CONFLICTS AND HARMONIES IN LAND USE IN THE KOGYAE STRICT NATURE RESERVE

BY

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DECLARATION

I hereby declare that, except for references to other people's work which have been duly acknowledged, this work is the result of my own research and that it has never been presented anywhere either in part or wholly for the award of any degree.

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DEDICATION

Dedicated to my wife Theresah and my daughters

Deborah and Esther.

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I am however solely responsible for any errors, omissions and shortcomings that may appear.

ABSTRACT

This study was carried out in the Kogyare Strict Nature Reserve, an area considered as ecologically fragile because of its strategic position between the northern savanna and the tropical rainforest in the South. The objective was to examine the conflict that has tended to affect the effective management of the reserve as a Strict Nature Reserve. This was looked at within the framework of socio-economic factors such as increasing population, claims of ownership and the general methods of land acquisition and the influence of these in explaining the incessant misuse of the reserve by inhabitants of the area.

The impact of this misuse, expressed in the degradation of the vegetation was largely measured using the 1972/73 aerial photograph interpretation as a base year for the determination of change in land use and cover of the area using the 1991 Landsat T.M. image of the area. Wildlife was also made reference to.

Three-hundred and sixty eight respondents were selected from seven communities, four of which had been affected by the eastward extension of the original Kujani Bush Forest Reserve in 1971. Opinion leaders, Odikros and Wildlife Department officials stationed in these communities were also interviewed for their opinions.

The logistic regression model was employed to identify and explain the presence of the conflict on the basis of identified proximate variables.

The incidence of conflict was accounted for mostly by claims of ownership over the area covered by 1971 eastward extension of the reserve and its resultant difficulty in getting land for farming. Connected with this is the loss of title to non-timber forest products (NTFP'S) such as wildlife even though these resources are extensively exploited illegally.

Also, it was observed that ignorance of the laws governing the reserve was not a major factor in explaining the misuse of the reserve resources. Rather, this was dictated by the dire need for survival in the face of difficulties associated with life in most deprived rural areas. The study revealed an extensive destruction of the reminder of the forest reserve.

It also recommends the encouragement of reafforestation programmes in the area, improvement in Community–Wildlife Department relations, increased budgetary allocation to the Wildlife Department and a co-ordination of activities of NGO's working in the area with that of the Wildlife Department.

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LIST OF ABBREVIATIONS

AP	:	AFRAM PLAINS
CAMPFIRE	:	COMMUNAL AREAS MANAGEMENT PROGRAMME FOR INDIGENOUS
DNPWLM	:	DEPARTMENT OF NATIONAL PARKS AND WILDLIFE MANAGEMENT
EPA	:	ENVIRONMENTAL PROTECTION AGENCY
GOPDC	:	GHANA OIL PALM DEVELOPMENT COMPANY
IIED	:	INTERNATIONAL INSTITUTE FOR ENVIRONMENTAL DEVELOPMENT
IUCN	:	INTERNATIONAL UNION FOR CONSERVATION OF NATURE
KSNR	:	KOGYAE STRICT NATURE RESERVE
KSNRDMP	:	KOGYAE STRICT NATURE RESERVE DEVELOPMENT AND MANAGEMENT PLAN
LI	:	LEGISLATIVE INSTRUMENT
MOU	:	MEMORANDUM OF UNDERSTANDING
NGO	:	NON-GOVERNMENTAL ORGANIZATION
NTFP'S	:	NON-TIMBER PRODUCTS
PNDC	:	PROVISIONAL NATIONAL DEFENCE COUNCIL
UN	:	UNITED NATIONS
UNCED	:	UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT
WWF	:	WORLD WILDLIFE FUND

CHAPTER ONE

THE PROBLEM AND RESEARCH DESIGN

1.1 GENERAL INTRODUCTION

Until recently, most people regarded economic development as the cornerstone of social progress. Land resources the world over were therefore exploited in the quest for this progress. Industrial expansion, mineral extraction, agricultural development etc were promoted as ends in themselves and as the means by which the lives of all members of society would constantly improve. However, it did not take long to realize that rapidly increasing population, especially, in the developing countries left unchecked can serve as the demise of the quality life anticipated. In Africa for instance, many traditional agricultural systems that were ecologically stable some few decades ago are breaking down under severe population pressure. Consequently, the land cover of most areas are rapidly deteriorating.

From a world population of 2.5 billion in 1952, 5 billion in 1985 to 5.8 billion in 1996 and an anticipated increase in future, more pressure will be brought to bear on land resources, subjecting it to intensive manipulation and exploitation.

Ghana at the turn of the 20th century had approximately 8.2 million hectares of high forest. This had reduced to 1.2 million hectares by 1996. About 80 per cent of the high forest has been cleared for farming, settlement and other uses. The high forest zone has for the past years been reduced at a rate of 75,000 hectares per annum or 2 per cent and may now be less than 1.30 million hectares (Forestry Department, 1996). A major cause of this deterioration as in many other developing nations is the increasing poverty due to low incomes and ignorance among the large segment of their peoples who rely on the tilling of the land for their livelihood (Saouma, 1993). They mine the land to produce their crops and feed their livestock and are too poor to

adopt simple innovations to add organic or inorganic fertilizer and to undertake soil and water conservation (Benneh, 1996). The result is the increasing encroachment on reserved forest lands which are perceived to be relatively richer in soil nutrients. Since the activities of these encroachers are not in consonance with the aims for the establishment of such reserves, the strict enforcement of laws by governmental agencies responsible for their protection always create conflict situations. The problem lingers on when no serious efforts are made to address the concerns raised from both government and the encroachers. Eventually, it is the environment that suffers as attempts at preserving them is fiercely resisted by the encroachers.

By the 1960's consciousness about the adverse effects of environmental abuse had begun to emerge. Following this awareness, there was a U.N.conference on the Human Environment in 1972 during which the need for global assessment of land degradation was highlighted (Ferrari, 1989; Sanders, 1992). The concern for the deteriorating quality of the natural environment vis-à-vis rapidly increasing human population inspired the 1992 United Nations Conference on Environment and Development (UNCED), the so-called Earth Summit in Rio de Jeneiro (Benneh,1996).

It was estimated by the IUCN in 1992 that about 15,000 kilometre square of "intact Closed Forest" remains in Ghana. This forms about 7 per cent of the country's land area. According to Hall (1987), about a third of Ghana's forest is estimated to have disappeared in the 17years between 1955 and 1972 whilst the average annual rate of deforestation since the turn of the century has been estimated at 750 kilometres square (World Bank, 1988). Even though the annual rate of deforestation has slowed in the 1980s and 1990s (Kotey et al 1998), increasing population is forcing many local communities to excessively depend on the forest lands for their livelihood. The realization of the disastrous consequences of the uncontrolled use of land resources

has prompted the stepping up of programmes and activities by NGO's, Governmental agencies and International Organizations in recent times to protect or at best ensure the sustainable use of the remaining forests. This is to be achieved through techniques of managing and utilizing resources to fulfil human needs without damaging the environment so badly as to make it difficult for future generations to manage and utilize environmental resources to satisfy their own needs (Okigbo, 1993).

Recent concerns, especially for the high forest in Ghana have been in the collaborative activities of the Forestry Department and the International Institute for Environment and Development (I.I.E.D) at finding ways by which the Tropical High Forest of Ghana can be sustainably used and managed. The custodian of the game and wildlife reserves in the country, the Department of Game and Wildlife has not been left out of this concern. As part of the Economic Recovery Programme, the Government of Ghana negotiated for a loan from the World Bank to help restructure the Forestry Department. An amount of 5.12 million U.S. dollars out of the loan was given to the Wildlife Department to systematically evaluate its conservation strategies to meet world standards (Wildlife Department, 1994).

However, it must be noted that studies and programmes often initiated have been in most cases, on the regional scale and problems diagnosed are generalized. Most programmes therefore fall short of expectation because significant information for the locality are overlooked at the regional scale of information gathering. However well intentioned, plans imposed from above are liable to generate social conflicts or to contain technical errors. In cases where comprehensive plans and programmes are drawn to meet local demands, their implementation is either unduely delayed or completely shelved to the detriment of the environment. In cases where the concerns

of people affected by land acquisitions for the establishment of forests and game reserves appear to be forgotten, they take the law into their own hands to engage in serious encroachment. This is because local inhabitants, confronted with the tasks of daily survival find it difficult to respond to appeals for altruistic self-sacrifice and consequently, forests are cut and burned to meet short term economic needs. This is done in a bid to offset the hardships imposed by these acquisitions. Until such a time that the legitimate concerns for land resources by such communities are met, attempts at effective preservation of wildlife will fail, considering the fact that these communities would have to meet the food and other requirement needs of their ever increasing populations.

1.2 STATEMENT OF THE PROBLEM

Land worldwide is put to many and diverse uses. Benneh, Agyepong and Allotey (1990) generally classify land use in Ghana into two main categories; agricultural and non-agricultural. Agriculture constitutes the most important use of land in terms of acreage and production. About 95 percent of the total land area of some 230,000 square kilometres is suitable for agricultural use (Benneh, Agyepong and Allotey, 1990). Forests and wildlife reserves, unreserved closed forests, unreserved forest-lands, mining, settlements and other institutional uses constitute the other category. (Table 1.1).

Forests and wildlife preservation and promotion are very important in many respects. Wildlife preservation is a source of scientific investigation for the advancement of knowledge. Their preservation also features prominently in tourism development and promotion of most sub-Saharan African countries such as South Africa, Zimbabwe, Tanzania etc. Nature oriented tourism alone accounted for between

$2 billion and $12billion in 1988 in developing countries (Global Biodiversity 1992). Above all, it helps to maintain an `equilibrium' in the ecosystem of most environments. Efforts have therefore been made over the years in Ghana to create and preserve

Table 1.1: MAJOR LAND USE CATEGORIES IN GHANA

USE CATEGORY	AREA (MILLION ha)	PERCENT LAND AREA
Forest Reserves	2.6	11
Wildlife Reserves	1.2	5
Unreserved closed forests	0.5	2
Unreserved Savanna Woodlands	7.1	30
Cultivated tree crops	1.7	7
Cultivated annual crops	1.2	5
Unimproved pasture	3.6	15
Bush Fallow and other uses	6.0	25
Total	23.9	100

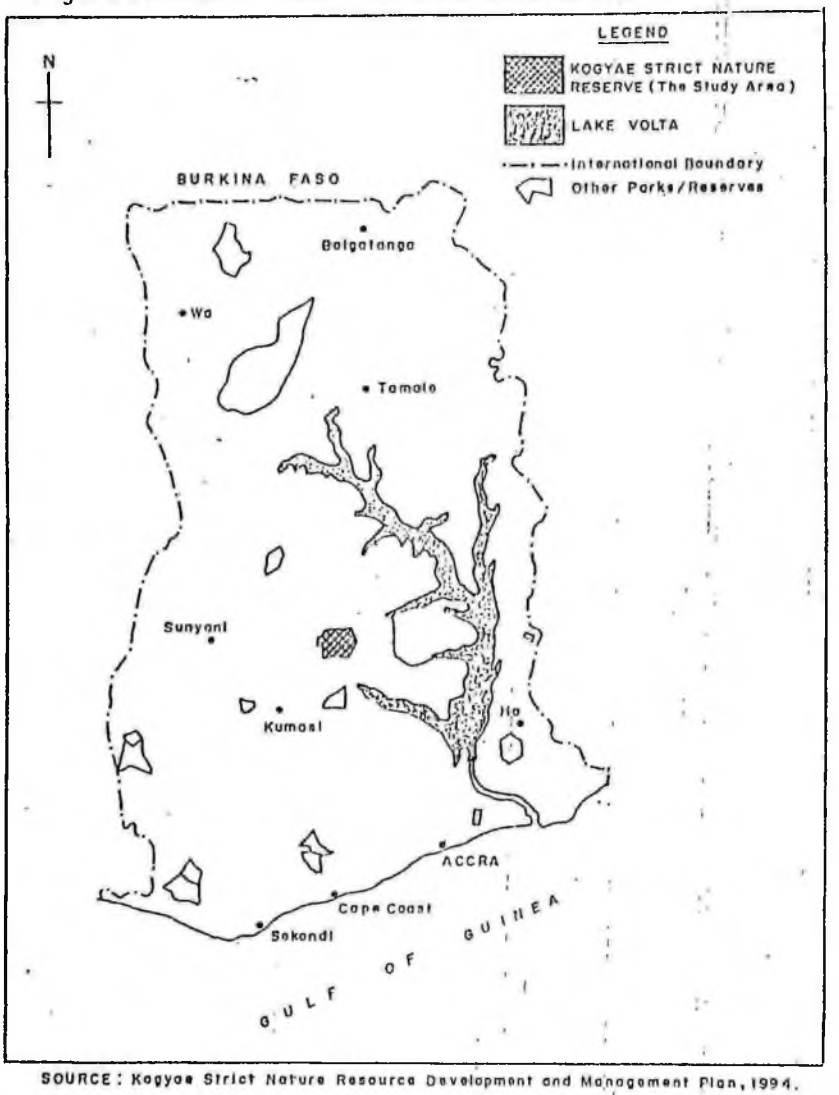
Source: Land Degradation in Ghana, Benneh, G, Agyepong, G.T. and Allotey J.A., 1990.

forests, parks and sanctuaries of wildlife to prevent their total extinction (Fig.1.1). This has been through assistance from international bodies like the World Wildlife Fund (W.W.F), the World Conservation Union, formerly (IUCN) and the International Institute for Environment and Development (I.I.E.D). There are current efforts at creating three new parks in the Afram Plains District (Kufogbe, Personal communication).

Although the initial concern for the creation of reserves may not be for tourism promotion, recent upsurge in tourism activity in the country has acted as a catalyst for the government to effectively conserve and promote them.

However, attempts along this course have not been easy. Annual bushfires have greatly affected the work of conservationists; efforts made every year in conserving

Fig.1·1 KOGYAE S.N.R. IN THE NATIONAL CONTEXT



SOURCE: Kogyae Strict Nature Resource Development and Management Plan, 1994.

flora and fauna are always hampered by bushfires. The Kogyae Strict Nature Reserve like many others in the country lost a great number of its wildlife in the ravaging 1983 bushfires. This together with other human activities have left the reserve more vulnerable to destruction. Typical among these is the improper agricultural land use practices which are crumpling under the ever increasing human population and poverty. It is said that wildlife has little chance of enduring in countries where too many people are poor (Chadwick, 1996). Under such conditions, conservationists lose ground or it takes them so long to win in that, by the time action is effectively taken, the resource would have been either degraded to a point of no return or it requires unnecessarily high capital to resuscitate and rebuild it (Asibey, 1986).

To find a solution to any problem require adequate knowledge and understanding of that problem in order to be able to give the right prescriptions. Programmes in the past to check the degrading of reserves in the country were in most cases on ad-hoc basis and therefore failed to find long lasting solutions to the socio-economic needs of localities in such reserved areas. The physical and human information base on which those programmes were planned were either inadequate or overlooked. A case in point is the "Operation Halt" exercise instituted in 1989 to stop all forms of encroachment in forest reserves and game reserves in Ghana especially those in the Western Region. This exercise suffered problems of inconsistency in policy formulation (Kotey et al, 1998). There was also a general absence of logistics to sustain the programme for a long time. As at 1993, the promised re-survey team to determine the future of large farms and major settlements, was yet to materialize; timber companies continued operations under salvage felling permits – thus taking out the few seed-bearing trees not felled by farmers which might have catalysed

recolonization. Making matters worse, there were serious divisions between government departments, sporadic conflicts with the illegal farmers and a breakdown in the ability of the district forestry office to control the situation. This is not an isolated case because just about that time similar things were happening in other game and forest reserves throughout the country. The Kogyae Strict Nature Reserve Development and Management Plan drawn up in 1994 and tailored purposely to address the problems of that reserve was until recently ineffectual.

Because of the delay in the implementation of the plan, the indigenous communities have persisted in their farming and other activities inside the reserve resulting in serious conflicts. Instances of conflict at Berem, Kyeiase Kyekyebon and Domi (Afram Plains No.1) in the Kogyae Reserve area and their influence on the effective maintenance of the reserve form the basis for investigation. The interest is further fueled by the fact that many people have observed increasing loss of forest trees and increased burning of bush in the Greater Afram Plains (GAP), an area which encompasses the Kogyae Strict Nature Reserve (Vargha, 1996). The problem is also viewed from the backdrop of the general perception that the area's resources may become generally degraded and unable to sustain the livelihoods of an increasing population (Burke, 1993).

1.3 OBJECTIVES

The general objective of the study is to examine the nature and extent of the conflict in the study area in relation to the prevailing land use and socio-economic conditions of both indigenous and settler communities in the area. The specific objectives are the following:

1. To determine the role ownership claims over sections of the reserve play in the

exploitation of resources inside the reserve.

2. To determine whether the acquisition of the land for a reserve has rendered inhabitants of the area landless.
3. To adentify the causes of conflict.
4. To highlight the extent to which the management practices of the Wildlife Department has contributed to the unauthorized use of resources in the reserve.
5. To identify the conflict resolution mechanisms that have been adopted to effectively resolve the conflict.

1.4 HYPOTHESES

Pressure on land as a consequence of increasing population has resulted in the deterioration of the environment of the reserved land as it is constantly being encroached upon for farming and other activities. Matters have not been helped by the persistent yearly desire to farm virgin lands by both the indigenous and settler farmers in the area. This has however not been without conflicts as the Wildlife Department performs its duty to keep out encroachers from the land.

The following hypotheses have therefore been put forward.

1. Landlessness among inhabitants of the area is the result of the acquisition of the land for a reserve.
2. Claim over ownership and use of some sections of the reserve is a cause of the conflict in the area.
3. The non-payment of compensation to affected farmers is positively related to the conflict in the area.

1.5 SIGNIFICANCE OF STUDY

The basic need for survival in these times of rising population, especially in the developing world has led to the uncontrolled and rapid exploitation of resources thereby destroying many ecosystems. The environment of the Kogyae Strict Nature Reserve is one such area in Ghana. Strict Nature Reserves are generally small areas containing fragile habitats that are intended to be accorded the highest protection possible. The Kogyae Reserve situated in the transitional zone of the country affords an excellent avenue for monitoring the environmental changes in the country.

However, the extent of degradation going on in the reserve has raised concerns from various circles. It has been noticed with great concern that uncontrolled use of resources in this ecologically fragile area cannot be without significant costs for the future, bearing in mind the debilitating effects of the gradually descending Sahara Desert.

The causes of this extensive misuse of the reserve are rooted in some socio-economic factors that have set the local communities against the Wildlife Department. The study therefore intended to investigate the causes of this conflict and the conflict resolution mechanisms that have been put in place to ensure that the conflict is resolved to enable the effective management of the reserve. The findings of the study will supplement existing information on the area at the disposal of government and all institutions and agencies that are concerned about maintaining a sustainable use of our natural resources especially those of the wildlife.

1.6 RESEARCH METHODOLOGY AND OPERATIONAL DEFINITIONS

1.6.1 TYPES OF DATA

Demographic and socio-economic data such as occupations, access to land, the Kogyae Reserve acquisition with its associated conflicts and conflict resolution mechanisms were collected through interviews, discussions and observation. Land use constitute a central point in the study and consequently has an effect on land cover change. Data on land cover change was obtained through the interpretation of available aerial photographs and statellite imagery of the area.

1.6.2 SOURCES OF DATA

Data for the research was gathered from primary and secondary sources. Primary data was obtained through a field survey and this involved the administration of a structured survey questionnaire and open-ended interviews with local chiefs, opinion leaders and Wildlife Department staff stationed in and outside the reserve. The questionnaire was directed at a target population of farmers, hunters etc who use the resources in and around the Kogyae Reserve.

Secondary data was obtained from the Wildlife Department, Ghana Wildlife Society, environment-related magazines and journals. Other sources include articles, documentary texts and Ghanaian newspapers.

1.6.3 METHODS OF DATA COLLECTION

A sample of 368 users of resources in the area, out of an identified total of 824 users were considered under the investigation. This procedure was adopted because of the absence of reliable data on heads of households in the area, a target group which would have been the most appropriate. The sample was chosen from 7 village

communities, four of which have been affected by the 1971 extension of the original Kujani Bush Forest Reserve. These are Berem, Kyeiase, Kyekyebon and Yaya Akura. These four communities were purposely selected for intensive investigation as the preliminary survey showed that this area was the main conflict zone. The simple random sampling technique was employed in the selection of the three other communities. The method of proportional representation was adopted to ensure a fair representation of the villages based on the observed number of users.

Consequently, Berem which accounted for 36.4 per cent of the total number of observed users had 134 slots, while Kyeiase and Kyekyebon had 64 and 51 slots respectively as shown in Table 1.2. The systematic sampling technique was then employed to select the respondents because of its simplicity and the homogenous economic characteristics of the people in the various communities. In such cases a random start does not create any biases. A list of 824 respondents was drawn in seven communities chosen in the survey. Based on the proportional representation of users in the various communities, every 2nd respondent on the list starting with a randomly selected case among the respondents was chosen and interviewed.

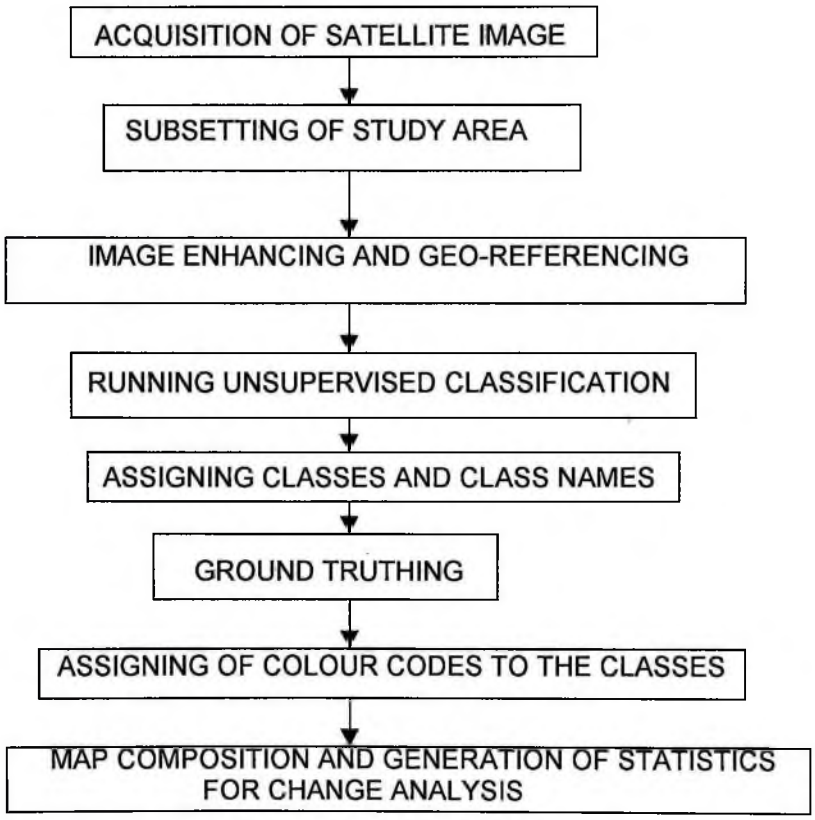
TABLE 1.2: DISTRIBUTION OF THE SAMPLED USERS

SETTLEMENT	NUMBER OF IDENTIFIED USERS	NUMBER OF SELECTED USERS	PERCENTAGE
Berem	300	134	36.4
Kyeiase	144	64	17.4
Kyekyebon	114	51	13.8
Yaya Akura	71	32	8.7
Dagomba	73	33	8.9
Sasebonso	68	30	8.2
Abrewanko	54	24	6.9
Total	824	368	100.0

Source: Fieldwork, 1998.

The 1972/73 black and white aerial photographs at the scale of 1:40,000 were acquired from the Survey Department. They were then assembled for interpretation. The interpretation which is an essentially deductive process led to the delineation of identifiable features such as the relief, quarries and the vegetative cover types on transparent paper. This was used to reconstruct a land-use and cover map of the reserve as at 1972/73. The aerial photographs interpreted was then used as the basis for the changes observed on the 1991 remotely-sensed image of the reserve. Figure 1.2 shows the methodological approach adopted in the analysis of land cover change in the Kogyae Reserve.

Figure 1.2: METHODOLOGICAL FRAMEWORK FOR LANDSAT TM INTERPRETATION



Source: Remote Sensing and Geographic Information Systems (G.I.S) in Ghana: Research, Applications and Collaborations, 1999.

The satellite image of the reserve was obtained from the Remote Sensing and Application Unit of the Department of Geography and Resource Development, University of Ghana. This was followed by the subsetting of the reserve using the ordinance reserve boundary. The image was enhanced and then geo-referenced to the existing 1:50,000 topographic sheet from the Survey Department.

The varying land use and cover were interpreted using unsupervised classification based on computer automated identified features. Classes were then assigned and class names given. Field validation or ground truthing was conducted to check the validity of classes assigned in the laboratory. The field observation was made possible through the assistance of the Wildlife Department staff, local community members and the research assistant who knows the geography of the area very well.

The field validation finally led to the reassigning and merging of some classes. On the basis of this the 1991 Landsat TM land use and cover classification map of the area was composed.

1.6.4 DATA ANALYSIS

Two separate analyses were performed. The first involved examination of the bivariate relationships between selected socio-economic characteristics of the people and the various outcome variables. Secondly, multivariate logistic regression technique was used to model some observed determinants of conflict. This method was favoured over the other regression models because of the dichotomous nature of the dependent variable (conflict) and the proximate variables. Descriptive techniques such as percentages and simple cross-tabulations were used to combine the variables in an optimal way.

Data on the extent of vegetal removal, a form of environmental degradation was through the analysis of aerial photographs and satellite image of the area. A 1991 satellite image was analysed in relation to the 1972 aerial photograph. Vegetal removal as a form of degradation was chosen for analysis because of its importance as the habitat of wild animals.

1.6.5 LIMITATIONS OF THE DATA AND STUDY

The results of the sample survey are affected by two types of errors, non-sampling and sampling errors. Non-sampling errors are due to mistakes made in carrying out field activities; such as errors in the way questions were asked, misunderstanding on the part of either the respondent or the interviewer, data entry, etc.

Determining the extent of vegetation degradation was mainly by computer analysis of change. Differences in structure, species type, distribution and height of trees could not be determined off-hand because of lack of expertise, logistics and time constraints. As a result, the plant species composition in the reserve could not be compared to determine the reduction in composition.

The study is limited by the use of random representative samples in the selection of settlement areas and the sample population. In any case, this study would serve as a source of further investigation into the socio-economic activities of the people in the area.

1.6.6 THE STUDY PERIOD

The study period covered two months – from September to October 1998. This period was chosen to take advantage of the period of land preparation towards the minor farming season. Secondly, it is the period in which there is a nationwide ban on

hunting for game. The period therefore enabled the observation of the activities that go on inside the communities and in the reserve.

1.6.7 OPERATIONAL DEFINITIONS

Various concepts have been used in this study to highlight issues concerned with land use in the Kogyae area. Prominent among these are land use and use conflicts, harmonies, national park, strict nature reserve and encroachment. These have been operationally defined as follows:

Land use refers to the varied uses to which land is put; for example the use of land for the establishment of settlements farming schools, reserves etc.

Land use conflicts explain the situation where planned land use in a particular area contrasts with what other people do with the same piece of land. For example, an area under agricultural use is zoned for the construction of a sports complex or a piece of land set aside for scientific study is the target for the construction of an inland port. Land use conflicts are generally disagreements arising out of the varied personal or sectoral interests over the use of a particular piece of land.

Harmony in land use on the other hand is the situation where the imposition of planned land use corresponds with existing land use in the area or is commensurate with the needs and aspirations of the local people. Where for example land under agricultural use is acquired for the provision of a school; a health centre or a market, the cost of releasing the land for these projects would be greatly off-set by the numerous gains that would accrue to the local people from the use of the amenities provided. A national park is defined as an area set aside for the purposes of protecting and conserving wildlife animals, plants soils and water. A park is used in

this context to mean a reserve in which destructive utilization such as hunting and trapping of animals, cutting of trees and farming is not permitted.

A strict nature reserve, unlike a national park, where touristic activities are permitted, is an area kept mostly for scientific study with only limited entry allowed.

Encroachment constitutes all acts of illegal farming, cutting of trees, hunting, and creation of settlements on government acquired reserved lands. For settlements already situated within the statutory limits of these reserves, encroachment constitutes going beyond stipulated limits for farming, hunting and other human activities.

1.6.8 STRUCTURE OF THESIS

The thesis is made up of six chapters. The first Chapter highlights the problem of the study and the research design. This includes a general introduction, objective, hypotheses to be tested and the significance of the study. It also includes the research methodology and operational definitions. Specifically, it looks at the sources of data, methods of data collection and analysis. The limitations of the data gathered and the study in general are also discussed. Terms used in the study are also operationally defined. Chapter 2 reviews the relevant literature on issues concerning land, conflicts, wildlife conservation and land degradation. It looks further at the general perception of people on wildlife conservation.

The study area is the focus of Chapter 3. This deals with aspects of the physical environment such as geology, soil, relief, drainage, climate, vegetation and fauna. It also looks at the socio-economic environment. It discusses issues such as population, land use and infrastructural development.

Chapter 4 discusses land acquisition and land use conflicts. It looks at land acquisition by the local people and government. The perceptions of the people on the

preservation of wildlife and the conflict resolution mechanism that have been put in place to bring peace to the area. Chapter 5 examines the spatial patterns of land use and cover change in the Kogyae Strict Nature Reserve. It looks at the results of aerial photographs and Satellite imagery interpretation of the area while Chapter 6 presents the summary, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 LAND TENURE SYSTEM

Land tenure refers to the rules that govern the ownership, use and transfer of land (Benneh, 1996). Generally, the main forms of land ownership in Ghana are communal, private and government expropriated lands. Communal land ownership is the system whereby land is collectively owned by an extended family, clan or community of ancestrally related people, with control or administration vested in the leader or his appointee, who may give out portions of the land to the community or non-community members to be used on an individual basis, on a more or less nucleated family basis, on a co-operative basis or through some other such recognized arrangement, for variable lengths of time (Gyasi, 1994). Land ownership is thus recognized within a communal socio-legal framework. Legislation and statutory regulations are largely uncommon to the predominantly illiterate population, who are generally governed by customary/traditional land administration practices (Kasanga, 1994).

In the study area for instance, individual community members enjoy free usufructuary rights over the communal land on the basis of kinship. Traditionally, any indigenous person who needed land for either farming or residential purposes had the right to use land anywhere provided it is within the jurisdiction of their local sub-chief. Once the land is not being used by another person, the local inhabitants do not need any prior approval from the local chief (Wildlife Department, 1994).

Strangers or settlers wishing to acquire land seek permission from traditional heads (local heads) to settle in an area and thereupon acquire land as a gift or on some contractual basis. This is usually completed after the presentation of drinks

and a sheep or, in lieu of that, money to cover the drink or sheep. Land can also be owned privately in any part of the country through the direct exchange of money for land or by some other criteria.

Government lands are lands that have been compulsorily acquired. Usually, these are stool lands for which a lump sum of compensation had to be paid to divisional chiefs (Gough and Yankson, 1997). These lands are vested in the state on behalf of and in trust for the people, and maintained for the common good. Such lands are diverse in nature and range from barren lateritic soils to well-watered forest lands. The Ghana government in the early 1960's acquired large stretches of land in the Central, Eastern Regions and some other parts of the country with the intention of establishing state farms (Kasanga, 1992). Instances can be cited of the establishment of palm plantations at Kwae, Twifo Praso/Ntafrewaso and Benso where large tracts of land has been compulsorily acquired from the people. Similarly, wide stretches of land have been acquired for the establishment of forest reserves, game reserves/national parks and water protection areas in various parts of the country. Some of the notable parks are the Mole, Digya, and Kakum National Park. Kogyae is classified as a Strict Nature Reserve. Forest reserves according to Benneh, Agyepong and Allotey (1990) may be classified into two categories, namely, the reserved forests which are constituted under the Forest Ordinance cap 157 and the Wildlife Reserves Regulations 1971 (L.I. 710) as subsequently amended and managed as forests and wildlife reserves.

Land areas, be they privately, communally on government owned, differ a great deal in the intensity with which they are used. Urban lands particularly those found in central commercial districts are usually subject to very intensive use, while farmlands are ordinarily treated somewhat less intensively and forest and grazing lands receive

still less intensive treatment (Mather, 1996). Rapid population growth and increasing immigration, leading to an alarming rate of encroachment on government lands have however compelled a serious look by government at these rural resources in recent times.

2.2 LAND CONFLICTS

The economic and social development of a people and for that matter a nation is generally thought to be dependent upon its ability to exploit its natural resources. This contention is however debatable because, not only does well-being rest entirely on how easily man is able to exploit these natural resources available to him, but more importantly, on how these resources can be sustainably used, bearing in mind their seemingly finite nature.

The exploitation of these natural resources have in most instances engendered conflict situations (Bacow and Wheeler, 1987), arising from claims over ownership and use right even at international levels where it has led to military skirmishes between disputing countries.

At the local level, instances of conflict over ownership and use of land have been reported in various parts of the country. Notable amongst these are the clash of arms between the people of Peki and Tsito (1979, 1980), the Nanumba-Konkomba (1980, 1994), Gonja-Vagala (1979-80) and Krobo-Akyem (1980). All these had in one way or another "land" or traditional political authority as the basic issue at stake (Nabila, 1992).

The 1994 Nanumba-Konkomba war, like all armed conflicts that preceded it, was a tragic mistake for which several thousand people, the majority women, children, the aged and the infirm had to pay with their lives. It turned the people of the region into

refugees in their own country, diverted financial resources budgeted for crucial areas of the national economy and arrested the region's development in no small way (Daily Graphic, 4th July, 1994).

Human beings everywhere depend on food for sustenance. Oftentimes, when settlements are sited at the immediate precincts of resources such as forest reserves, they become targets for exploitation. Finding of studies by Chisholm, (1962) Gyasi, (1979;) and Gyasi et al, (1990) confirm this. Vargha (1996) also reports of a similar situation in the Greater Afram Plains (G.A.P.) which encompasses the Kogyae Reserve and the Digya National Park. Several settlements e.g. Dagomba, Yaya Akura, Zipo, Asesewa, Kwaehunu Birem, Kyeiase are either located at the precincts of the reserves or inside. Human activities in these settlements have resulted in conflicts between the field staff of the Wildlife Department and the local people.

Conflicts may arise over land because people value different attributes of the said land. Economics is in most cases an important factor in land use and consequently a major influence in competition between land users (Maser, 1996). Apart from preserving land for its sake, which in a way may appear non-economical, other uses such as the establishment of industrial complexes, real estate development, large scale cultivation of land and ecotourism are directly economical. That is, the principle of economic utilization goes into their use.

Conflict over a resource lies in either competition among parties seeking its tangible monetary value or competition among parties split in seeking its tangible monetary value versus its intangible spiritual and scenic use. The real competition however is usually for the perceived value to be obtained by taking possession of the resource for its conversion potential – its ability to produce money (Maser, 1996).

In a way conflicts arise as a result of a perceived scarcity of resources. They intensify when the resource in question becomes scarce in absolute terms, Nolam, 1993). The perceived or real threat of a person's source of livelihood and survival usually explains why people or even nations stand their grounds when in competition over a particular resource. Gyasi (1996), cites the example of the dramatic refusal of the migrant Ningo farmers of Atobiriso and Okaikrom to grant government and Ghana Oil Palm Development Company (G.OP.D.C) officials entry into their acquired lands.

There is evidence in Ghana that a significant proportion of government acquired lands have been lying idle as far back as the early 1960's and has consequently induced landlessness among some inhabitants of some districts (Kasanga, 1994). The feeling of landlessness especially among increasing numbers of migrant farmers to some localities have led to an alarming rate of encroachment on government lands especially forest and game reserves. Instances of encroachment have been recorded from the Kakum Game Reserve where farmers constantly encroach upon the reserve for farming activities and illegal cutting of timber. The Bodi, Tano Ehuro, Manzan Sukusuku and Bia Tawya Reserves in the Western Region have not been spared either (I.I.E.D, 1993). Extensive areas not suited for agriculture, such as reserves and parks, are under pressure from farmers pushed out of landless areas of the country, while large areas of cultivable land elsewhere appear to be underutilized.

The establishment of national parks and forest reserves often deprive the local people of both land forage resources and rights of access to wildlife. Invariably, it tends to dislocate the people, create land shortage and land tenure problems. Such situations only succeed in worsening rural living conditions by dispossessing the peasants of land, their most fundamental resource with little or nor compensation (Gyasi, 1996).

Forest reservation according to Agyepong and Olesen (1992) have been less successful than expected over the years because the reserves have been encroached upon or burnt. Their findings in the Tain II forest Reserve study confirm that demand for farmland is an insidious factor of encroachment in reserved forest lands.

The situation is not different in the Greater Afram Plains (G.A.P) where sections of the Kogyae and Digya Reserves have been constantly encroached upon for farmlands. In the Kogyae Reserve area in particular, there are claims over ownership of some sections of the reserve by the indigenous people. There is also conflict between the Kwaman and Kumawu Stools over ownership of this same piece of land (Daily Graphic, 13th September 1994). Danso and Agyare (1994) also report conflict between migrant fishermen from the Volta Region and the field staff of the Wildlife Department in the Digya - `arm' area of the Digya National Park over encroachment. Problems of definition of boundaries have also been reported at the Sene section of the Digya National Park and Hwanyaso in the Afram Plains District. In all situations, individual private needs and concerns did not conform with the duties and obligations of the Wildlife Department, the custodian of these reserves; conflicts were therefore common. The case of the Kogyae Reserve is of particular interest because of its size as against the number of settlements dotted in and around it, coupled with the ever increasing number of migrant yam farmers who are always in search of virgin lands. (Wildlife Department, 1994). The Kogyae and Digya Reserves are likely targets for encroachment because of the 1994 northern conflict which has temporarily created some degree of landlessness among some tribes in the conflict. Most of these people who are farmers have moved south of the conflict zone to ply their profession.

It must be noted however, that, conflicts *per se* are not necessarily destructive. They can be personally and socially constructive, such as a focused debate on an

issue that brings increased growth in personal and social consciousness (Maser, 1996). Metcalfe (1997), for example reports of conflict between conservationists and rural communities in Zimbabwe as it is in many other countries. But as a new wildlife management policy, ecologists with the Department of National Parks and Wildlife Management (D.N.P.W.L.M) after serious consideration of complaints from the local people introduced the concept of "sustainable use" and encouraged an integration of conservation and development objectives. This was done by permitting local communities the right of management and use of the wildlife on their lands. It was evolved as an undertaking to reconcile the different interests of government and community authorities concerning control over wildlife resources. This became known as Communal Areas Management Program for Indigenous Resources and known by the acronym CAMPFIRE. This strategy has in effect toned down the earlier feelings of suspicion and mistrust as the local people and the wildlife officials now see each other as comrades with a common goal.

A similar system of accommodation was experimented in 1938 with the Taungya system in the Tain Tributary Block II Forest Reserve in Ghana. In this system tracks of land were released to village groups in compartments. Farmers cultivating these lands were under obligation to intersperse their crops with valuable timber species. The farmers would maintain their farms for only two years while tending of the planted trees by the Forestry Department would start in the third year. The system was unsuccessful because of its unpopularity among the local people. It was reintroduced in 1962 but has achieved little success as only fifteen acres of taungya was established as at 1970 (Agyepong and Olesen, 1992).

A conflict becomes destructive only when it destroys human dignity and degrades the productive capacity of the ecosystem leaving no options for future generations

(Maser, 1996). The activities of illegal settlers and poachers represent some form of destructive conflict because normally, they do not look beyond their present circumstances, that is, they exploit these resources to meet their immediate needs for food, shelter and clothen without thinking of the status of the resource in future.

2.3 AGRICULTURAL LAND USE PRACTICES

Agriculture has traditionally formed the principal economic activity in rural areas in Ghana. It generates the bulk of employment. This is practiced predominantly under two main farming systems – bush fallow system and shifting cultivation. The bush fallow system is characterized by rotation of fields, small scattered holdings, extensive use of slash and burn clearance systems using muscle power and simple implements like the hoe and cutlass with minimal use of machinery for work (Benneh, 1972; Okigbo, 1993). Farming is predominantly for subsistence but increasingly becoming commercial with products offered for sale in local markets and for export (Okigbo, 1993).

According to Benneh (1972), the bush fallow system has the advantage of securing food supplies with minimal or no land degradation. Success however depends on the pressure on the land by the population and the type of crops grown. The system works effectively under conditions of low population pressure and plentiful supplies of land. This is what Gourou (1965) observed as its greatest weakness. According to him, the system works satisfactorily so long as a certain balance is maintained between the spontaneous possibilities of nature and man's needs. He points out that if that balance is upset, natural fertility runs the risk of being quickly exhausted. If population increases, man adopts new agricultural methods which give greater yields without harming the soil or else, he reduces the length of the fallow

period. The effectiveness of the system is also dependent upon distance of the fields from the settlements; the nearer the field, the more likely its frequent cropping (Vargha, 1996).

Shifting cultivation on the other hand is the system where farmers in the search of new fertile lands whenever their cultivated soils become exhausted move their homesteads (Benneh, 1972). The farmer may not return to the abandoned land and this makes the fallow indefinite. This system also thrives where land is plentiful in relation to the needs of the community. The population capacity of the system has generally been estimated to be less than 25 persons per square mile (Benneh, 1972).

Land use practices in the Kogyae Reserve area and the Afram Plains in general are rapidly degrading the environment of the area in recent times. The bush fallow and shifting cultivation systems with their extensive use of slash and burn clearance methods have destroyed much of the vegetation in the area. With increasing population in the reserve area, lands are gradually being cultivated on a more permanent basis as there is not enough land to engage in the rotation of fields. Faced with the probhlem of "land shortage" outside the reserve, most people have resorted to farming the reserve land - a source of conflict in the area.

2.4 CONSERVATION OF WILDLIFE

Forest and game reserves are of much significance to many countries in varied ways. Their values include the generation of a wide range of produce and the provision of important environmental services and benefits to man (World Environment Encyclopedia, 1997). Their increasing importance for ecotourism in the economic development of nations cannot be overemphasized. Forests contribute tremendously to maintain soil fertility by preventing soil erosion through excessive run-

off and the recycling of nutrients through litterfall and decomposition of deadwood. It also prevents the drying out of watersheds, provide habitat for numerous flora and fauna and generally maintains biodiversity (Kuwornu, 1996). It is also important because of its pronounced micro-climatic influence and benefit to man.

2.5 GHANA'S FOREST POLICY

Taking cognizance of the economic, educational, cultural and scientific importance of forests and game reserves, governments in the past and present have made and are making serious efforts at safeguarding their future. Forest sector legislation goes back as far as 1906, when laws were passed to control the felling of commercial tree species. The creation of the Forest Department in 1908 led to the creation of 14,800 square kilometres of reserved forest as at 1939.

The Forest Ordinance Act of 1911 allowed the colonial government to reserve all uninhabited forests thus depriving most local populations of previous user rights. (Table 2.1).

The post-independence era also witnessed accelerated use of legislative powers in the expropriation of land for various purposes (Kasanga, 1994; Gyasi, 1995). For example the Wild Animals Preservation Act of 1961, the Forest Ordinance cap 157 and the Wildlife Reserves Regulations Act of 1971 (L.I. 710) as subsequently amended were used to create many forest and game reserves in the country. These were considered along both the productive and protective roles they were excepted to play (Wildlife Conservation Policy, 1974). Designated national parks and reserves occupy about 12,685 square kilometres, that is 5.2 per cent of the country's total land area (Ministry of Tourism, 1994). The wildlife protected areas are under the

administration of the Wildlife Department. Virtually, all the parks and reserves have some resident staff that is responsible for wildlife protection.

Table 2.1: OVERVIEW OF GHANA'S FOREST POLICY

1908	Creation of Forestry Department
1927	**Enactment of Forest Ordinance**
	• Principal Statute governing the constitution and management of forest reserves • Vests in central government the power to constitute reserves on all land for management by state
1948	**Adoption of First Forest Policy**
	• Planned management introduced in reserve areas **Critiques** • No firm commitment from government to provide resources for implementation • Alienated farmers from forest management decisions • Promoted the uncontrolled exploitation and eventual demise of off-reserve forests.
1962	**The Concessions Act, (Act 124)** Significantly modified the Forest Ordinance. The act provides that all timber resources, together with all land declared to be forest reserves or subject to timber concessions, are vested in the state in trust for the communities concerned. The power to grant timber concessions is vested in the Minister of Lands and Forestry.
1974	Forest Protection Decree • Prohibited a range of activities within reserves • Forest user rights of stools and communities transferred entirely to central government.
1994	**Forest and Wildlife Policy** • Encouragement of community initiatives protect natural resources for traditional, domestic and economic purposes • Development consultative and participatory mechanisms to enhance land and tree tenure rights of farmers and ensure access to local people to traditional use of natural resources.

Source: Kotey et.al (1998).

Ghana's first Forest Policy was adopted in 1948. The 1927 Forest Ordainance enactment gave the colonial government the power to constitute forest reserves but it was the 1948 policy that introduced planned management in the reserve areas. However problems were encountered in its implementation as resources (logistics) to

aid effective implementation were lacking. This period marked the genesis of the uncontrolled used of forest resources because the policy alienated the users of the land (farmers) who could have made some input in the management of the forests.

The post-independence Forest Policies of 1962 and 1974 did not achieve much. Not only did the 1962 Concessions Act (Act 124) deprive owners of Forest lands their use, but further took away their power to exploit timber resoruces off-reserve areas. This was consolidated by the 1974 Forest Protection Decree of 1974 which transferred entirely to the central government the forest user rights of stools and communities.

Policies and enactments which span the period between 1927 and 1993 sought to divest all forests from human contact and this greatly affected it as the people resorted to illegal expliotation of the resource.

In view of the observed inadequacies in these policies and their impact on the timber industry and the implications of tenure for forest resource management, the Forest Policy of 1994 was enacted to ensure participatory management of forests outside reserves by local people.

2.5.1 FACTORS INFLUENCING WILDLIFE CONSERVATION

2.5.1.1 CLIMATE

Climate plays a very important role in determining the state and nature of a forest resource.

Rainfall is a very important climatic element in determining the nature of a vegetation. It generally has effect over vegetation and agriculture in Ghana (Bettie and Wills, 1962). Vegetation is important as a resource as a well as providing habitat or

protection to other resources such as wildlife, soil and water. Adequate vegetation cover therefore provides stability to environmental systems.

However, in periods of extreme adverse weather conditions, eg drought, wildlife is at a serious risk of destruction especially by bushfires. For example, national concern about environmental degradation was highest during the long dry spell and ravaging bush fires in 1983.

2.5.1.2 POPULATION

Population is very important in terms of increasing pressure on land. According to the 1984 Population Census, Ghana had a population of 12.3million. A projection of the population as at 1998 put it at 18 million with a growth rate of 3.2 per cent. This increasing population has its attendant increase in demand for agricultural land and other uses. As human activity increases both spatially and in intensity, the degrading of the environment also accelerates. The increased human activity arises from increasing population to the extent that marginal lands are extensively cultivated. Hence the primary cause of most degraded areas is often attributed to population pressure on land (Gerakis, 1974). According to Nabila (1992), one major consequence of the rapid population growth of Ghana is the dwindling resource base of many localities. The inordinate intensification of human activity has led to the degradation of soils, air, water and the overall biomass of most communities. Ghana some few decades back had wide stretches of unfarmed and undisturbed lands which offered protection and breeding grounds for wild mammals and birds; but these have become seriously threatened because of indiscriminate destruction of their habitat due to rapidly increasing population. Blaikie and Brookfield (1987), however; caution that population pressure should not be used as a uni-causal model for explaining land

degradation (diversity loss), because there are instances where a marked decrease in population has led to the same result.

2.5.1.3 AGRICULTURE

As the major land use factor, agriculture exerts a powerful modifying influence on the environment. This is basically because it involves vegetation clearing which subsequently could be followed by improper cultivation practices. Expanding human population has required more and more land to meet the food requirement of man. This increase in absolute numbers of people for this requirement is a major stress on the environment (Gyasi *et al*, 1995). According to Saouma (1993), the simple need to nourish itself makes every living being a predator because we attack the environment around us in an attempt to meet the essential requirements of food, shelter and clothing. It is known for example that intensification of agricultural production as a result of increasing population pressure, intensification of farming, overgrazing and conversion of land to several other uses have resulted in several undesirable changes in the environment with adverse effects on agricultural production (Okigbo,1995). Typical among these is the acceleration in deforestation due to increase in demand for fuelwood. These landscape alterations have resulted in such drastic environmental changes that flora and fauna have been greatly reduced in numbers and in kinds if not exterminated altogether.

2.6 LAND DEGRADATION AND WILDLIFE CONSERVATION

Land degradation has been defined variously by different authors. Benneh, Agyepong and Allotey (1990) define land degradation as the impairment of the productive capacity of land. This productive capacity involves simple land qualities as depth of soil, organic matter content of soil, vegetal cover etc.

While wildlife reserves and forests are preservational in character, activities involving land clearing like timber extraction, farming and mining are degradational (Mather, 1986) and this comes about as a result of cumulative land use decisions through time (Blaikie, 1986).

Land degradation which essentially connotes deterioration of land resources, notably soil, vegetation and water according to the United Nations (1992), is the most important environmental problem affecting extensive areas of land in both developed and developing countries. This stems from the fact that productivity of large areas of land is declining just when populations are increasing.

Grasses are replacing forests as a result of excessive use of fire and the adoption of unsuitable methods of land cultivation. This has not only led to the destruction of trees but also their seedlings. In the vegetation transition zones between forests and savanna in general and in Ghana in particular, the "Acheampong bush" (*chromolaena odorata*) which is difficult to control due to its high regeneration ability has become a source of worry to the maintenance of forests. Once forests are cleared, legally or illegally, those portions are quickly colonized by this weed which is also highly combustible. Relating degradation to the food situation on the African continent, Benneh (1996) states that the deteriorating natural fertility of soils is seen as the primary factor in the generally declining, stagnating or at best marginally increasing agricultural output. This according to him is the cause of the adverse food supplies, nutritional status, incomes and general welfare of the expanding population. This decline in productivity of land and labour is what Blaikie and Brookfield (1987) describe as the "quiet crisis" which nevertheless erodes the basis of civilization.

It must be noted however that in the absence of human activity, the process of land degradation occurs in nature but at such a slow rate that the natural process of

regeneration and repair is able to keep pace to maintain a state of equilibrium Blaikie and Brookfield, 1987). It is when human activities such as those that remove the vegetation cover set in that land degradation is accelerated (Benneh et al, 1990).

Land use does not necessarily lead to degradation. Proper land use practices which do not lead to degradation are not only possible in a great majority of environments, but have been frequently accomplished in human history (Blaikie and Brookfield 1987) . However, the same human skills are not useful and effective in all places: under similar systems of management, the productivity of some land is well sustained, while that of other land deteriorates rapidly.

2.7 GENERAL PERCEPTIONS OF WILDLIFE CONSERVATION

Wilidlife conservation has gained wide recognition the world over in recent times. However, in some localities, people believe that usufructuary rights to these resources in whatever form should not be restricted. Generally, communities affected by governments' expropriation of land for wildlife conservation often see this as being very oppressive since it is they who suffer from these protectionist measures. (Kotey et al, 1998). Affected people usually claim they are denied access to resources they have traditionally exploited. There are further claims that not only do they lose their traditional management and use right to wildlife resources, but in some cases bear the full cost of crop damage or lose their lives because of migrating wildlife (Global Biodiversity 1992). The above scenario, exemplified in the 1974 Ghana Wildlife Conservation Policy that the government cannot be held liable for damage caused by wildlife nor for payment of compensation if such damage occurs, naturally stems the tide of opinion against wildlife conservation. When no concrete efforts are made to resettle or compensate such affected people, their resolve against deprivation is

strengthened. Most conservation programmes according to Milner and Douglas (1989) do not succeed because technical solutions fail to take account of the local peoples' perception of the problem of the environment. According to Amanor (1995), failure to understand the peoples' popular perceptions of the environment may lead to failure in the design of "green technologies", if these do not take local farming styles and objectives and strategies of farmers into consideration.

Where local populations are denied the use of a forest resource, their alienation from these resources can result in apathetic attitudes in which their members make little or no effort to expose the illegal exploitation of these resources. People are most often aware of widespread "looting" of timber from reserves by chainsaw operators and some timber contractors who own concessions adjacent to forest reserves, yet show no interest in reporting them to the authorities. This illegal exploitation has increased in recent times with rising rural populations (Wildlife Department, 1994) and poverty (Benneh, 1996).

This has not only led to encroachment on government lands but also the gradual wiping out of the moderate gains made in the past through indigenous conservation methods such as keeping and maintaining sacred groves, headwaters and river courses (Kofie, 1996). Exploitation of these land resources has therefore become the only available means of securing subsistence and income by these local people.

Conservation organizations have come to the realization that, local communities should not have to pay for national or global conservation. According to Wild and Mutebi (1997) integrated conservation and development projects, and the concept of biosphere reserves are among approaches to reconciling conservation with development that have been tested in a variety of ecological and socio-economic

settings over the last decade. Underpinning such an approach is the need to encourage community involvement in conservation efforts and to recognize the potential of the local people as the driving force for conservation. The conception that reserves and parks should be "no go" wildlife areas where the human being is seen as an inconvenience than as an integral part of the ecosystem (Bencherifa, 1993), have to be revolutionized to be in tune with situations prevailing on the ground. This is because wildlife has little chance of enduring in countries where too many people are poor and disenfranchised (Chadwick, 1996). Uganda for instance has chalked some successes in its wildlife conservation efforts especially in the Bwindi National Park because of the recognition of the fact that the co-operation of the local people in protecting the gorilla would only be forthcoming if they are made to benefit from the reserve. It consequently transferred some responsibility for the reserve management, law enforcement and surveillance from the largely "alien" government staff to the local comminutes (Wild and Mutebi, 1997).

2.8 CONCEPTUAL FRAMEWORK

There are varying and conflicting perceptions of benefits, needs and constraints in environmental resource ownership, management and development (Kasanga, 1994). Claims of legitimacy over the right of use and management have been at the heart of most land use conflicts (Devereux, 1988; Maser, 1996). These environmental resources have often been contested for at various levels of society by different social actors (Bacow and Wheeler, 1984).

Legitimacy as explained by Leach *et al* (1997), refers not only to command sanctioned by a statutory system, but also to command sanctioned by customary rights of access, use or control and other social norms. The question then is, how do

different social actors gain access, control and use of an environmental resource?. This is what the environmental entitlement framework chosen for this work seeks to address.

The environmental entitlement framework, originally developed by Sen (1981), sought to explain in simple terms why in the midst of "abundance" of resources (food), people face "scarcity" (starvation). His main concern was in relation to the gaining of access, control and use of resources by different groups of people. These resources according to him may be influenced by several factors among which absolute lack of resources may be only one of a number of reasons for people not gaining access to the resources they need to sustain their livelihoods.

According to Leach et al (1997), entitlements arise through several processes, three of which they analysed in their work in relation to Sen (1981). According to them, Sen's conceptualization of entitlements was not in the normative sense of what people should have but the range of possibilities that people can have. This range of possibilities according to Sen (1984), is the set of alternative commodity bundles that a person can command in society using the totality of rights and opportunities that he/she faces.

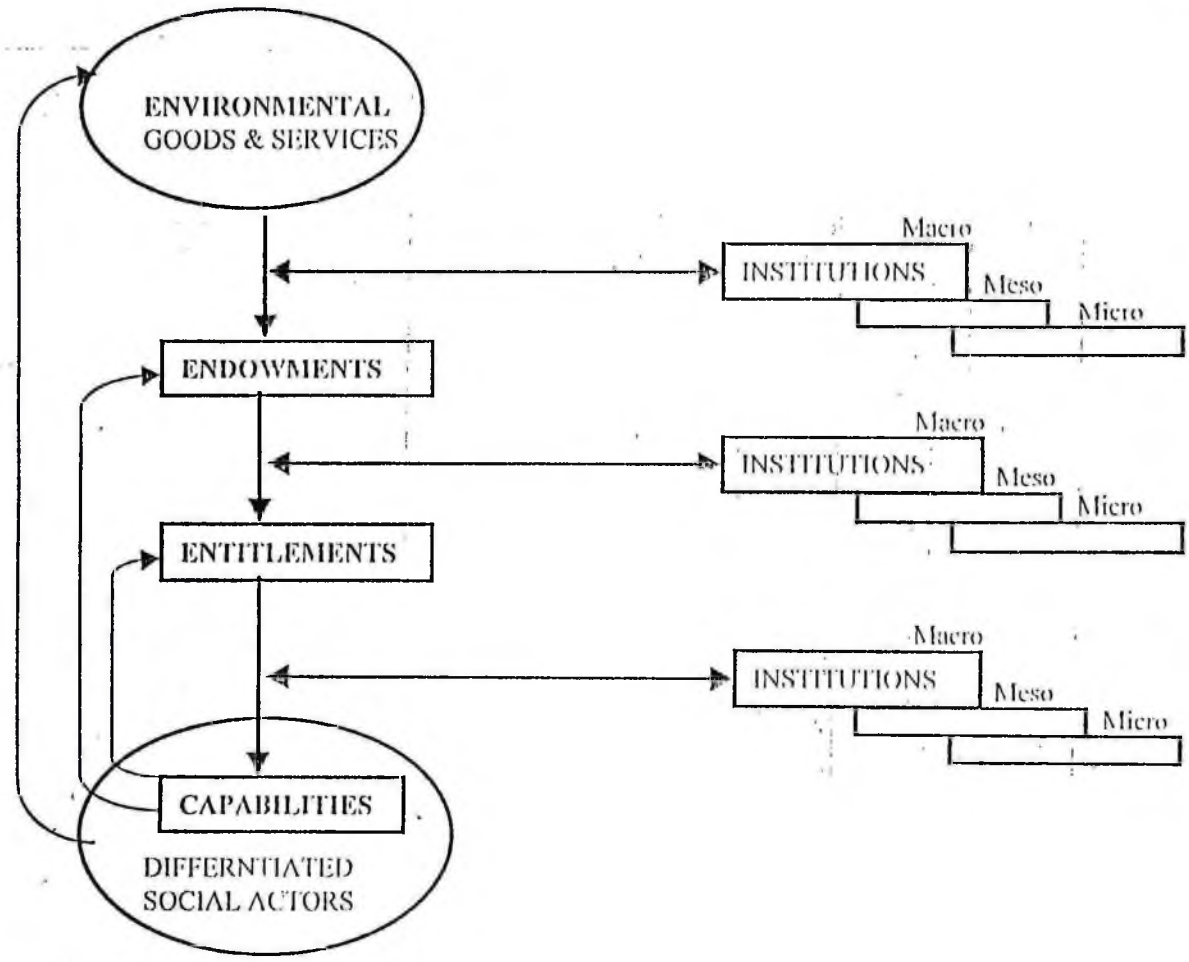
"Mapping" is another way by which entitlements evolve. This is the case where the initial ownership of a resource eg. land, transforms it into an entitlement. This, according to Sen (1981), may be based on processes such as production, trade, inheritance or transfer. Thirdly, the framework by Sen (1981) lays emphasis on the legal system in the acquisition of a resource. He however downplayed the extent to which the extra-legal or informal system can command over a resource (Leach et al 1997).

Environmental resource use as analysed by Sen (1981), Gasper(1993) and Leach et al (1997) stress that communities in which these entitlements are derived are not static but made up of active individuals. The environment, which in most analyses of people-environment relations is conceived of as simple linear relationships between population and resource availability only affected by such factors as level of technology (Ehrlich and Ehrlich, 1997) is further disaggregated into constituent parts and viewed as dynamic. These dynamic and disaggregated constituent parts form the basis for the analysis of the links between people and the environment in the framework.

The disaggregated constituent parts of the environment and their influence on the use of resources is explained by four key concepts used in the framework. These are environmental goods and services, endowments, entitlements and capabilities. (Fig.2.1).

Environmental goods and services are the initial endowment sets (resources) over which no claims have been laid. These resources become endowments when people gain rights and control over them. This is followed in the link by entitlements, which, according to Gasper (1993), refer to legitimate effective command over alternative commodity bundles The commodity bundles refer to utilities derived from environmental goods and services. This may include the direct use of commodities such as food, water, fuel etc or rights over them, governed by formal or informal arrangements. In formal terms, this may include the compulsory acquisition of land by government through legal arrangements while informal or extra-legal include communal/tribe/clan or private right over land. Entitlements are linked in the process by capabilities which refer to what people can do or be with their

Fig 2.1 The Environmental Entitlements Framework



Source: Leach et al. 1997

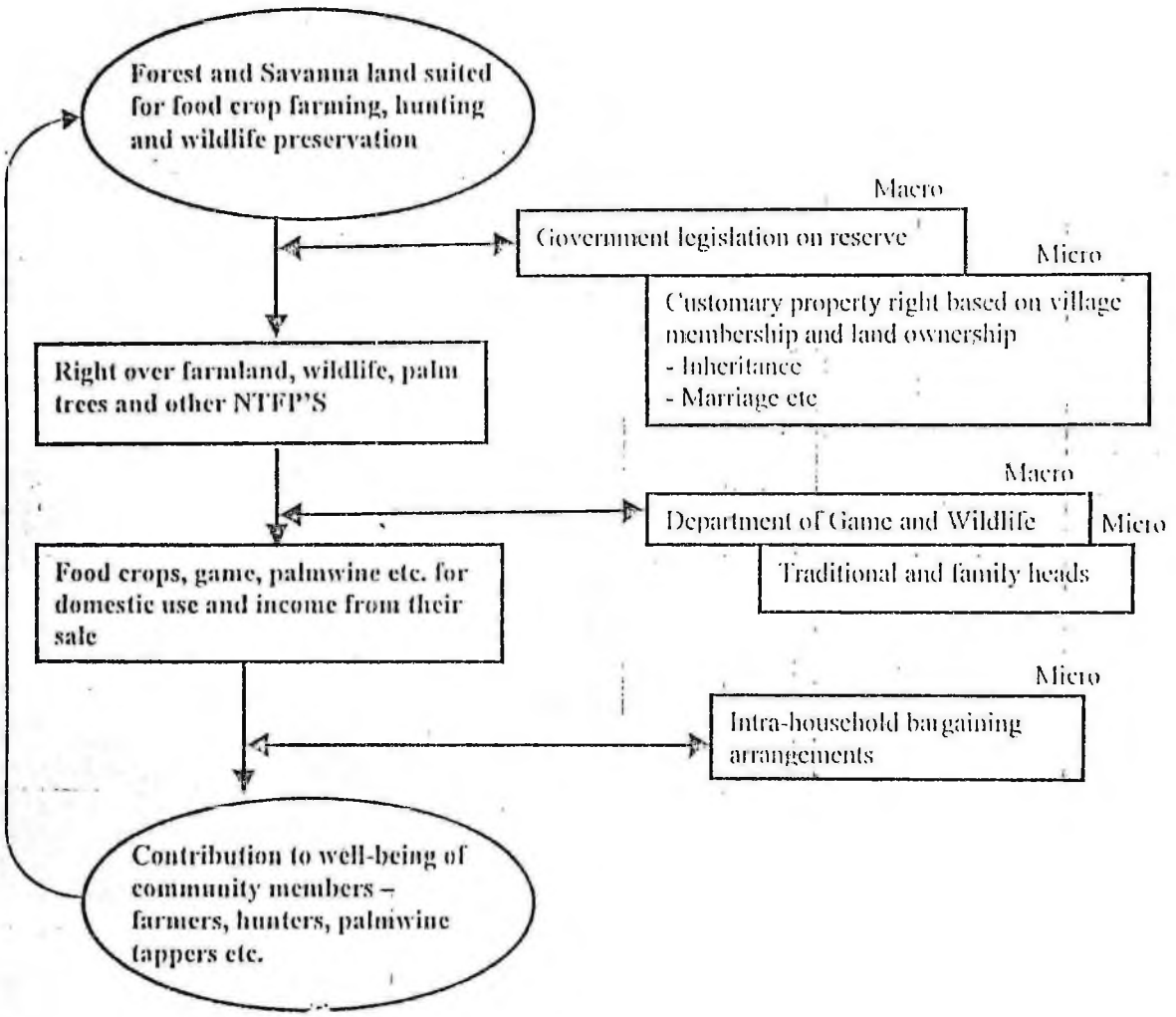
entitlements. For example, command over crops, fuel, water, forest, wildlife etc, derived from legitimate right over land resources give security or guarantees income and contributes to the well-being of the individual. Likewise, effective government control over forests ensures proper management and maintenance of the ecology of such forests.

As a further explanation of the framework, Leach et al (1997) focus on endowments, entitlements and capabilities as dynamic `mapping' processes which are mediated by various forms of institutions operating at a range of scale levels from macro to micro. These institutions according to them are regularized patterns of behaviour (practices) that emerge from underlying structures or sets of "rules in use" performed over time. The system of inheritance is one such practice that has evolved and has been performed over time in land use systems.

The relationships between these institutions which are either formal or informal and between scale levels is seen as crucial in influencing which social actors (both those within the community and those outside it) gain access and control over local resources. On the basis of property rights, formal property rights are those rightly legitimized by the state and could be defended in courts of law and the informal or customary rights are those legitimized by social norms and code of behaviour. These are legitimate in the eyes of those local claimants who for example regard government – reserved land as ancestrally inherited land, but illegitimate in the eyes of the state. In situations such as this, where notions of legitimacy are contested, conflict is the final product.

The framework, as related to this work is shown in Figure 2.2. For purposes of analysis, the land resource (forest), prior to its acquisition is termed the initial endowment set over which no claims have yet been made. This resource is made up

Fig 2.2 The Environmental Entitlements Framework:
Access to Land and Land use by Local people and Government



Source: Adapted from Leach, Mearns, Scoones 1997

of diverse forms (disaggregated environment) such as flora, fauna and the land itself. These are potential sources for the attainment of economic and social goals. Wildlife (game) is seen as a source of protein while the land itself is seen as a potential farmland. These resources are then sought for by various institutions at both local (micro) and government (macro) levels. The flora, fauna and potential farmlands become endowments when any of these social actors (institutions) gain access and control over them.

If it is assumed the local people (micro level) first gain ownership and control over the resource, then the resources would be claimed continually over generations on the basis of communal property right which invariably ensures free usufructuary rights. Migrant settlers may acquire these lands upon which they can have access to these resources through tenancy arrangements. However, claims of authority over the use of this land resource may change when government acquires it for the establishment of a forest reserve. This legal acquisition of the land is then enshrined in the legal system of the country. Activities contrary to the aims and objectives for the establishment of such a reserve(s) are viewed as detrimental and strictly prohibited. Such activities in the case of a strict nature reserve include poaching, cutting of trees, farming. However, when these activities are engaged in inside the reserve with impunity, conflicts arise and this is often associated with each institution (social actor), invoking legal rights to back its claim.

The set of entitlements to be derived from these land resources (fauna, flora and farmland) by the local people (if bonafide owners) may include the use of these resources for cash income or for subsistence. This, may be carried out on family or individual basis. On the other hand if solely government property, the reserved land containing diversity is protected and managed by an agency. This, however, can be

seen as "devoid" of entitlements at least in the meantime because they are not purposely utilized to achieve economic or subsistence goals. The aim usually is to protect environments of such reserves to avoid degradation. Pressures such as limited land as a result of increasing population or landlessness as a result of compulsory acquisition of land by government may force local people to encroach upon the reserve for various activities and since the interest of the local people do not conform with those of the government, conflicts arise. Capabilities, as the last step in the link are derived from either the consumption or sale of crops, hunted game, either legally from areas around the reserve or illegally from inside the reserve.

Leach *et al* (1997), however, stress endowments and entitlements to be analytical constructs of which the distinction between them depends on the empirical context and time. The framework thus reflects a cyclical rather than a linear process at different time scales. According to them, "for a given social actor at a particular time period, entitlements represent the set of potential outcomes given the initial endowment set, depending on the actual constraints that actor faces and the opportunities open to him/her. Those entitlements may in turn represent endowments at another time period from which a new set of entitlements may be derived".

The other concern of the environmental entitlement framework is how the natural resource management activities of diverse groups of people in turn help to produce and shape particular kinds of environments (not shown in the diagram). Thus, it looks at how the desire to satisfy basic human needs such as food, shelter, energy, influenced by driving forces such as population, level of affluence, technology, attitudes and values serve to influence the rate and intensity of land use and land changes which ultimately result in change of land cover. The dynamics involved in these driving forces could, however, vary from locality to locality. This therefore

underscores the need to understand issues at the locality level so as to ensure the development of appropriate planning strategies for different localities.

CHAPTER THREE

GENERAL CHARACTERISTICS OF THE STUDY AREA

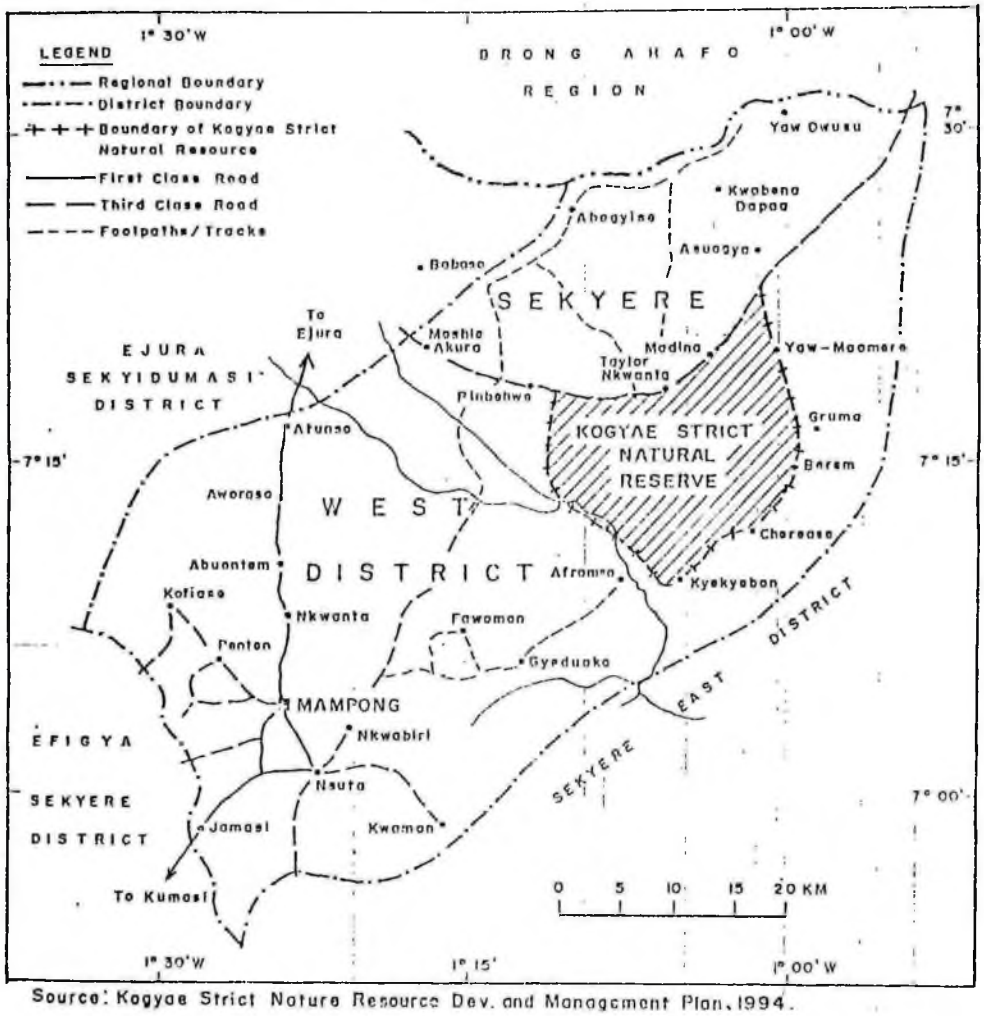
3.1 BACKGROUND TO STUDY AREA

Reportedly, the area presently covered by the Kogyae Strict Nature Reserve (KSNR) was captured by the people of Kwaman, Kumawu and Agogo from the Chumbulus in one of their numerous wars. This reserve, the only such designated in the country, is located in the north-eastern part of the Sekyere West District of the Ashanti Region (Fig. 3.1). The antecedent of the Kogyae Strict Nature Reserve, the Kujani Bush Forest Reserve was demarcated by Sir Francis Fuller, Deputy Commissioner of Stool Lands Boundaries Commission in 1919 and was managed as a forest reserve by the Forestry Department until 1967 when its administration was handed over to the Wildlife Department. An eastward extension was made to the reserve and was gazetted on 20th September 1971 under the Wildlife Reserves Regulations of 1971 – L.I. 710.

The Kujani Reserve and its 1971extension is what has come to be known as the Kogyae Strict Nature Reserve. Three main objectives were to be achieved through the establishment of this reserve, namely:

1. Retain the transitional vegetational and faunal types for scientific research and monitoring
2. Protect the watersheds of the tributaries of the Sene and Afram Rivers.
3. Preserve the historical battlegrounds of the Kumawu, Agogo and Kwaman people (Wildlife Department, 1994).

Fig. 3-1 A MAP SHOWING THE STUDY AREA : SEKYERE WEST DISTRICT



Source: Kogyae Strict Nature Resource Dev. and Management Plan, 1994.

3.1.1 LOCATION

Figure 3.1 shows the location of the Kogyae Strict Nature Reserve. It covers 386 square kilometres and lies approximately between longitude 1°00' and 1°13' West and latitude 7°09' and 7° 20' North. It lies 25 kilometres south-east of Ejura and 50 kilometres north-east of Mampong, the district capital.

A third class road (laterite road) from Aframso No.3 in the South through Kyekyebon, Kyeiase, Berem to Oku Junction in the north forms the eastern boundary. The northern boundary is also demarcated by another laterite road from Domi (Afram Plains No.1) in the West to Oku Junction in the east while the South-Western section is demarcated partly by the Afram River which flows in a north – west-south-east direction to Aframso No.3.

3.2 THE PHYSICAL ENVIRONMENT

The physical environment of the study area generally has an influence on human activity. The state and extent of use of the wildlife resources in the area is determined by the favourability of these elements to human activity. The favourable nature of these elements to economic activity (farming, hunting etc) has led to an influx of migrant farmers to the area thereby putting pressure on the land resources. Consequently, it has exacerbated encroachments on the reserve. These encroachments are the causes of conflict in the area. These physical elements, relief and drainage, climate and vegetation are discussed below.

3.2.1 GEOLOGY AND SOIL

The reserve lies in the Voltaian Basin. It is underlain by the Voltaian sandstones, shales and granite and characterized by the presence of ironstones

concretions (iron pans) at generally shallow depths below the surface of the soil resulting in poor groundwater infiltration (Wills, 1962; Dickson and Benneh, 1988; Vargha, 1996).

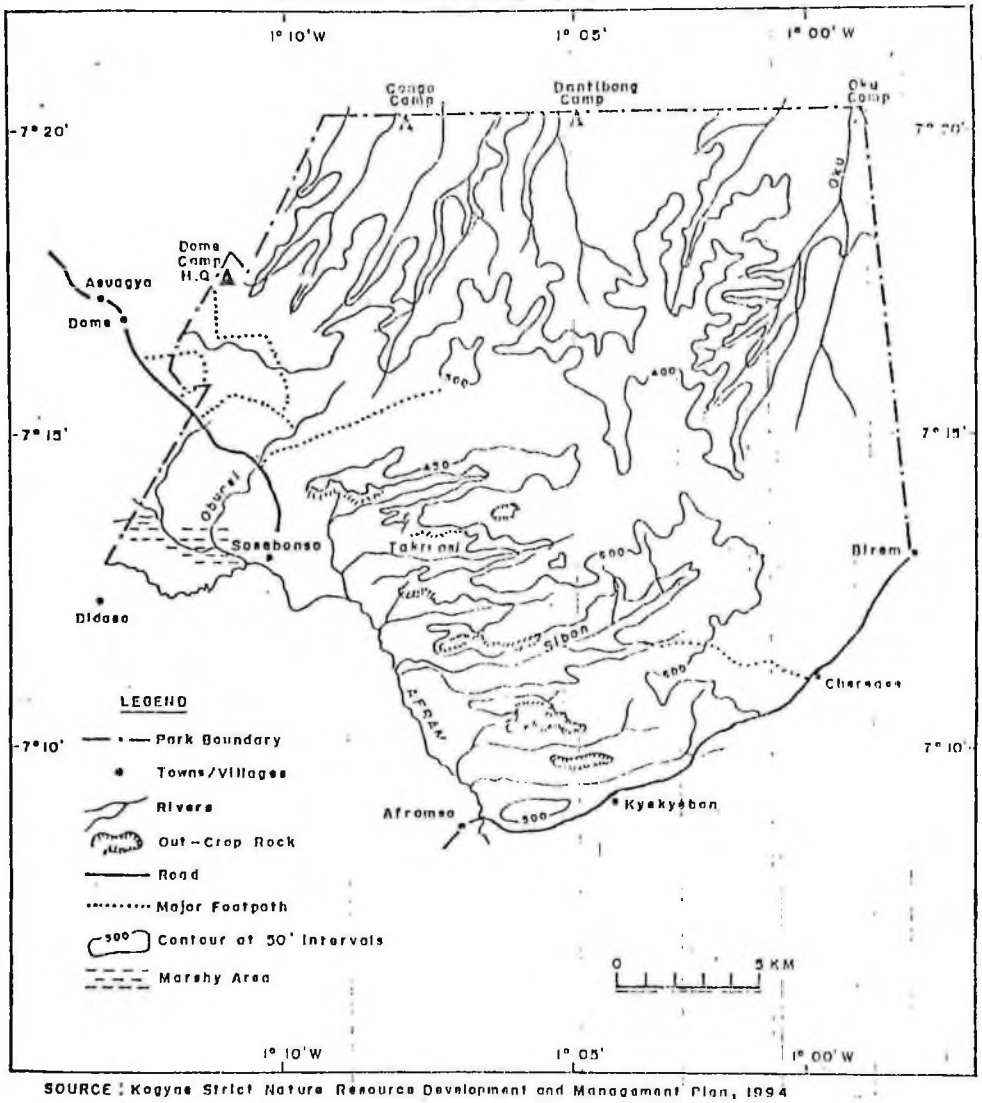
The soils in the savanna areas of the reserve are fragile, soft under foot and liable to alternate flooding and drying as a result of the flat-bedded sandstone rocks near the surface. The soils in the forest are loamy and liable to dry out quickly because of free drainage caused by the presence of a 2.5cm to 5.0cm layer of humus (Wildlife Department,1994). The loamy soils in the game reserve are therefore the target of most inhabitants due to the alternate flooding and drying of the soils in the savanna areas. Outcrops of flat-bedded red andstone are also common.

3.2.2 RELIEF AND DRAINAGE

The relief of the area is about 120 metres above sea level, rising to about 215 metres across the mid-portion from West to east. Most illegal agricultural activities are concentrated in this area. There are hilly areas to the South-Western corner of the reserve which rise to a height of about 230 metres.

The reserve is drained by a host of rivers in the north and south (Figure 3.2). Prior to the construction of boreholes in the various communities in the area, these rivers served as important sources of water for domestic use. Animals in the reserve also depend on these rivers for drinking water. The rivers in the north mainly Dantibon, Ajabuna and Akuma, flow northwards into the Sene River. The southern part is drained by the Afram and its tributaries – Sibon, Takurasi, Chichibon and Adencheche. All the rivers except the Afram dry up in the dry season.

Fig. 3·2 RELIEF AND DRAINAGE MAP OF KOGYAE STRICT NATURE RESERVE



SOURCE : Kogyae Strict Nature Resource Development and Management Plan, 1994

3.2.3 CLIMATE

The climate of the area is classified by Dickson and Benneh (1988) as wet semi-equatorial.

The area enjoys bi-modal rainfall, the major season beginning from May to June and the minor season from September to October. The peak is between June and September. The area has a mean annual rainfall of 1364mm (Meteorological Station, Ejura) and has an average mean monthly temperature of 26°C in August and 30°C between March and April. The rainy season is followed by a dry spell especially in the harmattan season during which there is a high rate of evapotranspiration.

Average monthly relative humidities (based on figures recorded at each day at 12 noon) are highest (75-80 per cent) during the two rainy seasons and lowest (70-80 per cent) during the rest of the year (Dickson and Benneh,1988). The climate generally favours the cultivation of diverse food crops such as yam, cassava maize, garden eggs etc.

3.2.4 VEGETATION

The Kogyae strict Nature Reserve lies in the transitional semi-deciduous forest zone; that is, between the high closed forest and open tree savanna. This has been described variously as guinea savanna (Taylor, 1967) and derived savanna (Rose Innes, 1977). Schmitt and Adu-Nsiah (1993), in a detailed report of the vegetation of the area distinguished four main plant communities. These are the transitional forest, riparian woodland, typical savanna and boval vegetation. The transitional vegetation type which is found between the true forest zone and the Guinea savanna is further classified into two sub-communities – the transitional forest towards the true forest zone (found at the south-eastern part of the reserve near Berem and Kyeiase) and the

transitional forest towards the Guinea savanna woodland which constitutes about a third of the reserve area (Figure 3.3).

The riparian woodland is made up of narrow bands of dense woodland along seasonal streams that flow into the Afram and Sene Rivers. The typical savanna surrounds the transitional and riparian forests in the reserve. The boval vegetation occurs at the south-western section of the reserve where there are rock outcrops of sandstone and lateritic iropans.

In all, 105 species of vascular plants have been identified in the reserve. This is made up of 57 trees, 10 shrubs, 9 climbers, 17 herbs and 12 grasses. (Wildlife Department, 1994).

Various species of trees in the reserve are rapidly being depleted through illegal felling of timber. The land is also being cleared of most of its vegetation due to agricultural activity (See Plate 3.1 and 3.2). Human activity therefore is seriously having a negative impact on the vegetation inside the reserve.

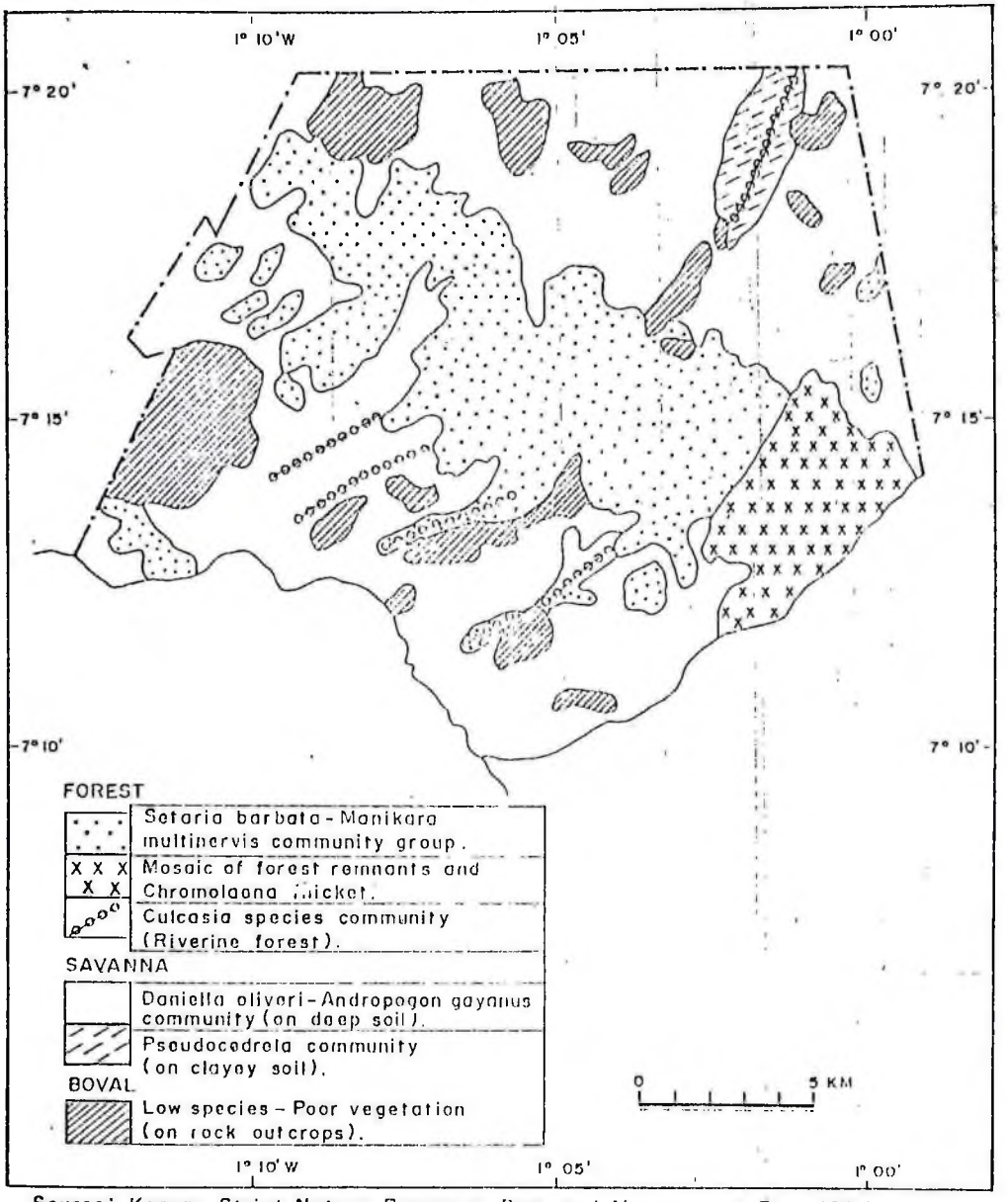
3.2.5 FAUNA

3.2.5.1 HABITAT AND ANIMAL SPECIES

From the zoological perspective, four types of habitat have been recognized within the Kogyae strict Nature Reserve. (Kogyae Strict Nature Reserve Development and Management Plan, 1994).

These are farmlands, the savanna, forest and bare rocks. The farmlands include all areas presently under cultivation inside the reserve and those recently abandoned. These areas provide a ready source of food for the animals. The savanna, classified into the woodland savanna found in the north-eastern part and

Fig. 3-3 VEGETATION MAP OF KOGYAE STRICT NATURE RESERVE



Source: Kogyae Strict Nature Resource Dev. and Management Plan, 1994.

Plate 3.1 A section of the destroyed remnant forest near Berem

Plate 3.2: An abandoned illegally felled timber (odum) near Berem

the grassland found in the northern part are associated with scattered trees and varying canopies.

The forests are found along rivers and streams and the natural forest of the original Kujani Forest Reserve. The canopy ranges from 50 per cent to over 80-percent. The bare rock areas are restricted to the southern and south-western end of the reserve where rock outcrops form a ridge.

Twenty-six species of mammals are listed and include five primates and a variety of antelopes. About 85 species of birds have been recorded. Some notable animal species are the bufallo, duikers, the roan antelope, waterbucks, red river hog and grasscutters. These animals are constantly being hunted for game by the inhabitants of the area leading to a reduction in their numbers.

3.3 THE SOCIO-ECONOMIC ENVIRONMENT

3.3.1 POPULATION:

The area is generally characterized by low population, 20 persons per square kilometre (Statistical Service, 1984). This sparseness has been attributed to wars and slave raids which in the past depopulated the area and also the difficulties of the environment found there (Dickson and Benneh, 1988). The area is however experiencing a population build-up in recent times as a result of the general trend in population growth and the steady arrival of migrant farmers to the area. The attractiveness of the area is due to the general availability of land and the improving infrastructure of the area. These developments generally have an influence on resource utilization in the area. According to the KSNRDMP document, conservative population estimates given by Rev. Father Roberts of the S.M.A. Catholic Church which is undertaking development projects in Oku show that population of the

communities in the Kogyae area in 1990-1991 was 6,893 out of which 1,377 reside in the reserve. Table 3.1 below shows the trend in population growth of some selected settlements in the study area.

According to Dadson *et al* (1994), the number of people inhabiting the Greater Afram Plains (GAP) has swelled in the last 25 years as environmental and economic "refugees" have flocked to this less populated region. The ample opportunities offered by the availability of land for farming account for the upsurge in population numbers. It is thus the movement of farmers to this relatively new agricultural area that would

Table 3.1: POPULATION TREND OF SOME SELECTED COMMUNITIES FROM 1960-1984

	CENSUS YEARS		
SETTLEMENTS	1960	1970	1984
Kyekyebon	173	217	386
Kyeiase	199	162	328
Asase Konkonba	-	-	142
Berem	350	456	742
Domi A/P No.1	264	136	223
Sankasase	21	28	-
Sasebonso	97	104	-
Dagomba	69	86	-
Total	1173	1189	1821

Source: Compiled from the 1960,1970 and 1984 Population Census data.

continue to determine the pattern of population density in the area. The pull of the Afram Plains as a potential area of agricultural expansion is of significance for future planning and development of the agricultural sector (Nabila, 1992).

The gradually improving accessibility of the major settlements in the Afram Plains to areas like Mampong, Ejura and Nkawkaw has played no mean role in the

gradual build-up in population. Most settlements in the Kogyae reserve area and the Afram Plains in general were established after the opening up of the road access to the Afram Plains for farming by the P.N.D.C government in 1984.

3.3.2 LAND USE

3.3.2.1 LAND TENURE

Security of tenure in the Kogyae reserve area as it is in most parts of Ghana favours the indigenous people. Land for either agricultural or residential use among the local people is within reach so long as it is within the jurisdiction of their local chief and is not being occupied by another person. Strangers can acquire land as a gift or on contractual basis. In most cases strangers who want land present drinks and a sheep or are made to pay money instead.

3.3.2.2 SETTLEMENTS

There are 17 village communities presently sited in the reserve area. Seven are within the reserve and 10 sited along the fringes. Those sited within are Atakpame, Sankasase, Dagomba (Nyamebekyere), Asase Konkomba, Abrewanko, Sasebonso and Yaya Akura. Those outside or along the fringes are Domi Balana, Domi A/A No.1, Taylor Akura, Congo Nkawanta, Medina, Oku Junction, Yaw Moammre, Berem, Kyeiase and Kyekyebon. The location of these settlements have posed serious bottlenecks to the effective management of the reserve as a strict nature reserve. This is because most human activities in these locations are not restrained.

Settlers, especially those from north, can be found grouped along ethnic lines at the fringes of the indigenous settlements like Berem and Kyeiase. Some however

prefer living in dispersed hamlets which consist of compound households. Settlements such as Dagomba, Yaya Akura, Domi Balana are made up almost entirely of migrant settler farmers.

Ethnicity is diverse with the indigenous Asante dominating the population in the indigenous settlements of Berem, Kyeiase, Kyekyebon and Sasebonso. The migrant settler population is made up of Grunshies, Moshies, Konkombas, Sisalas and Frafras.

3.3.2.3 PRESERVATION OF WILDLIFE

The preservation of the vegetation and fauna in the reserve is undertaken by the Wildlife Department which has laws specifically formulated to govern its activities. Unlike other reserves in the country where some form of interferance is permitted, the KSNR is strictly protected by law against even tourists.

Hunting and trapping of game, felling of timber or cutting of trees, cultivation of crops and the burning of bush in the reserve are strictly prohibited by law.

Mechanisms for the enforcement of these laws are through the stationing of wildlife officials in the various communities in and along the fringes of the reserve to check the activities of the people in the area. They engage in patrols with firearms and cutlasses supplied by the wildlife Department. Most anti-poaching patrols are done during the day even though limited nights patrols are conducted. The officials are also supposed to engage in periodic cleaning of the boundary espeically the one from Dome Camp to the confluence of the Afram and Dida Rivers.

The Kogyae Strict Nature Reserve, like many others in the country, has suffered from lack of definitive policy and management guidelines since its inception. This reserve especially has suffered from ad-hoc measures adopted by the

successive senior Wildlife Officers put in charge of it. The inconsistency in the management procedures adopted by the succession of officers have left in its trail accusations of their tacit involvement in the illegal exploitation of timber resources by the local inhabitants.

The Wildlife Department is also handicapped in respect of equipment at its disposal. With the exception of Kyekyebon where the Wildlife staff have been prevented from settling in the community, staff in the other settlements live in hired premises. There are no tents to enable them pitch their own camps. This situation has rendered them vulnerable to `attacks' because any attempt on their part to enforce the wildlife regulations in these communities is met with hostility and threat of ejection.

The Department of Game and Wildlife is again handicapped in terms of vehicles which would help the field officers to effectively do their work. There is only one tractor and a pick-up truck (recently repaired) that is used for patrols and the monitoring of activities of staff stationed in the various communities.

Expenditure ratios of the park reveal the insufficiency of funds for the effective management of the reserve. Recurrent expenditure is one major factor that determines the success of any conservation programme. According to Wildlife Department Sources, the recurrent expenditure should not be less than 70 per cent of

Table 3.2. BUDGET ON KOGYAE STRICT NATURE RESERVE FROM 1988-1993

YEAR	SALARIES	(OTHERS) RECURRENT EXPENDITURE	PER CENT SALARIES	PER CENT OTHERS
1988	1,661,000	220,000	88.3	11.7
1989	4,520,000	291,500	93.9	6.1
1990	5,706,000	813,500	88.0	12.0
1991	9,294,500	1,059,000	90.0	10.0
1992	9,203,000	796,000	92.0	8.0
1993	4,177,746	645,000	86.6	13.4

Source: Kogyae Strict Nature Reserve Development and Management Plan, 1994.

the total budgetary allocation. Analysis of the recurrent expenditure of the Kogyae Reserve reveal an abnormally low percentages over the years. See Table 3.2. The analysis reveal that for the period 1988 to 1993, an average of 89.8 per cent was on the payment of staff salaries leaving a meagre 10.2 per cent for the provision of equipment and management (Wildlife Department, 1994). This is however not a surprising development judging from the capital and recurrent financial allocation to the entire Wildlife Department from 1982 to 1986 as shown in Table 3.3.

Those inadequacies coupled with the general lack of interest in the communities to protect the reserve has frustrated attempts at achieving the objectives set for the preservation of the reserve.

It is evident from Table 3.3 that for the period 1982 to 1986, less than a third (29.6 per cent) of the approved budget for capital expenditure was released to the Department. This acted as a serious constraint on the equipment base of the Department. The recurrent expenditure also shows that only 43.3 per cent of the approved recurrent budget was released, the greater part of which went into the payment of salaries.

TABLE 3.3: GAME AND WILDLIFE DEPARTMENT FINANCIAL ALLOCATION - 1982 – 1986 ('000 CEDIS)

YEAR	CAPITAL		RECURRENT		TOTAL	
	APPROVED	RELEASED	APPROVED	RELEASED	APPROVED	RELEASED
1982	874	255	11,506	3,093	12,380	3,348
1983	4,967	64	16,641	11,355	21,608	11,419
1984	16,260	14,308	36,712	17,606	52,972	31,914
1985	18,355	11,585	44,259	33,819	62,614	45,404
1986	84,355	10,470	99,690	41,669	184,045	52,139
Total	124,780	36,954	208,808	107,542	333,619	144,224

Source: FAO/WORLD BANK (1987).

3.3.2.4 ECONOMIC ACTIVITIES

Agriculture is the major land use type and practiced extensively in an out of the reserve for achieving well-being. This is usually engaged in by both men, women and children who engage in the task of land clearing and preparation, sowing, weeding, harvesting and processing of crops into food for home consumption. Indigenous farmers mainly used the cutlass as against the hoe technology by migrant farmers from the north. Agricultural land use is influenced by the tenure system and climate. Farming activities and production systems are very closely related to prevailing rainfall regimes. Mixed cropping is the predominant practice usually on small scale basis. After two or three farming seasons, the plot of land under cultivation is abandoned by the farmer to allow the fallow vegetation to regenerate itself. This is mainly practiced by the indigenous people. The main crops grown are maize and yam. Yam is mostly grown by migrant farmers from the north who on the contrary abandon their farms on yearly basis. Other crops like cassava, groundnuts, plantain and vegetables are also cultivated.

Hunting and trapping of game is another economic activity extensively engaged in by the people. It is also a source of protein for a greater number of the people. The Department of Game and Wildlife estimates show that game is the main source of meat for 80 per cent of the rural population in Ghana (Asibey, 1986). Most of the indigenous villages like Sasebonso, Kyekyebon and Sankasase started as hunting camps and this activity has been sustained in these communities. Hunting of game is usually at its peak at the height of the dry season from November to February when bush fires are rampant. This is done at this time mainly through group hunting with the assistance of dogs. Gin traps and wire snares are often used in the reserve to avoid detection as guns do. Unlike the agricultural system or forestry where land

tenure arrangements ought to be obeyed, hunting activities does not require any special tenure arrangements. With the exception of the game reserve, there are no set territorial limits to hunting outside the reserve. Widespread hunting and the destruction of habitats through bush burning has greatly threatened mammalian and bird life in the area.

Charcoal making forms about the second largest economic activity engaged in after crop farming. This is done mainly by Sisala tribesmen. It was made known that a great number of them in the area migrated from the Afram Plains District after charcoal burning on commercial scale was banned by the District Assembly in 1991. The wood used in making the charcoal is usually obtained from dead trees left in the wake of yam cultivation. However, the use of live trees is on the increase, judging from the large quantities being produced.

Logging is done mainly by timber firms owning concessions around the reserve. There is also the presence of chain-saw operators. Notable timber species are odum, all Red Wood species, wawa, Senya and Mahogany. Non-timber forest products (NTFP's) comprising a multiplicity of products of both plant and animal origin are also used at the household level as food, medicines, households goods, chewsticks, building materials and for fuelwood.

3.4 INFRASTRUCTURAL DEVELOPMENT

The major road network in the area is a third class road that serves as the northern and eastern boundaries of the reserve. It links Ejura with Domi A/P No.1 and Oku Junction in the north and Aframso No.3 through Kyekyebon, Kyeiase and Berem to Oku Junction on the north-eastern half. The section between Berem and Oku Junction is not motorable in the wet season. Settlements in the north-west of the

reserve are linked to Domi A/P No.1 by tracks. The Field Engineers Regiment of the Ghana Army is opening up the area with new roads to connect Oku Junction with Anyinofi and Mame Krobo in the Afram Plains District. The main forms of transport are tractors, cargo trucks and buses which ply the laterite road mostly in the dry season.

Settlements such as Berem, Kyeiase, Kyekyebon, Domi A/P No.1 and Oku are served with primary and Junior Secondary Schools. There is however a general problem of trained teachers as newly trained teachers refuse postings there. There is a health clinic at Berem, however, the people of this community with the assistance of World Vision International, Ghana, have constructed a new clinic which is larger than the old one (Plate 3.3). The clinic presently in operation is manned by two nurses who treat mostly malarial and maternal and child health cases. Serious cases are referred to Nsuta or Mampong hospitals. The Catholic Church also operates a hospital at Oku to cater for the health needs of inhabitants in the northern section of the reserve.

Sustaining the environment and livelihoods of the Greater Afram Plains (GAP) is very crucial. This has led to the institution of the Natural Resource Management and Sustainable Agriculture (NARMSAP) programme. Its goal is to identify needs and solutions and to carry out collaborative interdisciplinary programmes to redress the problems of food insecurity and environmental degradation. Through international conferences, district and zonal workshops involving farmer representatives, assemblymen and women, local government representatives at district level and NGO's, the programme have identified and analysed various opportunities to deal with problems, enhance potential and to address constraints faced in natural resource management and sustainable farming in the area.

Plate 3.3: A newly-built clinic at Berem located inside the reserve

World Vision International, Ghana through such collaborative programmes have through its Ghana Rural Water Projects (G.R.W.P) sunk boreholes in most of the communities in the area. Hitherto, good and reliable water was scarce. Guinea worm was therefore prevalent. World Vision International, Ghana has also established a resource centre at Oku Junction to train the local people in the management of the boreholes.

CHAPTER FOUR

LAND ACQUISITION AND LAND USE CONFLICTS

4.1 INTRODUCTION

Several factors constitute conflicts in the study. The disrespect for the reserve boundary as a result of constant shifts over the years has resulted in indiscriminate lease of land for farming, timber logging and charcoal making. The road boundary which passes through Kyeiase, Kyekyebon and Berem according to the Kogyae Strict Nature Reserve Management and Development Plan (1994) document does not correspond exactly to the Legislative Instrument (LI) description.

Secondly, the apparent negligence of the WD to resettle some settler committes already located within the reserve at the time of gazetting of the KSNR in 1971 has led to the springing up of many settler communities inside the reserve.

Poaching also occurs throughout the reserve as was evidenced by the numerous hunting camps, spent cartridges, traps and snares. Some indigenous people engaged in hunting for Commercial purposes. Charcoal making, bushfires and illegal timber felling within the reserve are other factors that constitute conflict.

This chapter presents the findings of the field study. It looks specifically at issues concerning the mode of acquisition and claims to land, uses and the conflicts that result from this. It further discusses efforts at the resolution of conflicts. The observed data is analysed with the logistic regression model which is further used in testing of the hypotheses of the study. Unless otherwise specified, Tables appearing in chapters four and five are the result of fieldwork carried out for the study in 1998, source of Tables would therefore be absent in such cases.

4.2 ACCESS TO LAND

Land in the Kogyae Reserve area is generally owned by the peoples of Kumawu, Kwaman and Agogo. Inhabitants of these three sub-divisions of the Ashanti State therefore enjoy free access to land. Acquisition of land is mainly by self-allocation but on the basis that, the piece of land being acquired is not occupied by another person. This, however, requires the consent of the local traditional or family head of the individual. Land acquired by this means is passed on to other members of the landowning family through inheritance.

An investigation into the respondents' source of land for farming and other activities in the area showed that land acquisition through inheritance was predominant. Eighty percent of respondent's claimed they had access to land through this means while 17.4 per cent and 2.2 per cent acquired it through tenancy and leasehold arrangements respectively. Seventy-four per cent of all respondents had their lands inside the reserve. As regards the years of acquisition (occupation) of the said land, 20 per cent had access to it before 1970 and the majority, 78 per cent, after 1970 while 2 per cent could not determine the year they acquired their lands. The 78 per cent after 1970 suggests that they either inherited it or are first-time self-allocators.

The KSNR as a government acquired land is generally well known by the people. Eighty-nine per cent of respondents know it was compulsorily acquired by government with the aim of protecting plant and animal life in the area for posterity.

Since compulsory state acquisition of land may not be favoured by most people for various reasons, an attempt was made to know the reactions of the people to the acquisition by government. The views of respondents' who lived in the selected communities before 1971 were considered. Two hundred and forty-four respondents or 66.3 per cent were involved in this analysis. In all 30.4 per cent claimed they did

not properly understand issues concerning the acquisition to enable them form any judgement at that time; 41.3 per cent however claimed they expressed some misgivings and made up their minds to resist the take-over. The rest 28.3 per cent claimed helplessness at that time. All were however unanimous on the negative future implications of the acquisition to their livelihood due to rising population – 95.1 per cent claimed it would affect their farming and hunting activities while 2.5 per cent claimed they would find it difficult getting farmlands. A further 2.5 per cent feared adequate compensation would not be paid.

4.3 RESERVE ACQUISITION AND ITS EFFECTS

On the effect of the acquisition on their livelihood, 46.8 per cent of the total sample reported landlessness. It was however admitted they still farm the land in the acquired area. The rest reported facing the problem of getting land for their farms and also being left poorer financially, as shown in Table 4.1.

Table 4.1 EFFECTS OF RESERVE ACQUISITION ON LIVELIHOOD

EFFECT	FREQUENCY	PERCENTAGE
Landlessness	148	46.8
Limited Land	24	7.6
Left poorer financially	144	45.6
Total	316	100.0

The reduced total frequency in Table 4.1 is explained by the fact that most migrant farmers chosen in the survey did not respond because they claimed they had then not settled in the area. Data gathered show that 80 per cent of present users of land in the

area occupied it after 1972. Out of the 46.8 per cent who claimed landlessness, 134 respondents or 97.1 per cent had their land through inheritance. One hundred and twenty or 83.3 per cent who have been left poorer financially as a result of the acquisition had their land through inheritance as shown in Table 4.2 . Most of the affected people in this category claimed they lost their cocoa, palm trees and plantain farms through acquisition.

TABLE 4.2: FORMS OF ACCESS TO LAND AND EFFECTS OF ACQUISITION

EFFECTS	FORM OF ACCESS TO LAND						FREQ.	PERCENT
	INHERITANCE		LEASE PURCHASE		TENANCY			
	FREQ.	%	FREQ.	%	FREQ.	%		
Landless-ness	136	91.9	8	5.4	4	2.7	148	46.8
Limited Land	20	83.3	-	-	4	16.7	4	7.6
Left Poorer Financially	120	83.3	-	-	24	16.7	144	45.6
Total	276	87.3	8	2.5	32	10.1	316	100.0

The research has revealed that the abandoning of the inherited but government acquired land was for only a brief period as farming and hunting activities are still heavily concentrated inside the reserve. Perhaps the only impact of the acquisition in terms of crops is the change of emphasis from cocoa, plantain and palm production to maize and yam production.

The ineffective enforcement of laws due to the people's uncompromising stand towards the preservation of the acquired land, prompted by the non-recognition of the 1971 extension and the general absence of logistics to aid the work of the Wildlife Department has led to illegal reserve clearance and conversion into farmlands. The people have thus become entrenched on the reserved land for the fulfilment of their

economic goals and social needs. Seventy-eight per cent of all the respondents are presently engaged in their economic activities inside the reserve. All of them have expressed some reservations about relinquishing the land because they believe an action in that vein would mean a permanent loss to their future generations. There is also a claim of difficulty in getting land outside the reserve. The research however reveals that, in absolute terms, there is enough land outside the reserve to meet the farming requirement of the people, only that some form of re-allocation would have to be done.

It has also been revealed that the relatively richer soil in the reserve is the reason why the people are reluctant to shift their attention from it. The causes of the "poorer soil" outside the reserve as has been stated by most of the respondents can be traced to the extensive bush burning, charcoal burning and the wasteful methods of yam cultivation.

The relative proximity of the fertile land inside the reserve to fertile lands which may in fact exist farther distances away from the settlements but outside the reserve is yet another reason why the people are reluctant to leave the reserve undisturbed. Discussions held in Kyekyebon indicated members of that community preferred farming inside the reserve because by so doing, they avoid the rampaging activities of elephants trapped in an area called sergeant Doe. This location is near Kyekybebon. An attempt was also made to know the number of respondents affected by the acquisition vis-a-vis the years they acquired their lands.

TABLE 4.3 PERCENTAGE DISTRIBUTION OF RESPONDENTS BY YEAR OF ACQUISITION OF LAND

YEAR OF ACQUISTION	FREQUENCY	PERCENTAGE
1938 – 1971	72	19.6
1972 – 1981	76	20.7
1982 – 1991	124	33.7
1992-1998	96	26.0
Total	368	100.0

Table 4.3 reveals the increasing population pressure on the land in the study area. This reveals either a steady increase in the number of first time allocators or an increase in the number of inheritors who have consequently fragmented the land. This is shown by 77.6 per cent of respondents presently claiming to have been affected by the acquisition by government, as in Table 4.4. This contrasts with the 22.4 per cent of the respondents who acquired the land prior to 1972. The 17.4 per cent not affected by the acquisition in Table 4.4 are mostly migrant farmers from the north. Discussions in Yaya Akura and Dagomba which are deeply situated inside the

TABLE 4.4: NUMBER AFFECTED BY ACQUISITION AND YEAR OF ACQUISITION OF LAND

STATUS	YEAR OF ACQUISITION				TOTAL	
	1938 – 1971		1972 - 1998			
	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
Affected	68	22.4	236	77.6	304	82.6
Not affected	4	6.2	60	93.7	64	17.4
Total	72	19.6	296	80.4	368	100.0

reserve do not reveal much in terms of loss of title to land by their members. This prevails in all the other migrant settlements both inside and outside the reserve. This is by virtue of the fact that they as tenant farmers are guided by some form of tenancy arrangement which does not confer title to land on strangers.

4.4 SOCIO-ECONOMIC ACTIVITIES INSIDE THE RESERVE

Settlements in the Kogyae area especially those to the eastern half, prior to the mid 1980's were cut off from areas like Mampong and Kumasi as a result of the excessive flooding of the Afram River and the absence of a bridge over it. These conditions therefore limited them to a subsistence economy based mainly on crop farming. This is combined with other activities such as hunting and palmwine tapping by some inhabitants. Ninety-nine per cent of all respondents claimed they rely mainly on crop production for their basic needs.

Various reasons were given for the attachment of importance to the land in the reserve by the people. Their strongest argument however centres on their right of inheritance to the land acquired by government. This is shown by the high incidence (78.3 per cent) of respondents who are presently engaged in their economic and other activities inside the reserve because they claim it is an inherited property. As to whether respondents have at any point in time entered the reserve for any activity, 95.7 per cent reported in the affirmative. Table 4.5 shows activities respondents are engaged in.

As is evident from Table 4.5, 75 per cent of the respondents claim they engage in farming inside the reserve. Following this in the order of magnitude are those who went there to tap palmwine, (6.8 per cent), cut trees for their houses and barns (4.5

TABLE 4.5: ACTIVITIES INSIDE RESERVE

ACTIVITY	FREQUENCY	PERCENTAGE
Farm	276	75.0
Cut trees	16	4.3
Hunt	16	4.3
Tap Plam wine	24	6.5
Casual Labourer	8	2.2
Fetch Water	4	1.1
Travelled Along Path	8	2.2
No Response	16	4.3
Total	368	100.0

per cent). Two per cent went into the reserve as casual labourers on the farms of others.

The views of the respondents were further solicited to test their knowledge on the rules governing the reserve. The survey shows that 79.3 per cent knew very well the regulations governing the use of the reserve. All the respondents showed some knowledge of the prohibition of human activity inside the reserve as shown in Table 4.6. Asked further why they were engaging in these prohibited activities inside the reserve, 88.2 per cent of all the respondents claimed they had no other alternative than to encroach while 8.8. per cent claimed they did it in agreement with some wildlife officers. This is especially in the case of palm wine tapers who distil fermented palm wine into local gin, `akpeteshie'. Extensive interview with three of such people in Berem revealed that some Wildlife staff give protection to the tappers who are in turn obliged to give a percentage of whatever quantity is distilled to the officers.

Table 4.6: KNOWLEDGE OF RULES GOVERNING THE RESERVE BY RESPONDENTS

Instructions	Frequency	Percentage
Do not farm	24	6.5
Do not hunt	12	3.3
Do not cut trees	4	1.1
Entry generally prohibited	292	79.3
Permission be sought	8	2.2
No response	28	7.6
Total	368	100.0

These illegal activities inside the reserve have been a source of great concern to the Wildlife Department. One can appreciate the damage being done to the reserve taking into consideration the destructive farming practices often adopted by migrant farmers. The faunal species are greatly threatened because the investigation revealed that a large number of farmers in the area are also hunters and trappers. The activities of these farmers especially those located inside the reserves have over the years been encouraged unwittingly by the Ministry of Agriculture's practice of running demonstration plots in the reserve on modern agricultural techniques and the Lands Department's insistence on collecting land revenue from the farmers (Wildlife Department, 1994).

4.5 ENCORACHMENT ON THE RESERVE

In the bid to know what was being done by the Wildlife Department to check the activities of the encroachers, staff of the department stationed in Birem, Kyeiase and the Chief Wildlife Officer in Kumasi were extensively interviewed. It was revealed that until 1994/1995, no serious effort was made at stopping the encroachments. This was confirmed by 71.1 per cent of the respondents. However, In 1994, a task force was

instituted by the Department to achieve its goal. It's operations were aimed at putting pressure on the encroachers especially the settler communities inside the reserve through the destruction of farms inside the reserve. This was to enable the regeneration of the vegetation in the degraded areas of the reserve and the restoration of wildlife populations. The exercise, as expected, did not go down well with the people, especially the four indigenous communities Berem, Kyeiase, Kyekyebon Sasebonso chosen in the survey. According to the officials, the operation was somehow successful in Dagomba even though not without some difficulties. But it is interesting to note that, as at 1998, the people of this community still engaged in their farming activities inside the reserve.

According to the Wildlife Department sources, the operation in Berem was met with hostility. This resulted in a serious assault on one staff of the Department. The confusing roles of the Ministry of Agriculture and the Lands Department in the reserve as stated earlier did not further the cause of the Department of Game and Wildlife in this operation as most of the people used it to justify the continuous cultivation of the reserve land.

However, it must be noted that the apparent negligence of the Wildlife Department by not resettling the communities inside the reserve at the time of gazetting the Kogyae Strict Nature Reserve in 1971 did not help their cause in the operation. The people had become entrenched on the land and moving them out was not going to be easy.

The survey also sought to solicit the views of the people on the recent actions of the Wildlife Department to keep them out of the reserve. Approximately 44 per cent of the respondents believed the location of their settlements was a major cause. As noted in some major research findings, (Chisholm, 1962; Gyasi, 1979; Vargha,1996)

proximity of farmland is known to be highly correlated with use. Even though the reserve was not a farmland, the laxity exhibited by the Wildlife Department in strictly enforcing its laws gave the people the wrong impression that the reserve could be cultivated.

TABLE 4.7: VIEWS OF RESPONDENTS ON REASONS FOR THE RECENT "KEEPOFF" ACTION BY THE WILDLIFE DEPARTMENT

REASON	FREQUENCY	PERCENTAGE
Situation of Settlement	160	43.4
Human activities	12	3.3
Protect Wildlife	44	12.0
Don't know	152	41.3
Total	368	100.0

It can be observed from the Table 4.7 that the site of the settlements ranked first (43.4 per cent). The effect of human activities in the reserve (3.3 per cent) and the bid to protect wildlife (12 per cent) were the other reasons assigned for the turn-around in attitude of the Wildlife Department.

Attempts by the Wildlife Department to stop further degrading of the reserve as noted earlier was fiercely resisted by the indigenous communities. All the local heads (Odikros) and opinion leaders interviewed in the indigenous communities claimed the government was occupying their land illegally. This concern was confirmed by the Kogyae Strict Nature Reserve Development and Management Plan (1994) which states that the socio-economic concerns in this reserve have been brought about due to improper acquisition of land for the extension on the north-eastern and southern parts of the original Kujani Bush Forest Reserve.

The investigation further revealed that the people were not involved in the decision to extend the Kujani Reserve to its present boundary. Inhabitants of Berem, Kyeiase and Kyekyebon do not understand why the present eastern boundary, originally a track constructed by the people themselves to link their communities should be improved and used as the reserve boundary. This also meant that for as long as road construction goes on along that boundary, the reserve boundary would keep on shifting. The Kogyae Strict Nature Reserve Development and Management Plan in fact confirms that the present boundary along the road from Domi to Oku and Oku to Aframso does not conform with the boundary description of L.I. 710. (See Plate 4.1). The people of these three communities have also not come to grips with the situation whereby crossing the road from their settlements to the opposite side meant trespassing, moreso when all their facilities – schools (Plate 4.3 & 4.4), boreholes, clinic etc are located within the reserve. In Berem for instance, the boundary line (road) runs through the village (Plate 4.5).

Data gathered on respondents' reaction to the ejection moves by the Wildlife Department therefore showed a greater leaning towards resistance as can be seen in Table 4.8.

TABLE 4.8: REACTIONS OF RESPONDENTS' TOWARDS WILDLIFE DEPARTMENT'S ACTION

ACTION	FREQUENCY	PERCENTAGE
Refuse to vacate land	176	47.8
Continue to farm land	36	9.8
Petition Government	120	32.6
Confrontation	8	2.2
No response	28	7.6
Total	368	100.0

Plate 4.1: A section of the winding boundary at Berem

Plate 4.2: The location of a boundary pillar (in the foreground) lying several metres away from the present boundary at Kyeiase

Plate 4.3: A school located inside the reserve at Berem

Plate 4.4: A school building inside the reserve at Kyeiase

Plate 4.5: A section of Berem with the laterite road (boundary) running through it

Table 4.8 reveals that 47.8 per cent were not in any way ready to vacate the land followed by 9.8 per cent who claim they would continue to farm the land. In effect 57.6 per cent were not ready to leave the land. In all 67.4 per cent were strongly opposed to the moves by the Wildlife Department. Further investigation in these communities showed that the people would employ these means of resistance against any future action by the Wildlife Department until a better and constructive alternative solution is adopted.

4.6 THE ISSUE OF COMPENSATION

People settle disputes when they perceive the cost of continuing the dispute exceeds the cost of settlement. A second factor that accounts for changing willingness to settle is changing the cost of continuing the dispute. Finally, a person's inclination to settle may change during the course of a dispute because of changes in values (Bacow and Wheeler, 1987).

Ownership over land plays a major role in how, when and the intensity with which it is used. Most government lands are usually left fallow and devoid of any activity while private and communal lands are usually targets for crop production. All such government acquired lands especially stool lands when acquired have to be adequately compensated (Gough and Yankson, 1997). The law provides for the prompt and adequate payment of compensation for the land itself, plants, buildings and other artificial errections at the prevailing market value, replacement value, or cost of disturbance (Gyasi, 1994).

People have different perceptions of what constitutes proper compensation. In-kind compensation can be a more useful way of helping the intended beneficiary. For example, if a preservation project is going to displace people from their habitat, the

initiator of the project as compensation might offer to relocate the affected on a comparable land to meet the economic requirement needs of the people. Another alternative is the offer of direct cash payment. Compensation can be a helpful tool for resolving such disputes. For compensation to be effective, it must succeed in assuaging the concerns of those opposed to the proposed facility either through partnership in the development scheme or wherever possible, alternative economic activities should be planned and established in the project area.

Perhaps, one important reason for the resilience of the people not to submit to the pressures of the Wildlife Department is the issue over the payment of compensation. The survey shows that none of the affected respondents was paid any compensation nor offered any resettlement.

TABLE 4.9: LOCATION OF LAND AND OPTION OF RESETTLEMENT

LOCATION OF LAND	OPTION OF RESETTLEMENT				TOTAL	
	YES		NO			
	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
Inside Reserve	8	66.7	224	75.7	232	75.3
Outside Reserve	4	33.3	72	24.3	76	24.7
Total	12	3.9	296	96.1	308	100.0

Table 4.8 shows that 96.1 per cent of respondents in the affected communities claimed they were not given any option of resettlement. The rest, 3.9 per cent, who claimed they were offered resettlement were infact talking about unconfirmed rumours of a possible resettlement near Nsuta. According to Gyasi (1995), the non-payment of

compensation together with other shortcomings in the system of compensation and certain other factors has caused local disaffection in such affected communities. Bearing on the issue of compensation in the Kogyae Reserve and especially its 1971 extension is the claim over ownership. The ultimate traditional control over the land is confusing as the Kwaman and Kumawu Stools are locked in dispute over the land. The unending litigation is worsened by long delays in ruling by the law court on the land dispute involving these stools. This, according to the Wildlife Department sources, was the cause of the delay in the payment of compensation to the affected inhabitants.

However, 8.6 per cent of the respondents think the non-payment of compensation to the affected inhabitants was a deliberate act by the government to cheat them. They believed that the government was more concerned about the reserve than the people who inhabit the area.

4.7 PEOPLE'S PERCEPTION OF WILDLIFE PRESERVATION

The perception that wildlife resources are free gifts of nature and therefore at the disposal of man for his benefit was manifested in the investigation into the respondents' views of the Strict Nature Reserve. Responses showed that the belief is still held that there should be unrestricted access to the resources because that has been their source of livelihood since time immemorial.

Contrary to earlier findings of the Kogyae Strict Nature Reserve Development and Management Plan, 94.6 per cent of respondents claimed they had not benefited from the creation and preservation of the wildlife (flora and fauna) in the reserve. This is not wholly true because preceding analyses show that these resources are

extensively being utilized. Perhaps the creation of the reserve has even helped to sustain these resources over the years for its present users.

The same 94.6 per cent see the reserved land as a "wasted" potential farmland which should be released to them.

Perhaps a fair assessment of the environmental benefits of the creation of the reserve was denied in the investigation because of the inflexible stance of the local people in their demand.

The 5.4 per cent who think contrary however concede that the reserve exerts enormous influence on the environment in general and rainfall in particular. They believed the creation of the reserve was important because it also protects wild animals which otherwise would have been extinct in the area and to the disadvantage of the present generation.

4.8 FACTORS EXPLAINING THE CONFLICT

Issues raised in the preceding sections reveal the presence of conflict in the area. Even though the survey showed quite a sizeable proportion of the respondents (79.3%) knew very well the regulations governing the use of the reserve, they have resisted attempts by the Wildlife Department to remove them from the reserve and also restrict the illegal use of resources inside the reserve. The controversy surrounding the exact location of the reserve boundary coupled with the running of demonstration plots in the reserve by the Ministry of Agriculture has inadvertently encouraged and strengthened the resolve of the encroaches to exploit the resources. This is because the people saw the objectives of the Ministry of Agriculture in the reserve to be at variance with the objective of the Department of Game and Wildlife. However, an attempt was made to determine the root cause of the conflict. To the

question, "is there any conflict over land in the area?", the response was unanimous in the affirmative. This was blamed on the 1971 extension made to the original Kujani Reserve as stated earlier. In spite of this, the respondents gave a fair assessment of prevailing conditions as shown in Table 4.10.

TABLE 4:10: RESPONDENTS' VIEWS ON THE MAIN CAUSE OF THE CONFLICT IN THE AREA

CAUSES	FREQUENCY	PERCENTAGE
Failure to resettle us	4	1.1
Illegal Occupation by the people	184	50.5
Illegal occupation by government	172	47.3
Situation of reserve boundary	4	1.1
Total	364	100.0

As evident from Table 4.10, 47.3 per cent of the respondents out of a total of 364 emphasized the "illegal" occupation of the land by government as a cause of the conflict, while only 50.6 per cent thought their illegal activities inside the reserve was the cause. One per cent saw the situation of the reserve boundary as very irritating. Discussions in Berem for instance where the boundary runs through the village was skewed towards total abhorrence. Only 1.1 percent believed the issue had something to do with resettlement.

The concern for land by the local people is viewed as the key to the almost deadlock situation in the reserve area. This according to the Kogyae Strict Nature Reserve Development and Management Plan (1994) was the determining factor in the success or failure of the preservation efforts by government in the area. It states that,

"until such time that the legitimate demands by the indigenous people for land for their farming needs is met and their involvement in the management of the resource is guaranteed, the degradation of the reserve's resources will not curtail".

The immediate cause of the tension was however traced to the intensification in the activities of the Wildlife Department to rid off all illegal activities in the reserve in recent times. Connected with this were the reported cases of underhand dealings of some of the Wildlife officers in their operations during the task force days (1994 to 1995). There were allegations in Berem that some officials of the Department who took part in the operations (destruction of maize farms) solicited and took bribes ranging from ¢20,000.00 to ¢100,000.00 in order to leave some farms untouched. In spite of this, all the farms were destroyed and this left the people who paid the bribes very unhappy.

An interview with the queenmother of Berem revealed more allegations. The most prominent was the allegation of connivance of some top wildlife officers with a timber firm to illegally cut timber from the reserve.

Even though these allegations were denied, they still raised the issue of trust among the local people and the Wildlife Department as future collaborators in the preservation of the reserve.

4.9 THE LOGISTIC REGRESSION MODEL

Predicting whether an event will occur or will not occur, as well as identifying the variables useful in making the prediction, is important in most academic disciplines as well as the "real" world. There is a variety of multivariate statistical techniques that can be used to predict a binary dependent variable from a set of independent variables. Multiple regression analysis and discriminant analysis are two of such

techniques. These however pose difficulties when the dependent variable can have only two values – an event occuring or not occuring. Another difficulty with multiple regression analysis is that predicted values cannot be interpreted as probabilities. Linear discriminant analysis does not allow direct prediction of group membership as does the logistic repression model (Norusis, 1992). Brown (1980) used this method to study fifty three (53) men with postrate cancer. For each patient he reported the age, serum acid phosphatase (a laboratory value that is elevated if the tumor has spread to certain areas) the stage of the disease (an indication of how advanced the disease is), the grade of the tumor (an indication of malignancy), and X-ray results, as well as whether the cancer had spread to the regional lymph nodes at the time of surgery. The problem was to predict whether the nodes were positive for cancer based on the values of the variables that could be measured without surgery.

Analyses of the statistics in the preceding sections revealed the characteristics which were associated with conflict. It was also necessary to find out the relative importance of each of the determinants. To achieve this, six separate models were built on the basis of identified variables which were capable of causing conflict. The first model comprised the dependent variable (conflict) and the constant. Models 2, 3, 4 and 5 were built using the following identified proximate variables: (i) claim over ownership and use of some sections of the reserve; (ii) being left poorer financially after government acquisition of the land for a reserve; (iii) landlessness as a result of the acquisition, and (iv) difficulty in getting land after the acquisition by government.

The sixth model, comprising of all the determinant variables was built to show whether any variables which were significant in causing conflict when operating with only the constant or other similar proximate determinants would still be significant if they interacted with other unrelated variables.

The logistic regression model was chosen for this analysis because of the dichotomous nature of the dependent variable; conflict. In cases of such nature, the dependent variable can only have two outcomes – an event occurring or not occurring. Here, E which is the error expressing an observation's deviation from the mean in a linear regression model; $Y = E(Y/X) + E^1$ may assume one or two possible values. If $Y = 1$ then $E^1 = 1 - n(X)$ with probability $n(X)$ and if $Y = 0$, then $E = -n$ $(-x)$ with probability $1 - (X)$

The structure of the models

Logistic regression directly estimates the probability of an event occurring and the factors influencing the occurrence of the event. In the case of a single independent variable, the logistic regression model can be written as:

$$(X) = \frac{e^{Bo} + B_1 X}{1 + e^{Bo} + B_1 X}$$

where B_o B_1 = Coefficients estimated from the data

X = the independent variable

e = the base of the natural logarithm.

For more than one independent variable, it can be written as:

$$(X) = \frac{e^z}{1 + e^z}$$

where Z = the linear combination

$$Z = Bo + B_1 x_1 + B_2 X_2 + \ldots\ldots, B_n X_n$$

Where Bo is a constant

$B_1, B_2 \ldots . B_n$ are Coefficients of $X_1, X_2 \ldots, X_n$ (Independent variables)

X_1 = Landlessness

X_2 = Financial loss

X_3 = Difficulty in getting land

X_4 = Ownership and use

The two models were therefore used in building the basics for analysis. In building the models, the number of variables that have a bearing on conflict were minimized as much as possible for three reasons. First, the more limited the number of variables, the more the likelihood for them to be numerically stable and easily generalized. The more the number of variables included in the model, the greater the estimated standard errors become. This makes the model dependent on observed data. Another consideration was not to include categories of variables with zero frequency. Such inclusions can cause a number of undesirable numerical outcomes to occur such as large estimated coefficients and standard errors. The final consideration was the statistical significance of the variables. The literature suggests that a category of a variable must pass the 0.05 level of significance test to be able to be generalized with confidence. All variables which did not pass this test were not considered as proximate determinants of conflict and were therefore dropped.

Using the Forward Stepwise Selection procedure and the ENTER method, six models were built and their goodness-of-fit determined.

4.10 RESULTS FROM THE MODELS

There are two ways of indicating the goodness-of-fit of a model. One way is by comparing the predicted and observed outcome. The other way is by using the log-likelihood of the model. The log-likelihood is the probability of the observed results, given the proximate estimates. Tables 4.11, 4.12, 4.13, 4.14, 4.15 and 4.16 show the predicted and observed outcomes for conflict for models 1,2,3,4,5 and 6.

Table 4.11: MODEL CONTAINING ONLY CONSTANT (MODEL 1)

OBSERVED STATUS	PREDICTED STATUS		PERCENT CORRECT
	NO CONFLICT	CONFLICT	
No conflict	0	44	0.00
Conflict	0	324	100.00
OVERALL PERCENT CORRECT			88.04

TABLE 4.12: CLASSIFICATION TABLE FOR THE PROBABILITY OF CONFLICT FOR LAND OWNERSHIP AND USE (MODEL 2)

OBSERVED STATUS	PREDICTED STATUS		PERCENT CORRECT
	NO CONFLICT	CONFLICT	
No Conflict	0	44	0.00
Conflict	0	324	100.00
OVERALL PERCENT CORRECT			88.04

TABLE 4.13: CLASSIFICATION TABLE FOR THE PROBABILITY OF CONFLICT FOR LEFT POORER FINANCIALLY (MODEL 3)

OBSERVED STATUS	PREDICTED STATUS		PERCENT CORRECT
	NO CONFLICT	CONFLICT	
No Conflict	0	44	0.00
Conflict	0	324	100.00
OVERALL PERCENT CORRECT			88.04

TABLE 4.14: CLASSIFICATION TABLE FOR THE PROBABILITY OF CONFLICT FOR LANDLESSNESS (MODEL 4)

OBSERVED STATUS	PREDICTED STATUS		PERCENT CORRECT
	NO CONFLICT	CONFLICT	
No Conflict	4	40	9.09
Conflict	4	324	98.07
OVERALL PERCENT CORRECT			88.04

TABLE 4.15: CLASSIFICATION TABLE FOR THE PROBABILITY OF CONFLICT FOR DIFFICULTY IN GETTING LAND (MODEL 5)

OBSERVED STATUS	PREDICTED STATUS		PERCENT CORRECT
	NO CONFLICT	CONFLICT	
No Conflict	8	36	18.18
Conflict	4	320	98.77
OVERALL PERCENT CORRECT			89.13

TABLE 4.16: CLASSIFICATION TABLE FOR THE PROBABILITY OF CONFLICT FOR A COMBINATION OF LANDLESSNESS, FINANCIAL LOSS, DIFFICULTY IN GETTING LAND AND LAND OWNERSHIP AND USE (PROXIMATE DETERMINANTS) (MODEL 6)

OBSERVED STATUS	PREDICTED STATUS		PERCENT CORRECT
	NO CONFLICT	CONFLICT	
No Conflict	8	36	18.18
Conflict	4	320	98.77
OVERALL PERCENT CORRECT			89.13

A model that fits perfectly would have 100 per cent as the overall per cent correct for predicted outcomes. The overall percentage correct indicates the proportion of observed conflict which were correctly predicted by the models. The overall percent correct of 88.04 for models 1,2, 3,4 and 89.13 for models 5 and 6 indicates a good overall fit.

In spite of the good overall percentage achieved by the six models, this method is a weak indicator of the goodness-of-fit of a model. This is because the classification table does not reveal the distribution of estimated probabilities for the presence or absence of conflict. A stronger indicator of the overall goodness-of-fit of a model is to examine how "likely" the sample results actually are, given the parameter estimates. This is termed the likelihood. The likelihood is a number less than 1, so it

Table 4.17: – 2LL AND GOODNESS-OF-FIT STATISTICS FOR ALL THE MODELS

VARIABLE	MODEL NO.	–2LL	GOODNESS-OF-FIT
CONSTANT	1	269.41856	
OWNERSHIP AND USE	2	199.204	367.970
LEFT POORER	3	181.996	274.525
LANDLESSNESS	4	174.780	201.035
LAND DIFFICULTY	5	170.079	200.133

Table 4.18
MODEL CHI-SQUARE AND IMPROVEMENT STATISTICS OF VARIABLES IN THE MODELS

MODEL 2	CHI-SQUARE	df	SIGNIFICANCE
MODEL CHI-SQUARE	70.214	1	.0000
IMPROVEMENT	70.214	1	.0000
MODEL 3			
MODEL CHI-SQUARE	87.422	2	.0000
IMPROVEMENT	17.208	1	.0000
MODEL 4			
MODEL CHI-SQUARE	94.639	3	.0000
IMPROVEMENT	7.216	1	.0000
MODEL 5			
MODEL CHI-SQUARE	99.339	4	.0000
IMPROVEMENT	4.701	1	.0301

is customary to use – 2 times the log of the likelihood (2LL) as a measure of how well the estimated model fits the data (Norusis, 1992).

A good model is one that results in a high likelihood of the observed results. This translates to a small value for – 2LL. If a model fits perfectly, the likelihood is 1 and – 2 times the log likelihood is 0. Results from the models are shown in Table 4.17

The model chi-square in Table 4.18 is the difference between the –2LL for the model with only a constant (Model I) and –2LL for the subsequent models (Table 4.17). It tests the null-hypothesis that the coefficient for the last term "difficulty" in model 5 except the constant is 0. This compares to the overall F-Test for regression. Table 4.18 shows the coefficient of the variable added at the last step. The entry labeled "improvement" is the change in –2LL between successive steps of building a model using a stepwise form of variable entry. It also tests the null-hypothesis that the coefficients for the variables added at the last step are 0.

Table 4.19: LOGISTIC COEFFICIENTS WITH VARIABLE DIFFICULTY IN GETTING LAND

LOGISTIC REGRESSION CONFLICTS DIFFICULTY F/STEP ..... VARIABLES IN THE EQUATION.....			
VARIABLE	B	df	Significance
DIFFICULTY	-2.2462	1	.0401
CONSTANT	2.3946	1	.0000

4.11 DECISION:

The –2LL of 199.204 and a goodness–of-fit of 367.970 for model 2 in Table 4.17 indicate a very strong relationship between the variable, ownership and use and the conflict in the study area. The other variables also show strong relationships but in decreasing magnitude.

Moreover, the coefficient for the term "difficulty" in the model in Table 4.21 is -2.2462 and not 0. This contradicts the test that the null-hypothesis of the coefficient for the term in the model except the constant is 0. Furthermore, the improvement test also rejects the null-hypothesis because the coefficient for the variable added at the last step is not 0 but – 2.2462. This is supported by the significance level of the model chi-square for all the variables in Table 4.20.

In another development, the ENTER method in the same logistic regression model was used to determine the rate of prediction of conflict by all the identified variables combined. The combined effect is shown in Table 4.20.

Table 4.20: GOODNESS-OF-FIT WITH ALL VARIABLES COMBINED (MODEL 6)

LOGISTIC REGRESSION CONFLICTS WITH LANDLESSNESS, FINANCIAL LOSS, DIFFICULTY IN GETTING LAND, OWNERSHIP/ENTER			
-2 Log likelihood	170.079		
GOODNESS-OF-FIT	200.133		
	CHI-SQUARE	df	Significance
MODEL CHI-SQUARE	99.339	4	.0000
IMPROVEMENT	99.339	4	.0000

Table 4.21 contains the estimated coefficients of the variables in predicting conflict. On the basis of these coefficients, the logistic regression equation is written as:

$$Z = 2.3946 + 1.7098 (X_1) + 3.2397 (X_2) + 2.2462 \quad (X_3) + - 3.7165 (X_4)$$

Where: Z = Linear Combination

X_1 = Landlessness

X_2 = Financial loss

X_3 = Difficulty in getting land

X_4 =Ownership and use.

Model 6 as stated earlier was built to show whether any variable(s) which were significant in causing conflict when operating with only the constant would still be significant if they interacted with other unrelated variables. The 0000 significance levels for the variables "financial loss" and "ownership and use" in Table 4.21. show that they are very significant among the other independent variables in explaining the conflict.

Table 4.21: LOGISTIC COEFFICIENTS WITH VARIABLES LANDLESSNESS, FINANCIAL LOSS, DIFFICULTY IN GETTING LAND OWNERSHIP FOR MODEL 6

Variable	B	Df	Significance
Landlessness	1.7098	1	.0064
Financial Loss	3.2397	1	.0000
Difficulty	-2.2462	1	.0401
Ownership and use	-3.7165	1	0000
Constant	2.3946	1	.0000

Moreover, the significance level of .0000 and the model chi-square in Table 4.20 reject the null-hypothesis that the coefficients of all the terms in Table 4.21 are 0.

The – 2LL of 170.079 and the 200.133 goodness-of-fit for model 6 (Table 4.17) implies that in spite of the synthesizing effect of all the variables, it is still a long distance from 0; the point at which all the predictor variables will give the model a perfect fit and thus fully explain the conflict in the study area.

Model 6 therefore moderately explains the relationship between the dependent variable and the independent variables. The four independent variables together explain 170.079 of the conflict suggesting that the distance between the –2LL of 170.079 (Goodness-of-fit; 200.133) and 0 (Goodness-of-fit; 368) is the variation in the dependent variable unexplained by the independent variables.

This implies that additional variables need to be considered in relation to the prevalence of conflict in the area. This includes the sympathy often expressed for the local and migrant settlers on the use of land inside the reserve and the confusing activities of the Ministry of Agriculture and the Lands Department in the use of the land inside the reserve as against the role of the Wildlife Department. Remotely connected may be the land dispute between the Kwaman and Kumawu Stools.

On the basis of the analysed data, the hypotheses on ownership and use of sections of the reserve, landlessness as a result of the acquisition and difficulty in getting land are significantly related to the dependent variable in explaining the existence of conflict in the area as they did meet the 0.05 significance test level. The hypothesis that the non-payment of compensation to affected farmers is positively related to the conflict in the area was however rejected because it did not pass the 0.05 significance test.

4.12 CONFLICT RESOLUTION

Since conflicts are inevitable in life, conscious and genuine efforts are always needed in their resolution whenever they crop up. This is necessary because their persistence does not only lead to the loss of very productive man-hours in trying to resolve them, but also in economic terms, large sums of money may be used in the litigation process. Although the costs of conflict may not be eliminated, they likely can be reduced. Even if perfection will always be out of reach, the quality of decisions in environmental cases surely can be enhanced (Bacow and Wheeler, 1987).

Even though there had been some attempts in the past in the form of policy documentation, meetings between the local people and officials of the Wildlife Department to resolve the conflict little success was achieved until 1998. The Kogyae Strict Nature Reserve Development and Management Plan (1994) document, purposely developed and tailored to ameliorate the causes of the degradation suffered setbacks in its implementation. Meetings involving the District Chief Executive, representatives of the Wildlife Department, Nana Kumawuhene and other stakeholders with the Regional Minister in 1994 did not achieve any breakthrough. The efforts by government, the traditional authority, District Assembly were assessed

by the respondents as not impacting positively finding solutions to the prevailing problem. Each of these agencies recorded low ratings from the respondents. Only 13.2 per cent commended the effort by government while 27.2 per cent commended the traditional authority. The District Assembly recorded the lowest (7.7 per cent). The respondents were highly critical of the District Assembly because, in their view, it was the best institution to have understood their plight taking into consideration promises made by succeeding District Chief Executives.

As to what role they had played themselves, 38.9 per cent claimed they made no effort while 53.4 per cent claimed they appealed to government through petitions via their assemblymen and unit committee leaders; 7.8 per cent however claimed they used dialogue to resolve the issue with the Wildlife Department. The investigation revealed an expressed need for the amicable resolution of the conflict to allow peace to prevail in the area. The governemnt's role in this was rated high because of the "disturbing" land dispute between the Kumawu and Kwaman Stools – a dispute that has the potential of degenerating into a war (Daily Graphic, 13th September 1994).

The involvement of World Vision International, Ghana, the traditional authority, District Assembly and the local residents of the area in the resolution of the conflict been the Wildlife Department and the people was also seen as crucial.

As to their views on the form of settlement that would rest issues, 38.5 per cent of respondents were of the opinion that the present boundary should be abolished and pushed back to the original 1919 Kujani Forest Bush Reserve boundary, while 51.6 per cent thought it should be moved about 3 kilometres away from their settlements. (Table 4.22).

TABLE 4.22: VIEWS OF RESPONDENTS ON FORM OF SETTLEMENT OF THE CONFLICT

FORM OF SETTLEMENT	FREQUENCY	PERCENTAGE
Reserve boundary be maintained	12	3.3
Boundary back to 1919 boundary	140	38.5
Boundary be 3km away from settlement	188	51.6
Reserve be relocated	24	6.6
Total	364	100.0

It is evident from Table 4.22 that 90.1 per cent out of 364 respondents were in favour of the 1971 boundary extension being moved away from its present location. An approximately 7 per cent of the respondents were extreme in their demand, that is, they advocated the relocation of the entire reserve. Only 3.3 per cent were in favour of the present boundary being maintained. The demands of the respondents, which was a general view of the people in the indigenous communities meant there was the need for the use of tact and diplomacy in resolving the issue. This also meant the adoption of strategies that would not offend the sensibilities of the local people nor expose the reserve to uncontrolled use. There was therefore the need for a compromise. The other concern of the inhabitants of the four communities located inside the reserve was their desire not to be ejected from their present locations.

4.13 THE KOGYAE MEDIATION EFFORT

Varied methods in the resolution of conflicts have been employed in many land use conflict situations. These include eviction, litigation and accommodation. The methods in themselves do not guarantee a solution to any problem because in most cases their success depends on the human element in the conflict. In cases where

these methods are wrongly or improperly used, or do not meet the aspirations of the people, conflicts have persisted. The "Operation Halt" programme of 1989 is a good example of such failed conflict resolution effort.

In the context of this work, the method of eviction or expulsion was ruled out completely as this was what the local people were resisting. Litigation in the courts was neither a better alternative method. The method of mediation looked a better alternative because of the polarized stand of the local people and the Department of Game and Wildlife. This involved a third or fourth party who tried a peaceful settlement of the dispute through negotiation with the disputants. The disputants were helped to arrive at an agreed compromise. It must be noted that the skill of the mediator was very crucial in this regard because of the inflexibility exhibited by the disputants especially the local people. The success of the mediation effort also depended on the "genuine neutrality" of the mediator. It must be emphasized that at every level of conflict resolution effort, disputants must perceive him/her to be such, otherwise he/she may lose the trust and respect of the disputants. This can jeopardize any peace effort.

The Kogyae conflict resolution efforts looked very shaky at the beginning because of suspicion and mixed feelings about the roles of the mediators – World Vision International Ghana and the District Assembly (representing government). The local people were initially suspicious of the role of government officials in the mediation team, even though there was a general consensus that no break through could be made without government involvement. Perhaps this mistrust for government is a carry-over from the colonial period when the chiefs and people were willing to trust the courts rather than the government over issues concerning land. This mistrust was made manifest in the local peoples' option for the services of a private

land surveyor in the demarcation of the special use zones (S.U.Z.) This mistrust, it was gathered stemmed from the fact that it was the government that "wrongly" expropriated the land in the first place and would therefore do anything within its means to obtain more than a fair share of any deal that might go through.

World Vision International, Ghana was also initially seen by the Department of Game and Wildlife as an "honest broker" because of its developmental activities in the area. It had spent several millions of cedis to provide boreholes, a clinic and other social amenities, for the local and some migrant communities located in the reserve. (See Plate 4.2). World Vision was therefore accused of perpetuating the continued stay of the people inside the reserve. Its credibility was therefore at stake because in the minds of the Wildlife Department, it was an interested party in the dispute. The initial difficulties finally gave way and the peace effort went ahead.

In an attempt to diffuse the tension as a result of the official notice to the people to quit the reserve, a five-day Conflict Management Workshop was organized from 12-17th January, 1998 in Ejura. This brought together all the stakeholders in the conflict.

Two main objectives of the workshop were to:

1. Facilitate stakeholders participation in the identification and assessment of the practicability of traditional (indigenous and foreign) conflict management approaches.
2. Plan effective and sustainable strategies to be adopted by legitimized stakeholders.

4.14 MEMORANDUM OF UNDERSTANDING (M.O.U)

Following several meetings, consultations and field trips to the various communities in the area by a technical team made up of representatives of stakeholders (communities and Department of Game and Wildlife), World Vision International, Ghana and the District Assembly, a memorandum of understanding was drawn. This stressed the involvement of the communities in the total up-keep of the reserve.

The technical team took into consideration the fact that a policy of "no-use" could bring a greater risk to the ecosystem of the area. The hostility caused by cutting off resources from local people can be an an extremely risky strategy, as has been proven time and again in recent conservation strategy (Wild and Mutebi, 1997). This strategy is in line with the proposition of Bell (1989), which sought a 5 per cent allocation of national parks and reserves in each country for consumptive utilization by local communities. According to Wild and Mutebi (1997) aggressive protection is vulnerable to failure at "crisis points" when law enforcement fails. In other words, a protected area which has no local support, which provides no local benefit and which is maintained only by force, will be at a greater risk from occupation in times of insecurity and breakdown of law and order than a protected area in which local communities play a role in management, are benefiting from the park (reserve) and have developed good relationships with the park (reserve) management (Wild and Mutebi, 1997). The involvement of the people was more crucial in the case of the Kogyae Strict Nature Reserve because of its size, fragility and the fact that part of it has been demarcated as a Special Use Zone.

Another consideration for the involvement of the people in the management of the reserve was to make them feel the impact as partners in the development of the

reserve's potential as a tourist attraction, for, it is the local people who would benefit from it should its ecosystem improve. There was therefore the need to involve them in the management practices that would lead to this improvement.

4.15 SPECIAL USE ZONES

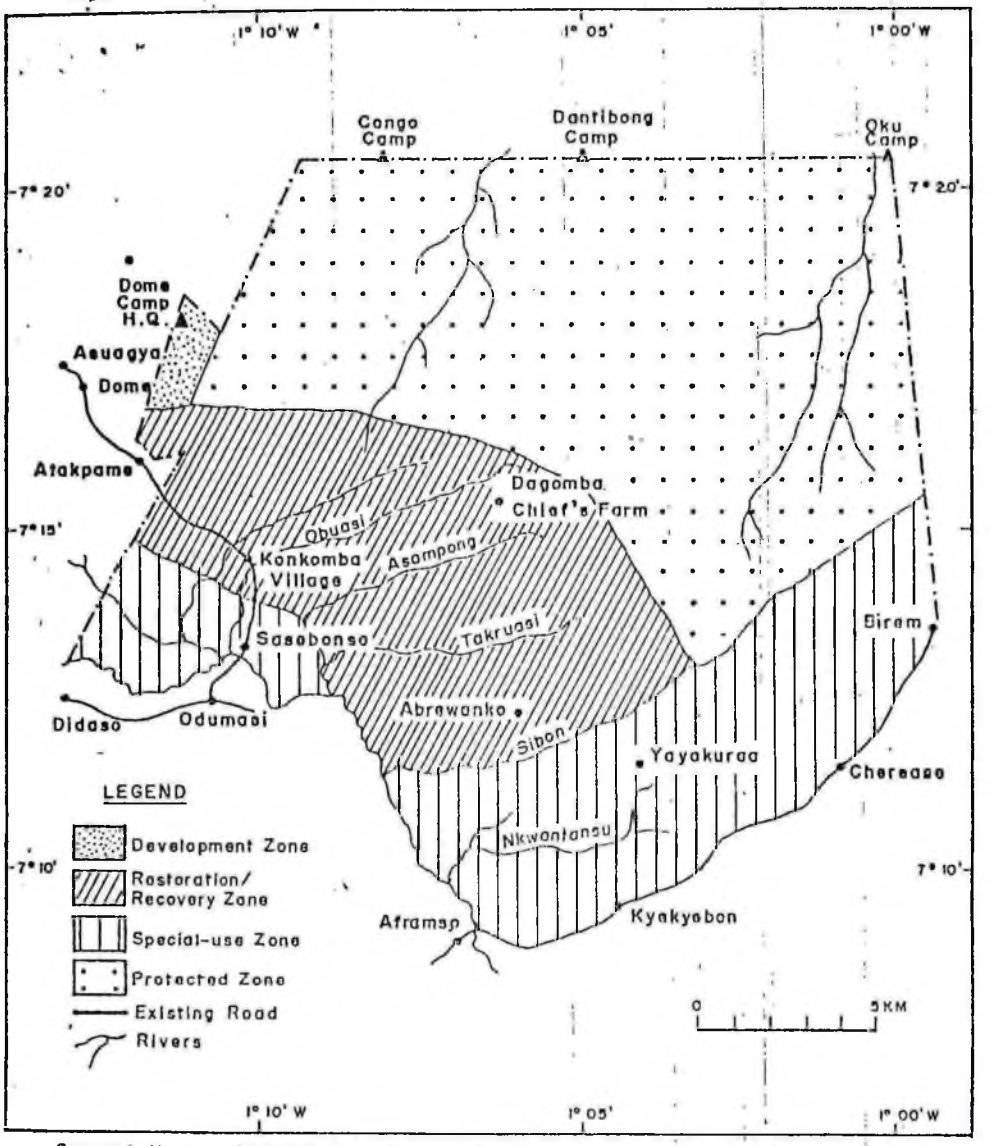
Considerations above culminated in the setting up of Special Use Zones (S.U.Z.) (Figure. 4.1), that is part of the reserved land being released to meet the land needs of the people. Taking a cue from observations made by wildlife conservation experts, it favoured collaborative or joint management of the released land to check abuse. This was to be achieved through:

1. the halting of all hunting activities inside the reserve, not excluding the special use zones;
2. ensuring a sustainable use of the resources in the special use zones;
3. controlled and regulated use of fire inside the special use zone. This also required the formation of fire volunteer squads in the communities.
4. collaborative planning, management and implementation of decisions concerning the special use zone by the local inhabitants and the Wildlife Department.

In line with these, Asasebonso, Dagomba, Abrewanko, Yaya Akura, Kyekyebon, Kyeiase and Berem were demarcated to form the special use zone. Consideration was given to the size of population in these communities and the general land use practices in the area.

Consequently, Berem, Kyeiase and Kyekyebon were given a concession of two kilometres each towards the original Kujani Reserve boundary while villages already located inside the reserve (Yaya Akura, Dagomba, Asasebonso, Abrewanko) had theirs towards the present boundary. (See Fig 4.1). The special Use Zone strategy

Fig. 4·1 MANAGEMENT ZONES OF KOGYAE STRICT N.R.



Source : Kogyae Strict Nature Resource Development and Management Plan, 1994.

was adopted to avoid the physical relocation of the people in these communities. Asase Konkomba was however not considered in the special use zone because the settlement was established inside the reserve after it was officially demarcated.

This special use zone carved from the zone of influence (Wildlife Department, 1994), consists of 16 kilometres square on the South-Western Corner of the reserve to the confluence of the Afram and Dida Rivers, plus an area of 79 kilometres square to the south-eastern portion using the Sibon River as the boundary. It extends 3.5 kilometres from the Sibon River to the boundary road from Berem to Oku.

The memorandum of understanding however made it clear that, the creation of the Special Use Zones did not signify the degazetting of that section of the reserve. The present boundary was to be maintained, even in Berem.

4.16 BUFFER ZONE

In accordance with the use of the Special Use Zone, a buffer zone was to be created to act as a recovery ecological zone. This area which constitutes about 86 kilometres square, representing 22.3 per cent of the reserve, consists of the rest of the extension to the southern boundary of the Kujani Bush Forest Reserve. This buffer zone or restoration zone, as is designated by the Kogyae Strict Nature Reserve Development and Management Plan, includes all those lands that have been degraded or significantly altered by farming, logging and charcoal making. (See Plate 4.6). It was expected that this zone would exclude all forms of destructive activities and provide facilities for the recovery of the vegetation and wild animal populations in the reserve.

Plate 4.6: A Weed area near Kyekyebon where illegal charcoal burning has recently taken place

CHAPTER FIVE

SPATIAL PATTERNS OF LAND USE AND COVER CHANGE IN THE KOGYAE STRICT NATURE RESERVE

5.1 INTRODUCTION

The Department of Game and Wildlife's inability to effectively maintain the Kogyae strict Nature Reserve in the face of increasing population of migrant farmers have resulted in vast land use and land cover changes. The result of the land cover change or land degradation can be categorized on the basis of two broad parameters namely physical and human factors. The physical factors include climate, vegetation, soil, water and wildlife while human factors are socio-economic factors.

Interviews granted by the local leaders in the indigenous communities of Berem, Kyeiase, Kyekyebon and Sasebonso revealed that inhabitants of these communities prior to the 1971 eastward extension of the original Kujani Bush Reserve lived in harmony with their environment as there was enough land to be used for whatever purpose desired. Land degradation was also minimal as no circumstances compelled the misuse of the reserve. These people have not come to terms with the fact that the acquisition of the reserve land by government means a permanent loss of land to them and their future generations in the face of this present trend of population growth. In their view, the eastward extension of the Kujani Bush Reserve was illegal. According to them the boundary and compensation problems associated with the acquisition of the reserve attest to this.

On the basis of the above premise, the people have cashed in on the apparent helplessness of the Department of Game and Wildlife due to logistical constraints to engage in serious encroachments on the reserve resources. With no eagerness to enage in sustainable resource use practises, the people constantly cleared the

reserve for crop production, illegally cut timber and also burned the reserve on annual basis in pursuit of game thereby seriously degrading the reserve.

This chapter analyses the land cover transformation of the resreve as a result of human driving forces and the subsequent impact on wildlife conservation. The methodology has already been explained (See chapter one).

5.2 RESULTS OF AERIAL PHOTO AND SATLLITE IMAGERY INTERPRETATION

5.2.1 AERIAL PHOTO INTERPRETATION

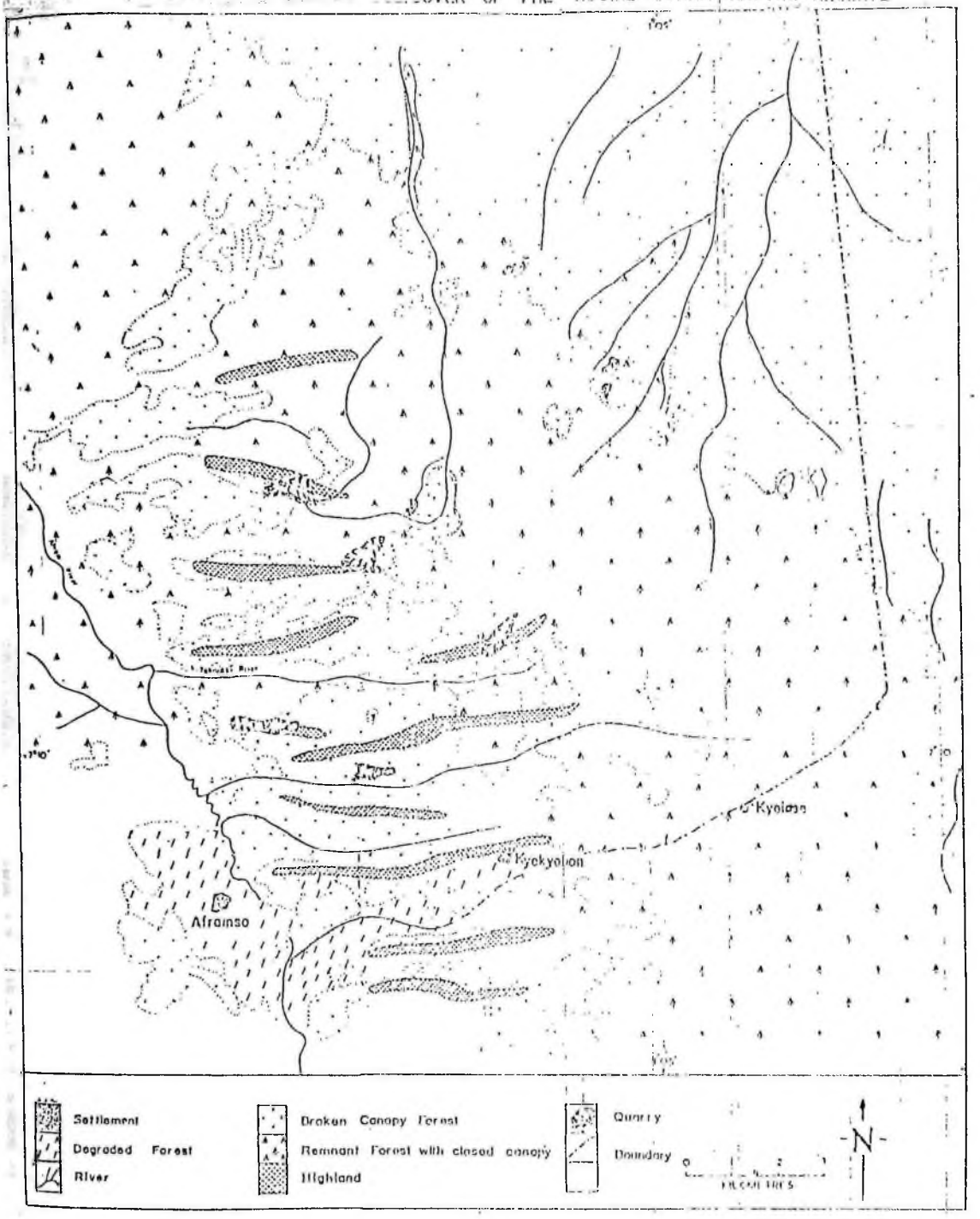
Table 5.1: Aerial Photograph interpretation of land use and cover categories and their area coverage

CLASS	AREA (KM^2)	%
Degraded forest	6	1.7
Broken canopy forest	95	26.9
Remnant forest with closed canopy	226	64.2
Highland	20	5.6
Quarry	5	1.4
Total	352	100

Source: 1972/73 Aerial Photographs, Survey Department.

Broad land use and cover categories as seen in Figure 5.1 were identified through the photo interpretation. The interpretation revealed a relatively undisturbed land cover except for the area around Aframso No.3. Perhaps, this may be due to limited human activity as there are no visibly cropped and fallow land.

The remnant forest with closed canopy formed 64.2 per cent of the land over, covering the mid-portions of the reserve. This category is composed of *setaria barbata – manilkara multinervis* community group. *Chroprora excelsa (*odum),


OVER OF THE KOGYAE STRICT NATURE RESERVE
Kyekyekon
Afrainso
Settlement
Degraded Forest
River
Broken Canopy Forest
Remnant Forest with closed canopy
Highland
Quarry
Boundary
N

Antiarias toxicaria (*Kyenkyen*), *Cola gigantea, Afzelia africana* are found on the south-eastern part near Kyeiase and Berem.

Areas of relatively undisturbed broken canopy forest formed 26.9 per cent of the area covered by the available aerial photographs. This is composed mainly of *Daniella Oliveri – Andropogon gayanus* community found on deep soil. *Culcasia* species community forming riverine forest can be found along the main river courses especially in the southern half of the reserve. Low species mainly herbs, sedges and grasses characterize areas of exposed rock outcrops of sandstone and lateritic ironpans.

5.2.2 RESULTS OF THE SATELLITE IMAGERY INTERPRETATION

The 1991 Landsat TM satellite image (Fig.5.2) shows an extensive deterioration of the original 1972/73 reserve cover. This has resulted in the almost disappearance of the remnant forest cover trending from north-west to south-east on the photo interpreted image. Figure. 5.3 shows the percentage area of land use and cover categories as at 1991.

Table 5.2: Landsat TM interpreted cover classes with total area coverage

CLASS	AREA KM^2
Grassland with/without scattered Savanna trees	33.84
Remnant forest with closed canopy	58.28
Savanna woodland with closed/almost closed canopy	98.93
Open Savanna woodland with scattered trees	57.66
Degraded forest	49.57
Weed areas	43.23
Weed areas with scattered savanna trees	44.49
Total	386

Source: Landsat TM image interpretation (1991).

LANDSAT TM 1991 LAND USE/COVER CLASSIFICATION OF THE KOGYAE STRICT NATURE RESERVE

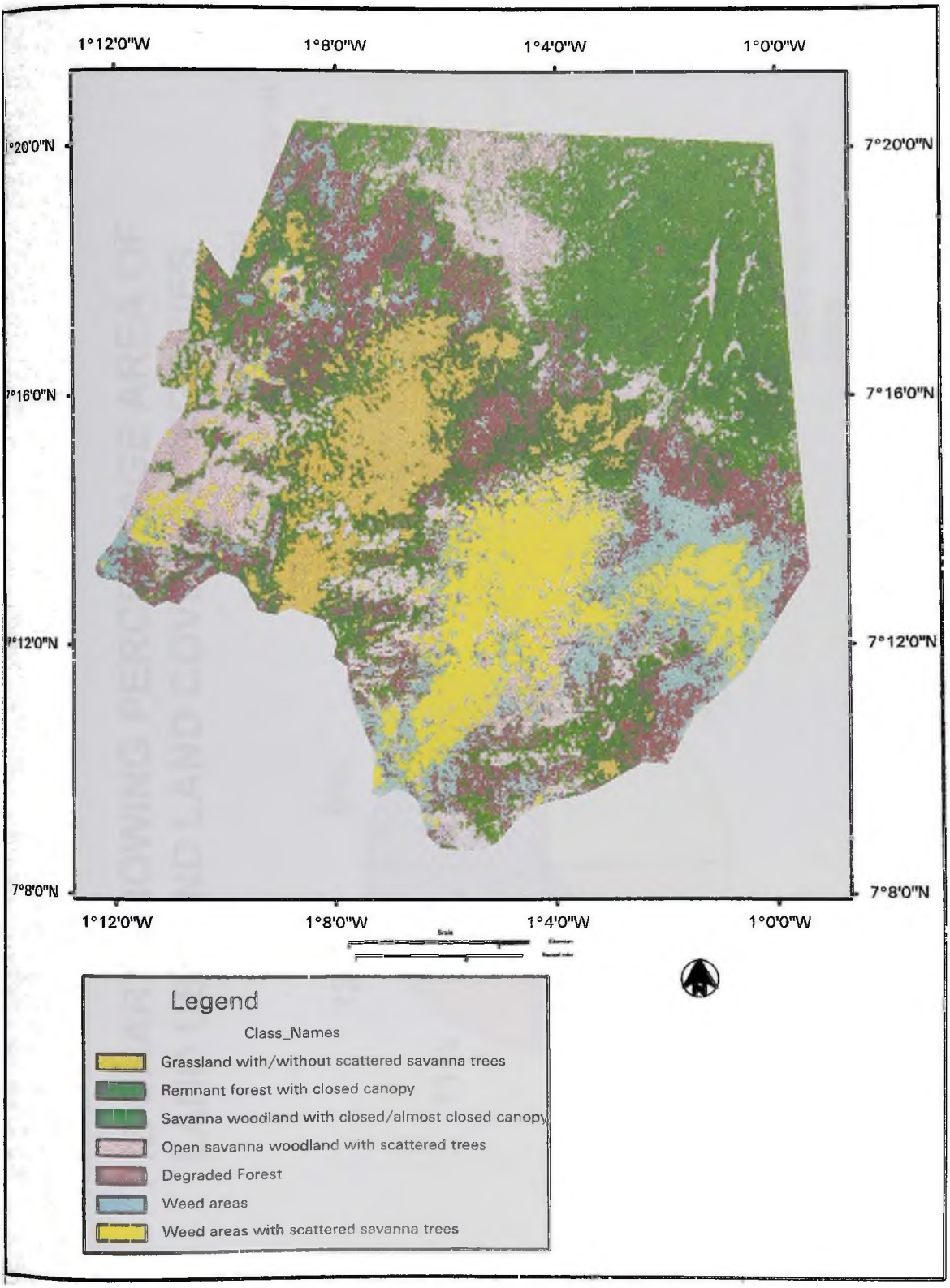
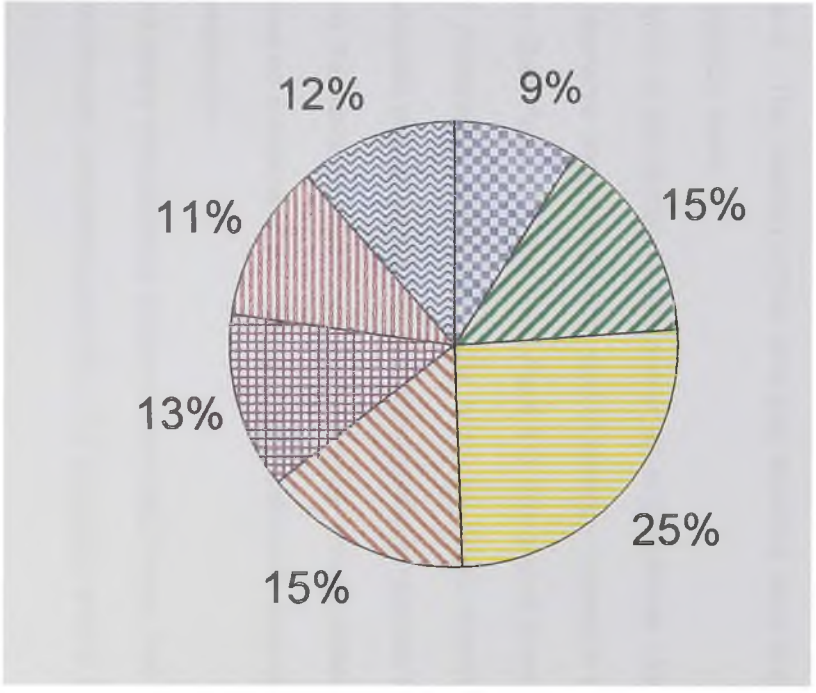


Fig. 5.3

PIE CHART SHOWING PERCENTAGE AREA OF LAND USE AND LAND COVER CATEGORIES



- Grassland with/without scattered savanna trees
- Remnant forest with closed canopy
- Savanna woodland with closed/almost closed canopy
- Open savanna woodland with scattered trees
- Degraded forest
- Weed areas
- Weed areas with scattered savanna trees

The degraded forest which as at 1972/73 covered only about 1.7 per cent (excluding the areas uncovered due to the unavailability of aerial photographs) had by 1991 been degraded to 49.57 kilometre square.

The remnant forest with closed canopy covering an area of 58.28 km^2 as at 1991 depicts the extensive damage done to land cover. The reserve area even though less by an approximately 34km^2 in the aerial photo interpretation had as at 1972/73, 226km^2 or 64.2 per cent of remnant forest.

Most of these degraded areas are now covered by weeds such as the *chromolaena odorata* and scattered savanna trees. Sections of the remnant forest with closed canopy have also been degraded into grassland with or without scattered savanna trees. The transitional forest zone towards the true forest zone covering Berem and Kyeiase has been extensively degraded as a result of intensive annual cultivation of the land. The clearing of the land has depleted most areas of their originally dense vegetation cover.

Field observation of this section of the reserve as at September 1998 revealed a mosaic of forest remnants and chromolaena thicket recently cleared in preparation for maize cultivation (See Plates 3.1 and 3.2). Plate 4.6 also shows a section of the weed area around Kyekyebon where there has been an illegal charcoal burning activity. With the exception of small areas with random pockets of remnant forests with closed canopies and the savanna woodland with closed or almost closed canopies which generally shows an evidence of the original forest, extensive areas are covered by broken canopy vegetation.

The grassland areas with scattered savanna trees depict areas that have been extensively degraded through yam farming activity. The grassland area to the

western portions of the reserve (Fig. 5.2) is the result of extensive yam cultivation in the area. It was revealed by the Chief Wildlife Officer in Kumasi that the head of the Dagomba community in this area had alone cultivated about 10 miles square of the reserve as at 1997/1998, an action that was boosted by an earlier award as the 1991 Ashanti Region best yam farmer (Wildlife Department, 1994), as confirmed by field observation of the area. The field observation also showed that farmers progressively extended their farming activities away from their settlements towards the centre of the reserve. This is explained by the annual desire of farmers to farm virgin lands especially yam cultivators.

The conversion of land to agricultural use coupled with excessive use of fire in land preparation has resulted in the "virgin" land being degraded and significant amount of secondary growth dominated by the "acheampong weed" taking over, especially, towards the south-eastern portion of the reserve boundary.

Other activities such as illegal charcoal burning and felling of trees and the uncontrolled use of fire for hunting also explained the loss of the original forest. The rapidly increasing human population of the area in recent times offers some explanation for the strong desire to use the resources in the reserve.

5.3 THE IMPACT OF LAND COVER CHANGE ON WILDLIFE PRESERVATION

Animal species reduction or deterioration can be associated with soil and vegetation degradation leading to the destruction of their habitat. The Kogyae Strict Nature Reserve Development and Management Plan of 1994 indicates that the destruction of the vegetation has had a negative impact on wildlife in the reserve especially in the reduction in numbers of species such as the hartbeest and the buffalo. The bay and yellow-backed duikers are reportedly lost completely.

The reduction in the animal species is largely attributed to the adverse environmental conditions that prevailed in the early parts of the 1980s and human activities such as farming and poaching in recent times.

The nationwide bushfires of 1983 for example are reported to have significantly changed the constitution of the reserve (Wildlife Department,1994). The subsequent annual bushfires and other human activities have consequently led to the drying up of most streams in the reserve thereby affecting the stock of animals especially the buffalo which mostly inhabit riverine areas.

5.4 LIMITATIONS OF THE STUDY

The determination of the extent of land use and cover change using the 1972/73 aerial photograph as the base year was limited by the unavailability of photographs covering the whole area. Approximately 34km^2 of the total area of the reserve was excluded in the analysis. This situation did not offer enough basis for a comparable analysis of the extent of degradation using the aerial photos and the remotely sensed image.

Nevertheless, the general pattern of land cover interpreted on the aerial photographs coupled with the satellite image interpretation, ground truthing and the knowledge of past vegetal conditions of the area by respondents offer enough support for the claim that the original land cover of the reserve has significantly deteriorated.

5.5 ENVIRONMENTAL AWARENESS

The vegetation prior to 1972 was observed by 61 per cent of the respondents as mainly forest with patches of scattered vegetation at rocky areas. This according to them has changed to wooded savanna in most places especially outside the

reserve in recent times because of human activity. This concern was greatly showed by elderly farmers in the indigenous settlements who have noticed this land cover and vegetation changes taking place over their life time. The decreasing fallow periods due to increasing human population has put enormous stress on the existing forest.

Seasonal bushfires as reported by 70 per cent of the respondents are seen as the major cause of the deteriorating environment in the reserve area. This is followed by the poor farming practices usually adopted by inhabitants of the area (20.7 per cent).

TABLE 5.3: VIEWS OF RESPONDENTS ON CAUSES OF CHANGE IN THE FORM OF VEGETATION

CAUSE OF CHANGE	FREQUENCY	PERCENTAGE
Farming practices	76	20.7
Bushfires	256	69.6
Logging and illegal felling	16	4.3
Charcoal making	16	4.3
Drought	4	1.1
Total	368	100.0

As evidenced in Table 5.3 only 4.3 per cent of respondents attributed the change to charcoal burning. It was learnt that this activity picked up after the mid 1980's after a bridge was constructed over the Afram River at Aframso No.3. Even though insignificantly reported by the respondents as a major cause of the deteriorating environment, it is one activity that has assumed alarming proportions in the area in recent times. Judging from the commercial quantities in which charcoal was being produced, it was suspected that live trees are increasingly being felled. The Sekyere West District Assembly seems to be showing no sense of urgency to regulate this activity in the area because of the revenue it derives from it. Even though this activity is mostly carried out outside the reserve, personal observations made during

the study period revealed a serious threat to the entire ecosystem of the area if this activity is not checked or regulated.

An attempt was further made to solicit the views of respondents on what should be done by the social actors to effectively maintain the reserve. Specifically, the roles of the government, District Assembly, traditional authority and the local inhabitants were asked. As regards the role of the traditional authority, 13.0 per cent asked for traditional support in checking bushfires while 15.2 per cent sought their assistance in the enforcement laws on the reserve. Four per cent wanted the traditional authority to help in retrieving some land from the reserve so that peace would prevail in the area, while the rest 3.3 per cent wanted their influence on the activities of charcoal burners in the area. Approximately, 36 per cent wanted involvement of their traditional authorities in the education of the people on the need for the reserve.

The District Assembly was expected by 13.0 per cent of respondents to help in the provision of seedlings and other logistics to help the people embark on reafforestation programmes. Making and enforcement of by-laws on bushfires was expressed by 31.5 per cent of respondents and a further 16.1 per cent sought their collaboration with the wildlife Department to sensitize the people on the need for the preservation of the reserve. The rest 8.7 per cent wanted a check on illegal felling of timber by the District Assembly. Tables 5.4 and 5.5 show the views of respondents on what should be done by the local people and the government in effectively maintaining the reserve.

TABLE 5.4: VIEWS OF RESPONDENTS ON WHAT SHOULD BE DONE BY THE LOCAL PEOPLE TO EFFECTIVELY MAINTAIN THE RESERVE

ACTIVITY	FREQUENCY	PERCENTAGE
Assist wildlife to enforce laws	28	7.6
Engage in Reforestation	100	27.1
Form task force against bushfires	44	12.0
Stop Bushfires	136	37.0
Stop Encroachment on reserve	48	13.0
Adopt better farming practices	8	2.2
No. response	4	1.1
Total	368	100.0

TABLE 5.5: VIEWS OF RESPONDENTS ON WHAT SHOULD BE DONE BY GOVERNEMNT TO EFFECTIVELY MAINTAIN THE RESERVE

ACTIVITY	FREQUENCY	PERCENTAGE
Enforce Laws on use	168	45.6
Equip Wildlife Department	44	12.0
Release Land to the people	8	2.2
Check illegal felling of timber	24	6.5
Embark on Educational drive	44	12.0
Provide Seedlings for Reafforestation	44	12.0
Equip fire volunteers	4	1.1
Deploy fire service	8	2.2
No response	24	6.5
Total	368	100.0

The main issue raised by the local people in Table 5.4, concerns bushfires. Thirty-seven percent of the respondents wanted something effective done on the bushfire menace. They were in favour of the communities stopping bushfires in the area. This was further supported by 12 per cent who wanted task forces formed in the communities to check bushfires. This is followed in magnitude by 27.2 per cent who wanted reafforestation programmes set up and 13.0 per cent want all forms of encroachment on the reserve stopped. Even though only 3 percent suggested the adoption of better farming practices, it was viewed as a very important factor in determining the future status of the vegetation in the area bearing in mind the increasing number of farmers flocking the area. It was even more pertinent now that sections of the reserve had been given out to the people for their farms.

Ironically 45.6 per cent of the respondents advocated for strict enforcement of the laws on wildlife conservation by government (Table 5.5). This can be explained by the fact that sections of the reserve recently given out to the people have eased the tension and therefore enabled a fair assessment of the situation. The issue of reafforestation also came up strongly as 12 per cent of respondents wanted the government to assist in the provision of seedlings towards this cause. Educational measures came second in order of magnitude of registered proportions.

CHAPTER SIX

CONCLUSION

6.1 SUMMARY

The study investigated the conflict that has characterized the use of land in the Kogyae Reserve. It sought to determine the role ownership over the reserve plays in the exploitation of its resources. As land constitutes the basic resource for economic activity in the communities in the area. The reserved land was acquired compulsorily from the traditional heads of Kumawu, Kwamang and Agogo to preserve biodiversity. An extension was made to it in 1971. This acquired land has deprived the local communities of the rights over the free use of resources that affect their livelihood – the land, game and non-timber forest products. The local people have however consistently flouted the laws governing the reserve and have persisted in the illegal exploitation of its resoruces.

Increasing population has its attendant increased demand for space for agricultural activity. The Kogyae area is experiencing a rapid build up in population because of the rapidly improving infrastructural facilities in the area. The rapidly increasing population of the area has put some stress on the traditional farming systems as the fallow period is gradually decreasing. In relative terms, the creation of the reserve has created some land shortage problems for the indigenous inhabitants as they preferred farming in the reserve land due to the relative richness in soil fertility there.

The Wildlife Department is responsible for the preservation of the Kogyae Strict Nature Reserve. It is however constrained by several factors among which are the

general lack of equipment such as boots, tents and vehicles due to low budgetary allocations. The confusing roles by the Ministry of Agriculture in encouraging communities inside the reserve to run demonstration plots and the Lands Department's insistence on collecting land revenue from the farmers has in a way encouraged the illegal exploitation of the reserve.

The failure of the Wildlife Department to resettle the communities located inside the reserve has also not helped their cause. A task force set up in 1994 to check the further degrading of the reserve has brought in its trail accusations of underhand dealings by some officials involved in the exercise.

In spite of the general consensus that the conflict should be resolved, mistrust nearly marred this peace mission. The local people were suspicious of the role of the District Assembly and the Wildlife Department for two reasons. First the high-handedness of government when it comes to land issues involving local people and government and secondly, the lack of political will to implement decisions which favour local people on land issues. This is evident from the Wildlife Department's inability to implement the 1994 Kogyae Strict Nature Reserve Development and Management Plan. World Vision International, Ghana, was also suspected by the Wildlife Department as being the unofficial mouthpiece of the local people because of its development involvement in the area.

A Memorandum of Understanding making room for the creation of a Special Use Zone (SUZ) was eventually agreed upon by the social actors. Hunting of game, excessive and uncontrolled use of fire in this zone was prohibited as the area still remained a protected zone. The protection and and maintenance of this zone was to be achieved through collaborative planning, management and implementation of decisions.

Going by the definition of harmonies in section 1.6.6, a conclusion can be drawn that there are no observed harmonies in land use in the area as the use of the demarcated land by the people is at variance with the duties and obligations of the Wildlife Department. Analysis however reveals a situation of conflict of land use as examplified in the diverse but illegal uses to which the reserve has been put.

6.2 RECOMMENDATIONS

The combined destructive impacts of the majority of the inhabitants of the area who are farmers, hunters and tappers are progressively destroying the biodiversity of the area. To ensure that the objectives of conservation of the Kogyae Strict Nature Reserve are achieved as expeditiously as poissible and to speed up the integration of conservation with development, the following recommendations have been put forward:

1. The inhabitants of the area should be encouraged to adopt improved agricultural practices in the face of increasing population in the area. This is more pertinent as portions of the reserve have now been given out officially for farming activities. It therefore requires an effective collaboration of the Wildlife Department and the Extension Services of the Ministry of Agriculture.
2. Communities within or at the interface of the reserve should be helped to diversify their economic activities to reduce their reliance on crop production. Activities such as beekeeping, snail and mushroom farming can be explored. They could reduce the reliance on bushmeat, thereby checking the rampant poaching of animals inside the reserve.

3. The Special Use Zone (S.U.Z.) created should be more effectively monitored to check abuse. Tough action should be taken against any Wildlife Department official caught collaborating with people to illegally exploit resources in the reserve.

4. The enthusiasm showed by the people for reafforestation programmes should be supported with funding, technical expertise and incentive packages. This should not be limited to only the reserve but also outside it.

5. Activities of NGO's working in the area should be well co-ordinated with that of the Wildlife Department. The incorporation of conservation awareness into community development should be a major priority of such NGO's.

6. Community–Wildlife Department relations should be improved and strengthened through educational forums. The local people and the Wildlife Department officials should be sensitized on their collaborative roles in seeing to the maintenance of the reserve and not to see each other as antagonists.

7. The budgetary allocation to the Wildlife Department should be increased to enable the procurement of essential equipment for effective surveillance.

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APPENDIX 1

QUESTIONNAIRE FOR INVESTIGATING INTO CONFLICTS AND HARMONIES IN LAND USE IN THE KOGYAE STRICT NATURE RESERVE

A1. Survey area (Village/Town)……

A2. Respondents (Name)……

Sex:……

A3. Interviewer's Name……

A4. Enter 99 for non-response and 98 for don't know.

BACKGROUND AND OCCUPATION

01. How old were you on your last birthday?

Age in completed years……

02. What is your marital status?……

Married....01 Single.....02 Divorced…… 03

03. How many dependents do you have?

Enter number……

04. What is your educational background?

Never been to school……..01 Primary....02 Middle/JSS……03

Secondary/SSS... 04 University……05 Other……

05. What is your main occupation?

Farming...01 Hunting...02 Trading……03 Charcoal burning..04

Other……

06. What is your ethnic group?

Asante...01 Akwapem...02 Ewe.....03 Ga/Adangbe ...04

Guan..05 Hausa..06 Mole-Dagbani...07 Grussi/Frafra..08

Gruma...09 Other……

07. Since when have you been living in this town/village?

The past 5 years...01 The past 10 years..02 The past 15 years...03

The past 20 years...04 The past 25 years..05 The past 30 years..06

08. What year was this settlement established?

Before 1950..01 Between 1950 and 1960... 2 Between 1960 and 1971...03 After 1971...04.

ACCESS TO LAND

09. What type/form of access do you have to land in this village/locality?

Inheritance..01 Lease purchase..02 Tenancy..03 Encroachment..04

10. How far is your land from the Park/Reserve?

State distance in metres...

11. In what year did you acquire the land?

Enter year .....

12. How did you acquire your land?

Inheritance...01 Lease purchase...02 Tenancy...03

Encroachment...04 Other ...05

13. Who was the authorizing body?

Local chief...01 Family Head/Elder...02 Paramount Chief...03

Other .....04.

14. How do you determine the boundaries of your land?

Boundary pillars...01 Plants...02 Physical features like hills, etc...03

Other forms..04.

15. Do you have problems defining your boundaries?

Yes...01 No...02

16. If yes specify nature of problem(s)

……

17. Where specifically is this land located?

Inside the demarcated reserve....01 Outside the reserve...02

THE KOGYAE ACQUISITION

18. Have you heard of the Kogyae National Park/Strict Nature Reserve?

Yes...01 No...02

19. If yes, how did it come into exitence?

Through Government's compulsory acquisition of land...01

Through Government's confiscation of land ...02

Other.....03

20. For what purpose was the land acquired

To protect plant and animal life...01

To acquire more land for government ...02

To deprive the people of their livelihood..... 03

Other……

21. Were you aware that it would involve acquisition of land which would include where you occupy?

Yes.... 01 No ...02

22. If yes, what was your initial reaction?

Annoyed...01 Indifferent ..02 Helpless...03

Frustrated ...04

Urge to resist..05 Other……

23. Whether you were aware or not, did you agree to sacrifice your farmlands/settlements for the creation of the reserve?

Yes... 01 No...02.

24. If no, why?

Because I would lose my source of livelihood....01

Because I would lose my source of livelihood...01

Because I shall not get adequate compensation for the loss ...02

Getting land for farming outside the acquired land would be difficult...03

Other.....

25. If yes, why?

Because I would be adequately compensated..... 01

Because I would be contributing to the preservation of plant and animal life..02

Other.....

CONFLICTS

26. Was your land or settlement affected by the compulsory acquisition by government?

Yes...01 No...02

If no, move to 32.

27. If yes, in what way has the acquisition adversely affected your livelihood?

Landlessness..01 Limited Land... 02 Left me poorer financially...03

Destruction of farms...04 Other.....

28. Were you given any option of resettlement?

Yes ..01 No...02

29. If yes, did you agree to a resettlement outside the acquired land?

Yes...01 No..02

30. If no, why? (specify).....

31. If you were resettled, how far is your new settlement from the reserve?

State distance in metres/kilometres……

32. Were you given instructions on the use of the acquired land?

Yes... 01 No...02

33. If yes, what are these instructions?

State: i……

ii……

iii……

iv……

34. Has there been any attempt(s) in the past or present to eject you from your settlement or farm? Yes... 01 No ..02

35. If yes, by whom? (Specify……

36. In what year (Enter year……

37. What is/are the reason(s) for the move to eject you from the land?

i……

ii……

iii……

iv……

38. What is you reaction to the move to eject you from the land?

Indifferent...01 Helpless..02 Resistance 03

Other……

39. Have you employed any means to prevent the government from taking your land in the past or present because you were not in agreement?

Yes ....01 No....02

40. If yes, what means did you employ?

Refusal to vacate the land ...01

Continue to farm the land....02

Continue to hunt game in the reserve...03

41. Where do you presently engage your farming/hunting?

Inside Reserve....01 Outside Reserve...02

42. If inside reserve, has there been any conflict over its ownership and use?

Yes.....01 No...02

43. Has there been any conflict over land in the area?

44. If yes, who are the disputants?

Local people and government....01

Between local people...02

Other……

45. If the dispute is between you (local people) and government, what accounts for this?

Because government did not resettle us properly...01

Because the local people are occupying the land illegally..02

Because government is occupying our land illegally..03

Other……

COMPENSATION

46. If you lost your land to government, have you been paid any compensation?

Yes....01 No ..02

If yes, move to 47

47. If no, why were you not paid any compensation?

Not entitled by virtue of ethnicity...01

Compensation paid to Traditional Authority....02

Other ……

48. What form did the compensation take?

Cash ...01 Resettlement...02

Cash and Resettlement...03

Other……..

49. Which government agency was responsible for the payment of compensation?

Lands Department ...01 Department of Wildlife...

Forestry Department...03

Other……..

50. If you were compensated, what then explains the conflict over the reserved land?

We have no land for farming....01

We are illegally farming and hunting in the reserve..02

Acquired land being underutilised....03

Other……..

51. Has the creation of the reserve benefited you in any way?

Yes...01 No...02

52. If yes, which way?

Specify……..

53. If no, why Specify……..

54. Have you at any point in time entered the reserved area for any human activity?

Yes.. 01 No... 02

(i) When? Enter year(s)

55. If yes, what activity?

To farm ...01 To cut trees...02 To hunt...03

To burn charcoal ..04 Other……

56. How many times have you entered the reserve for such an activity?

State No.....

57. Is such an activity allowed/legal?

Yes...01 No...02

58. If yes, who granted that right?

Department of Wildlife..01 Forestry Department...02

District Assembly....03 Traditional Authority...04

59. If no, why did you enter?

Specify……

60. Have you had any misunderstanding with the officials of the Department of Wildlife?

Yes...01 No..02

61. If yes, what is the cause of the conflict?

Because they are depriving us of our farmlands...01

We are settling/farming in the reserve illegally ...02

Other……

CONFLICT RESOLUTION

62. Would you agree to any form of settlement of the conflict?

Yes.....01 No...02

63. If yes, by whom?

Specify……

64. What form of settlement would you agree to?

Specify……

65. If no, why?……

Specify……

66. What has been government role in the resolution of this conflict?

Specify……

67. What has been the role of the District Assembly in the resolution of the conflict?

Specify……

68. What has been the role of the Traditional Authority in the resolution of the conflict?……

69. What role have you planed yourself in solving the conflict?

……

70. Has any other agency/agencies apart from Government/District Assembly and Traditional Authority been involved in trying to resolve the conflict?

71. If yes, which agency/agencies?

State……

72. Are you satisfied with the efforts of this/these agency/agencies?

Yes....01 No....02

73. If no, why? Explain……

……

74. What role do you expect from them?

Specify……

ENVIRONMENTAL AWARENESS, RECOMMENDATIONS AND SUGGESTIONS

75. What was the nature of the vegetation of the reserved before 1971?

Forest ..01 Wood Savanna with gallery forests……02

Grassland..03 Other……

76. What is the nature of the vegetation now?

Forest ..01 Wooded Savanna...02

Grassland ..03 Other……

77. Has there been any change in the form of the vegetation?

Yes..01 No...02.

78. If yes, what is/are the cause/causes of the change?

Farming.....01 No..... 02

Logging and illegal felling trees...02 Drought ..03

Other……

79. What impact has this change had on government's aim of protecting the plants and animals in the reserve?

Positive impact ..01 Negative...02 Don't know...03

80. What should be done to effectively maintain the reserved area by:

(a) The inhabitants of settlements in and around the reserve?

Specify……

(b) The Traditional Authorities?

(c) By District Assembly

Specify……

(d) By Central Government?

Specify……,

81. Other comments views and suggestions.

……

Thank you.