside protected areas

Though conservation practice has moved on a long way from legacy of fortress conservation, conservation funding is still dominated by the establishment and management of Protected Areas (PAs) chosen for their contribution to global biodiversity and containing high species diversity or rare or endemic habitats under threat (World Bank, 2000). Even where project activities are classified as relating to conservation outside PAs, this often means the management of buffer zones rather than areas with no connection to PAs at all. Such a continued focus on PAs reflects the continued nature or wildlife conservation mindset and the emphasis this places on the protection of natural habitats and can threatened species.

As more and more natural ecosystems are converted or heavily modified, exclusive reliance on a PA network becomes less viable.

Examination of environmental policy and practice in developed countries demonstrates that managed areas, as well as natural landscapes, contain much of environmental value and should be considered as important for conservation. Many highly modified and fragmented landscapes in developed and developing nations alike provide habitats for a wide variety of adaptable and new species and for the numerous ecological functions that sustain agriculture (Salafsky, Cordes, Parks, & Hochman, 1999). Exclusive concentration on global concerns for their rarity or diversity is no longer appropriate and it is necessary to widen our appreciation and consider the value of biological resources in all areas and to all people.

Many of the world's poor live in such agricultural landscapes greatly changed from their natural state and where natural resources are exploited for productive purposes. The aim of donor interventions in these areas is poverty reduction and welfare enhancement and, though sustainability concerns are also considered important, biodiversity conservation as such usually takes a back seat. This is despite the recognition of the role wild biological resources play in the livelihoods of rural communities, and especially of the poor (World Bank, 2000). On this note, the present study looked at how funds given to Okyereko Cooperative Society and the Global Habitat for Homeless impacted on the poverty situations in the project communities and how they were able to conserve the biodiversity.

Community Based Strategies to Biodiversity Conservation

In the parallel struggles for rural poverty reduction and the conservation of healthy ecosystems in Ghana, increasing evidence over the

past years suggests that poor rural communities are seizing new opportunities to develop livelihoods based on sustainable environmental management and emerging niche-markets in agriculture, tourism, forestry, and other biodiversity related sectors. Communities all over the world are leveraging the economic value of historically non-economic assets such as local culture and previously undervalued natural resources. Harnessing the currents of globalization, these communities tap the creativity of entrepreneurs and initiate collaboration with wholesalers, retailers, investors, product certifiers, and ultimately customers in complex value chains dubbed by a recent article “Sustainable Local Enterprise Networks” (Wheeler, Petty & Bizer, 2005).

Development agencies are observing a trend in which local communities depend heavily on biodiversity conservation sites found in the area and calling for a focus on community and enterprise-based strategies in pursuit of the Millennium Development Goals and other Multilateral Environmental Agreements (CBD, 1992). In an effort to reduce the dependency on natural resources, markets have been engaged to demand for local products, including village life as a commodity in itself, has been growing for years. As eco-tourists come to visit from afar, poor communities have an opportunity to build, consolidate and rejuvenate their assets: indigenous culture, wilderness (nature), educational experiences and remoteness are increasingly in high demand.

Definition of Assessment

Patton (1988) defines assessment as the practice that involves the systematic collection of information about activities, characteristics and

outcomes of programs, personnel and products for use by specific people to reduce uncertainties, improve effectiveness and make decisions with regard to what those programs, personnel or products are doing and emphasizes a systematic collection of information about a broad range of topics for use by specific people for a variety of purposes.

In contrast to Patton's general theoretical definition, the FAO (1988) defines assessment more practically as “ an evaluation as objective as possible of how a project has been done, how well participants are doing and the effects the project is having on intended beneficiaries” (p. 25).

Assessment can also be defined as periodic objective evaluation of a planned, on-going or completed project, program, or a policy (Imas & Rist 2009). According to Dart (1998), assessment involves the systematic collection of information about an activity or action in order to determine its worth or merit. It is a major part of learning and can provide a wealth of useful information on the outcomes of a project or action and the dynamics of those who undertake the project.

Assessment is used to answer specific questions that are related to design, implementation and results. In contrast to continuous monitoring, they are carried out at discrete points in time and often seek an outside perspective from technical experts. Their design, method and cost vary substantially depending on the type of question the assessment is trying to answer. Broadly speaking, assessment can address three types of questions (Imas & Rist, 2009). Firstly, descriptive questions; these seek to determine what is taking place and describes processes, conditions, organisational relationships and stakeholder views. Secondly, normative questions; these questions compare what is taking

place to what should have taken place; it assesses activities and whether or not targets are accomplished. Normative questions can apply to inputs, activities, and outputs. Thirdly, Cause-and-effect questions; the cause-and-effect questions examines outcomes and tries to assess what difference the intervention makes in terms of outcomes of projects. Impact assessment is a particular type of assessment that seeks to answer cause-and-effect questions. Unlike the general assessment which answers many types of questions, impact assessment is structured around one particular type of question. This research was intended to answer cause- and- effect questions in order to get the actual impacts of biodiversity projects at Gomoa Okyereko and Gomoa Adam.

On the other hand, in the context of participatory research of a project, an assessment can be thought of as a dynamic process specific in which both qualitative and quantitative measures have roles to play. Therefore, generic assessment framework should be an iterative, cyclical process involving feedback loops into the project itself having the capacity to be context specific and flexible to use both qualitative and quantitative measures.

Types of Assessment

According to Soares (2011) assessment types can be classified by applying various criteria. One of them is the time in which assessment was carried out with respect to the implementation of a programme (ex-ante assessment, mid-term assessment and ex-post assessment). Another criterion is the "location" of those who conduct the assessment and their dependence on the programme executors. If assessment is conducted by an independent contractor, then, it is termed external assessment. The external assessment is

assumed to guarantee independence of judgements and opinions. Its advantage is the fact that it is carried out by companies specialising in this kind of activity that ensures professionalism of the services provided. This external assessment can be subject to risk of inappropriately formulated conclusions and recommendations made by evaluators, resulting from the lack of an in-depth knowledge of institutions involved in the implementation of the external assessment of project (Soares, 2011).

In the case of the assessment conducted by people directly or indirectly connected with the administration responsible for a project, it is called internal assessment. Owing to this relation, a given institution can do its own assessment and because of that formulated recommendations can be more useful. However, the main weakness of this type of assessment is its lack of objectivity at analyses and data interpretation as well as the lack of trained personnel. As far as this research was concerned, it is an external assessment, because it was conducted by independent person who is different from the people who engaged directly in the projects.

According to Soares (2011) there are three types of project assessment according to the stage of the project it was carried out. Brief descriptions of the assessment types are as follows.

1. Ex-ante assessment is performed before programme implementation and its objective is to assess whether the planned intervention is accurate with regard to needs (of a sector or beneficiaries) as well as coherent with reference to planning aims and how they will be implemented. It can also be the assessment of a context, the identification of potential difficulties as well as the diagnosis of target group needs and expectations.

Ex-ante assessment is defined by Rossi and Freeman (1993) as an interactive process of providing judgement and recommendations by experts, separately from the planning, policy or programme issues. They further stressed that the objective of the ex-ante assessment is to improve and strengthen the final quality of a plan or programme under preparation. In this regard, assessment of this nature has to facilitate a constructive dialogue between people responsible for the project or programme and the experts. This means that ex-ante assessment also constitutes a key element to understand projects and allocate financial resources, indicating clearly the rationale and the scope of choices made. In the views of Rossi and Freeman (1993) six main elements of a project should be covered by the ex-ante assessment. These are: the analysis of the so-far experiences; the diagnosis of the socio-economic context of assistance; the assessment of the legitimacy of choices made and priorities of measures accepted as well as the assessment of their internal and external coherence; the assessment of the quantification of objectives; the assessment of the anticipated socio-economic influence as well as resource allocation and the assessment of the accepted programme implementation arrangements.

2. Mid-term assessment is another assessment type which according to Soares (2011) is performed towards the middle of the implementation of an intervention. This assessment critically considers the first outputs and results which enable the assessment of the quality of a programme or project implementation. It is essential for the assessment to be based on the assumptions made during the preparation stage particularly objectives and agreed indicators as well as the current context of the implementation. This is

especially crucial as a change in socio-economic conditions can make the initial diagnosis that was the starting point for the implemented intervention outdated. As a consequence, the results of this assessment may contribute to certain modifications to the implementation of an intervention and to up-date adopted assumptions. The mid-term assessment is to a large extent based on the data derived from the monitoring system and its quality depends on the scope and reliability of monitoring data (Soares, 2011).

Within the mid-term assessment, the following issues should be particularly taken into consideration: the analysis of the results of previous assessment that can provide the crucial data with regard to the intervention being assessed; the repeated (updated) assessment of the relevance of the adopted strategy; the examination of factors that have occurred and that can have an impact on the implementation process and the efficiency in achieving the original objectives; the confirmation whether the objectives have been defined accurately with regard to currently existing needs of the sector and beneficiaries; the assessment whether indicators are relevant as well as whether their additional modification would be necessary; the assessment of the so-far effectiveness and efficiency, particularly the results achieved so far and also the progress in attaining objectives; the assessment of the management quality of the project implementation; the assessment of how reliable data collected are referring to the project and the intervention results including the monitoring system and providing useful information for making decision about the performance of the programme or the project.

3. Ex-post (impact) assessment is the assessment of an intervention after it has been completed. According to Soares (2011), it should be carried

out not later than five years after the end of the implementation period. The ex-post (impact) assessment aims at examining long-lasting effects of a project and their sustainability. It is worth noticing that some results of a project impact will be visible only in the longer period. Thus, the assessment of intervention sustainability has sometimes has an estimated character taking into consideration only present conditions.

The overall assessment of the effectiveness and efficiency of an intervention as well as its accuracy and utility are of major importance. The reference to agreed objectives and the verification to what extent they have been achieved is particularly crucial here. This assessment comprises the examination of the anticipated effects as well as the identification of the effects brought by an intervention that have not been expected and this is of great importance as ex-post assessment not only recapitulates the implementation of an intervention but also constitutes the source of useful information for planning future interventions (Soares, 2011).

The research conducted at Gomoa Okyereko and Gomoa Adam in the Central Region of Ghana adopted ex-post (impact) evaluation design because the projects have been completed.

Types of Impact Assessment

According to Ponniah, Martella and Rukuni (1996) comprehensive impact assessment can be undertaken at the people (household) and community impacts levels.

People level impact

People level impact refers to the effect of the intervention on the ultimate users or target group for which the technology is developed and adopted. Impact begins to occur when there is a behavioral change among the potential users. The people level impact deals with the actual adoption of the appropriate technologies and subsequent effects on production, income, environment and whatever the development objective may be (Omoto, 2003). The people level impact can be economic, socio-economic, socio-cultural, and environmental.

The research looked at how the projects at Gomoa Okyereko and Gomoa Adam impacted on the economic, socio-cultural and environmental conditions of the people.

Economic impact assessment

Economic impact measures the combined production and income effects associated with a set of research and development activities (Ponniah & Martella, 1999). The economic impact assessment studies range in scope and depth of evaluation from partial impact studies (adoption studies) to comprehensive assessment of economic impacts (FAO, 2000). One popular type of partial impact assessment is adoption studies that look at the effects of new technologies such as the spread of modern crop varieties on farm productivity and farmers' welfare. Economic impact assessments are the comprehensive look beyond mere yield and crop intensities to the wider economic effects of the adoption of new technology.

Social impact assessment

Social impacts are important and need to be considered along with the economic and environmental impacts. Social impacts assessment include the effects of a project on the attitude, beliefs, resource distribution, status of women, income distribution, institutional implications of the community concerned. These can be assessed through socio-economic surveys and careful monitoring. Social impact has the potential to contribute greatly to the planning process of other types of development projects (FAO, 2000). It can assist in the process of assessing other possible alternatives to the project and help in their understanding and management of the process of social change.

In many studies, impact assessment is overlooked especially in agricultural research and development. Only few economic studies have included social impact analysis through qualitative assessments (FAO, 2000).

The research considered how the projects at these two communities involved the traditional authorities, the people in the communities and their social values during the implementation and after the projects.

Environmental impact assessment

The importance of environmental impact evaluation is increasing in agricultural research and development interventions due to the growing concerns of land degradation, deforestation and loss of biodiversity around the world. However, there are few countries and research institutions that have formally assessed the environmental impacts associated with agricultural research projects (FAO, 2000). The research that was undertaken at Gomoa

Okyereko and Gomoa Adam looked at the extent of trees species planted and acreage covered during the implementation of the projects.

Community level impact assessment

The community level impact assessment includes the institutional and the beneficiary impact assessment. This has been described as follows.

Institutional impact assessment

According to North (1996), strengthening local institutions has long been an important goal of biodiversity research and development. Organizations play an important role in strengthening local people's capacity by improving technologies and knowledge base of the biological, social, economic and political factors that govern the performance of a biodiversity conservation project. Most impact assessment studies are often subjected to rigorous appraisals from economic and environmental perspectives without giving due attention to the institutional aspect of the interventions (North, 1996).

While economic, environmental and social impact focus on the impact assessment of the technological outputs of projects and development organizations in the form of new techniques, methods, information and practices of the systems being used. Institutional impact assessment involves the assessment of the performance of an intervention in non-technical activities such as training, networking, facilitation, development of methodologies and advisory services in the areas of research and other policies, organization and management. The concrete results and impacts of

institutional development can be difficult to see and may take time to emerge. However, information, generated from institutional impact assessment has the great potential to lead to better, more effective actions and institutional performance of a project and development system (FAO, 2000). Institutional and organizational impact is measured in terms of changes in policy, institutional structure, networking, arrangements and achievements in human capacity building (Omoto, 2003).

The research also considered the roles played by the Gomoa East and Gomoa Districts, District Forestry Commission and the District Fire Office at the two districts during the training of the project management committee members and the fire volunteers at these two project sites.

Beneficiary impact assessment

Impact assessment of project beneficiary is a systematic inquiry into people's values and behavior in relation to a planned or ongoing intervention for social and economic change. This method draws heavily from the tradition in social science known as "qualitative research that fundamentally depends on watching people in their own territory and interacting with them in their own language and getting their opinion on the project they were involve" (Kirk & Miller, 1986, p. 36).

Beneficiary impact assessment also includes direct observation, incorporating simple counting which is expressed in quantitative terms. The ultimate goal of beneficiary impact assessment is to reveal the meaning people give to particular aspects of their lives so that development activities may better enhance people's ability to improve their own living conditions. This

demands close rapport between the practitioner of this approach, the beneficiary and the development practitioners. The beneficiary impact assessment approach is not intended to replace the questionnaire survey but to provide reliable qualitative, in-depth information on the socio-cultural conditions of a beneficiary population which is intended to be of immediate use to project managers and policymakers responsible for improving people's lives (Kirk & Miller, 1986).

The key assumption underlying beneficiary impact assessment is that, the people for whom development is intended, the beneficiaries, often lack a voice loud enough and clear enough to be heard by the project managers of development activities. Developing countries and donor institutions do not listen to the beneficiaries for lack of training or inclination. Sound beneficiary impact assessment is by encouraging people to express their beliefs and values, which leads to development which responds to participation of people in their own development. In this way, beneficiary impact evaluation or assessment may be seen as forging what is often a missing link in development work, introducing the socio-cultural dimension systematically so that programs and policies are designed and implemented for and by the people for whom they are intended and thus are sustained long after the last disbursement of funds is spent (Caroline, 1997).

The need to gain a practicable understanding of people's values and behaviour is essential to any effective development work. The way to proceed and the precise method to employ will vary according to the nature of the development activity, the beneficiaries, the managers and the phase of the

activity. Nevertheless, there are general practices which should be followed in all beneficiary impact assessment (Smout, 2000).

That is, the views of the beneficiaries of the projects are crucial for effective assessment of what the project achieved. The researcher sought the views of the projects beneficiaries from the two communities. The views of the project beneficiaries were included in the research to arrive why certain project activities were not achieved. For instance during the focus group discussion at Gomoa Okyereko, one beneficiary argued that the livelihood activities like the bee-keeping, grasscutter and snail farming were discontinued due the bees that came to the town to sting the community members.

Reasons for Conducting Impact Assessment of Development Projects

Impact assessment recapitulates and judges the entire project, particularly its outcomes and impacts. Its aim is to account for the use of resources and to report on the effectiveness and efficiency of interventions and the extent to which expected effects were achieved. It focuses on factors of success or failure and on the sustainability of results and impacts. It tries to draw conclusions that can be generalized and applied to other programmes and projects at other areas or regions (Baker, 2000).

Ideally, the results of impact assessment should be available when the next project is planned. That is, at least a year before the start of the next project. However, for project impact to be produced, impact assessment would have to be performed not later than five years after the end of the programming period. While waiting for this period to pass, a provisional

review is often requested shortly before the end of the programming cycle in liaison with the ex-ante assessment of the project (Soares, 2011).

The assessment of the projects started four years after the implementation of the projects at the two communities. The purpose of this assessment was to find out the activities that were carried out at these two project communities and whether the people in the communities were involved in the planning, implementation, execution and enactment of the bye-laws for the projects. Furthermore, the achievements made by the projects in terms of what was planned and achieved at the end of the projects. Finally, the strategies used in terms of management committees formed and their roles to ensure the success of the projects.

Conceptual Framework

This part discusses the conceptual framework which guided the study. It was used by Margoluis and Salafsky (1998) to analyse effective biodiversity conservation. Figure 1 shows the key elements of the conceptual framework which are subsequently explained.

Practitioners and their values, knowledge and skills

The first part of the model (Figure 1) shows the practitioners that take conservation action at any given project site. Analogously to the way that Callicott, Crowder and Mumford (1999) describe ecosystems, we can describe these practitioners from both compositional and functional perspectives.

From a compositional perspective, at the most basic level, actions are undertaken by individuals who value conservation and have the skills and

knowledge to make it happen. Individuals involved in conservation include resource users, field practitioners, program and portfolio managers, researcher, donors and policy makers.

At the next level (Figure 1), individuals are generally affiliated with organizations which include non-profit making organizations, government agencies, for-profit firms, universities, research centers and foundations. Within each of these categories, organizations can be further subdivided based on size and primary focus (For example, local verses global). Instead, at the next level they form project alliances with other organizations to implement specific projects. These alliances can take different forms, including informal collaborations, contractual agreements, partnerships, and consortia (Margoluis et al., 2000). Finally, at the highest level are the various networks that enable individuals, organizations and alliances to work and exchange information with one another. Networks include informal working groups, organizational families, learning portfolios and academic societies.

Conservation actions: Approaches, strategies and tools

The second part of the model shows the conservation actions that project managers can use to change the project situation. Selecting the right actions to achieve conservation may seem like a simple task but it can in fact be quite difficult. Traditionally, conservationists employ one broad approach. That is, the direct protection through the establishment of parks or by limiting harvest of key species from the conserved area.

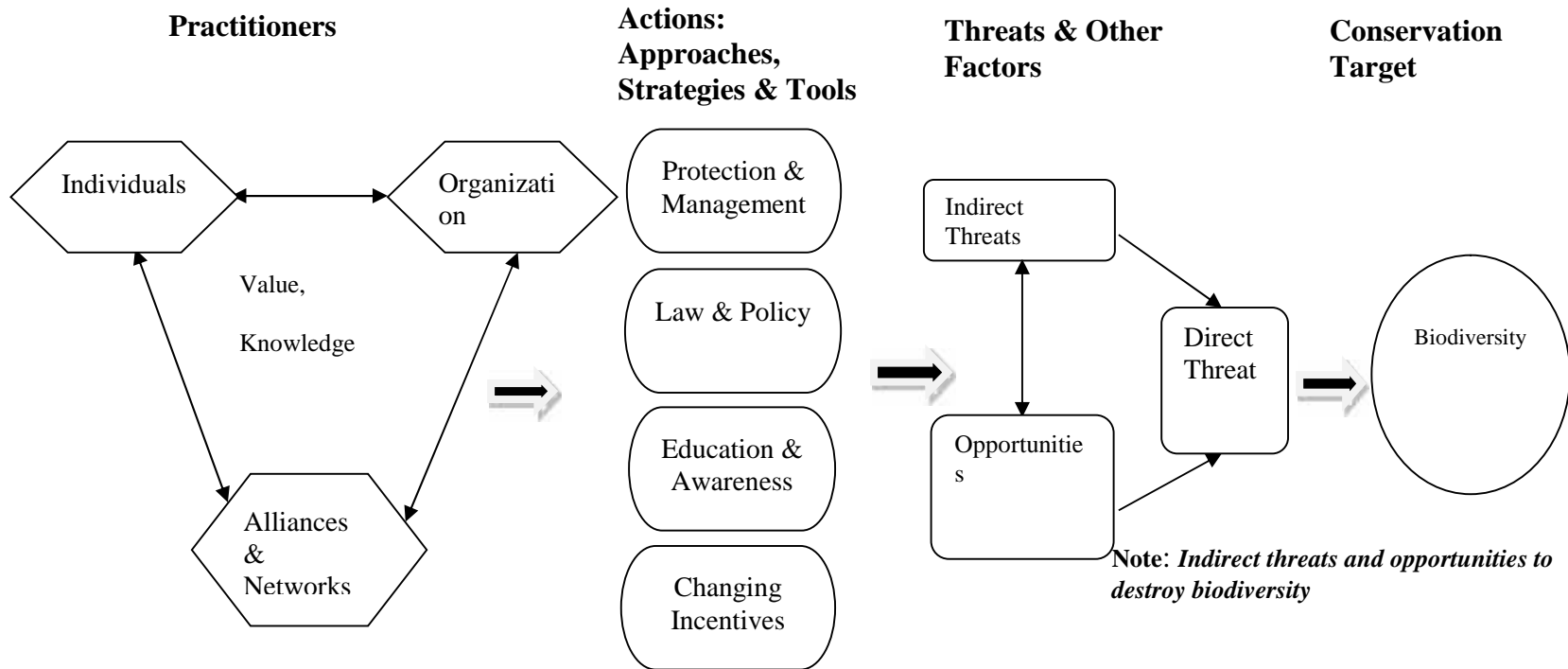


Figure 1: Biodiversity Conservation Model

Source: Margoluis and Salafsky (1998)

From Figure 1, over time they begin to add other approaches to their tool kit including legal and policy reform and environmental education efforts. And more recently, conservationists have begun trying to find economic and other incentives that would induce stakeholders to act to protect and conserve biodiversity. As shown in the general model (Figure 1), conservation actions can be broadly grouped into four categories: direct protection and management, law and policy, education and awareness, and changing incentives.

Threats to biodiversity conservation

In the general model (Figure 1), direct threats are the factors that negatively affect biodiversity (for example, commercial logging or overfishing by local community members). When it comes to how to counter these threats, it becomes important to know who or what causes the threats. Thus, in listing direct threats, it is important to specify who or what is behind them: logging by local people to build their houses is a different threat than logging by large industrial companies even if the same people cut down the trees in both case. In general, it is convenient to divide direct threats into internal threats caused by people who live around or near the site and external threats caused by people who live some distance away. Behind these direct threats are indirect threats and opportunities that are the drivers that lead to the direct threats (for example, poverty and local people's lack of education and awareness of resource management or resource management institutions to help them).

Biodiversity as the conservation target

The starting point for any project is to define the specific conservation target that the project ultimately would like to influence (Margoluis & Salafsky, 1998). In the general model of a conservation project, the target is biodiversity conservation. In most projects, biodiversity is defined as the species and ecosystems in a specific area, the scale of which can range from a small pond to an entire continent. For some projects, however, the targeted biodiversity cannot be tied to specific places but must be regarded as a stand-alone entity (For example, population of migratory birds and fishes). In some cases, defining a specific area or population to manage biodiversity may be fairly straightforward such as the biodiversity in a given national park. In most cases, however, such definition is surprisingly difficult (Salafsky, Cordes, Parks, & Hochman, 1999).

Integrated conservation and development projects present a difficult challenge in defining a target because, by definition, they have multiple targets related to both biodiversity conservation and improving human welfare.

As a rule in these cases, it is operationally easier to develop separate conceptual models for each target. In doing so, one generally finds that sustainable development concerns appear as factors affecting conservation targets and vice versa. In other words, conservation is a necessary but not sufficient condition for sustainable development. Sustainable development is a necessary but not sufficient condition for conservation (WCU, UNEP & WWF, 1991; Robinson & Opler, 1993; Redford & Mansour, 1996). In this study, restriction is made to cases in which biodiversity appears as the target

and do not enter into the entire debate over conservation versus sustainable use.

In Figure 1, it is assumed that all threats to biodiversity are linked to human activities following the compositionalist argument outlined by Callicott et al., (1999), which states that “Homo sapiens’ acquisition of culture has propelled the species out of nature’s ambit” so that “any human modification of nature is unnatural.” The stages in the conceptual framework helped the researcher to identify the roles played by the traditional authority, opinion leaders, project management committee members and the beneficiaries of the projects at these two communities (p. 26).

Impact assessment framework

Another model that the study looked at was impact assessment framework by Savedoff (2006). The framework illustrates how to assessment the achievements of a biodiversity conservation project. The model (Figure 2) explains what should go into evaluation research. In Savedoff’s view, project impact assessment study should start from the resources used in the project, the processes followed to utilize those resources for generating certain outputs, what the project has produced in physical terms and the changes that it has brought in the project environment.

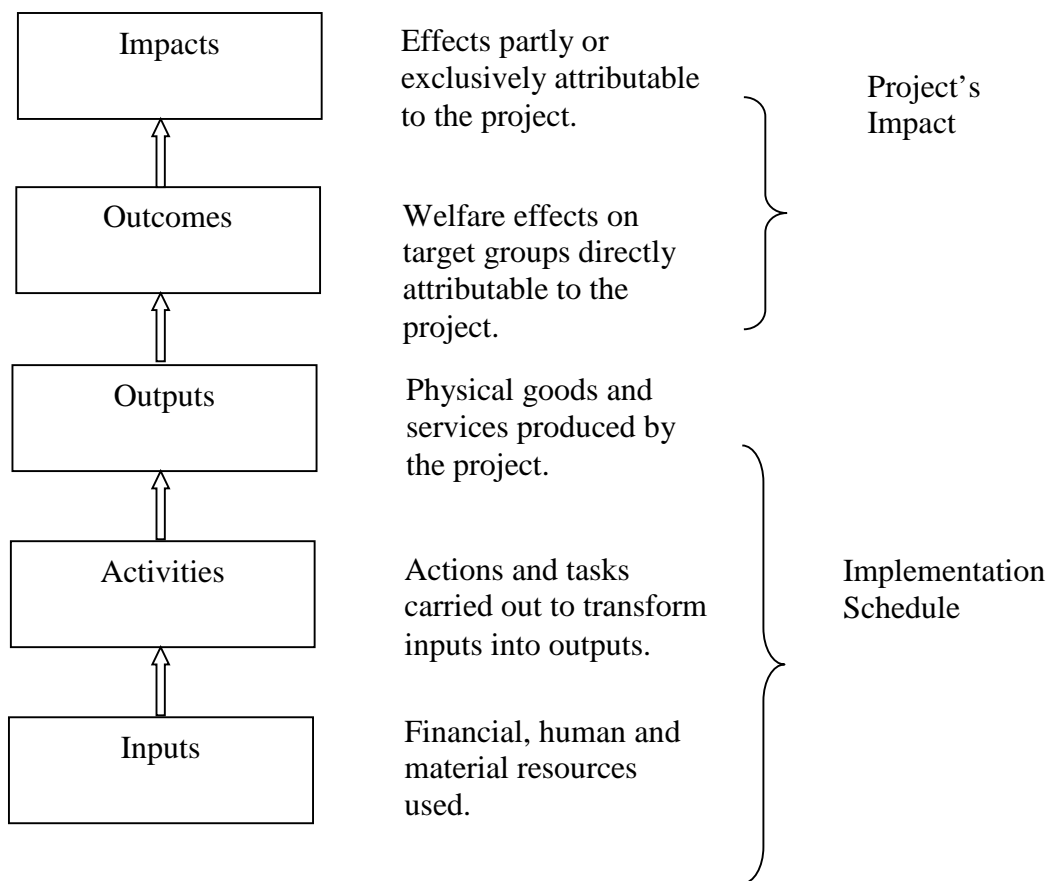


Figure 2: Impact Assessment Framework

Source: Adopted from Savedoff (2006)

Adapted conceptual framework

This part of the study discusses the adapted conceptual framework which guided the assessment of the projects at Gomoa Okyereko and Gomoa Adam in the Central Region of Ghana. It was adapted from Margoluis and Salafsky (1998) and Savedoff (2006).

The adapted framework made use of a number of variables used by Margoluis and Salafsky (1998), and Savedoff (2006). The two frameworks were fused together based on the reviewed literature and the GEF (2012) guidelines for assessment of their projects. The framework was adapted because the original biodiversity conservation model failed to present the

values, knowledge and skills of UNDP/GEF/SGP, Okyereko Co-operative Afforestation Society, Global Habitat for Homeless and Community leaders as stakeholders' inputs that led to conservation target as the impact of the projects. The conceptual framework was also adapted because when impact assessment framework is fused into the biodiversity conservation framework its helps to capture basic dimensions that lead to the realization of the research objectives.

Integrated biodiversity conservation model

The first part of the adapted model (Figure 3) shows the inputs of practitioners in the form of values, knowledge and skills that conservation practitioners bring together to undertake conservation action at any given project site. This explains how at the most basic level, biodiversity actions are undertaken by individuals in communities who value conservation and have the skills and knowledge to make conservation of biodiversity a reality. Individuals involved in GEF conservation projects include resource users, field practitioners, programme and portfolio managers and project fund donors. The views of these individuals during assessment of a project cannot be under estimated because they participated in the projects. These individuals and organizations further form project alliances with other organizations to implement projects. These alliances can take different forms, including informal collaborations, contractual agreements, partnerships and consortia.

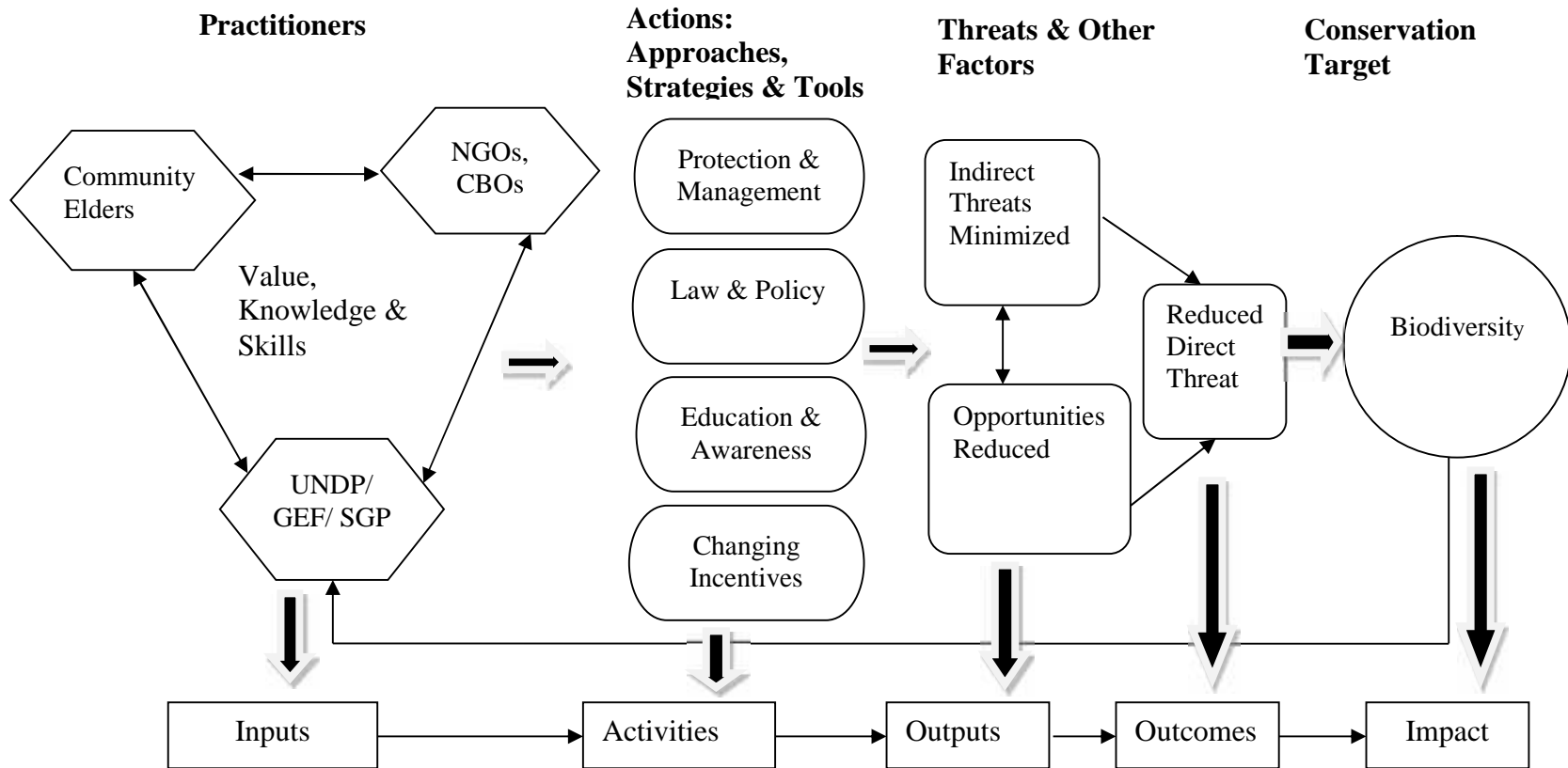


Figure 3: Integrated Biodiversity Conservation Model

Source: Adapted from Margoluis and Salafsky (1998) and Savedoff (2006)

Conservation actions: Approaches, strategies and tools

The second part of the adapted model shows the outputs in the form of approaches, strategies and tools that the project managers use in changing the project situation during the implementation of the project. From the literature reviewed so far, the traditional point of view of those who are involved in biodiversity conservation (the conservationists) employ one broad approach. The direct protection can be done through the establishment of the reserved area or by limiting harvest of key species. Over time, they begin to add other approaches to their tool kit, including legal and policy reform and environmental education efforts. GEF projects task the project managers at the community level to add other livelihood options and incentives that would induce stakeholders to act to protect and conserve biodiversity.

As shown in the adapted model (Figure 3), conservation actions can be broadly grouped into four categories: direct protection and management, law and policy, education and awareness, and changing incentives. These are the things that projects managers with the support from GEF are able to initiate on their own in order to sustain the project. As a matter of fact, laws, policies, education and awareness creation are all tools to ensure the success of the project.

Threats to biodiversity conservation

The adapted model (Figure 3) explains the direct threats that can also negatively affect biodiversity conservation target (for example, commercial logging or overfishing by local community members). When it comes to how to counter these threats, it is important to know who or what is causing which

threat. Thus, in listing direct threats, it is important to specify who or what is behind the threats: logging by local people to build their houses is a different threat from logging by large industrial companies even if it is the same people cutting down the trees in each case. In general, it is convenient to divide direct threats into internal threats caused by people who live around or near the site and external threats caused by people who live some distance away. Behind these direct threats are indirect threats and opportunities that are the drivers that lead to the direct threats (for example, poverty and local people's lack of education and awareness of resource conservation or resource management institutions). These direct and indirect threats can be reduced or solved by introducing alternative livelihood options, educating the people and awareness creation which has been a characteristic of many GEF projects.

Biodiversity as the conservation target

According to Margoluis and Salafsky (1998) the starting point for any project is to define the specific conservation target that the project ultimately would like to influence. In this adapted general model of a conservation project, the main target is biodiversity conservation. In most projects, biodiversity is defined as the species and ecosystems in a specific area, the scale of which can range from a small pond to an entire continent. For some projects, however, the targeted biodiversity cannot be tied to specific places but must be regarded as a stand-alone entity (For example, population of migratory birds and fishes). In some cases, defining a specific area or population to manage biodiversity may be fairly straightforward. Example is

the biodiversity in a given national park. In most cases, however, such definition is surprisingly difficult (Salafsky et al., 1999).

This adapted model goes also used the assumptions by Callicott et al. (1999) that all threats to biodiversity are linked to human activities. This is similar to the compositionalist argument outlined in Figure 1 which states that “Homo sapiens’ acquisition of culture has propelled the species out of nature’s ambit” so that “any human modification of nature is unnatural.” For the purpose of this study, the biodiversity conservation target emanated from the anthropocentric approach to biodiversity conservation where the main aim of conserving an area is linked to species which when extinct will have impacts on the future of mankind (p. 30-35).

The model was adapted for this study because it exhibits the major approaches use by GEF in its conservation efforts. The approaches ensure that there is a cordial relationship between the NGO or CBO requesting for the grant from GEF and the community in which the organization is going to operate. In addition, GEF project must have a management team, laws and policies in place to ensure smooth running of the project. Above all, there should be education and awareness creation for every GEF sponsored project before the implementation of the project in the community.

Summary of the Related Literature

The following deductions can made from the reviewed literature:

First, it can be seen that participation of the community members in project assessment study is critical as a way to cross check the information found in the project documents. Secondly, social norms of the people around

the conservation project should also be factored into the assessment study since they could have influence on the project. Thirdly, reasons for implementing the biodiversity conservation project should also be taken into consideration when assessing the impacts of biodiversity project.

Furthermore, assessment of project impacts may be difficult where there are no baseline survey before the implementation of the project and well-defined objectives and activities of the project. In addition, in assessing impacts of biodiversity project it is important to look at the involvement of the people in the project community to ensure that the possible issues that will affect the project in the near future are addressed.

Finally, for effective assessment of the achievements of a project to be conducted there should be progress report on the project and a field survey after the implementation of the project using questionnaires, focus group discussions, observation checklist and document review checklist.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the methodology followed in carrying out the study. It describes the study area, research design, sources of data and information and target population. It further explains how the sample size was determined, sampling procedures, research instruments and the procedures followed in data collection, data processing and analysis as well as its presentation. Ethical considerations are also discussed.

Study Area

Gomoa Okyereko is a farming community in the Gomoa East District in the Central Region of Ghana. It is situated about 1.5 Kilometre off the Accra Winneba road and 49 Kilometre from Accra. The population of the community is about 2500. The major occupation of the people of Gomoa Okyereko is farming in vegetables, cassava, maize and rice (Gomoa East District Assembly, 2012).

There are 12 traditional biodiversity conservation sites within the Gomoa Okyereko geographical area with a total land area of about 100 hectares. These protected areas harbour animal species like monkeys, antelopes, grasscutters, birds and reptiles. Economic trees like *wawa*, *osina*, *ceiba*, *mahogany* and other medicinal plants can also be found within these protected areas. These protected areas were partly destroyed by some indigenous people, especially group hunters and farmers who engage in

unsustainable farming practices like slash-and-burn methods of farming (OCAS, 2005).

With the efforts of the chiefs and elders of Gomoa Okyereko they were able to get funds from the UNDP/GEF/ Small Grant Programme to prevent the community members from destroying these conserved areas.

Gomoa Adam is also a farming community in the Gomoa West District of the Central Region, about five kilometres off the Apam – Cape Coast road and near the Kyirem Nkwanta Junction. The population of the community is about 2,100. The major occupation of the people in and around the community is farming in maize, cassava, plantain, vegetables and also processing gari for sale (Gomoa East District Assembly, 2012).

According to the elders of the community, the people of Gomoa Adam migrated from Techiman in Brong Ahafo Region and have lived in this area for so many years. The people lived peacefully near a large forest which part of it was declared as the home of their forefathers' fetish and burial grounds of the chiefs. These places were named after the gods and the first chief who led them from Techiman (Onya eku and Nana Sumuru respectively). The Onyaaku Shrine Forest was formally measured about 36 hectares whilst Sumuru was about 60 hectares. These forests harbour different species of animals, examples of these are monkeys, grasscutters, porcupine, antelopes, birds, reptiles and other medicinal plants. There is a very large stream which the inhabitants use for drinking and domestic activities. Due to human activities along the banks, the stream was partly destroyed.

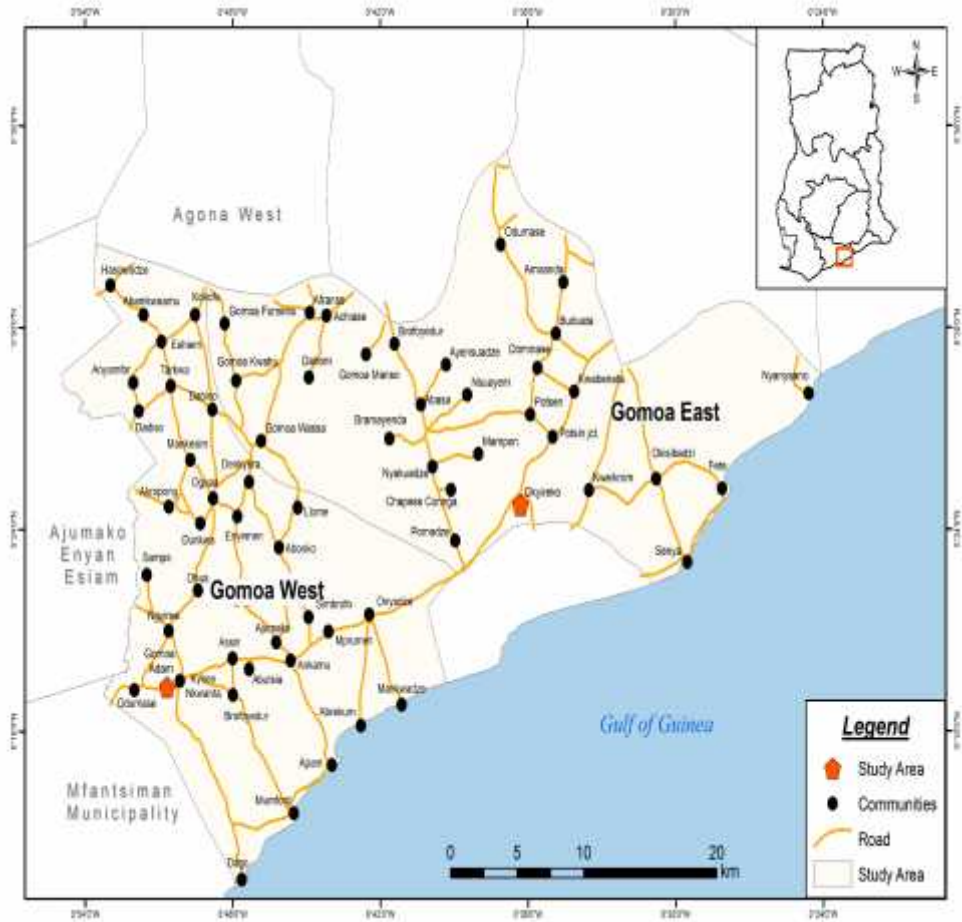


Figure 4: Map of the Study Areas in Regional and National Context

Source: Cartography Unit, DGRP, University of Cape Coast (2014)

Research Design

The study adopted evaluative and descriptive research designs. The evaluative research design is used when the phenomenon of interest has already occurred or has been completed some years before the time of assessment, observation or measurement (OED, 1996).

Descriptive design describes and interprets what exists (Payne & Payne, 2004; Punch, 2003). A descriptive design is concerned with the conditions of project that exist or are available, and opinions of those who were directly or indirectly involved in the projects (Glynn & Woodside, 2009;

Creswell, 2003). Unlike the explanatory research design which focuses on “why” questions, descriptive research design is used to obtain information concerning the current status of the phenomena under study and to describe “what” exists with respect to variables or conditions (Creswell, 2005; Sarantakos, 2005).

The descriptive design was well thought to be appropriate for this study because, the objectives of the study were basically to assess and examine the activities of the projects that were carried out towards the biodiversity conservation projects and what were finally achieved at the project areas.

Sources of Data

Data was gathered from both primary and secondary sources. Primary data sources constituted data collected in its original form from the field by the researcher. This data was collected using interview schedule, focus group discussion guides (FGDs) observation checklist and digital pictures of some of the project activities and outputs.

The study also reviewed past and contemporary authors like Tsikata, Attuquayefio, Ofori-Sarpong, & Adomako, who have researched into biodiversity conservation projects. In addition, relevant organizations like UNDP/GEF Small Grants Programme and other Community-Based Organizations were contacted for appropriate secondary data and information. Finally, data and information were also gathered from libraries, journals and internet sources.

Target Population

The target population for the study included all beneficiaries and non-beneficiaries of the projects. These were chiefs, assemblymen, project managers, community members and the National Co-ordinator of UNDP/GEF/SGP programme.

The target population for the study was 151 and the sample size was 110 (i.e., 73% of the target population) was selected. The sample size was made-up of 51 beneficiaries from Gomoa Okyereko and 59 beneficiaries from Gomoa Adam. This sample size was arrived at using Yamane (1967) sample size table at 95% confidence level (See, Appendix A). The Yamane's sample size table is a table with various target populations and the appropriate sample sizes. The 95% confidence level was chosen because it was appropriate for the study.

Sampling Procedures

Both probability and non-probability sampling techniques were employed. The communities involved in the research were purposively selected based on communities with projects that have been completed for more than four years. The reason for this is that, for assessment to be done on a specific project, that project should have been completed for some years before the impact of the project can be seen or felt (OED, 1996).

Stratified sampling technique was used to classify the beneficiaries of the two projects into those who were trained in land and forest management, agro-forestry, small business enterprise programme, plantation development, demonstration farms, Moringa plantation, income generating activities and

environmental brigade to fight fire. Proportionate allocation was done for each category of the target population to get the views of the people who engaged in the various activities. Simple random sampling method (i.e. the lottery method) was used to select the sampling units. The allocated number to each stratum was subjected to the lottery technique until the required sample size was obtained as presented in Tables 1 and 2 respectively. The reason for using stratified sampling and simple random techniques were to give each beneficiary from the various activities an equal chance of being included in the study. The sample from each category of activities gave the people the chance to comment on the activities they were engaged in.

Table 1: Gomoa Okyereko Project

Activity	People involved	Sample
Community members trained in land and forest management	28	21
People trained as fire volunteers	14	10
Members trained as Community-Based Management Committee	11	9
Community leaders trained in plantation development	6	4
Women trained in improved wood stoves	10	7
Total beneficiaries	69	51

Source: Field data (2014)

Table 2: Gomoa Adam Project

Activity	People involved	Sample
Farmers trained as trainers on agro forestry	7	5
Women supported in cassava processing	18	13
Project Management Committee trained in the establishment of moringa plantation	26	19
Volunteers trained to form an environmental brigade to fight fire	17	12
Community opinion leaders trained on environmental and income generating activities	8	6
Members supported in snail, grasscutter and beehives	6	4
Total beneficiaries	82	59

Source: Field data (2014)

In addition to the beneficiaries categories identified above, two project contact persons, two field officers, two project secretaries, two chiefs, two assemblymen and the National Co-ordinator of United Nations Development Programme/Global Environment Facility Small Grant Programme (UNDP/GEF/SGP) were included. These comprise 30 community members (15 non-beneficiaries from each community) who were also purposively selected to solicit their opinions about the projects. The idea was to enable the researcher to get more views to complement the information obtained from the beneficiaries of the projects and that of the project documents.

Data Collection Methods and Instruments

In order to obtain data for the research, document review, interview, focus group discussion and field observation were employed. The following instruments were used as discussed.

Document review checklist

Documents were reviewed using a checklist (appendix B) developed from the project proposals, baseline studies and quarterly reports of Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) submitted to Global Environment Facility (GEF). The document review checklist looked at the stated objectives in terms of its relevance and clarity of specification of project beneficiaries and other management strategies. The document review checklist also looked at the relationship between the projects' inputs, outputs and the stated objectives.

In-depth interview guide

The interview guide (appendix C) was used to gather qualitative information and opinions of persons involved in the Gomoa Okyereko and Gomoa Adam projects. In other words, the project managers who were in charge of writing project reports and project implementation schedules were interviewed using this instrument. The chiefs, assemblymen and the National Co-ordinator were also interviewed using this instrument. The in-depth interview guide helped the researcher to touch on complicated and detailed issues and at the same time gave others the chance to express their opinion about things important to them with respect to the projects.

Interview schedule

Interview schedule (appendix D) was used to interview the beneficiaries and non-beneficiaries of the two projects. The purpose was to get the individual views about the projects, their contributions to the projects and what can be done to improve future projects. The Interview schedule was also used to confirm what was found in the progress reports and the achievements made by the project executives.

Focus group discussion guide

The focus group discussion guide (appendix E) is an instrument used for social inquiry, taking the form of structured discussion, moderated by the evaluator or researcher who supplies the topics or questions for discussion. The focus group discussion made use of the participants' interaction, creativity and spontaneity to enhance and consolidate the information collected. The focus group discussion brought together the project manager of each project site, chiefs, assemblymen, beneficiaries and non-beneficiaries to discuss the differences in answers given during the interview guide administration.

Observation checklist

Observation checklist (appendix F) was used by the researcher to collect data on the measures taken during the project implementation stage. This was done by going to places where the projects were implemented to better understand the context within which certain measures were undertaken. Observation checklist also enabled the researcher to get information on the two projects. The observation of the project was done by using a checklist of

what the project progress reports stated it has been able to achieve at the end of the projects as compared to what could be found on the field.

Pretesting of the Instruments

To discover possible weaknesses, inadequacies and ambiguities in all aspects of the research, pretesting of the observation checklist, focus group discussion guide, in-depth interview guide, interview schedule and document review checklist were administered to correct mistakes before administration of the instruments. The pretesting of the instruments was conducted at Ekumfi Essuehyia Biodiversity Conservation project site which was also sponsored by UNDP/GEF Small Grant Programme in the Central Region of Ghana. The Ekumfi Essuehyia biodiversity conservation project was selected for pretesting of the instrument because it had similar characteristics and also it was completed within the same time as the project at Gomoa Adam.

Data Collection Procedures

The research was carried out in close consultation with Okyereko Co-operative Afforestation and Global Habitat for Homeless Staff, the Chief of the community and the beneficiaries of the project. The project portfolio was reviewed to provide an overall picture of the project concentrating on the aspects of relevance, effectiveness and efficiency that can be dealt with at the portfolio level. The document review covered project appraisal documents, logical framework and plan of operations, records of inputs, progress reports and contractual correspondence to verify that such documents and contractual correspondence are in accordance with good practices. The detailed activities

that the document review covered included;

The project strategies and technical reports were used to assess the consistency of project strategies with national priorities and community needs. Secondly, interview guide was used to assess the various stakeholders on the purposes and priorities of the project. In addition, completeness of the participatory approaches used and its consistency and conformation with approved standards and guidelines used by UNDP/GEF/SGP were also assessed. Furthermore, the number of stakeholders trained and equipped with skills and knowledge in livelihood activities; and

Finally, the detailed field study used participatory rural appraisals techniques (i.e. everybody who matter most was consulted) to carry out the research in the project communities. The study organized two focus group discussions at each community with eight members each including the non-beneficiaries to seek answers from the chief and the opinion leaders of the communities to the related questions in the focus group discussion guide. The researcher also visited each project site to determine the trees planted and ascertain the acreages planted.

Data Processing and Analysis

Having collected the field data regarding the project, data processing and analysis was carried out to ascertain the impact of the biodiversity project on the people of Gomoa Okyereko and Gomoa Adam in the Central Region of Ghana. Quantitative data collected from the office of UNDP/GEF/ Small Grant Programme, beneficiaries and non-beneficiaries of the two selected biodiversity conservation project sites were analyzed using the Statistical

Product and Service Solutions (SPSS) software package (Version 17). Descriptive statistics were used to analyse the data. The background characteristics of respondents were analysed using frequency and percentage distribution. The outcome of the interview and focus group discussion were presented in the form of statements and tables as applicable to the data. Findings were deduced from the analysis of both quantitative and qualitative data gathered and recommendations were made to address the issues identified.

Challenges Encountered from the Field Work

The study had problem with physical access to the project areas. This was due to the weedy nature of the conserved areas. In addition, the respondents were reluctant to answer the interview guide. These problems were resolved by the project executives who assigned the nursery attendant and the project secretary who helped in the collection of the data from the respondents and counting of the trees in the conserved areas.

Ethical Issues

The ethical dimensions of every research and how they are addressed are very important. This research considered the issues of informed consent, anonymity and confidentiality. Neuman (2007) and Leary (2001) conceived that researchers must not coerce respondents into participating in researches, thus, protecting their rights is key in every study. Provision of adequate information about the study was therefore important to enable the participants decide whether they want to take part or not (Seymour & Skilbeck, 2002;

Childress, 2001; Leary, 2001). In other words, participation must be voluntary at all times. Informed consent was sought from respondents and project managers before the research was undertaken. Introductory letter from the UNDP/GEF/ Small Grants Programme was used to seek the consent of project managers, beneficiaries and non-beneficiaries of the projects. This was important to ensure that participants were not coerced in anyway.

In addition, the issue of anonymity was ensured. Anonymity protects privacy by not disclosing a participant's identity after information is gathered (Babbie, 2007). This was guaranteed because the names of participants did not appear on the instruments that were used. The use of interview schedule guaranteed the respondents' anonymity since names and other personal details were not associated with specific responses given.

Furthermore, the purpose of confidentiality which according to (Babbie, 2007) is to conceal the identity of respondents was also adhered to. This was pertinent in order to protect the rights of all the respondents. The study achieved this by not sharing or discussing any information given by the respondents with any third party. Moreover, information gathered from the respondents was used for the purpose for which it was collected.

Summary

This chapter described the methodology that was used for the study and the procedures that were followed to collect the data and information from the field. In brief, it looked at the study area, research design, sources of data, sampling procedures, data collection methods and instruments, pretesting of the instruments, data collection procedures and data processing and analysis.

Challenges encountered from the field work were also enumerated. The concluding part of this chapter elaborated on the ethical considerations of the study. The next chapter presents the results and discussion of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the analysis, results and discussion of the data collected. The data was analysed in two parts. The first part described the socio-demographic characteristics and the views of the respondents whilst the second part addresses the research questions. The second part was further divided into what happened at each project community (Gomoa Okyereko and Gomoa Adam).

Socio-demographic Characteristics of Respondents

The respondents' socio-demographic characteristics as depicted in the tables 3, 4, 5, 6, 7 and 8, covered issues in respect of sex, age, educational level, project activities that beneficiaries were engaged in and the reasons for creating the biodiversity conservation sites.

Sex of respondents

As indicated in Table 3, the male respondents were 56.4% while 43.6% were females. This means that more males participated in the study than their female counterparts.

Table 3: Sex of Respondents

Sex	Frequency	Percent
Male	62	56.4
Female	48	43.6
Total	110	100.0

Source: Field data (2014)

Age of respondents

From Table 4, none of the respondents for the study was below 18 years of age. Of the 110 respondents who were beneficiaries of the projects, 13.6% were between the ages of 18 – 27, 35.5% were between the ages of 28 – 37, 37.3% were between the ages of 38 – 47 and 13.6% were 48 years and above. This means that the study covered the various age categories that matter most in every community in terms of making decisions regarding biodiversity conservation.

Table 4: Age of respondents

Age	Frequency	Percent
18 - 27	15	13.6
28 - 37	39	35.5
38 - 47	41	37.3
48 and above	15	13.6
Total	110	100.0

Source: Field data (2014)

Educational level of respondents

From Table 5, it was observed that 49.1% of the respondents had completed Basic education, 43.6% had completed Senior High School and 7.3% of the respondents had never been to school before.

Table 5: Educational Level of Respondents

Educational level	Frequency	Percent
Never been to school	8	7.3
Basic	54	49.1
Senior High School	48	43.6
Total	110	100.0

Source: Field data (2014)

Employment status of respondents

From Table 6, it was observed that 1.8% of the 110 sampled were students, 62.7% of the respondents were self-employed, 0.9% of the respondents were a teachers under who joined the project to learn more about the environment, 5.5% of respondents were retired from active service and finally 39.1% were farmers.

Table 6: Employment Status of Respondents

Employment status	Frequency	Percent
Student	2	1.8
Self-employed (artisans)	58	62.7
Professional (e.g. teacher)	1	0.9
Retired	6	5.5
Farmer	43	39.1
Total	110	100.0

Source: Field data (2014)

Reasons for the Creation of the Biodiversity Conservation Sites

According to Ehrlick and Ehrlick (1992) biodiversity is conserved based on five main reasons, which are economic, protection against epidemic pathogens, ecological, aesthetic and ethical considerations. The researcher wanted to find out whether the respondents were aware of the reasons for creating the biodiversity conservation sites in the two project communities. The results are illustrated in Table 7.

Table 7: Reasons for the Creation of the Biodiversity Conservation Sites

Reasons by respondents	Frequency	Percent
Conserve the environment	21	19.1
Provide micro-climate for agriculture	13	11.8
Prevent illegal cutting of trees	17	15.5
Protect the gods of the community	11	10.0
Prevent wind damages	18	16.4
Protection of the stream	30	27.3
Total	110	100.0

Source: Field data (2014)

The results revealed that (Table 7), 19.1% of the respondents were of the view that the sites were created to conserve the environment for future generations. Another 11.8% of the respondents were of the view that the biodiversity conservation sites were created to provide micro-climate for agriculture and also to prevent the forest areas from total destruction by the community members. In addition to the above, 15.5% of the respondents were

of the view that the sites were created to prevent illegal cutting down of trees. Moreover, 10% of respondents were of the view that the sites were created to protect the gods of the communities and to prevent the forest from total destruction. Furthermore, 16.4% of the respondents argued that the project sites were created to prevent wind damages. Finally, 27.3% of the respondents were of the view that the sites were created to protect the gods and also to prevent the only stream at Gomoa Adam from drying up during the harmattan season.

The reasons given by all the respondents (beneficiaries and non-beneficiaries) affirm the reasons for the creation of the biodiversity conservation sites in the project proposals of Okyereko Co-operative Afforestation Society and Global Habitat for Homeless. The reasons given by the two organizations were that, the sites were created to solve the problem of annual bush fires, illegal hunting of animals using chemicals, indiscriminate cutting of trees and pollution of the stream/ river. Although the respondents did not give exactly the words used in the proposals, these problems stated above when solved will lead to protection of the environment in general and solving the issues raised by the respondents.

The reasons given by both the NGOs and respondents confirm the reasons for biodiversity conservation by Ehrenfeld, (1998); Ehrlich and Ehrlich (1992) who admonished that biodiversity is conserved based on any of the five main reasons, which are economic, protection against epidemic pathogens, ecological, aesthetic and ethical considerations. The projects at Gomoa Okyereko and Gomoa Adam were done based on ecological, aesthetic and ethical considerations.

Threats to the Sites before the Biodiversity Projects

The study conducted by Margoluis and Salafsky (1998) revealed that biodiversity targets are influenced by direct and indirect threats. The researcher wanted to find out whether the respondents were aware or can remember some of the threats that were affecting the environment at Gomoa Okyereko and Gomoa Adam before the implementation of the biodiversity projects. It can be observed from Table 8 that all the respondents cited indiscriminate cutting of trees as the major threats to the biodiversity conservation sites before the projects at these two communities and 30.6% of them mentioned illegal hunting using chemicals as the threat that existed before the projects. Furthermore, 16.1% of the respondents said that setting fire to trap rats and grasscutter were the threats that existed before the projects. Finally, 15.1% and 3.5% of the respondents were also of the view that annual bush fires and pollution of stream (river) respectively were the threats before the projects. The results are presented in Table 8.

Table 8: Threats to the Sites before the Project

Situation before the project by respondents	Frequency	Percent
Illegal hunting using chemicals	97	30.6
Annual bush fires	48	15.1
Indiscriminate cutting of trees	110	34.7
Setting fires to trap rats and grasscutter	51	16.1
Pollution of stream/ river	11	3.5
Total	317*	100

Source: Field data (2014)

* Multiple responses

The project proposals submitted by Okyereko Co-operative Afforestation Society and the Global Habitat for Homeless mentioned four main threats. Which were annual bush fires, illegal hunting of animals using chemicals, indiscriminate cutting of trees and pollution of the stream (river). From Table 8, it can be seen that each of the respondents can mention at least one of the threats outlined in the project proposals of Okyereko Co-operative Afforestation Society and Global Habitat for Homeless.

Objectives of the projects

The assessment of the projects' impact was done based on the problems that existed before the projects, objectives set to tackle the problems identified and the achievements made in terms of environmental, social and economic impact. The objectives set for the projects by the Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) are as follows;

Okyereko Co-operative Afforestation Society (OCAS) project objectives

The first objective of the Gomoa Okyereko project was to organize community awareness and educational programmes on the importance of biodiversity conservation and utilization, dangers and effects of land degradation, deforestation and bush fires;

Secondly, to re-plant degraded areas around and within the forests, to restore and preserve the natural lands, population of animals and cultural beliefs;

Thirdly, to promote and create sustainable livelihood support assets (food security, good health, gender equity in income generation, agro-forestry practices and access to sustainable supply and use wood fuels) livelihood activities that support and sustain local biodiversity conservation and future community based eco-tourism development) for local community groups; and

Finally, to train 120 women in improved wood stove production and utilization techniques.

Global Habitat for Homeless (GHAF) project objectives

First, the project planned to conduct environmental education and awareness creation on bio-fuel at Gomoa Adam and surrounding communities. Second, to restore, preserve and protect Onyaaku and Sumurum sacred groves at Gomoa Adam to save the biodiversity in the forests. In addition, to establish and operate an ecological training centre to serve as ecotourism training centre for farmers, schools and other groups of people in and around the Gomoa West District as well as in the Central Region;

Furthermore, to introduce improved farming methods, agro-forestry and construction and use of efficient wood fuel stoves in order to reduce the excessive harvesting of indigenous trees as firewood and production of charcoal from the sacred groves; and

Finally, introduce the farmers to the commercialization of snail farming and the cultivation and processing of moringa, jatropha, and sunflower as income generating activities.

Major Activities Undertaken at Gomoa Okyereko

The major activities undertaken by Okyereko Co-operative Afforestation Society were examined under the following headings: Launching of the project and training of community based natural resource management committee, focal persons and opinion leaders, re-planting of degraded areas around and within the forests, agro-forestry extension, capacity building for livelihood support, livelihood support enterprises, partnership for forest management, inter-cropping of the degraded site, land degradation measures taken and finally, training of women in improved wood stove production and utilization techniques.

Launching of the project and training of community based natural resource management committee, focal persons and opinion leaders

According to the survey and the progress report for the first quarter dated 17th July 2005, the project at Gomoa Okyereko was officially launched with a durbar which was attended by 120 stakeholders including the staff of Gomoa East District, Environmental Protection Agency, Forestry Commission, chiefs, opinion leaders in the Gomoa Okyereko community and community focal persons. The launching of the project was to operationalize the objectives of the project and allow the participants to formulate bye-laws and enforce the existing beliefs, taboos and plans to guide the project implementation (OCAS, 2005b). It was planned that the project will be launched and all stakeholders will be invited.

After the launching of the project, a two day capacity building workshop was organized for 28 selected community focal persons and 11

opinion leaders. The main topics treated included techniques in forest management, agro-forestry; biodiversity conservation and sustainable management of natural resources, leadership skills, business development, financial and organisational management. The impact of this activity was that key stakeholders of the project learnt techniques for forest and funds management which helped in successful completion of the project at Gomoa Okyereko.

Sensitization workshop

From the progress report for the first quarter dated 17th July 2005 presented to UNDP/ GEF Small Grant Programme, the project organised four sensitisation workshops with key stakeholders on their roles and responsibilities. The beneficiary stakeholders included the chief and opinion leaders, Assembly Member of the area, District Agricultural Extension Officers, District Environmental Protection Officers and other officers from the District Forestry Commission (OCAS, 2005b). The sensitization workshops which were organised by the project helped in defining the various roles and responsibilities. It was found from the survey that what was planned was achieved in terms of stakeholders' consultations. The study also found that, the specific roles that were assigned to each of the stakeholders helped the project to avoid conflict of interest between the key beneficiaries of the projects. The role and responsibilities of the stakeholders are shown in Table 9.

Table 9: Roles and Responsibilities of the Stakeholders

Activities	Responsible group
Planning of project activities	Chief, opinion leaders, project contact person.
Official commission of the project	Chief, opinion leaders, project contact person and EPA Officers.
Supervision and monitoring of afforestation project	District Agricultural Extension Officers, District Environmental Protection Officers.

Source: Field data (2014)

Training of the community based natural resource management committee

Eleven local representatives were trained, empowered and equipped to operate as a community based natural resource management committee. The training focused on successful management of natural resources, monitoring and evaluation, conflict management and documentation. Before selecting the committee members, the chiefs were informed and series of community sensitizations were undertaken. Community members were asked to voluntarily offer themselves to be part of the committee and the final selection was done in consultation with the chiefs and other opinion leaders from Gomoa Okyereko community. According to the local representatives who were trained, the training offered them the opportunity to be consulted at each stage of the project's implementation process at Gomoa Okyereko.

Community awareness creation and educational programmes on deforestation and bush fire

The project organised two training programmes in wildfire management in Gomoa Okyereko for 14 fire volunteers. Participants were trained in the importance of conserving their local biodiversity, eco-system and natural forest resources, causes and effects of deforestation and the need to grow trees as well as national environmental policies and laws. According to the project executives, several community meetings, durbars and house to house visits were made by the volunteers to create awareness on the environment. It was planned that 20 people will be trained in the wildfire management but 14 persons were trained. Reasons for the differences in the planned and achieved were due to non-availability of four additional people to be trained. According to the opinion leaders and the project beneficiaries, the training of the 14 wildfire volunteers helped reduce the annual bush fires at Gomoa Okyereko community.



Plate 1: Briefing of Wildfire Volunteers at Gomoa Okyereko

Source: Field data (2014)

Re-planting of degraded areas around and within the forests

Hundred hectares of degraded forest area was surveyed (using tape measure and pegs) and demarcated around and within the traditional forest for the replanting of indigenous trees and plants. The survey and demarcation of degraded areas was carried out with the help of the District Environmental Protection Agency, Forestry Commission and representative of the Chief of the Gomoa Okyereko community.

Two and half hectares of tree nurseries were developed at the project community to produce 100,000 seedlings annually to supply the required tree seedlings for reforestation. The selection of sites was done in conjunction with the Assembly Member of the community and the representative of the Chief. The nursery preparation and planting of seedlings was done by the community focal persons under the supervision of a District Agriculture Extension Office.

A total of 90 hectares of land was planted with *cederella odorata*, *teak*, *ofram*, *cassia*, *siamea*, *mahogany*, *moringa* and *ceiba*. Table 10 shows the distribution of trees planted. Planting of trees was done under agro-forestry farming techniques with planting distances of 3 metres by 3 metres. Land preparation was done by clearing and burning of the original vegetation in the degraded areas before pegging and planting. According to the project executives, during the second year, some of the community members integrated maize, cocoyam, cassava and plantain in the growing of trees. The impacts of these activities were that members of Gomoa Okyereko community who helped the surveyor learnt how to identify number and count particular species of trees in the conserved area. Gomoa Okyereko community members also learnt how to integrate trees with food crops with the required planting

distance between the crops and the trees. The number of trees that were planted in and around the conserved are presented in Table 10.

Table 10: Distribution of Tree Species Planted by the Community

Tree type	Number planted	Existing trees
Teak	5,450	5,145
<i>Cederella odorata</i>	6,000	3,849
<i>Cassia siamea</i>	30,000	26,468
Ofram	5,890	4,336
Mahogany	3,500	3,151
<i>Ceiba</i>	1,000	795
<i>Moringa</i>	5,000	4,570
Total	56,840	48,314

Source: Field data (2014)

The Project Management Committee at Gomoa Okyereko planned that 100 hectares of the conserved area would be demarcated and planted with 5,450 *Teak*, 6,000 *Cederella odorata*, 30,000 *Cassia siamea*, 5,890 *Ofram*, 3,500 *Mahogany*, 1,000 *Ceiba* and 5,000 *Moringa* trees. After the project, the management of the project estimated that, more than 89% (90 hectares out of the 100 hectares demarcated) of the identified degraded areas were planted and 85% of the trees planted are in healthy condition. The average survival rates of the planted trees were also estimated at 85%. This can be seen in Table 10.



Plate 2: Demarcated Area before the Gomoa Okyereko Project

Source: Field data (2014)

Agro-forestry extension

Traditionally, the people in the Gomoa Okyereko community practice some form of agro-forestry farming. That is, combining food crop growing with fruit. The project has inculcated tree growing culture in individual farmers as alternative business which before the project was not part of the community's farming practices. Less than 50% (12 out of 28) of the focal persons have established their agro-forestry farms. According to the project executives, 46 beneficiaries of the 69 beneficiaries at Gomoa Okyereko are tenant farmers who have no title to land to practice what was learnt.

Capacity building for livelihood support

The project organized 28 focal persons who have become trainers-

of-trainers in basic principles in plantation establishment (clearing, peg cutting, pegging, and selection of species.), plantation management (field recording, and records keeping, weeding, timing and bushfire prevention. These people are now resource persons supporting interested farmers to establish tree plantations in Gomoa Okyereko.

Livelihood support enterprises

The 14 volunteers were trained in business and financial management. After the training, nine of the trained volunteers benefited from the micro-credit scheme whilst five of them also received input for animal rearing including four sheep and five goats. The five volunteers who benefited from four sheep and five goats are now earning GHC 120 and GHC 90 from the sale of each sheep and goat respectively.

Partnership for forest management

Partnership for forest management was established with all the 28 focal persons in the project community. Accordingly, two work forces were formed and trained in the Gomoa Okyereko community to participate in forest management including planting and nurturing of trees. This was made possible through series of community meetings, workshops and training moderated by the project management. These 28 focal persons helped the nursery attendants of the project by watering the seedlings during the implementation of the project activities.

Inter-cropping of the degraded site

In Gomoa Okyereko, 24 people were allowed to grow food crops within the trees when the trees were being planted. Some of the crops planted were cassava, maize, plantain and yam. The work force of 24 people intercropped cassava, cocoyam and maize during the replanting of the degraded areas outside the forest. The food produced during the project was estimated by the District Agriculture Officer as shown in Table 11.

Table 11: Quantity of Food Produced during the Gomoa Okyereko Project

Crops planted	Estimate Crops planted (tons)	
	Tons produced	Tons consumed
Cassava	250	134
Maize	500	324
Plantain	120	62
Cocoyam	5	5
Total	875	525

Source: Field data (2014)

The project executives at Gomoa Okyereko pointed out that about 60% of the food crops produced was consumed locally by the people who engaged in the project. The remaining was sold to supplement family income and maintaining the farm. The project contributed to food security in the area by introducing to the farmers modern ways of farming and maintaining their farms.

Land degradation measures taken

The major causes of land degradation within the project area were wildfires; unsustainable farming practices especially indiscriminate cutting of trees for fuel wood. The project has therefore developed and established innovative incentives for the reduction of fire incidence for the communities within the project area by introducing agro-forestry as alternative farming practices and enforcing bye-laws on land management.

Some of the traditional land management practices and preventive methodologies that were used under the project included the mainstreaming of wildfire management in traditional land management processes through the development and dissemination of appropriate use of fire in farming systems; and training and building the capacity of fire volunteer squads to fight fire in the area.

During the survey, farmers in the project area had started planting trees on their farms. The discussions with the non-beneficiaries of the project at Gomoa Okyereko also brought to bear how non-beneficiaries at the project have started their own agro-forestry farms.

Training of women in improved wood stove production and utilization techniques

The project organized 10 women into trust groups and assisted them to construct improved stoves. Thirty twin improved stoves were produced by the women who were grouped into trust groups. They were able to save up to 60 % of the fire wood used in their activities. These women were further trained to assist other women to replicate what they were taught in other parts of the

community. According to the women who were trained under the improved wood stove they have also trained 15 more women who are now applying the improved stoves in their activities.

Major Activities Undertaken in the Gomoa Adam Community

The activities of the project at Gomoa Adam were also examined based on the following; Environmental education and awareness creation on bio-fuel at Gomoa Adam and surrounding communities, capacity development, ecological training centre, farming methods, agro-forestry and construction and use of efficient wood fuel stoves, introduction of sustainable agro-forestry technologies in Gomoa Adam, commercialization of snail farming and the cultivation and processing of cassava, moringa, jatropha, and sunflower as income generating activities.

Environmental education and awareness creation on bio-fuel at Gomoa Adam and surrounding communities

From the fieldwork and reports presented to UNDP/ GEF/ Small Grant Programme, it was found that the project organized four sensitization workshops with key stakeholders on their roles and responsibilities. The beneficiary stakeholders included the Chief and Opinion Leaders, Assembly Member of the area, District Agricultural Extension Officers, District Environmental Protection Officers and officers from the District Forestry Commission. The project also educated and created the necessary awareness for the people of the surrounding communities about the project and the benefits of conserving their biodiversity with brass band. This awareness

creation helped in the conservation efforts by educating the people on how to hunt for wild animals without using chemicals and also how the people in the project community can interact with the environment to avoid erosion and bush burning.

Capacity development

The biodiversity project at Gomoa Adam also developed the capacities of the people in the community in land, forest and wildlife management and the findings are summarized in Table 12 with the achievement made within each activity.

Table 12: Capacity Development for the People of Gomoa Adam

Planned activities	Achievements
Establishment of 120 hectares of Onyaaku and Sumurum community sacred groves and 8.5 acres ecological centre.	About 50 hectares of the sacred groves and 2.5 acres ecological centre have been conserved.
Twenty-six community natural resource management group was formed and trained.	Twenty-six member project management committee was formed.
Community bye-laws on wildfire, wildlife, commercial tree harvesting, land degradation enacted and enforced.	Bye-laws on land degradation, wildfire, wildlife and commercial tree harvesting were enacted and enforced.

Source: Field data (2014)

From Table 12, the project planned that 120 hectares of Onyaaku and Sumurum community sacred groves and 8.5 acres of ecological centre were to be established but at the end of the project, 48.95 hectares of the sacred grove was conserved and 2.5 acres of ecological centre established. The project was unable to achieve 120 hectares of Onyaaku and Sumurum grove and 8.5 acres of ecological centre target because of unfulfilled promise of people who promise to offer land for the project but exited from the project during the early stages of the project.

Ecological training centre

The project planned to establish and operate an ecological training centre to serve as ecotourism and training centre for farmers, schools and other groups of people in and around the Gomoa West District as well as in the Central Region. The ecological training centre was built but no training was done. According to the executive director, the training was not done due to inadequate resources to mend the centre.

Farming methods, agro-forestry and construction and use of efficient wood fuel stoves

Farmers in the Gomoa Adam community were introduced to improve farming methods, agro-forestry and construction and use of efficient wood fuel stoves in order to reduce the excessive harvesting of indigenous trees as firewood and for charcoal production from the sacred groves. According to the seven women that were sampled from the 10 women trained in the construction of efficient wood fuel stoves. The stoves are helping the women

to save 60% of the wood fuel that would have been used in their gari processing activities.

Participatory land-use plan, woodlot and agro-forestry establishment at Gomoa Adam

According to the project executives at Gomoa Adam and the project proposal, the project planned to put in place participatory land-use and forest restoration plans but at the end of the implementation period the project was able to demarcate certain areas for ecological centre and gari processing. The land-use was available on the field but it was not documented on physical map.

In addition, the project planned to establish 100 hectares of forest lands within the sacred groves with indigenous tree species. At the end of the project, 90 hectares of the conserved area was replanted with 5,450 *Teak*, 6,000 *Cederella odorata*, 30,000 *Cassia siamea*, 5,890 *Ofram*, 3,500 *Mahogany*, 1,000 *Ceiba* and 5,000. Moreover, 10 farmers were trained on organic farming and tree-crop intercropping and one hectare of the demarcated land was partly planted with cassia trees.

Finally, on the establishment of three hectares of ecological sustainable livelihood farm with diverse fast growing timber species (*Entandrophragma angolensis*, *Terminalia superba* and *Ceiba pentandra*) and production of honey, snails, mushroom and small ruminants. One hectare of the ecological center was established with cassia trees. The achievements under the various activities can be seen in Table 13.

Table 13: Participatory Land-use Plan, Woodlot and Agro-forestry Establishment at Gomoa Adam

Planned activities	Achievements
Participatory community based land-use and forest restoration plans	Land-use plan available on the field, specific areas were designed for tree planting, ecological center and gari processing
Hundred hectares of forest lands within the conserved area replanted with indigenous species	Enrichment planting was carried out within the sacred grove (sacred groves measured 90 ha)
Training on composting for organic farming and tree-crop intercropping.	Ten farmers were trained on composting for organic farming and tree-crop intercropping.
Establishment of 50 hectares of individual woodlots and agroforestry with moringa established in the community.	One hectare of land was demarcated and partly planted with cassia trees.
Establishment of three hectares of ecological sustainable livelihood farm with diverse fast growing timber species (<i>Entandrophragma angolensis</i> , <i>Terminalia superba</i> and <i>Ceiba pentandra</i>) and for the production of honey, snails, mushroom and small ruminants.	One hectare of ecological center established. Only cassia trees were planted.

Source: Field data (2014)

Introduction of sustainable agro-forestry technologies in Gomoa Adam

The project at Gomoa Adam planned that it will produce 150,000 seedlings annually, train 10 farmers as trainers in agro-forestry technologies and assist 60 farmers to establish agro-forestry technology demonstration farms. But the activity of producing 150,000 seedlings annually yielded 10,000 seedlings out of the proposed 150,000.s In the case of training the farmers; the project ended up training 20 project management committee members instead of the proposed training of farmers. Finally, there was no demonstration farms. The project executives at Gomoa Adam attributed the failure of these activities to unavailability of farmers to be trained on agro-forestry techniques and also changes in the rainfall pattern which made it impossible for them to achieve the 150,000 seedlings target. The results of these activities have been presented in Table 14.

Table 14: Introduction of Sustainable Agro-forestry Technologies in Gomoa Adam

Planned activities	Achievements
Community nursery capable of producing 150,000 seedling annually established.	Half a hectare of nursery site produced 10,000 seedlings (first year) now abandoned.
Train 10 farmers as trainers on agroforestry technologies.	Twenty Project Management Committee members were trained.
Assist 60 farmers to establish agroforestry technology demonstration farms.	No such demonstration farms exist.

Source: Field data (2014)

Commercialization of snail farming and the cultivation and processing of cassava, moringa, jatropha, and sunflower as income generating activities

According to the project management committee at Gomoa Adam, it was planned that during the initial stages of the project, the snails from the project would be produced for commercial purposes and also processing of moringa, jatropha and sunflower on commercial quantity. The snails were attacked by termites which later killed all of them.

According to the third quarter report of Global Habitat for Homeless, the cassava farm failed due to lack of rains and only five out of the 15 beehives were colonized); grasscutters, rabbits and snails all died towards the end of the project due to termite infestation (GHAF, 2007). The beehives and site for the snail rearing were all abandoned after the project in the conserved area due to disputes on how to share the profits.

During the field survey, it was also found that beneficiaries of the project at Gomoa Adam have started their own grasscutter, snails and bee-keeping centres. The results have been presented in Table 15.

Table 15: Small Business Enterprise and Livelihood Activities

Planned activities	Achievements
Support 15 women to grow cassava for gari processing	Thirteen women were supported in cassava cultivation for gari processing
Support six people with snails, grasscutters, rabbits and beehives	Six men were provided with 30 snails, four grasscutters, five rabbits, 15 beehives

Source: Field data (2014)



Plate 3: Snail Farming Inspection during the Project at Gomoa Adam

Source: Field data (2014)



Plate 4: Beehives Inspection during the Project at Gomoa Adam

Source: Field data (2014)

Implementation of activities at Gomoa Adam

From the checklist developed for the survey, it was realized that the establishment of natural regeneration areas, training (survey, mapping, signing community agreements by natural resource committee members), enrichment planting, embarking on intensive wildfire prevention and management were achieved. This is because, what was proposed in the project documents were fully achieved and the impacts of these activities can be seen in the community. For instance, for the past four years there has been no fire outbreak in the community due to the intervention put in place by the project.

The implementation of the sub-activities of the project at Gomoa Adam was subjected to scoring. The scoring of the various activities were done by giving (2) to an activity that was implemented according to the indicators set in the project proposal and also the impact of the activity can be seen on the field. One was given to an activity that was implemented according to plan but was not fully achieved even though the impact of the activity can be seen. On the other hand, (0) was given to an activity which was not executed, (-1) for an activity which was undertaken not according to planned indicators but impact can be seen on the field. Lastly, (-2) was given to an activity that was not executed according to the indicators set and also where the impact of the activity cannot be seen on the field. The following keys were used to arrive at the scoring of the project at Gomoa Adam. *Key Note: (2) – excellent, (1) – good/fair, (0) – not executed, (-1) – badly executed, (-2) – very badly executed.* Table 16 indicates the summary of the results.

Table 16: Implementation of Activities at Gomoa Adam

Activities	Level of implementation
Community profile compilation	1
Weekly environmental awareness creation and outreach to other communities.	1
Community mobilization, formulation and documentation and agreements on the creation of natural regeneration sites.	1
Introduction of improved soil fertility technologies to farmers.	1
Embark on intensive wildfire prevention and management	2
Nursery establishment and training of community members	1
Establishment of natural regeneration areas, training (survey, mapping, signing community agreements by natural resource committee members) and enrichment planting	2
Establishment of multipurpose family and individual agroforestry farms	0
Initiate alternative livelihood support activities (sunflower processing, gari	1

Table 16 continued

processing, honey production, poultry
and small ruminants)

Establishment and operation of the
ecological training centre -1

Project monitoring 1

Source: Field data (2014)

Ecological training centre

The Plates 5a & 5b illustrate the ecological training centre at Gomoa Adam (before) during the implementation stages and (after) abandoned after the project.



Plate 5a: Ecological Training Centre at Gomoa Adam before Project

Source: Field data (2014)



Plate 5a: Ecological Training Centre at Gomoa Adam after project

Source: Field data (2014)

The activities undertaken at these two project communities followed the conceptual framework adapted from Margoluis and Salafsky (1998), which starts with the collaboration between the implementing NGOs, the community and the donor agency by bring together their inputs in the form of values, knowledge and skills. From the collaboration stage, the project managers are given tools and strategies in the form of training and education to come out with policies, laws and management strategies to change the threats that were there before the project to achieve biodiversity conservation target. These assertions by Margoluis and Salafsky (1998) were duly followed in achieving the projects' results.

Community Members Involvement in the Project Activities

According to Kirk and Miller (1986) beneficiary impact assessment of project is a systematic inquiry into people's values and behavior in relation to a planned or ongoing intervention for social and economic change (Kirk & Miller, 1986). From this assertion, the researcher wanted to find out whether the community members were involved in the planning, implementation, monitoring and execution of the projects' activities. For instance, Global Habitat for Homeless which implemented the biodiversity project at Gomoa Adam had five volunteers from different academic backgrounds as its Board of Trustees and five permanent staff and all these people were from Gomoa Adam Township. These people were made up of the Secretary, Field Supervisor, Women Development Co-ordinator, Nursery Assistant and the Executive Director.

The project also inaugurated 26 project management committee members who were responsible for organizing and coordinating community members and also reporting to the Board of Trustees on the various project activities. Sub-committees were also formed from within the various project components. These sub-committees were tasked to carry out specified activities like the livelihood components, wildfire prevention, forest management and report to the project management committee which then submit verbal reports to the Board of Trustees.

On the other hand, Okyereko Co-operative Afforestation Society which implemented the project at Gomoa Okyereko had in place before the funding, a Community Based Natural Resource Management Committee. After getting funding from Global Environment Facility, the committee was

further trained to focus on successful management of the natural resources, monitoring, conflict management and documentation of project activities. Table 17 shows how the community members were involved in the two biodiversity conservation projects.

Before the selection of the committee members the chiefs were informed and series of community sensitizations were undertaken. Community members were asked to voluntarily offer themselves to be part of the committee and the final selection was done in consultation with the chiefs and other opinion leaders. Making reference to the conceptual framework used for this study by Margoluis and Salafsky (1998) which states that, alliances of values, knowledge and skills of the community members, sponsoring organization and NGOs play a key role in ensuring that biodiversity conservation projects achieve its objectives.

Table 17: Involvement of the Community Members

Activity	Gomoa Okyereko	Gomoa Adam
Planning	Project executive members	Project executive members
Implementation	Project executive members, Board of Trustees, project Management Committee Members	Project executive members, Board of Trustees, Project Management Committee Members
Monitoring	Secretary, Field Supervisor and Project	Assemblyman, the chief, Field

Table 17 continued

	Management Committee Members	Supervisor and Project Management Committee Members
Enactment of Bye-laws	Project executive members, Project Management Committee Members, opinion leaders and chiefs	Project executive members, Project Management Committee Members, opinion leaders and chiefs

Source: Field data (2014)

To assess whether the community members were involved in the selected UNDP/GEF/ SGP projects at Gomoa Okyereko and Gomoa Adam. The study adopted three criteria that were developed in June 2006 by Global Environment Facility (GEF). The degree of involvement by indigenous community members were categorized as follows.

1. Significant involvement: including projects that were designed exclusively to benefit indigenous people or projects where the executing or implementing agency was an indigenous organization and there is free level of participation;
2. Moderate involvement: including projects that had distinct components or sub-projects benefiting and targeting indigenous people and community members had restricted number of people to be involved in the project; and

3. Limited involvement: including projects that had participation of indigenous people in a few project activities. These include projects that established benefits to indigenous people at the outcome level of the project completion.

From these three criteria used above, the study can conclude that, the projects at both communities achieve significant involvement. That is, the organizations that implemented the projects were all indigenous organizations (owned by the people in the communities) and the community members carried out the planning, implementation and execution of the project's major activities. Again, these activities were done by the people who were trained from the communities through the various workshops organized and consulted other external people where necessary.

Findings from the involvement of community members in the biodiversity projects at these two communities do not support the assertion by Brockington (2002) which states that the process of identification, establishment and management of conservation areas are top-down and politically-led with selection taking place centrally and implemented by government ministries. The findings were in line with the assertion of Margoluis and Salafsky (1998) which also states that alliances of values, knowledge and skills of community members and NGOs play a key role in ensuring that biodiversity conservation projects achieve their objectives.

Impact of the Projects in Terms of Biodiversity Conservation

According to Ponniah and Martella (1999), Omoto (2003) impact assessment can be undertaken at people and community levels. That is, impact

assessment should look at the environmental impacts, economic impacts, institutional impacts and other impacts that can be attributed to the project. The researcher wanted to find out whether the projects that were done at Gomoa Okyereko and Gomoa Adam had impact. The following were the findings from the fieldwork.

Gomoa Okyereko project impacts

Both positive and negative impact of the project were seen on the field during the assessment of the project at Gomoa Okyereko. The summary of the impact indications were based on both positive and negative impacts as follows.

Organizational and technical impacts

The formation of working groups facilitated the involvement of a number of technical and non-technical staff in the planting of trees to restore the degraded ecosystem. The community members who accompanied the surveyor during the project implementation stage acquired skills in how to identify and count trees in the conserved area. Also, community members were also introduced to food crop (cassava, maize, plantain and cocoyam) farming. Again, leaders of the various implementation committees were able to settle internal matters. They had rules and regulations that governed the conduct of the people in the implementation of the project. Furthermore, on the tree planting and nursery management; 28 focal persons were exposed to nursery management and nurturing of trees on farms.

Environmental impacts

The project has contributed to the rehabilitation of biodiversity and restoration of the degraded forests in the Gomoa Okyereko community. For instance, the project was able to achieve 90 hectares of demarcated area with 5,145 *Teak*, 3,849 *Cederella odorata*, 26,468 *Cassia siamea*, 4,336 *Ofram*, 3,151 *Mahogany*, 795 *Ceiba* and 795 *Moringa* trees.

Economic impacts

The project generated direct employment for two nursery attendants who were given weekly allowances of GHC 70.00 for their efforts and also the project supported six men with snails, four grasscutters, five rabbits and 15 beehives. Finally, the project beneficiaries have identified livelihood activities that can sustain investment in tree plantation.

Institutional impacts

The project trained 28 focal persons and 14 fire fighting volunteers on how to manage forest, establish nursery, plant trees and manage the conserved area. A mentoring process initiated by the project has helped train local groups who in turn impart knowledge to their colleagues who were not involved in the project at Gomoa Okyereko.

Project sustainability

The project was implemented within the forest and wildlife policy of Ghana which emphasizes community involvement in the natural resource management and within the priority objectives of the chief and the people of

the Gomoa Okyereko community. The project had full legal and policy support from the traditional authorities and this has helped sustain the gains of the project after the implementation period.

Technological impacts

The project did introduce new technology to the farmers and also built on their indigenous knowledge. Sixty people were trained in forest management, leadership, financial and organisational management under the project and they have acquired all the necessary skills and understanding to undertake the project activities with minimal supervision. Even though the project has come to an end, members of the project are re-sharpening their skills in plantation establishment that were developed during the project implementation stage.

Negative impacts of the project at Gomoa Okyereko

The implementation of the project created a dependency syndrome. That is, the work force and the project implementation committees were always looking up to the Project Coordinating Unit before they can take decisions on the project. At the community level, members were looking forward to the project to provide all the essential elements for the plantation establishment. The reason was that when members go for project meetings, the project executives do refreshment for them and since the project has come to an end and there is nothing like refreshment when meetings are held.

Gomoa Adam project impacts

The impact of Gomoa Adam biodiversity project were grouped under economic, environmental, social and sustainability.

Economic impacts

The project supported the beneficiaries on various livelihood activities to provide viable economic incentives that improved the living conditions and reduce poverty in the community. Accordingly, members were trained on cassava processing, beekeeping, rabbit and snail rearing. The cassava processing centre was still in operation during the field visit to the project area and offers direct income to the project beneficiaries. Project beneficiaries also enjoy discount when they process personal produce at the cassava factory which reduces economic burden of travelling to distant places to process their goods. The cassava processing factory is an opportunity and has potential to provide meaningful income that can reduce poverty if members are supported into large scale cassava cultivation. The honey production was started in small scale and the first harvest was not sold because of the quantity. The project also provided micro credit to female members in Gomoa Adam community to begin the farming season as a start-up capital during the project implementation.

Environmental impacts

The community's enthusiasm for restoring and conserving the forest from total degradation was realized. The project at Gomoa Adam restored and conserved a total area of 20.25 hectares and 28.70 hectares of Onyaaku Forest

Reserve and Sumurum Forest Reserve respectively. There has been considerable restoration of flora and fauna species in these forests in line with United Nations Convention on Biodiversity. The short and long term strategies used to prevent wildfires within the community have recorded no incidence of fires that destroy food crops and houses before the implementation of the biodiversity project at the Gomoa Adam community. The restoration and conservation of the sacred groves have prevented pollution and provided protection to the stream that provides water to the Gomoa Adam community from drying. The forest serves as barrier to wind damages to houses, crops and prevented surface run-off that causes land degradation. According to the project's executives, the forests regulate the extreme temperatures within the catchment area thereby providing suitable micro climate for agriculture. The project management claims that practicing of sustainable land management practices has restored long term productivity of the soil. Plates 6a and 6b show the stream (river) at Gomoa Adam before and after the project.



Plate 6a: Stream (river) at Gomoa Adam before the Project

Source: Field data (2014)



Plate 6b: Stream (river) at Gomoa Adam after the Project

Source: Field data (2014)

Social impacts

One of the achievements the community members are proud of after the project is that of social unity. The project has united the community members to identify innovative strategies, procedures and opportunities that has promoted environmental conservation and reduced poverty in the area. The project has curbed conflict between farmers and illegal loggers and hunters who burn and destroy farms through their activities. Migrated youths from far and near cities in search of jobs returned into the community to participate in the project. The project provided innovative strategies and built the members capacities to ensure food security. The most critical challenge in the community was shortage of water for domestic and economic activities.

The provision of poly-tanks has improved the water condition in the community considerably. The community members' capacities were also

developed to provide solutions to long term soil infertility in the community. The cassia woodlot now offers wood-fuel security to the energy scarcity that is prevalent in the Gomoa Adam community. Plate 7 shows one of the four poly-tanks provided to the community.



Plate 7: Poly-tank provided for Water Storage at Gomoa Adam

Source: Field data (2014)

Project sustainability

The project had 26 management committee members who were trained on project design, implementation, reporting writing, monitoring and evaluation. The committee members were accountable to the entire project members and were charged to provide comprehensive written and oral reports to the entire members once every month. The integrated livelihood

components in the project in the form of snail and grasscutter rearing has potential to ensure continuous financial support to the project if the project beneficiaries start practicing what was learnt during the project implementation. The technical skills developed on the sustainable soil and water conservation, organic manure production, agro-forestry practices and the livelihood activities have been practiced by more than 60% of the beneficiaries interviewed. It can be said that, there is greater assurance of sustainability of the gains made by the project if the UNDP/ GEF Small Grant Programme will continue to work in the community for some time before moving out completely.

Strategies put in place by OCAS and GHAF in Conserving the Biodiversity

The researcher wanted to find out the strategies used during the project implementation in the form of bye-laws, project management committees and board of trustees to ensure smooth implementation of the projects' activities.

The factors which influenced the projects' achievements were both internal and external. The internal factors which influenced the project were the institutional framework within which the projects were implemented and the project management approaches used. From the conceptual framework adapted from Margoluis and Salafsky (1998) it was found that management strategies like law and policy, education and awareness creation and changing incentives (livelihood activities) help to achieve conservation target. On this claim, the study looked at how the bye-laws, project management committees

and board of trustees put in place by the NGOs helped the projects achievements.

Focus Group Discussion (FGD)

Four Focus Group Discussions (FGDs) were organized at Gomoa Okyereko and Gomoa Adam. The FGDs were made up of 8 members each for purpose of sharing ideas on the institutional framework and project set-up, project management approaches, stakeholder involvement, capacity development, bye-laws and sanctions. The members in the FGDs were 23 males and 9 females making a total of 32 with ages ranging from 18 to 65.

Institutional framework and project set-up

During the FGDs, it was learnt that the implementation of the project was mainstreamed into the traditional administration system where the chiefs in the project areas were actively involved in the monitoring of field and office activities of the project. It was found that the chiefs' supervisory role on the project implementation and contribution of land to support the project showed commitment to the project. For purposes of ensuring implementation of the project was effective, forestry and agricultural staff were also integrated into the project to provide technical backing to the project. This allowed the District Managers of the Forestry Service Department and Ministry of Food and Agriculture to adopt strategies that were relevant to the situation at the project sites.

From the FGDs, it was also found that the project implementation committee which was formed in project community ensured efficient and

effective implementation of the project. The beneficiaries of the projects were governed by an executive committee and guided by local rules and regulations which spell out membership conditions, functions of the executives and what funds of the project were to be used for.

Again, according to participants at the FGDs the implementation arrangements put in place by the project management contributed significantly to the project achievements. It created a sense of ownership for the project. The formation of the project committees limited the level of consultation and mobilization which project could have spent time and resources doing.

Project management approaches

The discussions revealed that in carrying out the project mandate, the projects introduced new agro-forestry and energy saving technologies (energy saving stoves) and built on what the people knew already.

Stakeholder involvement and capacity development

The participants in the FGD stated that the strategy used in the project encouraged the participation of the projects stakeholders in planning, implementation, monitoring and benefit sharing by involving the people in both project communities and the traditional rulers. The participants were also of the view that the project strengthened the community members and the traditional rulers through extension, training and organization which allowed them to participate in the projects. It was also found during the FGDs that the implementation strategy used created awareness and empowerment, improved access to resources, information and technology), control in decision making

and material welfare which includes education, training and income generation.

Bye-laws

One FGD each was done at Gomoa Okyereko and Gomoa Adam with the Chief, the Assemblyman, two Board of Trustees Members and four Project Management Committee Members. The FGD discussed the bye-laws used and sanctions for each offender.

Bye-laws used by Gomoa Okyereko project

The participants during FGD said that to fell a tree at home or farm for any reason, permission must be sought from the traditional authorities, the assembly member, the unit committee members and the Natural Resource Management Committee (NRMC). If permission is granted for the tree(s) to be cut down, five Ghana Cedis (GH¢ 5.00) is to be paid to the area council and a tree is planted to replace the one cut.

The sanctions of the offence of cutting trees in the farm or around the house without permission; First, If the person asks for permission from the Project Management Committee Members and is not granted and the tree is cut down, it attracts a penalty of sixty Ghana Cedis (GH¢ 60.00). Secondly, If permission is not sought at all and a tree cut down, it attracts a penalty of three Hundred Ghana Cedis (GH¢ 300.00) and finally, If the person commits the above two offences, the cut tree would be confiscated and sold and the proceeds used for community development.

Established woodlot

From the FGD, it came to light that no tree is allowed to be exploited in the community established woodlot. However, permission can be granted for leaves and barks of certain trees to be taken for medicinal purposes.

The sanction for this offence of cutting of a single tree in the established woodlot would attract a penalty of a ten Ghana Cedis (GH¢10.00) and the cut tree would be confiscated.

Bushfires

Participants during the discussions said that bush burning of any kind is not allowed in Gomoa Okyereko community unless the fire volunteers are informed for adequate preparation before burning takes place.

The sanctions for going against this directive is that, any bush fire irrespective of its purpose and who is involved, attracts a fixed fine of ten Ghana Cedis (10.00) per episode and if the fire causes damage to a property or life, the extent of damage is objectively assessed and the value determined for the offender to pay.

During the FGDs for the non-beneficiaries of the project at Gomoa Okyereko, members confirmed that the bye-laws after the project are strictly enforced after the project by the Unit Committee Members and the Natural Resource Management Committee (NRMC) with the support of the chiefs.

One member said that,

I cannot even cut down trees in my own farm without informing Mr. Bright Annobil and Uncle Anno. (Note: Mr. Bright Annobil and Uncle Anno

are members of the Natural Resource Management Committee at Gomoa Okyereko.



Plate 8: Focus Group Discussion at Gomoa Okyereko

Source: Field data (2014)

Implementation strategies used by Gomoa Adam project

Another Focus Group Discussion (FGD) was organized at Gomoa Adam. Participants were made up of the Project Secretary, Field Supervisor, Women Development Co-ordinator, Nursery Assistant, the Executive Director, the Chief, the Assemblyman and one Opinion Leader from the community. The ages of the participants ranged from 32 years to 62 years.

Bye-laws used by Gomoa Adam project

Participants during the FGD were of the view that to cut a tree within the Gomoa Adam community or farm, permission must be sought from the project management committee who will later inform the Chief, the Assembly

Member of the area and the Unit Committee Members. If permission is granted for the tree(s) to be felled, ten Ghana Cedis is paid to the Town Development Committee and a tree is planted to replace the one cut.

Sanctions for not obeying the above instruction is that, if permission is sought but not granted and a tree is felled, it attracts a penalty of fifty Ghana Cedis (GH¢ 50.00). But if permission is not sought at all and a tree is cut down, it attracts a penalty of two hundred and fifty Ghana Cedis (GH¢ 250.00). Where permission is either not sought or sought but not granted, the tree cut would be confiscated and sold. The proceeds will later be used for community development.

Established Woodlot

The participants discussed that no tree is allowed to be exploited in the Gomoa Adam established woodlot. However, permission can be granted for leaves and barks of certain trees to be taken for medicinal purposes. The sanctions for going against this directive of cutting of tree in the established woodlot attracts a penalty of a ten Ghana Cedis (GH¢ 10.00) and the cut wood confiscated.

Conserved area

Participants said that it is strictly prohibited for any tree to be exploited in the conserved area because it is believed to harbour the gods of the community. The sanctions for this offence are that, tree cut down within the conserved area attracts one goat and two fowls all black for pacification of the

gods. Again, the cut tree will also be confiscated and a fifteen Ghana Cedis (GH¢ 15.00) fine slapped on the offender.

Bushfires

The FGD revealed that bush burning of any kind is not allowed in the Gomoa Adam community. The sanctions for the offence of this nature irrespective of its purpose and who is involved attracts a fixed fine of ten Ghana Cedis (GH¢ 10.00) per episode. In addition, if the fire causes damage to property or life, the extent of damage would be assessed and the value determined for the offender to pay.

Streams

The FGDs and the individual interview all confirmed that deliberate use of chemicals for hunting is strictly prohibited in the Gomoa Adam community and all farmers who farm very close to the banks of streams must leave 50 metres distance from the banks to allow regeneration of the vegetation.

The sanctions for encroaching the stream banks or hunting using chemicals attract a non-negotiable fine of hundred Ghana Cedis (GH¢ 100) per episode per person.

During the focus group discussions, participants were also of the view that the problems that existed before the project like using chemicals in hunting wildlife, pollution of water bodies, regular bush fires and indiscriminate cutting of trees have been stopped. The participants attributed the non-existence of the problems that existed before the projects to the bye-

laws enacted and the project management committee put in place. The bye-laws have also prevented hunters at Gomoa Okyereko and Gomoa Adam from trapping rats and grasscutters in the conserved area.

The management strategies and bye-laws used in the projects confirm the assertion made by Margoluis and Salafsky (1998) that management strategies, law and policy, education and awareness creation and changing incentives (livelihood activities) play instrumental roles in achieving biodiversity conservation targets.

Implementation challenges

It was learnt from the first and second quarter progress reports and the focus group discussions that the following challenges were encountered during the implementation of the biodiversity project at Gomoa Adam (OCAS, 2005a; GHAF, 2007).

1. Termites infestation on the land destroyed the snails, rabbits and grasscutters housing units and eventually killed the snails, rabbits and grasscutters at Gomoa Adam.
2. The Gomoa Adam community's over-reliance on rain-fed agriculture during the project implementation period made the cultivation of cassava to fail.
3. The beneficiaries of the compost production were of the view that it is labour intensive and the transportation of the compost to the farms is difficult and because of that the compost production came to a halt.
4. The bee-keeping activity at Gomoa Okyereko was stopped due to the fact that bees from the project site escaped and stung community members.

Summary of Differences and Similarities

The two projects that were implemented at Gomoa Okyereko and Gomoa Adam by Okyereko Co-operative Afforestation Society and Global Habitat for Homeless had the following differences and similarities.

Firstly, Gomoa Okyereko Project Management Committee Members are using bye-laws enacted during the project implementation period and social norms in the community as a measure to sustain the gains made by the project. On the other hand, the Gomoa Adam project used bye-laws, social norms, traditional beliefs and taboos to sustain the project.

Secondly, the only livelihood activity left at Gomoa Okyereko is the individual farmers practicing agro-forestry (i.e. tree planting with fruits) whilst in the Gomoa Adam they have livelihood activity like gari processing centre and individuals engaging in agro-forestry.

In addition, both projects at Gomoa Okyereko and Gomoa Adam had Board of Trustees, Project Management Committee, Secretary, Field Supervisor, Nursery Assistant, Women Development Co-ordinator and Executive Director (contact person) and bye-laws that were used to implement the project activities.

From the summary of the literature reviewed, it was found that for impact evaluation to be effective there should be participation of the beneficiaries of the project, baseline survey before the implementation of the project and a well-defined objective(s) of the project. The projects had all above items and were used for the assessment of the projects' gains. The projects were able to put in place bye-laws and project management committees that ensured successful completion of the activities.

Document Review Checklist for the Researcher

The assessment of the project documents was done using a scale of 1 to 5. The scale is presented as (1) being the least score and (5) being the highest score. The results have been presented in Table 18.

Table 18: Document Review Checklist for the Researcher

Activity	Community	
	Gomoa Okyereko	Gomoa Adam
Immediate Objectives including specification of targets	3	3
Specification of beneficiaries:	4	4
Specification of Outputs and Output Targets:	4	3
Specification of inputs by: Donor(s) and NGO(s)	5	5
Relationship between inputs, outputs and objectives:	5	5
Implementation arrangements and managerial structure (Clarity of definition and Appropriateness)	5	5
Work-plan including timing of inputs, activities and outputs: (Clarity and Realism (practicality)	4	4
Identification of prerequisites and risks for project success: (Clarity of definition and Realism (practicality)	1	2
Linkages with other related institutions and organizations: (Clarity of definition and Adequacy)	5	5

Source: Author's construct (2014)

From Table 18, the study found that specification of inputs by donor agencies and NGOs, relationship between inputs, outputs and objectives,

implementation arrangements and managerial strategies and linkages with other environmental related institutions and organizations were all clearly stated and undertaken as scheduled in the work plan for the projects. These activities were therefore scored 5. In addition, specification of beneficiaries and work-plan (timing of inputs, activities and outputs) were scored 4. The reason for scoring both projects 4 is that the project at Gomoa Okyereko failed to train the 28 focal persons on plantation establishment on time. The training of the 28 focal persons was delayed for one month (i.e., from April to May, 2005). The Gomoa Adam project was also scored 4 on specification of beneficiaries and work-plan because the project planned that 26 community natural resource management group was to be trained on plantation establishment but the project ended up training 26 member project management committee members on plantation establishment.

Furthermore, the identification of prerequisites and risks for the projects' success was scored 1 and 2 for the projects at Gomoa Okyereko and Gomoa Adam respectively. The reasons being that, the project at Gomoa Okyereko failed to assess the risk factors on bee-keeping by allowing the bees from the project site to come to town to sting the community members. On the other hand, the project at Gomoa Adam also failed to assess the risk factors of possible termite infestation which eventually killed the snails, grasscutters and rabbits for the livelihood activities.

Respondents' Views on the Projects' Success

The respondents' views were also used to conclude the assessment of the projects at Gomoa Okyereko and Gomoa Adam. The respondents' views

were grouped under sex, age, occupation, educational background and the activity they were engaged in. The respondents of the interview guide were asked whether the projects were successful or not successful.

From Table 19, 95.5% of the male respondents and 85.4 of the female respondents were of the view that the projects were successful. On the other hand, 4.8% of the male respondents and 14.6% of the female respondents also argued that the projects were not successful.

Furthermore, 80% of the respondents between the ages of 18-27 and 89.7% of the respondents between the ages 28-37 were of the view that the projects were successful. On the other hand, 20% and 10.3% of the respondents between the same age groups respectively also commented that the projects were not successful. When the respondents were probed further the study found that the respondents who said the projects were not successful were persons whose activities were stopped during the initial stages of the projects. For example, those who engaged in bee-keeping, snail farming and grasscutter rearing at Gomoa Okyereko. Other views of the projects can be seen in Table 19.

Table 19: Respondents’ Views on the Projects’ Success

Respondents	Successful		Not successful	
	Frequency	Percent	Frequency	Percent
<i>Sex</i>				
Male	59	95.2	3	4.8
Female	41	85.4	7	14.6

Table 19 continued

Age

18 – 27	12	80.0	3	20.0
28 - 37	35	89.7	4	10.3
38 - 47	39	95.1	2	4.9
48 and above	14	93.3	1	6.7

Educational level

Never been to school	6	75.0	2	25.0
Basic	53	90.7	5	9.3
Senior High School	45	93.8	3	6.3

Occupation

Student	2	100.0	-	0.0
Self-employed (artisans)	56	96.6	2	3.4
Professional (e.g. teacher)	1	100.0	-	0.0
Retired	5	83.3	1	16.7
Farmer	36	83.7	7	16.3

Source: Field data (2014)

Based on the views of the respondents in the interview guide the study can conclude that the projects were successfully done at Gomoa Okyereko and Gomoa Adam.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter summarises the research problems, objectives, main findings and conclusions that were drawn from the study. It also provides recommendations based on the findings and the conclusions that emerged and provides areas for further research.

Summary of the Study

The purpose of the study was to assess the impact of biodiversity conservation projects at Gomoa Okyereko and Gomoa Adam in Gomoa East and Gomoa West districts respectively in the Central Region. The main problems had to do with using chemicals in hunting for wildlife, regular bush fires, indiscriminate cutting of trees and pollution of water bodies. This study also sought to assess the impact of the projects after the implementation in the light of the problems and the objectives set before the projects and how they were able to solve or reduce the problems identified.

Purposive sampling method was used to select the communities involved in the study. Proportionate allocation was done for each category to get the views of the people who engaged in the various activities. Simple random sampling method was used to select the target population. The allocated number to each stratum was subjected to the lottery technique until the required sample size was obtained.

Key Findings of the Study

The key findings were made based on the fieldwork conducted, the project proposals and the progress reports of Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) as follows:

Training and sensitization workshops

The project at Gomoa Okyereko organised a two day capacity building workshop for 28 focal persons and 11 opinion leaders. The topics treated under workshop included forest management, agro-forestry, leadership training, biodiversity conservation and sustainable management of natural resources, financial and organisation development.

On the other hand, the project at Gomoa Adam organised four sensitization workshops for the key stakeholders on their roles and responsibilities. The key stakeholders included the Chief, two opinion leaders, Assemblyman for the area, District Agricultural Extension Officer, District Environmental Protection Officer and the District Forestry Officer. The project educated and created the necessary awareness for the people of the surrounding communities (Kyiren Nkwanta, Gomoa Ngyiresi and Gomoa Odumase) about the benefits of conserving biodiversity.

Replanting of degraded area

The project at Gomoa Okyereko was able to develop two and half hectares of tree nurseries which produced 100,000 seedlings. In addition, a total of 90 hectares of land was planted with 5,450 *Teak*, 6,000 *Cederella*

odorata, 30,000 *Cassia siamea*, 5,890 *Ofram*, 3,500 *Mahogany*, 1,000 *Ceiba* and 5,000 *Moringa* trees. On the project at Gomoa Adam, 48.95 hectares of the sacred grove and 2.5 acres of the ecological centre were conserved. The 48.95 hectares of the sacred grove was planted with 125 *Entandrophragma angolensis*, 135 *Terminalia superba*, 420 *Ceiba pentandra* and 25,340 *acassia trees*).

Agro-forestry

The project inculcated tree growing as culture to individual farmers as alternative business which before the project was not part of the Gomoa Okyereko community's farming practices. The Gomoa Adam project also produced 10,000 seedlings and trained 20 project management committee members on agro-forestry method of farming.

Capacity building and livelihood support

Gomoa Okyereko project organised and trained 28 focal persons on plantation establishment and plantation management. Fourteen volunteers were also trained in business and financial management. Nine of the volunteers were given four sheep and five goats.

Gomoa Adam project on the other hand, developed the capacities of 26 project management committee members on land, forest and wildlife management. Furthermore, 13 women were supported in cassava cultivation and processing. Six men were also provided with 30 snails, four grasscutters, five rabbits and 15 beehives.

Community involvement in the projects

The planning, implementation, monitoring and execution of the project activities were all done by the project management committees at Gomoa Okyereko and Gomoa Adam.

Organisational and technical impacts

Gomoa Okyereko project introduced participatory forest management to the local farmers who engage in food crop farming. The project had 28 focal persons who were exposed to nursery management and nurturing of trees on farm. Gomoa Okyereko on the other hand had 26 project management committee members who were trained on project design, implementation, monitoring and evaluation. Also, technical skills of the project management committee were developed on sustainable soil and water conservation, organic manure production, agro-forestry practices and livelihood activities.

Conclusions

Based on the results and discussion as well as the key findings, the following conclusions could be drawn:

1. There was an extensive awareness creation through all the participating and nearby communities on environmental conservation throughout the project implementation period and the degraded sacred groves were restored and conserved. However, activities like establishment of 150,000 seedling nursery and assisting 60 farmers to establish agroforestry technology demonstration farms were never achieved.

2. The ecological training centre was built but was abandoned and there was no commercial cultivation of moringa and jatropha for processing. The farmers were introduced to improved farming practices such as the use of composting and agroforestry practices. According to the project executives, during the project implementation stages, the farmers were practicing composting and agroforestry technologies but after the project they have abandoned these methods of farming and they are complaining of high labour cost in the compost production and transportation.

3. The project at Gomoa Okyereko was able to achieve almost all the objectives and activities set for the project but five to six years after the project there is little to show in terms of the livelihood support scheme which serves as compensation for conserving the biodiversity.

4. Even though the projects have achieved about 75% of the objectives and activities at the end of the projects, the only problem was how to sustain the achievements made. The reasons assigned to these failures were that, there were no funds after the projects to carry out some of the activities like the micro-credit scheme, gari processing, weeding around the conserved areas and funds for meetings of the project management committee members.

5. From the interview guide, focus group discussions and observations made during the study the projects were successfully done. The challenges encountered by the projects were as a result of the fact that the projects were first of its kind in the two communities.

Recommendations

Based on the key findings of the study and the conclusions drawn, the following recommendations are submitted for consideration:

1. The Okyereko Co-operative Afforestation Society (OCAS) and Global Habitat for Homeless (GHAF) as NGOs should target groups like farmers, self-employed, politicians, policy makers and also should aim at increasing awareness of natural resources, including management of wildlife, water bodies and bush fires to increase policy support;

2. Okyereko Co-operative Afforestation Society and Global Habitat for Homeless should mobilize funds and support from UNDP/GEF/SGP to carry out the necessary activities that were not carried out during the implementation stages of the projects;

3. The Okyereko Co-operative Afforestation Society and Global Habitat for Homeless with the help of the communities involved in the projects should develop its own demonstration and teaching farms to teach the farmers on agroforestry since the agro-forestry demonstration farm was never done;

4. The Okyereko Co-operative Afforestation Society and Global Habitat for Homeless should give specialized training to the project implementation committees and identify community facilitators in the project areas to mobilize the groups, plan and execute their own activities as an exit strategy within the project context after the implementation of the project;

5. The role of traditional authorities in the implementation of biodiversity projects should be clearly defined to include active involvement in the planning, implementation and execution of the project activities;

6. UNDP/ GEF/ Small Grant Programme, the two District Assemblies and the Chiefs of the communities should set up sustainable systems to avoid a dead-end of projects because of funds. This must be done through setting up of special community fund to generate funds to rehabilitate all degraded community forests in the area;

7. The Okyereko Co-operative Afforestation Society and Global Habitat for Homeless should submit a request for up-scaling of the project activities. Considering the achievements made and the importance of the project to the environmental management of the coastal savannah, it is recommended that the project should continue and move into the up-scaling phase with modification of the project design matrix and subject to the following conditions: Firstly, the up-scaling of project activities should concentrate on consolidating and maintaining the gains made during old projects. Secondly, new project design matrix should be developed to focus on the objectives to achieve the overall projects objectives.

Suggestion for Further Research

It is suggested that further researches should be done on Government's efforts in biodiversity conservation in Ghana. Other researchers can also investigate policies helping biodiversity conservation in Ghana.

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APPENDICES

APPENDIX A
(SAMPLE SIZE DETERMINATION)

Size of population	Sample size (N) for Precision (E) :		
	±5%	±7%	±10%
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82

Source: Yamane (1967)

Sample size for ±5%, ±7% and ±10% precision levels where confidence level is 95% and $P=.5$.

a = Assumption of normal population is poor (Yamane, 1967). The entire population should be sampled.

APPENDIX B
PROJECT DOCUMENT REVIEW CHECKLIST FOR THE
RESEARCHER

The purpose of this Document Review Checklist is to evaluate the impacts of UNDP/GEF biodiversity projects at Gomoa Adam and Gomoa Okyereko in the Central Region.

OVERALL ASSESSMENT OF PROJECT RELEVANCE (Appropriateness)
(1=very poor 2= unsatisfactory 3=satisfactory 4=good 5=excellent/highly relevant)

1. Immediate Objectives including specification of targets:
 - a) Clarity of definition []
 - b) Relevance []
2. Specification of beneficiaries: []
3. Specification of Outputs and Output Targets: []
4. Specification of inputs by:
 - a) Donor(s) []
 - b) CBO(s) []
5. Relationship between inputs, outputs and objectives: []
6. Implementation arrangements and managerial structure.
 - a) Clarity of definition []
 - b) Appropriateness []
7. Work-plan including timing of inputs, activities and outputs:
 - a) Clarity []
 - b) Realism (practicality) []

8. Identification of prerequisites and risks for project success

a) Clarity of definition []

b) Realism (practicality) []

9. Linkages with other related institutions and organizations.

a) Clarity of definition []

b) Adequacy []

10. OVERALL ASSESSMENT OF PROJECT DESIGN (Score 1-5)

(Relevance to development problem)

1. Survey findings/baseline study results []

2. Results of research/pilot activities []

3. Extension trials and demonstrations []

4. Farm inputs and services (e.g. seeds, tools, credit) []

5. Physical facilities (i.e. constructed/rehabilitated) []

6. Technical recommendations []

7. Policy formulation/ planning advice []

8. Organisation/ management advice []

9. Investment potential (i.e. projects identified/prepared) []

10. Staff trained on the job []

11. Staff trained on fellowships/study tours []

12. Farmers/ producers trained []

13. General comment(s) of all the documents on the project reviewed.

.....
.....

APPENDIX C

INTERVIEW GUIDE FOR THE NATIONAL CO-ORDINATOR AND
PROJECT EXECUTIVES

The purpose of this Interview Guide is to evaluate the impacts of UNDP/GEF biodiversity projects at Gomoa Adam and Gomoa Okyereko in the Central Region. It would be greatly treasured if you could help me complete this Interview Schedule. This research is purely for academic purposes and nothing else. You are however, assured of confidentiality and anonymity. Thank you.

1. After getting the grants, what are the things that the CBO/ NGO has to do before the implementation of the project?.....

.....
.....

2. How do you ensure that community members participate in the project?

.....
.....
.....

3. How do you identify beneficiaries for a given project?

.....
.....
.....

4. After the completion of the project, who ensure the sustainability of the project?.....

.....
.....

5. What were some of the challenges that the project faced during the implementation of the project at:

a) Gomoa Okyereko.....

.....

b) Gomoa Adam.....

.....

8. How were these challenges addressed during the implementation of the project?

a) Gomoa Okyereko.....

.....

b) Gomoa Adam.....

.....

9. Any recommendation(s) for future project.

.....

.....

.....

f) Other (specify)

5. a) Are you a beneficiary of the biodiversity conservation project in this community? Yes [] No []

6. b) If yes, which project activity did you engage in this community?

.....
.....
.....

Socio-cultural importance

7. Why was the biodiversity conservation site created

.....
.....
.....
.....

8. a) Is the biodiversity conservation site serving the purpose for which it was established?

Yes [] No []

8. b) Please, explain your answer for (8) above.....

.....
.....

9. What were the threats to the biodiversity conservation site before the start of the project?.....

.....

10. a) Were the threats solved after the implementation of the biodiversity conservation project in this community? Yes [] No []

10. b) Please, explain your answer for (10a) above

.....
.....
.....
.....

11. a) Are there any traditional beliefs governing the biodiversity conservation site before and after the implementation of the project?

Yes [] No []

11. b). If yes, mention some beliefs/ taboos that you know?

Before the Project

Beliefs.....
.....
.....

Taboos.....
.....
.....

After the Project

Beliefs.....

.....

.....

Taboos.....

.....

.....

11 .c). Are the beliefs and taboos being enforced? Why is it so?

.....

.....

.....

.....

11. d). Can you cite cases of people who flouted these bye-laws?.....

.....

.....

11.e). What was the offence and the punishment(s) meted out?

Offence.....

.....

Punishment.....

.....

.....

Economic benefits

12. a). Do you have access to biodiversity conservation site after the project?

Yes [] No []

12. b) If yes, state how often

13. Mention at least five benefits that you/ community derive from the biodiversity conservation site after the project implementation in order of importance.

1.....

2.....

3.....

4.....

5.....

14. a) Do outsiders come here to visit the biodiversity conservation area?

Yes [] No []

14.b). If yes, what benefits do you or the community derives from their patronage?.....

.....

.....

.....

15. a). Are there any economic activities which are dependent on the biodiversity conservation area?

Yes [] No []

15.b). If yes, mention them.....
.....
.....
.....

Social Impact

16. In what way(s) does the biodiversity conservation site unite the people in the community?.....
.....
.....

17. In what way(s) does the biodiversity conservation site preserves the cultural identity of the people in the traditional area?.....
.....
.....
.....

18. Does the biodiversity conservation site have any spiritual significance to the community? Explain
.....
.....

.....
.....

19. a) List three challenges faced by the beneficiaries and non-beneficiaries during the implementation stage in order of importance.

Beneficiaries

1.....

2.....

3.....

Non-beneficiaries

1.....

2.....

3.....

19. b). How were these challenges solved?

Beneficiaries

1.....

2.....

3.....

Non-beneficiaries

1.....

2.....

3.....

20. Suggest three things that must be considered in future projects in order of importance.

1.....

2.....

3.....

APPENDIX E

**FOCUS GROUPS DISCUSSION GUIDE FOR BENEFICIARIES, NON
–BENEFICIARIES AND EXECUTIVES OF THE PROJECTS**

The purpose of this Focus Groups Discussion Guide is to evaluate the impacts of UNDP/GEF biodiversity projects at Gomoa Adam and Gomoa Okyereko in the Central Region. It would be greatly treasured if you could help me complete this guide. This research is purely for academic purposes and nothing else. You are however, assured of confidentiality and anonymity. Thank you.

1. Name of Community

2. Location:.....

3. Name of biodiversity conservation site or sacred grove.

.....
.....

4. Size of biodiversity conservation site:

a) Before the project.....

b) After the project.....

5. Ownership of biodiversity conservation site

.....

6. Brief history about the Biodiversity conservation site.

.....
.....
.....

Socio-cultural importance

7. Why was the biodiversity conservation site created

.....
.....
.....

8. What were the threats to the biodiversity conservation site before the start of the project?.....

.....
.....

9. Mention some of the threats that this project has been able to solve after the implementation of the biodiversity conservation project in this community?.....

.....
.....

10. a) What are some of the traditional beliefs/ by-laws governing the biodiversity conservation site before and after the implementation of the project?

.....
.....

10.b) Are these bye-laws/ beliefs being enforced? Why is it so?

.....
.....
.....

10c. Can you cite cases of people who flouted these bye-laws?

.....
.....
.....

11d. What was the offence and the punishment(s) meted out?

.....
.....
.....

Economic Benefit

12. State how often do you go to biodiversity conservation site after the project?

.....
.....

13. Mention some of the benefits that you/ community derive from the biodiversity conservation site after the project implementation.

.....
.....
.....

14. What are some of the benefits that you or the community derive when people come to visit the biodiversity conservation site?

.....
.....
.....
.....

15. Mention economic activities that are dependent on the biodiversity conservation site?

.....
.....
.....

Social Impact

16. In what way(s) does the biodiversity conservation site unite the people in the community?.....

.....
.....

17. In what way(s) does the biodiversity conservation site preserves the cultural identity of the people in the traditional area?

.....
.....
.....

18. Does the biodiversity conservation site have any spiritual significance to the community? Explain.....

.....
.....
.....

19. Challenges faced as a community during and after the implementation of the project.....

.....
.....

20. How these challenges were solved during and after the implementation of the project.....

.....
.....

21. Any recommendation for future project(s)?

.....

.....

.....

APPENDIX F

OBSERVATION CHECKLIST

The purpose of this Observation Checklist is to evaluate the impacts of UNDP/GEF biodiversity projects at Gomoa Adam and Gomoa Okyereko in the Central Region.

1. The project area after the completion of the project.
2. Nursery for the tree planting exercise.
3. Pictures of the biodiversity conservation site before the implementation of the project.
4. Facilities constructed or rehabilitated during the implementation of the project.
5. Get copies of the following
 - a) Baseline survey before the implementation of the project.
 - b) Progress reports submitted to GEF.
 - c) Pictures of the major activities during the project.
6. Any other thing seen at the project sites.