UNIVERSITY FOR DEVELOPMENT STUDIES

BIOCULTURAL DIVERSITY, INDIGENOUS KNOWLEDGE AND NATURAL RESOURCE MANAGEMENT IN THE UPPER WEST REGION OF GHANA

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DEDICATION

To my beloved son, Carol-Mint Tieme Yelfaanibe and wife, Tifooha Delphina, my mother, Benedicta Naasaab, my late father, Emmanuel Yelfaanibe Kayang and my siblings namely Dr. Eugene-Murat Yelfaanibe, Edith Yelfaanibe, Raymond-Dart Yelfaanibe, Jude Ziem Yelfaanibe and Festus Kogh Yelfaanibe.

DECLARATION

I, **Yelfaanibe Augustine,** author of this thesis hereby declare that this work titled:

'BIOCULTURAL DIVERSITY, INDIGENOUS KNOWLEDGE AND NATURAL RESOURCE MANAGEMENT IN THE UPPER WEST REGION OF GHANA',

is my independent work for the award of Masters of Philosophy (MPhil) Degree in Development Studies at the University for Development Studies, Tamale. I affirm that this work has never been presented in whole or part for any other award of this University or elsewhere. All sources that I have consulted in the processes leading to this final output have been acknowledged and dully cited.

Signature..... Signature.....

Augustine Yelfaanibe **Rev. Fr (Dr.) A. H. K Abasi**

(CANDIDATE) (SUPERVISOR)

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ABSTRACT

The influences of modernity throughout Africa and the developing world have seriously contributed to the negation of ongoing efforts to ensure sustainable management of natural resources especially in resource poor environments. One reason for this outcome has been the lost of indigenous African values and the dwindling of traditional modes of transmitting those knowledge forms that link human life as part of a totality of life in the natural environment through intricate relationships. This thesis was set out to investigate the problem of biocultural diversity and Natural Resource Management within the context of indigenous people's worldviews across three cultural-linguistic groups, namely, Dagara/Dagaaba, Sissala and Waala, in the Upper West Region of Ghana. The process employed largely qualitative methods using of multiple case studies and field surveys to collect data in order to assess both traditional informal as well as state and NGO led type of institutions and how they function together to ensure sustainable practices in natural resource management within the contemporary set up. Emphasis was laid on how culture and spirituality are normally incorporated into natural resource management practices with traditional or informal system and that of the formal system. Therefore, this thesis sought to collect culture specific information on the processes, perceptions and management strategies for natural resources from specialized groups and/or individuals that co-exist at the community level. The research found that although spirituality influences the way natural resources are managed, it is difficult to isolate and deal with it. Formal institutions also pay lip service to the incorporation of most indigenous knowledge systems within a biocultural context as these do not often reflect in policy and only little of it is highly found in practice. It therefore concludes that efforts should be geared towards a functional integration of formal and informal knowledge worlds and recommends that such integration must be forged along lines of more sustained biocultural diversity and value systems within different contexts of endogenous development processes.

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ACRONYMS

CBD:	Convention on Biodiversity
CBNRM:	Community-based Natural Resource Management
CBO:	Community Based Organisation
CFC:	Community Forestry Committee
CPR:	Common Property Resource
CSO:	Civil Society Organisation
DA:	District Assembly
EPA:	Environmental Protection Agency
FGD:	Focus Group Discussion
FSD:	Forestry Service Division
FWLP:	Forest and Wildlife Policy
GEF:	Global Environment Fund
GNFS:	Ghana National Fire Service
GO:	Governmental Organisations
GSS:	Ghana Statistical Service
GWLD:	Game and Wildlife Division
IDI:	In-depth Interview
IKS:	Indigenous Knowledge Systems
JDA:	Jirapa District Assembly
LDA:	Lawra District Assembly
LKDA:	Lambussie-Kani District Assembly
MDA:	Ministries, Departments and Agencies
MOFA:	Ministry of Food and Agriculture
NDA:	Nadowli District Assembly

NGO:	Non-Governmental Organisation
NR:	Natural Resource
NRM:	Natural Resource Management
NRMP:	Natural Resource Management Programme
NSBCP:	Northern Savanna Biodiversity Conservation Project
PNDC:	Provisional National Defence Council
PRA:	Participatory Rural Appraisal
SEDA:	Sissala East District Assembly
SNS:	Sacred Natural Sites
SPSS:	Statistical Package for Social Sciences
SWDA:	Sissala West District Assembly
TII:	Traditional Informal Institutions
UN:	United Nations Organisation
UNCBD:	United Nations Convention on Biodiversity
UNEP:	United Nations Environment Programme
UNESCO:	United Nations Education, Science and Cultural Organization
UWR:	Upper West Region
WCED:	World Commission on Environment and Development
WCMC:	World Conservation Monitoring Council
WEDA:	Wa East District Assembly
WMA:	Wa Municipal District Assembly
WWDA:	Wa West District Assembly

BOXES

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

The issue of global resource diversities and the eminent crisis confronting biological diversity is widely acknowledged by the 1992 Convention on Biodiversity (CBD). Research has shown that in terms of biodiversity alone about 1.4 million of all known species (consisting of 26.96% of flora and 73.04% of fauna) on earth are in existence (Bhargava, 2006; Wilson, 1983, 1992; WCMC, 1992). Apart from diversity in life forms, there are also diversities in cultures in which language is often the distinguishing factor. Based on the latter, Maffi (2001) asserts that there are 6,000 linguistic groups in the world today, a figure which Loh and Hammond (2005) put at about 6,800. Irrespective of any imaginations, it is estimated that Africa alone is home to 30% of the total languages spoken in the world (Awedoba, 2002) and hence Africa share of global linguistic diversity may be estimated between 1,800 and 2,040. But despite the rich biological and cultural diversities, there is evidence to show that these global diversities are continuously declining at quite an alarming rate. It is estimated, for instance, that 20% of languages worldwide will disappear in every 30 years and 50% in every 100 years (Haverkort, 2006; Maffi, 1991). Biodiversity levels are also estimated to be experiencing similar trend across the globe with about 25% of all mammals threatened by extinction in the next 30 years. The latter somehow corroborates with the levels of decline in the linguistic diversities. Be that as it may, it cannot be gainsaid that the world's biological and cultural-linguistic resources are heading towards a future catastrophe.

There has been a renewed interest led by the world body, the United Nations Organisation, to campaign for the protection, conservation and, in some cases, the co-management of global biodiversity resources. This led to a number of policy responses in many nations across the world and Ghana is no exception. In 1992, Ghana signed to ratify the United Nations (UN) Convention on Biodiversity Conservation (CBD) as a way of ensuring sustainable management of her natural resources for development. This notwithstanding, the issue of species decline remains a challenge locally and brings to question what both the state and local community institutions have been able to achieve

following many years of numerous interventions. Some scholars have found reasons to blame the failure in natural resource management (NRM) on top-down approaches to dealing with the issues (Agrawal and Gibson, 1999; Groot and Maarleveld, 2000; Leach, Mearn and Scoones, 1999; Lynam *et. al.*, 2007; Ribot and Larson, 2004). For them, the solution can be sought in bottom-up approaches - a more horizontal, participatory, actor oriented and community-based responses to managing local natural stocks. However, despite years of experimentation with both sets of approaches natural resource levels are still dwindling and this seems to suggest that more is left to be done.

It is now widely recognized that many decades of NRM policy and practice ignored the cultural imperative for ensuring successful NRM outcomes especially at the community level. Even in the wake of this reality issues of spirituality and how it binds local community people to their natural environment appears to be given only a window dressing attention through the recognition of sacred natural sites (SNS) such as sacred groves and shrines. In fact, until recently, African cultures have generally been marginalised in most areas of development research, policy and practice largely because of negative perceptions. But even more marginal for policy intents and purposes are the issues on spirituality. In terms of natural resource management, the many decades of colonialism and relegation of much of the non-material aspects of African traditional and cultural value systems have had no mean an impact on the way people have come to perceive, extract and use natural resources over many years.

In Ghana, the sustainability of natural resource management systems (both formal and traditional informal) is increasingly threatened. There are mass extractions of both trees and wildlife resources to satisfy the social, economic, political, cultural and even spiritual needs of individuals in particular and also to meet the overall national development goal. The importance of the economic values of natural resources appears to have sidestepped the significance of other use values of locally available natural environmental resources. Values of resources have also transformed not only because of population explosion but also because many other new uses have been uncovered. Thus, it may be gainsaid that

1.3 Research Questions

In order to investigate the problem of poor use of biocultural diversity, indigenous knowledge and natural resource management, the following questions were set out to be answered.

1.3.1 Main Question

How can NRM systems utilize biocultural values of local communities to ensure proper management and sustainability of NRs? Specifically, the following questions would require answers.

1.3.2 Sub-Questions

- What are the biocultural values of natural resources in the Upper West Region and how do they impact on existing approaches for the management of natural resources in the area?
- What are the indigenous NRM systems in place and to what extent do they integrate culture and spirituality to manage NRs?
- What are the state led and NGO systems in place and to what extent do they integrate culture and spirituality to manage NRs?
- What options are there for policy and practical community-based management of biocultural resources?

1.4 Research Objectives

The following objectives were set

1.4.1 Main Objective

To examine how NRM systems among different cultures in the Upper West Region utilize their biocultural values to ensure proper management and sustainability of natural resources.

1.4.2 Specific Objective

The specific objectives are as follows:

- To find out the biocultural values of natural resources in the Upper West Region and how they impact on existing approaches for the management of natural resources in the area;
- To identify the indigenous NRM systems in place and to what extent they integrate culture and spirituality to manage natural resources;
- To identify the type of state led and NGO systems in place and how they integrate culture and spirituality to manage natural resources; and
- To recommend options for policy towards a practical community-based natural resource management approach within a biocultural context?

1.5 Relevance of the Study

There is considerable evidence of poor management of ecosystems with many conventional prescriptions of resource management now known to be unsustainable (Coop and Brunchorst, 2001). This has been viewed to be one resulting from the non-recognition of the influences of combined institutional structures in the process of natural resource management decision making. There is, therefore, the need to establish the niche between three essential building blocks of resources governance, namely, the distribution of social, environmental and political values, and the functional-ecological connectivity between landscape components. Absence of these, have been adduced as one factor responsible for the great magnitudes observed in the failure of natural resource management systems in recent years than those observed historically (ibid).

Focusing attention on environmental protection is one useful strategy to sustain the use of natural resources but this would be difficult to attain without making the proper linkages between critical value systems of local communities especially and biodiversity system. There is a consensus that biological and cultural diversity are inextricably linked (Posey, 1999; UNESCO, 2001). However, the relationships between these diversities and the growing threats they face have drawn a lot of attention from scholars across the world

(Harmon, 2001; Moore *et. al.*, 2002; Sutherland, 2003; Maffi, in press). Their opinions and analyses of these relationships are beginning to crystallize around the concept of biocultural diversity (Maffi, 2001). Subsequently, biocultural diversity has emerged as a new field of study and academic research. With respect to NRM, Dery and Millar (n.a.) have argued that sustainable management of natural resources is better attained from a biocultural diversity perspective, though with a recognition that knowledge of this diversity has been on the decline especially in the northern parts of Ghana. The traditional belief in the spiritual properties and uses of trees and sometimes wildlife has effects on the protection and improvement of the environment and biodiversity. Irrespective of the threat posed to biocultural diversity there is enough evidence to prove that the rich knowledge of rural communities in the three northern regions is still being used extensively to address many needs. More and more people are drawing on indigenous knowledge especially, in respect of the medicinal uses of trees and grasses (ibid).

In line with all these discussions among other things, this thesis explored the existing traditional informal institutions for NRM in the Upper West Region of Ghana and the relationship between the functions of these institutions and those that are government and/or NGO led in order to propose a sustainable management option for natural resources within a biocultural context. It is my view that an exposition of this sort will add to the existing body of knowledge on the subject in general and in the area of NRM in particular as far as the Upper West Region of Ghana is concern. Additionally, it would not only serve as a reference document for future research on the subject in the study area and beyond but also it can become an important source of information to guide both policy and practice on the management of natural resources in Ghana.

1.6 Limitations of the Work

Although biocultural diversity is a new area for academic research, a cross-cultural study that links the subject to NRM issues can prove to be quite challenging for small thesis work such mine. There were many challenges which may have impacted on the quality of this thesis.

First, in a situation where language is a pathway to understanding local epistemologies on natural resources, it brings to question the capacity of the investigator to do a more exhaustive content analysis of the data collected and arrive at conclusions without being able to speak and understand some of the languages. In many of the situations, the researcher had to rely on the benevolence of some local people he could lay hands on without having anytime to do any serious assessments on them.

Second, my focus was to understudy the three main cultural-linguistic groups in multiple locations of the Upper West Region; to relate how diversities of local cultures influence NRM; and investigate the extent to which formal and informal forms of knowledge complement each other for more sustainable NRM systems within the study area. This turned out to be equally problematic because names of NRs such as herbs, different tree and animal species which are central to the research but could only be available in the local dialect or language of the informant were collected across the different groups of participants encountered in the course of data collection. It would have been very useful to do comparative analysis of the biodiversity use and/or values (social, cultural, economic, religious and spiritual) in the analysis. It could have also been more interesting to note instances whereby the same species of plant or animal has similar or contrasting attributes or value across a certain cultural divide or location. Unfortunately, these aspects may appear to be weak as they seem not to be properly articulated in my write up. These constraints notwithstanding, the researcher made use of the local names to present my findings as far as possible without any attempts to make comparison or generalize for any single situation.

1.7 Scope of the Study

This study is concerned with biocultural diversity, indigenous worldviews and how these can be harnessed to ensure proper and sustainable management of natural resources within societies of the Upper West Region of Ghana, notably, the Dagara/Dagaaba, Waala and Sisaala. It draws from the background that there is a global extinction crisis of biodiversity and that this crisis is closely followed by a decline in the cultural diversities.

The two diversities have been found to be linked. Amid the issues being raised, it is recognized that existing institutional framework, both local and national, have become seriously challenged and hence calls for the need to inter-marry different knowledge systems to enhance natural resource management approaches and practices.

In the discussions of biodiversity however, a lot of emphasis has been laid on the management of trees or forests and wildlife although other life forms as pertaining to land and water have been touched. Linguistic difference was used as the basis for distinguishing between the cultural differences of the Dagaaba, Wala and Sissala who are explored in this work.

The discussion on natural resources went beyond the socio-economic, political, aesthetic and mere medicinal values of resources to deal more with their cultural and spiritual values. As much as possible, the study was limited to the use of local epistemologies regarding natural resources and especially influence of culture and spirituality in NRM and how these are integrated into contemporary NRM practices. The ideas used in this work were a result of data collected mainly from Chiefs, community Elders, Tindana, Herbalists and other individuals and groups who are autochthonous members of the three cultural-linguistic groups. The analysis of the relationship between traditional informal institutions and state led and NGO also only reflects the role of the DA, FSD, MOFA and SUNTAA-NUNTAA in CBNRM practices.

CHAPTER TWO
THEORETICAL PERSPECTIVES

This chapter examines some existing works on the topic. It begins by exploring some on-going discourses on biocultural diversity and natural resources and the performance of natural resource management institutions over the decades. The discussions are used to feed into an endogenous development framework to establish some theoretical basis for re-considering both past, present and ongoing NRM interventions.

2.1 Biocultural Diversity and Natural Resources

Biocultural diversity denotes the link between biodiversity and human diversity (Posey, 1999; Maffi, 1999; Rist and Haverkort, 2007; Cocks, 2006). Cocks (2006) stresses that it is important to explicitly recognize the role played by human diversity in biodiversity conservation because biodiversity represents a source of raw material on which the processes of evolution depend. The less diversity there is, the greater the chances that life itself could be destroyed through lack of resilience to environmental change. Biodiversity needs to be maintained because it provides humans with different ways of understanding and interacting with the world and ultimately offers different possibilities for human futures (Milton, 1996).

The meaning and significance of cultural diversity have become more complicated and arises from the fact that since humans came into being, many separate societies have metamorphosised and emerged around the globe with marked variations many of which persist to date. Beyond the obvious cultural differences that exist between peoples, such as language, dress and traditions, there are also significant variations in their shared conceptions of worldviews, knowledge and morality, in the way societies organize themselves, and in the ways they interact with their environment (Rist and Haverkort, 2007). Therefore, the role of cultural diversity in maintaining the diversities in biological life form can never be under-estimated.

The idea of a cultural diversity may be thought of to encompass *"the presence of many different modes of understanding, different systems of values, different kinds of*

knowledge within the world as a whole, and within individual societies" (Calhoun *et. al.*, 1997:99). Diversities do not necessarily have to come from outside. The formation of new groups within new identities within a culture is equally important (ibid: 100). Thus, cultural diversity should not be perceived simply as a matter of preserving old ethnic identities but also one of creating new non-ethnic ones. It is, therefore, a reflection of creativity of the fact that human culture is made by human action and can also be changed. This notion of cultural diversity brings to bear the fact that a study on cultural diversity must recognize both the intra- and inter- cultural issues and dynamics.

Cultural diversity is, generally, tricky to quantify, but Rist and Haverkort (2007: 26) note that *"a good indication is thought to be a count of the number of languages spoken in a region (...) as a whole. "*I would concur with this view point as basis for delineating between cultural-linguistic units in analyzing issues on biocultural diversity.

According to Loh and Harmon (2005), biocultural diversity may be thought of as the sum total of the world's differences, no matter what their origin. It includes biological diversity at all its levels, from genes to populations to species to ecosystems; cultural diversity in all its manifestations (including linguistic diversity), ranging from individual ideas to entire cultures; and, importantly, the interactions among all of these.

Globally, different cultures and peoples perceive and appreciate biodiversity in different ways because of their distinct heritage and experience (Dery and Millar, n.a; Posey, 1999; Millar, 1999). Most discussions on the intricate relationship between the conservation of biodiversity and cultural diversity center around the arguments that cultural diversity can sustain a wide variety of use practices and the conservation of natural resources (Posey, 1999; McNeely, 2000). Examples of how 'indigenous' and 'local' people around the world have protected both individual species and entire habitats have led to the interest in linking biodiversity to human diversity. In many parts of the world natural features and habitats, often protected by religious taboos and considered sacred by community members, have survived due to strong cultural forces and today act as reservoirs of local biodiversity (Laird, 1999; Cocks, 2006). These areas generally form part of the

surrounding communities' ancestral domains and are part of their cultural identity (Laird, 1999). From a more general perspective, they contribute to a people's sense of place (Kusel, 2001; Wiersum *et. al.,* 2004). For instance, the Menominee tribes have a spiritual relationship with their forest representing a twinned identity for both the tribe and the forest (Groenfeldt, 2003). Thus, 'indigenous' and 'local' people are understood to ascribe symbolic significance to their surrounding landscapes and consequently perceive and value nature differently than ecologically trained conservationists and biologists (Posey, 1999; Infield, 2001).

2.2 Approaches to Natural Resource Management

Globally, there have been shifts in the approaches to natural resource management each coinciding with a more or less general structural transformation in governance systems across the world (Ribot and Larson, 2004). The earlier approaches were top-down with emphasis on protection and conservation of natural resources. To make the protectionist ideology effective, conservation practices were later being encouraged alongside by national governments. But such 'conventional' thinking on natural resource management encouraged a technical approach to problem solving (Uphoff, 1986; Ramirez, 1999; Groot and Maarleveld, 2000). It involved a linear process with clearly defined steps to follow (Lynam *et. al.,* 2007). It is now being observed that practitioners who approach resource management in this top-down manner often exclude the knowledge, preferences, and values of the people affected or concerned by the outcome (Groot and Maarleveld, 2002; Long and Long, 1992). Ramirez (1999) argues that sustainable changes are more likely to be initiated when the attitudes, beliefs, or preferences of people managing or depending on resources are taken care of in the identification of problems and the development of solutions to manage natural resources. It is expected that greater community involvement can achieve the desired understanding or sense of trust that practitioners require to be effective (Lynam *et. al.,* 2007).

In recent years, there has been a considerable restructuring of institutional arrangements governing natural resource management. The institutional changes that flow from there amount to a redefinition of the role of the state and have stimulated further exploration

and experimentation regarding a variety of local government and non-state forms of management and co-management (Ribot and Larson, 2004: 235; Doornbos and Meyner, 2004). They further argued that restructuring of this kind often involves local communities and user groups, joint environmental management schemes, NGO-based initiatives, co-operative bodies and other actors at the micro and meso level so as to bring about more sustainable and equitable forms of natural resource management through the enhancement of local participation (Ribot and Larson, 2004). But it remains to be seen whether the institutional changes that come with decentralisation can promote more sustainable NRM practices, new practices must be capable of transcending past institutional rigidities, containing environmental degradation, promoting sustainable and equitable natural resource use, allow more effective handling of resource conflicts and facilitating joint environmental resource development (ibid).

2.3 Institutions and Natural Resources

There is a dichotomy in the systems (or structures) for managing natural resources in Africa and particularly so in Ghana. Indigenous people all over the world have co-evolved with some form of knowledge which allowed them to co-exist peacefully with the natural environment over the millennia. There were structures evolved over long periods of experience and experimentation within the environment where people lived and continue to occupy to date. However, these systems were highly unsystematised and their inherent philosophies have also remained largely undocumented. Institutions built on this kind of structure have been commonly referred to in the literature as informal or traditional informal institutions. These institutions were created and used by the African people to manage natural resources and run their own systems of administration long before coming into contact with the European. Following an aftermath of European invasion of Africa and a subsequent long period of colonialism, a new structure built on ‘Cartesian rationality’ (Gudoka, 2003:1-2) emerged together with a State system. This superimposed the hegemony of the colonialists and their systems on those of African descent, the latter eventually becoming inferior to the former which has become the formal system and structure. Thus, the difference in the management systems between

what is known and called formal and informal can be traced in the structures (institutions) and philosophies that underlie the systems.

Agre (2000) has cited Laudon (1985) to define institutions as a set of rules widely shared values and interests pertaining to areas of strategic importance. These values and interests are served by specific organizations through the allocation of status and roles and they are internalized by individuals through lengthy socialization carried out by organizations. In the view of Bacho (2004), institutions should be perceived as collectively agreed upon social arrangements that govern interactions among members of a given group of people. In line with the above positions, institutions may be viewed as social constructs peculiar to a group of people for the benefit of members. Bebelleh (2007) asserts that if institutions are to be defined in this way, then they can have similar functions although different in structure or vice-versa as one moves from one group to another. They are not permanent but change with time depending on the interests and values of the constituents. They may also be internalized and individualized and may need an external force or motivation to bring about change (ibid). This view point corroborates well with many perceptions on the dynamics of culture.

In Ghana NRM institutions may be considered in two-folds, namely, formal and informal or traditional institutions. Formally created institutions are those established for instance by constitutions, statutes, common laws and governmental regulations which are externally enforced. They are characterized by functional and structural arrangements that are in accordance with certain fair standards and tend to define the political system (hierarchical structure, decision making powers and individual rights of people), the economic system (including rights to available resources and contractual agreements) and the protection system which mostly comprise the judiciary, police and military (Bacho,2004; Bebelleh, 2007). In terms of NRM in Ghana, such formal institutions may be extended to include the FSD, GWLD, MOFA and NGOs working in the NRM sector. Formal institutions usually tend to exist and function in fairly the same manner across all cultures based on the laid down standards. Unfortunately, cultural values regarding natural resources in Ghana are very diverse both within and also across cultural zones. As a result formal institutions in NRM are often challenged in their bid to apply their own

internal rigidities to a cultural system. In many instances, existing incompatibilities between such formal institutions and cultural systems have led to unsustainable NRs in local communities especially the fauna and flora. Generally, formal institutions derive their powers and functions from the laws of the state. They are controlled and regulated by the legislature or authorized bodies that ensure the provision of minimum standards for compliance and service delivery. To be able to change the functions or structure of such institutions would mean that some legal procedure be adhered to.

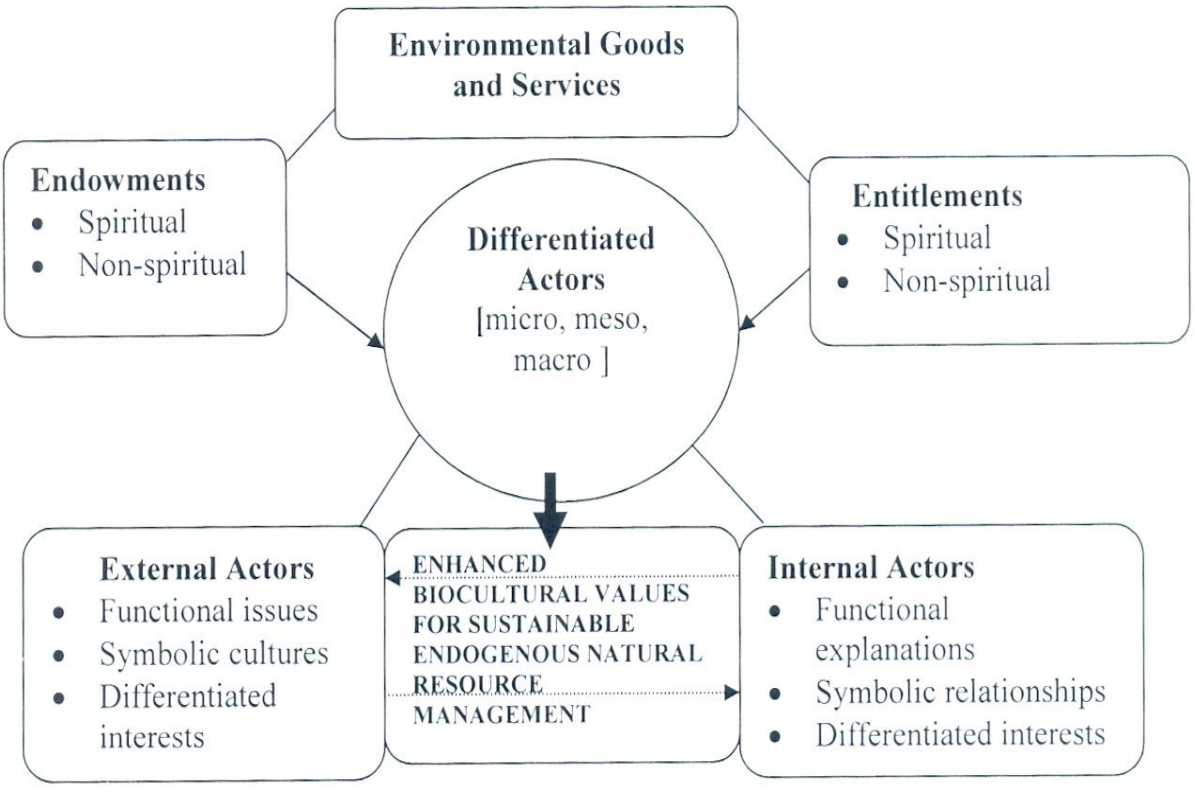
In the case of informal or traditional institutions no written constitutions, statutes and/or Western styled government regulations are responsible for their existence. Although such institutions have transformed overtime, they have co-evolved and co-existed with the indigenous people as socially accepted structures and principles of behaviour for the group. Unlike formal institutions, traditional institutions are backed by norms, conventions, traditions and customs, language and culture as handed down from generation to generation through the people's own history (Goodin, 1995). The belief in the supernatural as couched in the local worldviews or knowledge systems form the basis for safeguarding the way traditional institutions function. In the Upper West Region of Ghana, traditional institutions would include Chiefs, Elders, Tindana (Earth or Land Priests), soothsayers, diviners and sorcerers, rainmakers, traditional healers (including herbalists) as well as clan/family heads. Apart from their general socio-political functions, these institutions work together both covertly and overtly to ensure proper management of community NRs. Indeed, before coming to being of formal institutions, issues of NRM are already a concern for traditional institutions and they ensured that rules established were strictly adhered to within their local structural arrangements.

2.4 Perceptions of Natural Resources within Local Institutional Framework

It cannot be gainsaid that the way people within different cultures perceive, use and manage natural resources is invariably determined by the kind(s) of biocultural values that prevail within the cultural set up. In the Upper West Region, perceptions of natural resources vary from physical, social, economic, cultural, spiritual and even political need and this determines the amount of values attached by individuals and groups to any given

'gift of nature' (Bacho, 2001) and hence the way such a gift would be managed. In an exposition of an environmental entitlements theory, Leach, Mearns and Scoones (1997a, 1999) have shown that natural resource endowment provides a variety of goods and services to different people in different cultures of the world. The product is that, there is an emergence of differentiated actors within the resource environment who hold titles to the available endowment and hence would normally influence the way the resource would be appropriated or used. Within the context of Upper West Region, and perhaps elsewhere, the functional system of human-environment relationship may be perceived as a by-product of many years of interaction within and among institutions (both formal and informal) which together reproduce and manage the existing framework for the governance of locally available environmental resources *(see* Figure 2.1).

Figure 2.1: Community Systems and Natural Resource Management



Source: Author's Construct

As depicted in figure 2.1 internal external actors co-exist in communities to manage natural resources from varied perspectives and interests. External actors are mostly interested in how to manage existing resource endowments and the different entitlement mostly using codified processes. On the other hand, are concerned more about the functional relationships with the local environment and how to protect their different titles within the context of their worldviews, cosmovision and spirituality. This allows indigenous communities to maintain their cultural identity. As a result of the different positions, any emergence of an external force becomes an attempt to alter the status quo when viewed from a typical indigenous community perspective. Formal institutions within community systems often should exist as co-manager of local natural resources. But the extent to when this is normally achieved leaves much to be desired. According to Borrini-Feyerabend (2001:84) co-management is:

> *"a process by which different social actor (local communities, interest groups within communities, traditional and local authorities, government agencies, elected officials, NGOs, private businesses, etc.) identify a common vision and strategy for human development and natural resource management in the territory of their concern, and negotiate, agree upon, implement and guarantee among themselves a fair sharing of the entitlements and responsibilities implied by the vision and strategy".*

Natural resources are social in the sense that biophysical relationships and social and institutional processes are interdependent (Lawrence *et. al*., 2001:6). Thus, within a co-management perspective sustainability may be viewed as being dependent on the matching of culturally appropriate local and regional systems of resource governance, and resource exploitations with the bioregional capacity to provide resources and ecosystem services. However, there is a tendency that whenever quantifiable social attributes are identified for purposes of indicator development or mapping the more subtle, and yet important processes through which power and urgency are enacted in decision making become neglected.

Generally, external agents or government are perceived as donors and the communities being acted upon as recipients of local action. Consequently, communities sometimes perceive external interventions as a superimposition, even a subversion of local authority. This makes local actors passive participants especially in community-based natural resource management (CBNRM) project (Leach, Mearns and Scoones, 1999) and thereby render them unsustainable. Mulvaney (2003:1) argued that the failure of CBNRM approaches arise from its implicit assumptions about the "community" and the "environment." CBNRM strategies characterize the community as a neatly bounded, static, homogenous entity. Therefore, failure to highlight community heterogeneity and social differentiation inhibits the effective targeting of strategic interventions that may take advantage of, or be confounded by, the diversity of social identities that transect the community's boundaries. Likewise, a lack of attention to the power that manifests in these dynamic social relations perceives communities as static recipients without linking structure and agency to orienting outcomes. This may maintain the mystification of the intended and unintended structural discontinuities that form at the interface situations where normative commitments, structures, and rules collide in formal and informal arrangements (Long, 1992). Thus, a critical juncture at which occurs renegotiation within power dynamics as actors enroll each other in projects of their own may be overlooked (Villarreal, 1992).

Similarly, nature and the environment have been characterized as linear, homeostatic equilibrium processes. According to Mulvaney (2003) this is troubling because it shapes natural resource policy and tends to favor retrograde assumptions about climax communities which long ago have been shelved by ecological theorists. Thus, when the relic assumptions of policy makers are interrogated, environmental outcomes are seen as a result of combinations of contingent factors, conditioned by human intervention, sometimes the active outcome of management, and often the result of unintended consequences. In most cases, however, local people's worldviews and its attendant impacts on behavior fail to take credit even where they have played a role.

questions about the links between people and the environment tend to arise. For example, which social actors see what components of variable and dynamic ecologies as resources at different times?; how do different social actors gain access and control over such resources?; and how does natural resource use by different actors transform different components of the environment? Answers to these and other questions may be sought by in natural resource management practices that derive from a biocultural approach.

2.5 Formal and Informal Natural Resource Management Systems in Ghana

Within the formal system of arrangement, Kendie and Guri (2006) identified four approaches - protectionism, conservation, community-based natural resource management (CBNRM) and currently a resurgence of protectionism. In most developing countries, it is usually the government, not the people around protected areas that ultimately decides the fate of forests and wildlife resources. In that case, people centred approaches that seek to promote local participation and community development as central issues of external intervention often tend to water down the objectives of government and hence complicates the implementations (Turner, 2004; Fabricius *et. al.,* 2004). The failure of many programmes in Ghana in particular has been seen in the top-down approach that particularly pays no attention to local needs (Kendie and Guri, 2006). Protectionists' ideologies, for instance, have come to be in serious conflict with local people's needs and worldviews (Fabricius *et. al.,* 2004). By and large, modern trends are eroding the intricate relationships evolved over the millennia between African people and nature even though such relationships also had conservation dimensions (Kendie and Guri, 2006). It is now widely acknowledged that traditional knowledge systems are vital for the survival of society in their environments by entitling communities to identify resources and products vital for their sustenance (Oduro and Sarfo-Mensah, 2003; Tabuti, 2006; Gadgill *et. al*., 1993; Kendie and Guri, 2006). Many conservation practices in local communities are guided by spiritual norms such as taboos (Tabuti, 2006) and despite the strong intrusion by the state system, this knowledge has been used to and is still being used to conserve and enhance natural resource especially local community biodiversity (Gadgill *et. al.*,1993). Tabuti (2006) asserts that apart from identifying useful species in

their environment, communities have knowledge which is relevant for managing and conserving natural resources. This knowledge includes knowledge on phenology whereby communities are adept at telling when species flower/mate, fruit/ beget their young or respond to changing environmental conditions or situations, when to go to the river or till the land and when not. Generally, spirituality is at the core of these belief systems and practices which at the same time are important to the conservation of both plant and animal species (Oduro and Sarfo-Mensah, 2007). The breakdown of traditional beliefs and associated taboos which underpin traditional natural resources management practices are among the greatest threats to the sustainability of indigenous practices (ibid). In West Africa and Ghana for that matter the interpretation of nature amongst the ethnic groups and tribes has influenced most aspects of social, material and spiritual life of people (Frazer, 1926) and hence local concepts and interpretations of nature link it inextricably with the social, material and spiritual life of the people.

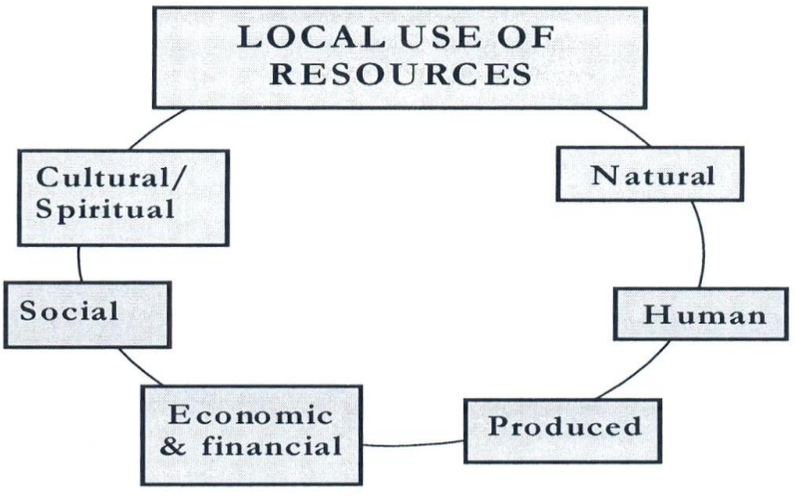
2.6 Endogenous Development Framework

From the discussions above, it follows that no single theory can sufficiently address the complexities that underlie natural resource management problems particularly in Africa. As a result, this research would be underpinned by endogenous development framework since it can accommodate both indigenous and western-styled theories in discourses on academic as well as practical relevance. Endogenous development theory is premised on the existence of three inter-connected worlds notably the natural (physical/material) world, the social (human) world and the spiritual world within the living world (Haverkort *et. al.*, 2003:31). Before this postulation, the natural science which derives mostly from cartesian rationality recognized only the natural and social worlds but not the spiritual. In African indigenous worldviews, however, the three worlds constitute an integral component of a complete life and hence the gap between African scientific knowledge and practice and those of the West (Millar, 2005). Haverkort *et al.,* (2003) define endogenous development as development based mainly, though not exclusively, on locally available resources, local knowledge, culture and leadership, with the openness to integrate traditional as well as outside knowledge and practices. It has mechanisms for local learning and experimenting, building local economies and retention of benefits in

the local area. Within the framework of development theory, Haverkort *et al.,* (2003) have defined the term endogenous development to mean development based on people's own resources, strategies and values. In this context solutions developed at the grassroots include material, socio-cultural and spiritual dimensions based on both monetary and non-monetary market systems. Supporting endogenous development, therefore, implies strengthening the resource base of the local population, and enhancing their ability to integrate selected external elements into local practices. The aim is development based on local needs and capacities, in order to broaden the options available to the people, without romanticising their local views and practices. The objectives of endogenous development include the strengthening of local market systems, local organisations and traditional knowledge.

From an endogenous development perspective, the extent of local capacities to use the local resources is determined by the worldview that the spiritual, human and natural worlds are interconnected. According to Haverkort *et al*., (2003) six types of local resources may be distinguished—natural, human, social, cultural, produced or man-made and economic-financial *(see* figure 2.2). Natural resources include land, ecosystem, climate, plants and animals; human resources involve such aspects as knowledge and skills, local concepts, ways of learning, teaching and experimenting; social resources involve family, ethnic organization, social institutions and leadership, and the cultural/spiritual resources encompasses the beliefs, norms, values, festivals and rituals, art, language and lifestyle (ibid). In the context of this work, however, emphasis would be on the natural, human, social and cultural/spiritual resources but with the recognition that both man-made and economic-financial resources equally impact on these resources in many ways.

Figure 2.2: Local Use of Resources in Indigenous Communities



Source: Haverkort *et al.*, (2003)

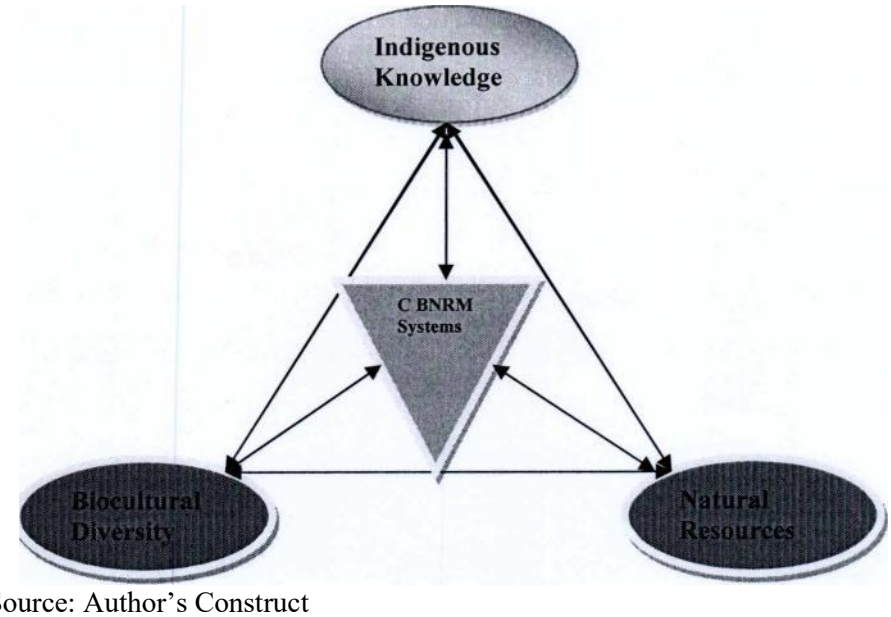
Generally, the way people perceive nature depends on culturally defined value and belief systems that form an important, often intergenerational, source of information. Cultural and spiritual values are critical driving forces in nature conservation and ecosystems management but are often difficult to represent in decision-making processes. The cultural importance of natural ecosystems not only consists of tangible goods and services, but also includes many intangible, non-material or information services. These non-material and spiritual values are part of local people's cosmovision and play a pivotal role in shaping their perception of nature (Verschuuren, 2007). Spiritual values are often linked to the importance of nature using symbols and natural elements with sacred and religious significance. They embody the qualities of nature that inspire humans to relate with reverence to the sacredness of nature. Verschuuren (2007) demonstrates that sacred natural sites (SNS) are not only at the core of the human, spiritual and natural worlds but also form an interface for religious, symbolic and conservation values. He argued that extrinsic, intrinsic and biocultural values are critical elements for conservation and ecosystems management. According to Posey (1999), many societies place high value on the maintenance of either historically and/or culturally important landscapes or culturally significant species. In terms of natural resources,

Carter and Bramley (2002) defined these values to be a mix of intrinsic and extrinsic qualities. Verschuuren (2007) notes on the one hand that intrinsic qualities are those that are objectively measurable. On the other hand, extrinsic qualities are those that are largely subjectively measurable. Both value types are significant but are not often integrated into the management process.

2.7 Biocultural Diversity, Indigenous Knowledge Systems and Natural Resources

Granier (1998) defines indigenous knowledge as the unique, traditional, local knowledge existing within and developed around the specific conditions of women and men indigenous to a particular geographic area. It is also known as 'traditional' or 'local' knowledge because it is embedded in the community and is unique to a given culture, location or society. This knowledge therefore provides the basis for local-level decision making in food security, human and animal health, education, natural resource management, and various other community-based activities.

Figure 2.3: Linking Formal and Informal NRM Systems in a Biocultural Context



Source: Author's Construct

Indigenous communities have developed adept knowledge of the natural resources within their environment and they have utilized this knowledge to protect and conserve natural resource for many centuries. As depicted in figure 2.3, this knowledge which is drawn largely from the diverse knowledge forms and values of community cultures are relevant for management of natural resources to date. Throughout the Upper West Region, indigenous people's knowledge and experiences are well expressed in the different cultures of people in the ways in which they make meaning out of objects or natural resources in general and biodiversity in particular. Within the context of this thesis, indigenous knowledge systems are viewed from two standpoints - first, the people's knowledge of the resource endowments within the natural environment of the cultural group in reference and second, the way people relate with and utilize the available natural endowments and environmental services to meet their socio-cultural, spiritual, religious, economic as well as other needs. Together, these define the kind of community institutions and natural resource management systems that are evolved to safeguard pertinent cultural values and ultimately lead to the creation and re-creation of new knowledge for the sustainable management of natural resources within the worldview of the people. No matter the cultural background, community people's knowledge of their natural resources create opportunities for each cultural group to define natural resource management systems that are not only culturally suitable but also effective within their own institutional context. Thus, it may be argued that the sustainability of NRM systems can be viewed in terms of the strengths in the indigenous knowledge base and how this knowledge transform to meet the expectation of the members of a cultural group as well as the functional relationship between the peoples worldviews and the biodiversity. With the introduction of the state system, however, formalized structures have emerged to coexist with informal community-based structures for the conservation and protection of natural resources.

Table 2.1 provides a list of the issues and/or perceptions that show the link between biocultural diversity, indigenous knowledge and natural resources (NRs) as the basis for the protection and conservation of natural resources.

Table 2.1: Interface between Different Contexts and Perceptions for NRM in Ghana

Context	Issues /Perceptions
IKS	Ancestorcentrism, Totemism, Spirituality, etc
NRs	Trees/Forest, Land, Water, Air, Wildlife, Fire, etc
Biocultural Diversity	Worldviews, Cosmovisions, SNS, Art forms, etc
Management Institutions	Management Systems: Traditional and Cultural value systems, norms, belief systems, proverbs, folklores, mythology, etc Management Structures: Chief, Elders, Family/Clan heads, Soothsayers, Diviners, Sorcerers, Rainmakers, Magazies, Mallams, Traditional Healers/Herbalists, etc

Source: Author's Construct, 2009

As shown in the table, perceptions of natural resources in IKS are usually expressed through beliefs in the ancestors, totems and forms that link people's spiritual to their environment. There are diversities in these knowledge systems across cultures and these are often expressed using their different worldviews, cosmovisions, the type of SNS and art forms that they create using the local knowledge systems. In all indigenous institutions of the Upper West Region, the implicit aspects of the management systems are expressed in traditional cosmologies of local people using the value system, norms, beliefs, proverbs, folklores and also mythology. But in all these cases, there are underlying structures which have the mandate or authority to direct behavior and the actions of the community people.

CHAPTER THREE
RESEARCH METHODOLOGY

Panneerselvam (2004:2) defines research methodology as *'a system of models, procedures and techniques used to find the results of a research problem.'* The methodology for this research begins by outlining the general approach to the research, the background of the study area; and the sampling methods as well as data collection procedures and sampling methods that were applied to reach and elicit the views or opinions of research participants in the field. It ends with the data management procedures and techniques of data presentation and analyses.

3.1 General Approach

According to Groenewald (2004), one needs a grasp of a vast range of research methodologies in order to select the most appropriate design, or combination of designs, most suitable for a particular study. This view corroborates with that Meetoo and Temple (2003) who argue that using different methods may allow a researcher to investigate the different ways that account are built up. It also helps to detect data inconsistencies (Twumasi, 2001). Different methods may be used to verify each other, but they may also be complementary or contradictory. Complementarily does not imply that findings have to be identical (Morse, 2001; Meetoo and Temple, 2003).

Increasing number of researchers in various fields of social and behavioral sciences have been advocating for the combination of quantitative and qualitative approaches to the study of various social phenomena. This new movement has given rise to what has come to be known as mixed methodology research. Philosophically, it is a movement that moves past the recent paradigm wars by offering a logical and practical alternative. It makes use of the pragmatic method and system of philosophy and its logic of inquiry includes the use of induction or discovery of patterns, deduction (testing of theories and hypotheses), and abduction - uncovering and relying on the best of a set of explanations for understanding one's results (Johnson and Onwuegbuzie, 2004). According to Johnson and Onwuegbuzie (2004) mixed methodology research is formally the class of research where the researcher mixes or combines quantitative and qualitative research techniques

into a single study. In the view of Kellaher *et al.*, (1990:121), both qualitative and quantitative data can cross validate each other around "a common reference point". Qualitative methods have traditionally been described as interpretative or phenomenological whereas quantitative methods are associated with positivist approaches (Meetoo and Temple, 2003). A key difference between quantitative and qualitative methods is their flexibility. With quantitative methods such as surveys and questionnaires, on the one hand, the researcher asks all participants identical questions in the same order. The response categories from which participants may choose are "closed-ended" or fixed. They are, therefore, less flexible (Mack *et. al*, 2005). On the other hand, qualitative methods are typically more flexible in that they allow greater spontaneity and adaptation of the interaction between the researcher and the study participant(s). Qualitative methods ask mostly "open-ended" questions that are not necessarily worded in exactly the same way with each participant. Open-ended questions have the ability to evoke responses that are meaningful and culturally salient to the participant and unanticipated by the researcher. They are also rich and explanatory in nature (ibid). With open-ended questions, therefore, participants are free to respond in their own words, and these responses tend to be more complex than simply "yes" or "no". Open-ended questions also allow the researcher the flexibility to probe initial participant responses by asking follow-ups such as 'why' or 'how', listen carefully to what they say, engage with them according to their individual personalities and styles, and use further probes to encourage them to elaborate on their answers (ibid).

There are problems in attempting to tie a worldview or epistemology to a particular quantitative or qualitative method, especially if researchers are attempting to use both kinds of methods. One of the strengths often put forward for using qualitative methods is that they allow the researcher to discuss the views of research participants and to reflect on the influence of their own social location on their perspective (Meetoo and Temple, 2003). Mack *et al*., (2005) note that in qualitative research, participants have the opportunity to respond more elaborately and in greater detail than is typically the case with quantitative methods. In turn, the researcher has the opportunity to respond immediately to what participants say by tailoring subsequent questions to information the

participant has already provided. A great contribution of this method is the culturally specific and contextually rich data that it produces. In the light of the above assertions, I wish to concur with Meetoo and Temple (2003) and also Mack *et al*.,(2005) to conclude that this research is inclined to more of qualitative methods rather than quantitative methods.

3.2 The Design and Process Research

The choice of an appropriate design to a research is founded in the researcher's own ability to identify and separate the research issues and apply appropriate methods, tools and techniques to enable him/her arrive at valid conclusion. Within the context of mixed methodologies, this research was designed to combine a case study and survey tools and techniques in order to collect appropriate data across all selected communities in the study area for synthesizing cross-cultural issues on the topic. Generally, the case study method views a phenomenon under study as a unique case within a given physical, sociocultural, economic and political context (Bacho, 2001; Kumekpor, 1995; Marshall and Rossman, 1995). The case study method was used because the research sought to collect concrete data in order to explain patterns and relationships under specific context. Bacho (2001), for example, asserts that cases exist within their given contexts and the researcher needs to seek explanations as regards certain events and processes, how they occur and why they occur the way they do in each given context. A people's worldview and how this impinges on natural resource management systems and institutional practices and/or approaches cannot be divorced from the cultural, socio-economic setting, the physical environment and the larger political arrangements within which they occur. This research views natural resource management within different cultural environments and local settings as well as different institutional arrangements within each specific context. In the light of this, a multiple case study approach becomes more relevant as the principle of peculiarity of factors and circumstances surrounding each case category will be more appropriately studied in-depth. The complex interaction of the various actors and processes in each case study will also be easily identified. Bacho (2001:81) observed that an advantage of a (multiple) case study is that the method allows the researcher to:

- *Have a comprehensive coverage and in-depth probing of all the research issues;*

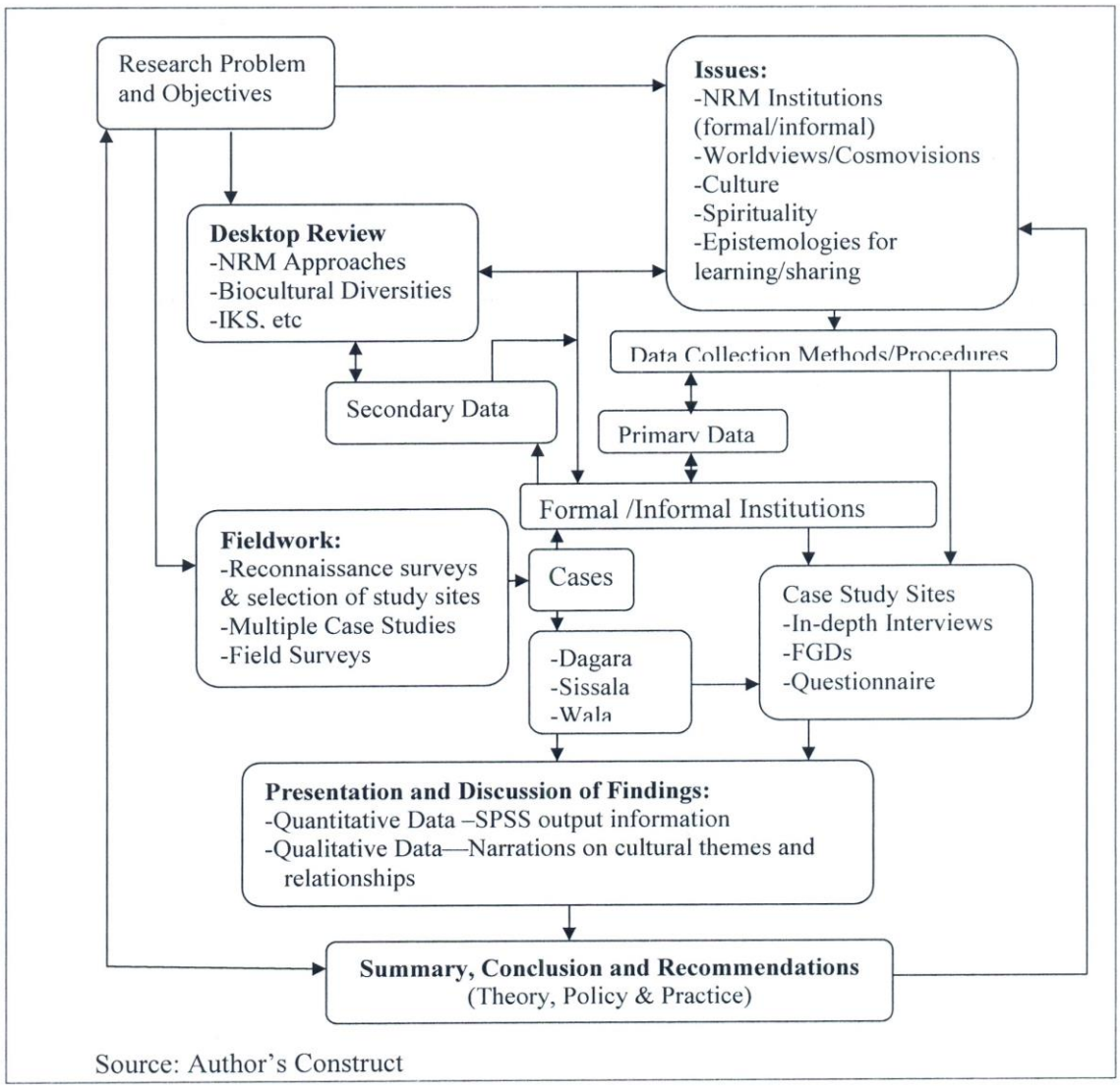
- *Understand and appreciate the complexities of factors at work by bringing together all the cases under investigation in a cross case analysis; and,*
- *Collect a rich mix of (...) data which complement each other in the presentation of the report.*

Throughout the research journey, the study tried to maximize these benefits that the approach normally seeks to offer in a variety of ways. By using multiple case study methods, I gained deeper knowledge insights on the diversity of the worldviews of local communities and their epistemologies of the intricate nature of relationships between people, their institutions (both formal and informal) and their spirituality on the one hand and the natural environment on the other hand. These constituted a community-wide and cultural specific type of data at three (3) levels of data collection - community (using FGDs), intermediate community (using FGDs and in-depth interviews involving local resource managers and other formal/informal community institutions) and individuals (using survey questionnaires and key informant interviews with local community historians) as they were encountered during the fieldwork.

The study also collected individual opinions across some generational lane - the youth, middle and old age groups using survey methods. According to Opoku (2000), a survey normally enables the researcher to infer the corresponding characteristics in a population. In the light of this, individuals from the different cultural units were sampled and interviewed. It was intended to ascertain information on individuals within the context of a locality and changing cultural practices in an arena of different natural resource management options. Thus, a synthesis of case study and survey research data provided an opportunity to collate and compare perceptions at both the individual and community level standpoints by inferring from the different data sources and making informed judgments. It also provided a basis for identifying points of departure between individual actions and the general community worldview as well as providing some opportunities for exploring the reasons why some individuals may depart from the general community norm(s).

In the context of the above discussions, the research journey was set out to cover all aspects of the research from the selection of topic to the publication of data in a complex inter-connected way as depicted in figure 3.1. In this figure, the niches between the various stages of the study right from the research problem and objectives through to the summary, conclusions and recommendations with a rather non-exhausted guide of blueprints are shown.

Figure 3.1: The Research Journey



Source: Author's Construct

The figure shows that the research problem was conceptualized from issues whose combined effect prompted that there still exist gaps between state organized institutions and NGO interventions and those of traditional people and their indigenous knowledge systems in management of natural resources. In the literature review, the discourses on this gap in practices are pursuit by examining some existing approaches to natural resource management and the relevance of indigenous knowledge systems especially their worldviews and spirituality and how these feed into different natural resources management practices among the Dagara/Dagaaba, Sissala and Wala as distinct cultural-linguistic groups of people. Reconnaissance surveys were used to guide the selection of the study communities from which data was later collated using in-depth interviews (IDIs), focus group discussions (FGDs) and questionnaires to reflect the issues of interests to the work. From the data that was gathered in the field, descriptive and inferential techniques were used to present and analyse both the quantitative and qualitative aspects and this then formed the basis to summarise the research and provide its findings, draw conclusions and make some recommendations for addressing the problem (or the research objectives) by enhancing natural resource management practices within a biocultural context especially at the formal institutional level. Traditional communities, however, need to take action to mitigate the impacts of Western influences on their values systems as far as natural resource management is concerned.

3.3 The Research Area

This section covers the political administrative region, location and natural environment, socio-demographic characteristics as well as governmental and non-governmental organizations in biocultural diversity in the Upper West Region of Ghana.

3.3.1 The Political Administrative Region

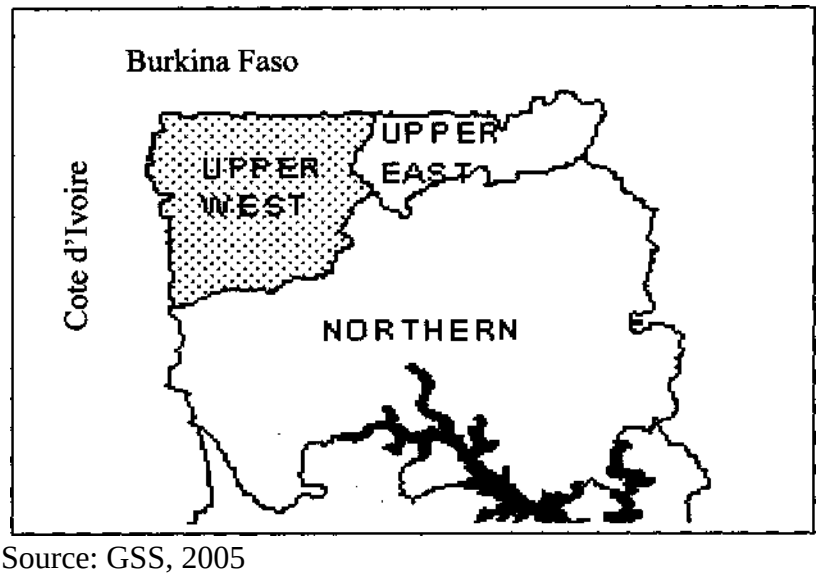
This research was carried out in the Upper West Region (UWR) of Ghana. The Upper West Region is the tenth of the ten administrative regions of Ghana. It was created in 1983 during the military junta of the Provisional National Defense Council (PNDC). Before this time, the Region was fused with present day Upper East Region and called

the Upper Region (Kuubuor, 2003). At present, the Region consists of nine administrative districts - Wa Municipal Assembly (WMA), Wa East District Assembly (WEDA), Wa West District Assembly (WWDA), Sissala East District Assembly (SEDA), Sissala West District Assembly (SWDA), Nadowli District Assembly (NDA), Jirapa District Assembly (JDA), Lawra District Assembly (LDA) and Lambussie-Kani District Assembly (LKDA) - as part of the national agenda to prosecute and deepen the process of decentralization. Before this time, there were only five (5) administrative districts namely Wa, Sissala, Nadawli, Jirapa-Lambussie and Lawra.

3.3.2 Location and Natural Environment

The Upper West Region is located at North Western corner of Ghana. It lies between longitudes 1° 25" W and 2° 45" and latitudes 9° 30" N and 11° 00"N. In terms of land mass, the Region covers approximately 18,478 square kilometers which is about 12.7% of the total land area of Ghana (GSS, 2005). As shown in figure 3.1 the region is bordered on the North by the Republic of Burkina Faso, the East by Upper East Region, the South by Northern Region and the West by Cote d'Ivoire.

Figure 3.2: Map showing the Upper West Region in the National Context



Source: GSS, 2005

Ecologically, the Region is part of the broad northern savanna eco-zone of Ghana which also encompasses the Upper East and Northern Regions. The vegetation is characterized

by the guinea savanna type with scattered drought resistant trees such as the Shea, the baobab, dawadawa and neem. According to the GSS (2005), the heterogeneous collection of trees provides all domestic requirements for fuel wood, charcoal, construction of houses, cattle kraals and fencing of gardens. The shorter shrubs and grass provide fodder for livestock. They also cater for various socio-cultural and spiritual needs of the inhabitants throughout the area.

Like the vegetation, the climate is one that is common to the three northern regions. There are two seasons - the dry and the wet seasons (Bacho, 2001; Dickson and Benneh, 1988; GSS, 2005). The GSS notes that the wet seasons commences from early April and ends in October each year. During the dry season from early November to late March, the Region comes under the influence of cold and hazy harmattan winds particularly during the nights and early morning and high temperatures by mid-day. The temperature in this Region ranges between a low of 15 °C at night during the harmattan season and a high of 40 °C in the day during the hot season-around late March, just before the onset of the rainy season in April.

3.3.3 Socio-Demographic Characteristics of the Upper West Region

According to the year 2000 population and housing census, the Upper West Region has a total population of 576,583 out of which 47.9% are males and 52.1% female. There are three main ethnic groups namely the Dagara/Dagaaba who constitutes 57.5%, the Sissala, 16.0% and the Wala 16.3 % (GSS, 2005). Other smaller groups include Brifors (or Lobis), the Chakala and other settler groups from other parts of Ghana and outside Ghana as well. The GSS (2005) data suggest that only 17.5% of the total population of the Upper West Region is living in six urban localities namely, Wa, Tumu, Lawra, Jirapa, Nandom and Hamile. The rest of the people, consisting predominantly of subsistent farmers, live in rural areas and are largely dependent on the natural environment to eke out a living. It is estimated that 72% of the entire population of the Upper West Region are employed in agriculture and related work (GSS, 2005).

The three (3) main religions - Traditional African, Christianity and Islam - are fairly reflected in all the districts of the Upper West Region, although the degree to which each religion is represented varies across districts and locations. Data showing the distribution of the population by religious affiliation by district are provided in Table 3.1.

Table 3.1: Religious Affiliation by District

Religion / District	Proportion of Population by District (as a %)				
	WDA	SDA	NDA	J/LDA	LDA
Christianity	24.7	12.2	58.5	42.5	56.4
Islam	44.4	70.1	12.4	11.4	6.0
Traditional	27.1	16.7	25.0	44.8	34.1
All Others	3.8	1.0	4.1	1.3	3.5

Source: GSS (2005:29)

From the table, Wa Municipal Assembly and Sissala District are predominantly Muslim whereas Nadawli and Lawra Districts are dominated by Christian. On the other hand Traditional African religion is the dominant form of worship for the people of Jirapa-Lambussie District although it marginally exceeds Christianity by about 2.3%. Since the dominant religion may tend to influence the behaviour patterns of people and the relation with nature, religion formed one of the bases for selecting the case study sites in the selected districts and across cultural-linguistic groups.

3.4 Sampling Procedures

Non-probability sampling methods and techniques are mostly recommended for case study research in the social sciences. Within the method, a variety of options, namely, purposive (or judgmental), quota, snowball and convenience sampling are available to choose from. Even though probability sampling methods are often prescribed for survey research, my choice to do a survey is not intended to achieve the goal of validity and reliability on the basis of appropriateness in sample size. Hence, non-probability sampling techniques were still deemed be appropriate for not only the case study sites, but also targeting respondents for recruitment into the study.

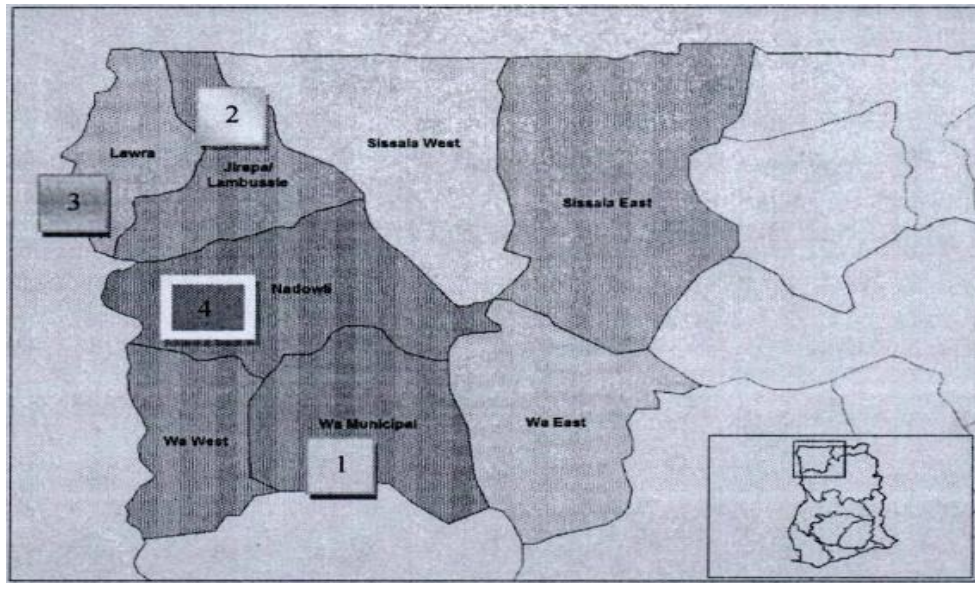
3.4.1 Purposive Sampling

Welman and Kruger (1999) consider purposive sampling as the most important kind of non-probability sampling to identify the primary participants. For purposive sampling, the sample is selected based on the researcher's sense of judgement and the purpose of the research (Babbie, 1995; Greig and Taylor, 1999; Schwandt, 1997) by looking for those who *"have had experiences relating to the phenomenon to be researched"* (Kruger, 1988:150). In this research, this sampling technique was applied together with other non-probability sampling techniques to select the case study sites and participants as discussed below.

- **Selection of the Study Sites**

a) ***District:*** For this research, the choice of districts was based on religious and cultural linguistic considerations. Consequently, Lawra, Lambussie - Kani (carved out from the northern parts of the former Jirapa - Lambussie District) and Wa Municipal districts were selected in order to include all three (3) ethnic groups - Dagaaba, Sissala and Wala *(*see Table 3.2). As shown in Table 3.1, these districts also cut across the three (3) major religions in Ghana, namely, Christianity, Traditional African and Islam respectively. Additionally, Nadowli District was visited purposely to understudy the community biodiversity project in Fian village.

Figure 3.2: The Study Districts in the Regional Context



1=Wa Municipal 2=Lambussie-Kani 3=Lawra 4=Nadowli
Source: Adapted from GSS, 2005

b) ***Communities:*** In each district, only the indigenes were targeted as subjects for the research. During the fieldwork, the study made use of direct inquiry to identify two communities that were typical of the cultural-linguistic group for which the district was selected. The areas were also selected to reflect first homogeneity in terms of traditional religious practice and second, based on a co-existence of diverse religions. Selected communities across districts are provided in table 3.2.

Table 3.2: Case Study Communities by Districts

District	Group	Selected Areas
Lawra	Dagaaba/Dagara	Gbier, Gonper/Yikpee
Lumbussie-Kani	Sissala	Samoa, Naawie
Wa Municipal	Wala	Jonga-Tabiasi, Kpaguri
Nadowli	Dagaaba/Dagara	Fian

Source: Fieldwork, 2008

c) Community Biodiversity Projects: These are projects that were jointly initiated by GEF/NRMP/NSBCP in selected areas, notably, Fian and Samoa, of the Upper West Region. I visited these projects to ascertain community people views on such interventions vis-à-vis their local management practices.

- **Selection of Research Participants**

In each district or community, traditional informal institutions, government and NGOs that are working either directly or indirectly in natural resource management or a related area were targeted. In the case of the Traditional Informal Institutions, Chiefs/Elders, Tindana, Soothsayers and Diviners were the main targets. Apart from these people, only native community people were recruited in each cultural set up for in-depth interviews and also I for the questionnaires using the snowball sampling to meet successive respond not in the field.

For the formal institutions the coverage included representatives from NGOs such as MOFA, the DA and FSD. Suntaa-Nuntaa, and NGOs in Wa was visited for an interview with the Director of the project. This NGO was selected because it has a long history of working with rural women. It was also found during the process of gathering natural resource related literature as one noted for using appropriate and effective approaches to promote sustainability of the natural environment.

3.4.2 Quota Sampling

A uniform quota of ten (10) respondents was assigned to each cultural-linguistic group for purposes of small surveys conducted on individuals in order to corroborate the data from qualitative sources or otherwise. Unlike a typical survey research where the essence of the investigation is usually to research a 'significant' number of the target group of the research population, qualitative research methodologies tend to emphasise the depth of interrogations of the issues on the subject of the research and quality of the data generated rather than the number of individuals recruited for the data. Thus, a total of thirty (30) respondents were interviewed in order to determine individual actions relating to natural resource and also to compare their responses across the groups.

3.4.3 Convenience Sampling

To ensure that women are not left out in the process of administering the questionnaire, I specifically asked for women to be recruited and interviewed during the process of collecting data.

3.5 Sources and Techniques of Data Collection

Both primary and secondary sources were used to collect data. Leedy (1997:101) defines primary data as *"the data that lie closest to the source of the Ultimate Truth underlying a phenomenon."* Beyond the region of primary data lies the region of secondary data (ibid). Hence, the primary sources were the individuals and groups who were interviewed using various tools and techniques at the different levels of the data collection process. The secondary sources, however, were drawn from documented evidences which were mostly books, journals, publications, office reports and profiles of districts as well as speeches from important personalities relating to the subject. The interne was also be used.

Within the context of primary data, Participatory Rural Appraisal (PRA) was used to collect data from the respondents. PRA has been largely recommended by many scholars on the grounds that it is not only convenient for doing research particularly in rural areas but also because it allows the researcher to adapt his/her research tools or even invent new ones in the field during the process of data collection (Chambers, 1997; Kumar, 2002; Millar and Apusigah, 2003). Thus, it is this flexibility that gives the approach an added advantage as compared to other conventional methods for collecting information in the field. Its flexibility equally makes it appropriate for collecting both qualitative and quantitative data.

3.5.1 Questionnaires

This was used to collect data that tried to assess the diversity of individuals both within and across the socio-cultural, economic and political spheres in the research locations. They were also used to carry out interviews using other methods. It is often argued that questionnaires are a research instrument of quantitative rather than qualitative

investigators. But as Sarantakos (2005:262) notes *"this is particularly so for standardized questionnaires"* which are mostly used for large survey. Qualitative researchers on the other employ unstandardised and unstructured questionnaires rather than standardized questionnaires. Unstandardised and unstructured questionnaires, containing open-ended questions and allowing subjectivity and flexibility in the way questions are constructed and answered, are in accord not only with epistemological principles but also with common practice (ibid). As a method, questionnaires are less expensive, produce quick results and also offer stable, consistent and uniform measures which are free of variation particularly within groups. A serious limitation of this method, however, is that it does not create room for probing, prompting and clarification of questions into much detail as provided by other methods.

In each of the cultural-linguistic set ups, structured questionnaires which occasionally included open-ended questions especially where the question required a little bit of clarification to make it more complete were administered in order to data from individual respondents. This was used to reach out to 30 respondents, consisting of ten (10) participants from each of the linguistic groups. In all, ten (10) females (33.3%) and twenty (20) males (67.7%) were covered.

3.5.2 Focus Group Discussions

According to Mack *et al.,* (2005), focus groups are effective in eliciting data on the cultural norms of a group and in generating broad overviews of issues of concern to the cultural groups or subgroups represented. They are a qualitative data collection method effective in helping researchers learn the social norms of a community or subgroup, as well as the range of perspectives that exist within that community or subgroup. It is a method in which one or two researchers and several participants, usually numbering between six (6) to twelve (12) people, meet as a group to discuss a given research topic. These sessions are usually tape recorded, and sometimes videotaped. During focus group discussions, the researcher (the moderator) leads the discussion by asking participants to respond to open-ended questions - that is, questions that require an in-depth response rather than a single

phrase or simple "yes" or "no" answer - for detailed notes to be taken on the discussion. In this research, discussions were audio-recorded and field notes taken at the same time so as to capture and report the details of the discussions as accurately as possible. A principal advantage of focus groups is that *'they yield a large amount of information over a relatively short period of time and because it seeks to illuminate group opinion, the method is especially well suited for socio-behavioral and cultural specific research that will be used to develop and measure interventions that meet the needs of a given population'* (Mack *et al*., 2005:64).

From the field records, it was noted that participants in the focus groups were aged between 35 and 75 years. Except in the case of Fian, the focus groups mostly included the Tindana or his representative. The distribution and characteristics of these participants across the study sites is shown in Table 3.3. As already mentioned, the main concern was to have a guided discussion with local community representatives on NRM practices, worldviews, cosmovisions, local epistemologies and also to explore how culture and spirituality hinge issues on natural resource management. The people's perceptions and relationship with external interventionists were also discussed.

Table 3.3: Composition of Focus Groups by Community and Gender

Community	Characteristics of Group	Number of		Total
		Male	Female	
Fian	Community Forest Committee	5	2	7
Lawra-Gbier	Chief/Elders and Women	6	4	10
Jonga-Tabiasi	Chief/Elders	7	-	7
Samoa	Chief/Land owners	9	-	9
Naawie	Chief/Elders	10	-	10
Total	**5 Groups**	**37**	**6**	**43**
	Representation	**86%**	**14%**	**100%**

Source: Field Data, April 2008

As shown, the groups were male dominated as women constituted only 14% out of the total of 43 representatives from all the study sites put together.

3.5.3 In-depth Interviews

In order to investigate traditional informal and formal sector (GOs and NGOs) institutional knowledge systems and practices, as well as their linkages with regards to bioculcultural diversity and natural resource management, in-depth interviews were held with key persons in the communities and also with officers from the DA, MOFA, FSD and SUNTAA-NUNTAA (an NGO). These institutions were selected because they work either directly or indirectly in natural resource or environmentally related areas. For the DA, however, the essence was to look at local governmental bye-laws and policies within the context of a decentralized structure.

In the view of Mack *et al.,* (2005), in-depth interviews are one of the most common qualitative methods. They are, generally, very effective in giving a human face to research problems. An in-depth interview is a technique designed to elicit a vivid picture of the participant's perspective on the research topic. During in-depth interviews, the person being interviewed is considered the expert and the interviewer is considered the student. The researcher's interviewing techniques are motivated by the desire to learn everything the participant can share about the research topic. Researchers engage with participants by posing questions in a neutral manner, listening attentively to participants' responses, and asking follow-up questions and probes based on those responses. They do not lead participants according to any preconceived notions, nor do they encourage participants to provide particular answers by expressing approval or disapproval of what they say. In-depth interviews are usually conducted face-to-face and involve one interviewer and one participant. One advantage of using in-depth interviews is that they are useful for learning about the perspectives of individuals. They are also an effective qualitative method for getting people to talk about their personal feelings, opinions, and experiences. In addition, they offer an opportunity for the researcher to gain insight into how people interpret and order the world (ibid).

During the in-depth interviews, the consent of participants was sought before audio-recording their stories as they narrated them. The distribution of the respondents for in-

depth interviews during the institutional visits at the community, government and NGO levels are shown in tables 3.4 and 3.5.

Table 3.4: Distribution of Community In-depth interviews

District	Location of	Description of	Gender
Nadowli	Fian	Herbalist	Male
Lawra	Lawra - Gongper	Local Historian	Male
	Lawra-Yirkpee	Local Historian	Male
	Lawra	Herbalist	Female
Wa Municipal	Wa-Kpaguri	Local Historian	Male
Lambussie-Kani	Naawie	Herbalist/Local Historian	Male

Source: Field Survey, April 2008

These informants were found to be aged between 50 and 80 years. As shown they consisted of only 16.7 % female and 83.7% male, confirming a male dominance. Within the formal sector, the interviews focused on institutional arrangement, approaches and practices, levels of collaborations especially with communities and traditional institutions and also the extent to which these GOs and NGOs integrate culture and spirituality in their natural resource management practices.

Table 3.5: Distribution of Formal Institutional Interviews

Name of Institution	Number of		Total
	Male	Female	
Ministry of Food and	1	-	1
Lawra District Assembly	3	-	3
Forestry Service Division	2	1	3
SUNTAA-NUNTAA	1	-	1
Total	**7**	**1**	**8**

Source: Field Survey, April 2008

3.6 Management of Field Data

Panneerselvam (2004:14) asserts that *"after data is collected, proper tools and techniques should be used for classification and analysis of data."* For this research, both descriptive and inferential tools and techniques were used to present and analyse the results. According to Osuala (2005), descriptive tools and techniques of research are that which specify the nature of given phenomena - be that phenomena simple or complex.

But, the need for systematic ways of telling what a situation is means that the situation is no longer simple (ibid: 197).

During the fieldwork, in-depth interviews and focus group discussions were audio-recorded and notes were also taken with help of a field assistant. After each field visit, the reports were written based on the field notes and all the audio recordings are also transcribed in the exact words of the respondents. These were then classified into cultural themes under the different case categories and synthesize using descriptive narratives to reflect the collective worldview of communities as the basis for determining diversities within and outside community cultures. According to Osuala (2005:99), the use of descriptive tools in assessing a situation is a prerequisite to inferences and generalization.

Literally, the theory of knowledge which serves to decide how social phenomena should be studied is essentially every researcher's epistemology (Creswell, 1994; Holloway, 1997; Mason, 1996). One way to achieve this is to conceive of data as being contained within the perspectives of people that are involved in the phenomenon and those who are being studied within the context of the phenomenon as representatives from the group must be engaged at their different capacities in relation to the problem under investigation to collect the requisite data (Groenewald, 2004). This notion was used as a framework to guide the analysis of qualitative data.

For quantitative data, the Statistical Package for Social Sciences (SPSS) was used as the main tool. Data from the questionnaires were codified and entered into a spreadsheet on SPSS. Following this, the data entered was explored to detect cases of missing data points, pattern and interrelationships of variables before actual analysis. The data was analysed using frequencies, percentages, cross-tabulations, chi-square, charts and graphs for inferences to be drawn from the descriptive values. The resulting output from SPSS was used to present some background information on the socio-demographic characteristic of the respondents and for establishing the basis for the collective view on the issues of culture, spirituality and their influence of these on their relationship with natural resources. It was also used to determine the perceptions of people about the way

traditional institutions function and influence natural resource management outcomes with their localities.

CHAPTER FOUR
MAIN FINDINGS AND DISCUSSIONS OF DATA

This chapter presents and discusses the views expressed by the research participants as who were encountered in the field using various methods and appropriately selected tools and techniques to elicit information from them. It begins with some analysis of the socio-demographic characteristics of the participants captured by the structured questionnaires that were used in the different localities both within and across all cultural sites for data methods, notably, key informants/in-depth interviews and focus group discussions.

4.1 Socio-Demographic Characteristics of Respondents in Survey

The questionnaire was designed to elicit individual opinions on natural resource issues and some livelihood condition within their respective home localities or their immediate environments. It tried to find out factors that lead to adherence or non-adherence to local rules or laws that guide people's behaviour and influence the way community members tend to utilize natural resources within the context of their own culture. The purpose was to generate information that can enhance the outcome of in-depth interviews and focus group discussions from a more individualistic point of view. Since this was not meant to generate the bulk of the information required for situating the research problem and to provide answers to the research questions, only a small sample was taken. In all 30 respondents (10 from each cultural-linguistic group) were covered and the results are discussed below.

Table 4.1: Distribution of Respondents by District

District	Frequency	Percent
Wa Municipal	16	53.3
Lawra	4	13.3
Lambussie-Kani	10	33.3
Total	**30**	**100**

Source: Field Questionnaire, April 2008

A large proportion of the interviews involving the questionnaire took place in the Wa Municipal Assembly. Here, both Wala and Dagaaba were interviewed and they together

constituted 53.3% of all cases covered. The rest of the Dagaaba (13.3%) were interviewed in the Lawra District. In the case of the Sissala, all were selected and interviewed within the Lambussie-Kani District. In all, there were equal representations of ten (10) respondents selected from each of the three (3) cultural-linguistic groups.

Table 4.2: Distribution of Respondents by Location in District

District	Name of Community	Number of Participants	Percent
Lawra	Gbier	2	6.7
	Lawra	1	3.3
	Nandom	1	3.3
Lambussie-Kani	Lambussie	7	23.3
	Naawie	3	10.0
Wa Municipal	Charia	6	20.0
	Siiru	10	33.3
	Total	**30**	**100.0**

Source: Field Survey, 2008

All 10 respondents of the Wala ethnic group representing 33.3% were taken from one community - Siiru. Generally, tracing the typical Wala people can often be confusing if the necessary care is not taken. People from different ethnic backgrounds who become muslims are easily misrepresented as Wala the notion being that a Wala is synonymous to Islam. Siiru, however, is a typical Wala settlement. As shown in table 4.2, 7 (70%) of the ten (10) Sissala consisting of 23.3% of the total sample came from Lambussie and the rest of the 30% representing 10% of the total sample were taken from Naawie village. Similarly, 60% of the Dagaaba were from Charia and represent 20% of the total respondents. The rest of the 40% Dagaaba came from Lawra, Gbier and Nandom.

4.1.1 Sex Distribution of Respondents

With respect to gender, it turned out that 66.7% and 33.3% of all respondents were men and women respectively.

Table 4.3: Gender of Respondents

Gender	Number of	Percent
Male	20	66.7
Female	10	33.3
Total	**30**	**100.0**

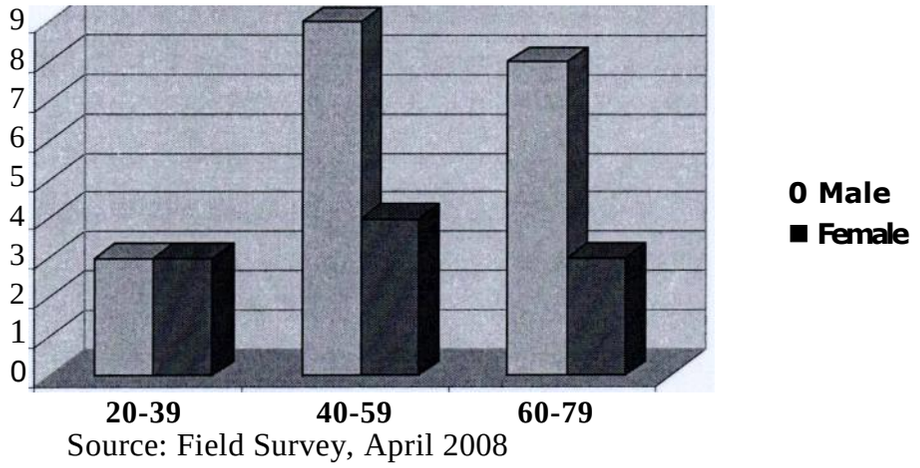
Source: Field Survey, April 2008

Gender issues are of utmost importance in natural resource management concerns. From the table, a third of all respondents to the questionnaire are women. Among the societies which the research covered, patriarchy is the norm and hence a fair representation of the views of women may tend to reflect how the concerns of gender are featured in natural resource management decisions both with and across cultures.

4.1.2 Age of Respondents

The age distribution of respondents to the questionnaire by gender is presented below.

Figure 4.1: Age Distribution by Gender of Respondents



Source: Field Survey, April 2008

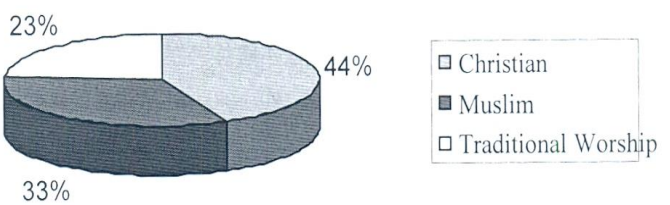
Age is a plausible variable on the depth of knowledge that people may have in relation to culture and traditional value systems. The ages of the respondents were classified as young (20-39 years), middle-age (40-59 years) and old-age (60-79 years). By this classification, it was possible to compare views of respondents across different age barriers. An assumption here was that the aged tend to possess and present the purest form of knowledge that reflects the different cultural entities in relation to traditional practices in natural resource management than the young. From the figure above, it is clear that all three categories were fairly represented both in age and across gender. Indeed, from the data collected it turned out that 23 out of 30 respondents believed that less of traditional rules are obeyed now compared to the past. The main reason for this

outcome was that the value systems have eroded due to an ever increasing insurgence of Western values, high levels of out-migration from the study environment which is much rural compared to a more urban south in the transition, forest and coastal belts of Ghana as well as the diffusion of other local cultures. Factors such as education and assimilation knowledge of their original values systems and hence they become completely lost.

4.1.3 Religion of Respondents

Three main religions, namely, Christianity, Islam and Traditional African worship coexist in the area. Each of these religions tend to influence the behaviour patterns of its followers and hence the perceptions of these followers and their consequent reactions towards some of their own ancestral practices. The distribution of the respondents according to the three main religious denominations is presented in the figure below.

Figure 4.2: Religious Affiliation of Respondents



Source: Field Survey, April 2008

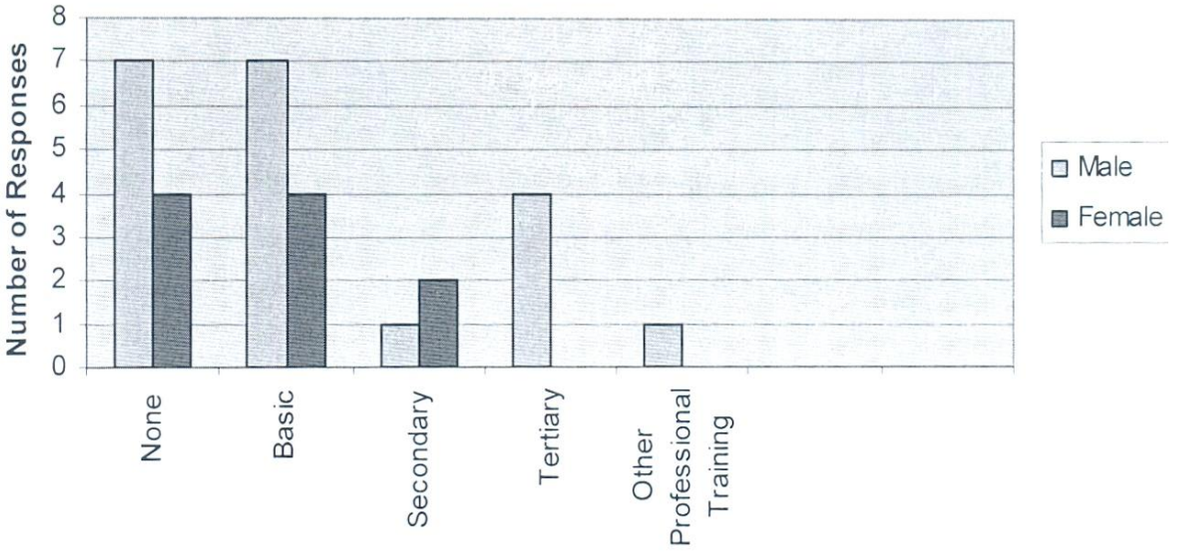
From the figure, the majority of respondents are Christian. Only 23% are Traditional worshippers. The large representation of Christians and Muslims in the sample only justifies the dominance of foreign religions in the area and hence the extent to which most people in the area may tend to perceive their own cultures and value systems. Haverkort (2003) and Gudoka (2001) note that most African values systems have long been perceived from a Eurocentric lens largely because of the claim that they lack

Cartesian rationality and therefore they become branded as fetish and/or devilish. This notion is so much embedded in the African Christian and/or Muslim that it has for long eroded and devalued the value systems particularly those regarding natural resource management. One of the strengths in the design principles for local management of natural resources in indigenous communities had been the mythology of violation of the rules or restrictions in place and gravity of the sanctions that were meted out to offenders. So frightening was such sanctions that society lived in fear and compliance to the rules and restrictions imposed. In fact, those who made the laws and sanctioned had their own code of conduct without which they themselves became powerless. It was realized from the field data that the strong intrusion of Western cultures especially Christianity and Islam have contributed significantly to the erosion of most of these codified systems for local title holders and appropriators of natural resources. This in turn has given way to new forms of life thereby in communities that weaken the efficacy of any powers to sanction indiscipline in the local environment.

4.1.4 Educational Status of Respondents

The educational status of respondents showed that 73.4 % of them had either basic education or none at all. 10% of them had secondary education whereas 13.3% and 3.3% attained tertiary level and other professional training (basically teaching) respectively. As the majority of the respondents had little or no education means that the dominant view from the perspective of individuals captured by the questionnaire is less likely to be influenced by Western values resulting from training in formal school set up. The outlook of the educational attainment by respondents is depicted by the figure 4.3.

Figure 4.3: Educational Attainment of Respondents



Source: Field Survey, April 2008

From the graph, there was equal representation of both men and women at the levels whereby people received no education at all or had received only basic education. More women, however, were covered at the secondary level but none at the tertiary and other professional categories. This perhaps still explains that fewer women from the area are able to go beyond the secondary levels compared to their men counterparts. As noted earlier, the societies here are male dominated. Women's access to natural resources is very marginal. They neither control nor own natural resources. It is argued that one way of breaking these barriers is to give equal opportunity to women in education and in all spheres of decision making. But as it appears, the views of women in the higher echelons of the educational strata would be missing and more especially against the backdrop that men constitute the majority of the sample.

4.1.5 Occupation of Respondents

The type of occupation or employment of a person tends to show how critical natural resources might be in the individual's livelihood and perhaps that of the family. Below is the occupational distribution of the 30 respondents by type of employment and gender.

Gender of Respondent			Type of Employment		
			Public Sector	Private Job	Total
Male	Main Occupation of Respondent	Farming	0	14	14
		Petty Trade	0	1	1
		Teaching	5	0	5
	Total		5	15	20
Female	Main Occupation of Respondent	Farming	0	5	5
		Petty Trade	0	4	4
		Teaching	1	0	1
	Total		1	9	10

Source: Field Survey, April 2008

From the table, 19 (or 63.3%) of the respondents are farmers which is primarily a natural resource based occupation, 16.7% are in the informal sector and the rest are in the formal sector employment (basically, teaching). Those in the informal sector were either into agro-related businesses such as pito brewing, grain banking and retailing or livestock trade. It thus appears that natural resources availability is very critical for the livelihoods of many of the respondents covered and hence their reflections on them are most likely to be very apt.

4.1.6 Marital Status of Respondents

Nineteen (63.3%) of the respondents are married, 30% are widowed and 6.7% are single. Out of the married people 14 (or 46.6%) are male and 5 (or 16.7 %) are female. In the table below, it is clear that all the unmarried respondents are male. Out of nine (9) widows 4 (13.3%) are male and 5 (16.7%) female. In the study area, ownership of resources and/or rights to property inheritance is egos father. Hence, in a situation where 50% of all women interviewed are widows, it is probable that their rights to natural resources are likely to be denied and their participation in the decision making processes would be very minimal. Within the traditional set up, decisions particularly with regards to access, control and ownership of natural resources have remained the preserve of household heads.

Table 4.5: Distribution of Respondents by Marital Status and Gender

Marital Status	Gender of Respondent		Total
	Male	Female	
Single	2	0	2
Married	14	5	19
Widowed	4	5	9
Total	20	10	30

Source: Field Survey, April 2008

4.2 Influences of Households on Natural Resources and Biocultural Diversity

This section looks at the influences of respondents' family size and extent of family relationships and how this impinges on natural resources and hence biocultural diversity.

4.2.1 Characteristics of Respondents' Households

From the surveys, 80% of the interviewees were household heads with household size ranging between 5-20 persons. The rest belonged to households under the headship of other individuals. In this area, however, the extended family system is practiced. The extended family structure among the Dagaaba of Lawra-Nandom is arranged along lines of double descent whereby people trace relationships from both the mother and father side (Tengan, 1994, 1997; van der Geest, 2003; Yelfaanibe, 2007). This, the extent of a 'social house' (Tengan, 1994, 1997) among these people is far more complex than that of the rest of the Dagaaba and also the Sissala and Wala. Generally, the patrilineal system is the dominant practice among all three linguistic groups. Within the communities from which respondents were drawn, it was observed that 36.7% of them came from communities where their patri-kin represented less than 0.25 of population while 20% and 30% were represented by about 0.25 and more than 0.50 respectively. This implies that the larger part of the sample size came from communities where their patrilineal extended relatives constituted less than half of the population where they are resident. In terms of NRM, this could have some implication in relation to the authority and control over natural resource. People from the same extended family system would normally have similar claims to certain resources. This creates both a constraint and an opportunity

on people's attitudes natural resources. It will also normally determine the extent to which individuals of a given social house will go to protect a collective interest. Thus, in the event that a minority group are the resource owners, but cannot sufficiently

exercise their rights over available natural resources due to their numbers, then there is likely to be a high level of non-compliance of the laid down rules, restriction and norms by the predominant group and vice versa.

4.2.2 Relationships and Access to Natural Resources

Data from the questionnaire revealed that 60% of the interviewees who are able to access NRs are related to the resource owners. Thus, a conclusion can be drawn that access to natural resources in the Upper West Region largely depends on the network of family relationships of those seeking to use the resources. The most common resources in this regard were noted to be land and economic trees often for generating food for the household members. When a particular resource is required for use by a relative, they give prior notice to the owner who then can determine the level of access and rights with respect to the length of time. The beneficiaries in this case were found to include mainly widows and their children who are able to access marginal lands from the relatives to farm for a living.

With the exception of land, access to resources in open access is less restricted or less rigid but these restrictions also vary in degree relative to the value of the resource in question. For example, rights to harvest economic trees such as shea and dawadawa in cultivated areas are more restricted compared to uncultivated areas or the bush. Where the cultivated area is not owned by the farmer, the rights to economic trees may be defined in the initial agreement. Shea fruits may be harvested and owned by the household of tenant farmers. Dawadawa on the other hand may not be permitted for the same use rights under the same piece of land. Additionally, the tenant farmer is not allowed to cut down any matured tree for wood.

From the interviews, only 26.7% of the respondents who accessed and resource natural resources from other people mentioned that they are always permitted to use rights

whenever they contacted the owners. By this, it can be deduced that many people within the northwest corridors who own NRs are still very much concerned about the way these resources are managed and hence they tend to institute their own monitoring mechanisms generally aimed at meeting their individual or family interests and also to safeguard the resource for the future. Throughout the locations, this seems to have been the most common underpinning regarding NRM. However, it must be mentioned that the case of land is an exception and represents a hosts of its own complexities. These notwithstanding farm owners tend to monitor the land use practices of tenant farmers and for good or selfish reasons may eject them to get back their land.

With the exception of double descent groups of the Dagaaba in the Lawra District, access to NRs on relationship lines normally follow paternal lines. Out of all the resources that people do not own but can usually access, 36.7% of respondent claimed that such resources are often in open access; 43.3% agreed with this view but said only sometimes whereas only 13.3% mentioned that they are not in open access.

4.3 Indigenous Cultural-Linguistic Diversities

There are instances where settler groups speaking different languages have come to co-exist with the three (3) language groups of the area. In such instances, the interaction between the new language and the indigenous spoken dialect can also influence the local epistemologies with passage of time. From the data, not more than three (3) languages co-existed in anyone community. It showed that only one language was spoken in 53.3% of respondents' communities whereas two (2) and three (3) different languages are in 13.3% and 33.3% of respondents' communities respectively. Therefore, native language and dialect were dominant representing about 53%. Although, different languages were spoken, about 83% of the respondents did not see any cultural differences between people of the different language groups implying that language differences cannot form a good basis for establishing diversity of cultures within the northwest corridors of Ghana. It also means that the presence of a new language group in a community does not offset the overall structure of the cultural value systems and practices. From the surveys, 83.3% of the people noted that there are cultural differences

across linguistic barriers. Thus, cross-cultural differences in the principles used to manage natural resources may not depart in any significant way from one another. This tends to be reflected in the way the internal systems of local culture work as almost all respondents concluded that internal dialectical differences do not contribute to any intra-cultural difference. In view of these conclusions, it is to be expected that local philosophies or epistemologies regarding natural resource management may vary slightly from one another.

4.4 Livelihood Systems of Households and Natural Resources

Apart from the major occupation of the individuals, 90% of the respondents had other minor jobs that they do to earn a living. These activities include rearing, carving and casual labour and amounted to about 73.4% of all the responses in the data. Generally, the natural resource base of the communities was assessed as constituting the core of all livelihoods engagements by the respondents. The key resources mentioned were land, trees/forest or wild resources as well as water. What this means is that any weakening of the NR base for any or all of these vital resources has a great potential to displace a vast majority of the local population of northwest Ghana. Thus, the way natural resources are managed in the study area must be of great concern to all. It was also realized that 70% of the respondents had other household members depending largely on the natural environment for a living. One (1) out of the thirty (30) respondents claimed that land, forest or wild resource did not have any direct consequences on his household livelihood because they sustained mainly by salary income.

4.5 Indigenous Rules and Natural Resource Governance Systems in the Upper West Region

Generally, there are rules guiding the way resources are managed within every socio-cultural environment. Whether natural resources exist in open access or not, the general governances systems and practices for protection and conservation are anchored on the notions of ‘social house’ (Tengan, 1994) and ‘ancestorcentrism’ (Millar, 2005). As shown in Box 4.1, these concepts are not mutually exclusive.

Box 4.1: The Idea of Ancestorcentrism

Most African cultural values are deeply rooted in the notion of the ancestors. Millar (2005) asserts that ancestral spirits are relevant in defining action and inaction and in so doing, it generates knowledge. Such knowledge usually becomes useful for enhancing biocultural practices and for management of natural resources; the concept the ancestors among the Dagaaba would refer to as "saakumnu" or "saakum-yelle". It is also known as "lesiriye" among the Wala and "aanawa" among the Sissala. Generally refers to the people's spirituality, culture, science, art, way of life, and view of the world as evolved over the millennia from the accumulated experiences gathered within the living environment. This phenomenon is expressed in the (extended) family system, the clan system, the lineages, the totems, belief systems, value systems and the personality of individuals even across borders (Millar, 2005: 5). Central to this notion, however, is the idea of spirits. Indigenous spirituality, however, has no historical founder (Gudoka, 2001; Uka, 1991) mainly because it came into existence as a result of the human experience of the mystery of the cosmos. In an attempt to solve this mystery of the universe, indigenes have asked questions, search for answers, and come to conclusions that the mystery must be supernatural power, to whom belongs both the visible and invisible(Millar, 2005). In ancestorcentrism, indigenes are converted to their spirituality. They are born into it, live by it, and practices it either in public or private life. (...) it has no written literature, sacred scriptures or creedal forms. It is an essentially oral tradition passed through mythology and legends, stories and folktales, songs and dances, liturgies and rituals, proverbs and pithy-sayings, adages and riddles. Some of these oral traditions are preserved in indigenous arts and culture, symbols and emblems, names of people and places. [These together constitute] a means of transmitting cultural and spiritual values, sentiments, ideas and indigenous cultural "truths "(ibid). (From Millar, 2005)

For natural resources in open access, 83.3% of the interviewees acknowledged that there are rules within the communities for checking the way natural resources should be extracted. Mostly it is the Chiefs and/or the Tindana (Earth Priest) who make the rules. In areas where the power of the Chief and the Tindana are separate, rule made by the Chief are given the divine backing of the Tindana through pronouncement that permit the gods to prefer punishment on offenders. There are usually preceded by some form of vows which commit the authorizing body (in this case, the Chief and/or Tindana) first and foremost to the pronouncements and hence making it deterrent enough. In some case where the Tindana's duties are limited to only traditional Priestly duties such performing libation, sacrifices and rituals, farm owners popularly known as *wiesob(a)* (in Dagaare) or *baga-tina* (in Sissali) or *yoodaana* (in Waale) can impose their own restrictions on natural resources within their land jurisdiction. In such a case, however, they will rely on the services of the Tindana or totina to make sacrifices or rituals to purify the land for

offences that may arise. Although the powers of the Tindanas have been largely subdued by those of the Chiefs, the latter group has so far proved to be less effective on issues of managing NRs arguably because the institution is alien to the people. Notwithstanding the low capacity of Chiefs alone to design and implement indigenous rules for effective NRM, 83.3% of the respondents attested that traditional rules regarding natural resources are mostly obeyed by community people. This means that even under the current challenges traditional and cultural value systems still have the potential to thrive and bring about change in the management systems and regimes for safeguarding natural resources. When the rules were broken, 80% of the respondents confirmed that offenders are often punished. It was interesting to observe from the responses that 26 (86.7%) out of the 30 respondents from all cultural-linguistic groups agree one cannot refuse sanctions brought to bear on him/her for breaking local rules meant to protect and conserve natural resources. This shows that traditional institutions are always able to exert themselves over local people's attitudes and that restrictions imposed by these institutions have a great potential to control behaviour and attitudes towards the ways and manner that natural resources are extracted. Only 10% of the respondents mentioned that it was possible for people who break traditional rules to refuse sanctions by the local institutions such as the Chief or Tindana. However, they said that when this happens defiant offenders could face the wrath of the ancestors or spirits through mysterious deaths either involving themselves or their families.

Apart from the fact that individual farm or land owners may set their own rules regarding NRs within their purview, community wide rules, restrictions, regulations and laws are formulated by the traditional authority, mostly the Tindana (Earth Priest) or the Chief or even both of them together. These community laws are generally unwritten but popular within the general worldviews of the community people. In each of the cultures, violation of these laid down community laws can lead to bad omen on the part of the offender or the community as whole depending on the nature of the offence. In some of the communities too there are designated areas, objects, and dates forbidden for certain actions or behaviours.

Although it has been observed that traditional rules can be effective in protecting and conserving natural resources, less of the rules regarding traditional and cultural values systems are obeyed now as compared to the past. From the survey of the three cultural-linguistic groups, 76.7% of the respondents attest to this assertion. To this group, it is mostly the proliferation of Western values among the local population that is largely accounting for this. On the other hand, 23.3% of those surveyed believe that in cases where the teaching of African values still persists and are a bit effective, these rules are obeyed more now than in the past.

4.6 Resource Availability and Impact on Local Knowledge Systems for Managing Natural Resources

Indigenous people have adept knowledge on the various uses of resources that have surrounded them over the millennia. Consequently, they are generally able to derive maximum social, cultural, economic and spiritual benefits from them using the type of socio-politico-economic arrangements that have emerged in the history of their evolution from the natural resources surrounding them. The cultural values of natural resources are often related only to components of the vegetation or fauna such as trees or forests as dwelling places for spirits, land as burial places for ancestors, sites for ritual ceremonies and other sacred natural sites or features (Laird, 1999; Posey, 1999; Seeland, 1997). Thus, in the Upper West Region of Ghana, concerns of biodiversity conservation are rife because of the levels of decline in global biological resources that has been observed over decades. As Posey (1999) notes there is an inextricable link between biological diversity and cultural diversity. Consequently, the trend of natural resources and the value transformation over the long periods can have some indication for local cultures. Table 4.6 shows how the respondents across the three cultural-linguistic areas assessed the general resource condition within the Upper West Region of Ghana.

Table 4.6: Assessment of Natural Resource Availability by Respondents

	Response on Availability now relative to the past					
	Less now		*No change*		*More now*	
Resource	Count	%	Count	%	Count	%
Land	26	86.7	4	13.3	-	-
Trees/Forest	27	90.0	-	-	3	10.0
Water points	19	63.3	-	-	11	36.7
Game/Wildlife	26	86.7	4	13.3	-	-

Source: Field Survey, April 2008

From the table, there is a generally high level of resource decline in all four categories or types. But the most rapid among these declining resources are the land, trees or forests and also game and wildlife. The worse affected areas were found to be the Lawra-Nandom enclaves with high population density coupled with years of continuous fragmentation of land mainly for food crop fanning have let to degraded lands and soil impoverishment. The area is also largely sparse of vegetation with many species of plants of medicinal and spiritual significance disappearing. East of this area around Lambussie-Piina and also Jirapa southwards, are better conditions of the natural environment. Vegetation cover and soil conditions within this area are much better. There are similar conditions in areas around Wa. Within the present conditions, 13.3% of the respondents said they did not observe any change in land and wildlife resources both now and the past. It is likely that these people may belong to the younger age category and as a result are yet to witness further fragmentation in their family land. In a similar vein, 10% of the people witnessed more of tree cover at present probably due to some on-going re-afforestation or plantation development projects. Interestingly, 36.7% responded that there are more of water points in their localities now than in the past. This could also be a result of the creation of community dams or dug outs they have witnessed over the years or the outcome of emerging streams from gullies due to degraded conditions of the natural environment.

The levels of decline of natural resources as depicted have some implications for biocultural diversity. Generally, indigenous people perceived ponds, rivers, wells and other sources of water including rain as sacred and hence associate some spirituality to

them. They are treated as part of sacred natural sites (SNS). In the past, even when these resources were relatively abundant, they were regulated by the forefathers. The restrictions imposed on these water resources were such that at certain times, people were not, allowed to visit points for water. In the case of rivers where people drew water, water sources were also forbidden to be cut. Water itself was a god and so people could swear by the river, pond, well or the rain. Water was essential for sacrifices and purification of sins. It was also used in the performing of libation and in naming ceremonies and also during conflict resolutions to reconcile the different factions or ask for forgiveness of younger people who offended a parent or an elder. Similarly, land is a god and needs to be revered. Within the traditions of African people, the idea of land as a natural resource is constructed around the notion of Mother Earth or the Earth god. It has become increasingly recognized that both land owners and users have valuable environmental knowledge about this resource. This knowledge is generally vital in NRM project at the local level. According to Critchley *et al*., (1994), projects that tend to ignore local traditions about land would often do so to their detriment.

From the above perspectives, the decline in these resources or the rapid transformation in their use value poses a risk for the sustenance of the worldviews of the local people in the long run. For instance, even though the totemistic phenomenon is still strongly held among people of all three cultural-linguistic groups, over 70% of the respondents tend to agree that these totems are no more common within their environments. The absence of these species has a potential of eroding this belief system in the long run and thereby pose an even greater threat to the already depleted natural resources. In the Lawra-Nandom areas, there is the likelihood of a breakdown in the cultural system and spirituality of the local community people especially with the spread of Christianity and also the high levels of migration from the area.

As shown in Table 4.7, there is a generally high level of dependence on all natural resources by households with the exception of game and wildlife. The highest

dependence is on water points which may be accounted by population increases and dwindling rainfall patterns within the study area as a whole.

Table 4.7: Dependence of Respondent's Household on Natural Resources

	Response on levels of Dependence relative to the past					
	Less now		*No change*		*More now*	
Resource	Count	%	Count	%	Count	%
Land	7	23.3	-	-	23	76.7
Trees/Forest	7	23.3	5	16.7	18	60.0
Water points	1	3.3	1	3.3	28	93.3
Game/Wildli	19	63.3	8	26.7	3	10.0

Source: Field Survey, April 2008

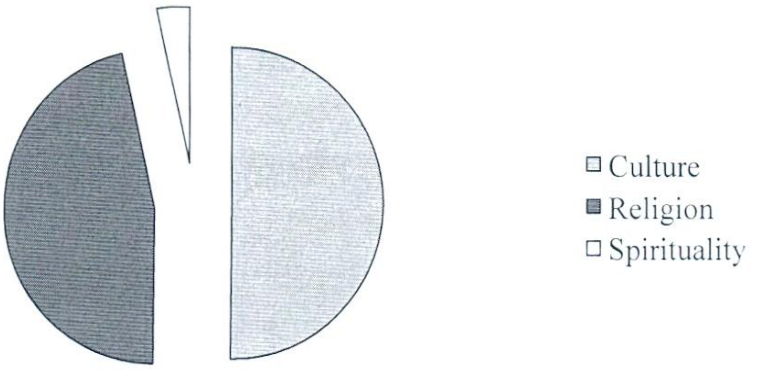
4.7 Cultural Influences and Natural Resource Management Practices

In the Upper West Region, influences on the natural environment may be perceived to be part of interplay of factors including those of traditional institutions which together form the regulatory mechanism and the farming practices.

4.7.1 Influence of Traditional Institutions

As noted earlier, traditional political institutions have oversight responsibility for managing natural resources within their domains. They do this in collaboration or with support from other informal local structures such as soothsayers, sorcerers, diviners or rainmakers which may exist as an individual or a group. It was widely agreed by the respondents that these traditional institutions are able to influence the way communities approach and manage their natural resource as only 30% of the respondents held a contrary view. In the course of the data collection and later during the analysis, the areas of weak institutional control by traditional authorities were found to be around Wa and Charia where at the time of the study there existed Chieftaincy disputes. The absence of an established traditional authority system accounted for perhaps poor compliance of traditional rules bordering on natural resources within such areas.

Figure 4.4: Socio-cultural Perceptions and Natural Resource Management



Source: Field data, April 2008

Traditional institutions create and use the existing social, political, economic and cultural environment to establish their hegemony over their subjects. With respect to natural resource management, cultural values, religious beliefs and spirituality sometimes couched in well structured mythologies are used to instill discipline and fear on people on how to relate with features of the natural environment. In an effort to ascertain the relative importance of culture, religion and spirituality, 50% of the interviewees said that it is the culture that influence the way they relate with and use natural resources than anything else. Only 3.3% of the respondents observed that it was their spirituality that influences the interaction with natural resources whereas 46.7% said there were being influenced by their religious beliefs. From the in-depth interviews and focus group discussions it was realized that generally, issues of spirituality, religion and deeply rooted cultural values are almost inseparable in the unadulterated traditional cosmologies of community people in their day-to-day living. On the other hand, both Christians and Muslims are always quick to separate and distant themselves from perceived negative traditional and cultural practices even though these may hinge on spirituality within the individual or group of people. Sometimes they brand them as mere evil or satanic. Thus, among the vast majority of Dagaaba and Wala, influences of Christianity and Islam have

led to an eventual collapse in systems for protecting and conserving natural resources to meet the overall community need.

An essential and common belief system that link people's behaviour and reverence to natural objects is rooted in the notion of the existence of dwarfs. Dwarfs are referred to as *kontoni* or *kontome* in Dagaare, *kontomo* in Sissala and *kontonhi* in Waale. From the questionnaire, only 46.7% of the respondents believe in the existence of dwarfs. Out of this, 33.3% were able to link the existence to natural resources and also noted that this belief influence the way they often use natural resources.

4.7.2 Influence of Farming Practices

The field survey shows that 25 out of the 30 respondents had farms from which they produce crops and animals. From this number 19 representing 76% of those who had farms were engaged in it as their major occupation. The rest of the 24% of them farm to supplement their main livelihood sources. It was realized that 16 (or 64%) grow more crops presently compared to the past mostly because they want to spread their risks due to the difference in the climatic system today compared to the past. All the farmers confirmed that less of tradition crop varieties are planted now as a result of the vagaries in the weather patterns over the years. Consequently, survival has gained grounds over all other issues of culture and spiritual considerations in the cropping systems and patterns. According to the Regional crops officer, Wa, some traditional varieties encountered in the field during extension work are cropped not just because of the food value but because farmers believe that they scare evil spirits from entering and causing damage to their farms. Such crops also are mostly used to meet some cultural needs during occasions of ill health, death or when one is orphaned. Popular among these local varieties was Kerstin groundnut (traditionally called *songsogli or sinsuoli*in Dagaare).

Except in the case of one respondent, all the interviewees keep some livestock but only about 17% of them do so because of spiritual reasons. It is probable that this number is part of the traditional worshippers who would often have to sacrifice to the gods, ancestors or the spirits for various reasons in their daily life. In most African worldviews,

keeping local livestock breeds may be synonymous with certain aspects of a people's spirituality as some tribes such as the Massai of East Africa tend to derive inner satisfaction from keeping cattle. Similar examples are cited from the Xhosa in South Africa by Cocks (2006). Generally, however, it came out that many people (76.7 %) are only able to keep fewer livestock now than in the past and these are mostly improved breeds as indicated in Table 4.8. For all those who kept both local and improved livestock breeds, the number of improved breeds was assessed to be more.

Table 4.8: Type of Livestock Breeds kept by Respondents

Kind of Breeding Stock	**Number of Respondents**	**%**
Local	5	16.7
Improved	20	66.7
Mixed (or Both)	4	13.3
Not Applicable	1	3.3
Total	**30**	**100.0**

Source: Field Survey, April 2008

Fire is commonly used by farmers for various reasons in their fields including land preparation. In an interview with one Elder of the Dagaaba, it was mentioned that fire is generally regarded as a spirit. Apart from domestic uses, fire was used by the gods to punish wrong doers by burning them to death, destroying their farms or livestock or even destroying their home or village. The exact cause of fire therefore was always investigated from the soothsayers or diviners. Fire is associated with the rain god *(saa-mwin* in the local parlance of the Dagaaba people) in the form of thunder and lightning. Among the social houses of the Dagaaba, the *kpielle* are associated with this god. They refer to themselves as *saa-biiri* which means children of the rain god and often act as intermediaries between the rest of the community people and the god. When lightning strikes someone in the village, they are normally the first point of call to 'calm the nerves' of the god, their father. From the oral accounts of the Dagaaba, anyone who swears by the rain god and later wants to reverse this deed requires that fire is used by people from the *kpielle* clan to undo it. Water is then poured to cool the forces of the rain god. Thus, in the traditional cosmology of the Dagaaba as a people, rain is perceived as a combination of two opposite forces-water on the one hand and fire on the other. Whereas water is used for purification and also to calm down situations fire is

traditionally used as a symbol to punish. Apart from its spiritual undertones, fire is used by farmers to achieve diverse objectives during their working hours on the farm. From the questionnaire, all 19 farmers interviewed use fire on their farms for purposes some of which are shown in Table 4.9.

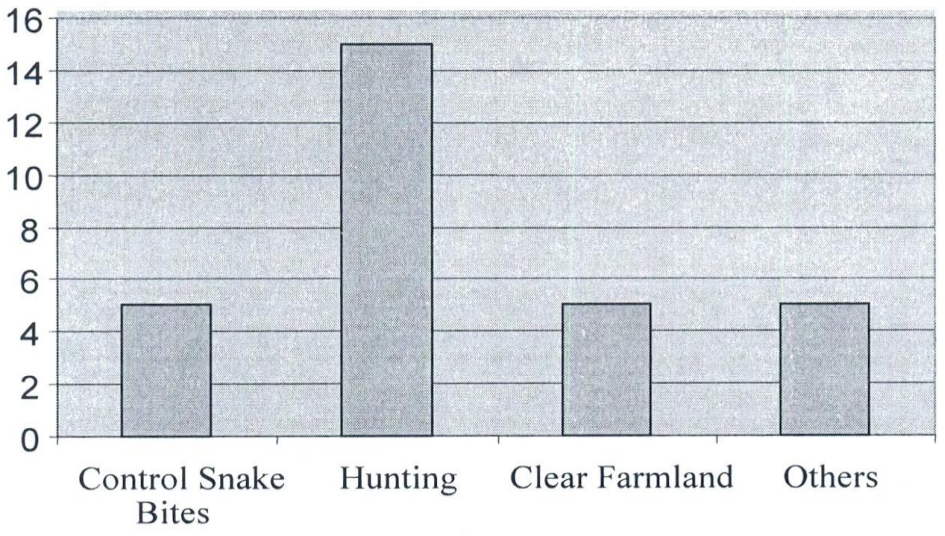
Table 4.9: Purposes for which Respondents use fire on the Farm

Purpose	Frequency	Percent	Valid Percent	Cumulative Percent
Cook food	2	6.7	6.7	6.7
Burn crop residue	4	13.3	13.3	20.0
Clear new farm	5	16.7	16.7	36.7
Cook and burn crop Residue	3	10.0	10.0	46.7
Cooking and Clearing of new farms	1	3.3	3.3	50.0
Cooking, burning and clearing	4	13.3	13.3	63.3
NA	11	36.7	36.7	
Total	30	100.0	100.0	100.0

Source: Field Survey, April 2008

As shown above, the most popular reason is that fire is used to clear new farm. Other important reasons include burning of crop residue after harvest and the combined effects of cooking, burning crop residue and clearing of farms to begin new cropping seasons.

Figure 4.5: Reasons for Bush Burning Activities



Source: Field Survey, April 2008

As shown in figure 4.4, hunting was found to be the main cause of bushfires in general. Other causes are shown in Table 4.9. The fact that farming ranks second to hunting suggests that the activity is largely controlled among farmers. It therefore would appear that fire from hunting activities rather than farming is largely responsible for natural resource depletion in the area overtime.

4.7.3 Influence of Spiritual Beliefs

One area where traditional institutions explore to exert influence on natural resource management systems is through the promulgation and exaltation of the spiritual realm and the forces of nature. These are sometimes used to mystify trees or groves, water points, land or rock or stone and also animals as basis to protect and conserve or impose limits to their uses.

Trees and animals are popularly known to be host to some natural and spiritual powers. Out of the respondents, 56.7% of them know that there are trees within their cultural environment that are believed to serve as host to spirits. Popular trees in the list were baobab (*adansonia digitata*) - 23.3%, kakala or kpakpalaa-13.3%, gozan or zizanna-

10.0%, nim-3.3% and ebony *(diopgros mespoliformia)-6.7%.* From the interviews with key informants and focus groups it was realized that this knowledge guides the behavior of people and tends to impose some limits on the way people harvest wood. Opinions on the nature or kind of spirits these trees (good or bad) hosted were rather mixed. Among 10% of the interviewees these spirits are mostly the bad type and as such they could cause harm to people who encounter them in their host environment. According to 46.7% of them, both good and bad spirits are hosted but the specific kind could only be detected through soothsayers and diviners in case one has cause to know. On another hand, however, 43.3% could not tell because they do not have any idea of the relationship between trees and spirits. Some of the uses of the trees which are known to be associated with spirits include food, medicine, fuel and sacrifices. In 23.3% of the time, respondents noted that trees known to be hosting spirits may be felled or harvested sometimes with or without sacrifices. What this implies is that the mere association of a tree to a kind of spirit does not necessarily lead to its protection or conservation.

Tabooed species of both plants and animals are generally not common these days. It was acknowledged among only 26.7% of the respondents that their tabooed species are still common within their socio-cultural environment. This notwithstanding, there exist no conscious efforts by the any social house to initiate measures to protect, conserve or regenerate their lost taboos to maintain that natural intercourse between them and mother nature. Indeed, it appears the major issue is how to deal with conflicting rights in order to exercise control over natural resources within the general cultural milieu, particularly under conditions of heterogeneity. Common among this category of taboos are the red dove, crocodiles, squirrels and monkeys/baboons. It was observed that 73.3% of the respondents do not see the animals or trees they taboo to be common within their locality these days. This implies that over the years, species of animals and/or trees that are the taboos of community people have become increasingly scarce. According to the Chief and his Elders in Naawie village, *'the absence of vegetation cover accelerated by rampant burning of the bush and an ever increasing incursion of man into the natural environment for food to meet the demands of the growing population has pushed wildlife far from man to the extent that some of them cannot be seen any more'*. Perhaps, one

reason is the fact that no conscious plans or efforts were ever initiated by any community to protect the life of these animals especially those that social houses tend to relate with.

In the survey, some people were able to link some game and wildlife species to spirits. For example, 33.3% of the responses linked animals such as the python and "bush cow" with capabilities of spiritual powers because they believe that they are spirit media themselves. Beyond the questionnaire, these views were substantiated with similar examples in interviews with herbalists, some elders knowledgeable in the history of their communities as well as the discussions with the focus groups. However, there were mixed opinions as to the type of spirits that these animals possess. The significance of such animals can be found either in terms of their food value, medicine, fuel and sacrifices.

From the field surveys, it was realized that people did not need to have spiritual powers to be able to kill any of such animals. Hence, the perception of the capacity of an animal host spirits does not guarantee that the particular species will be protected or conserved. This is because anybody can trap it for any purpose. Like trees, 63.3% of the respondents noted that their taboo animal was not common in their cultural environment.

4.8 Community level Institutions and Natural Resource Management

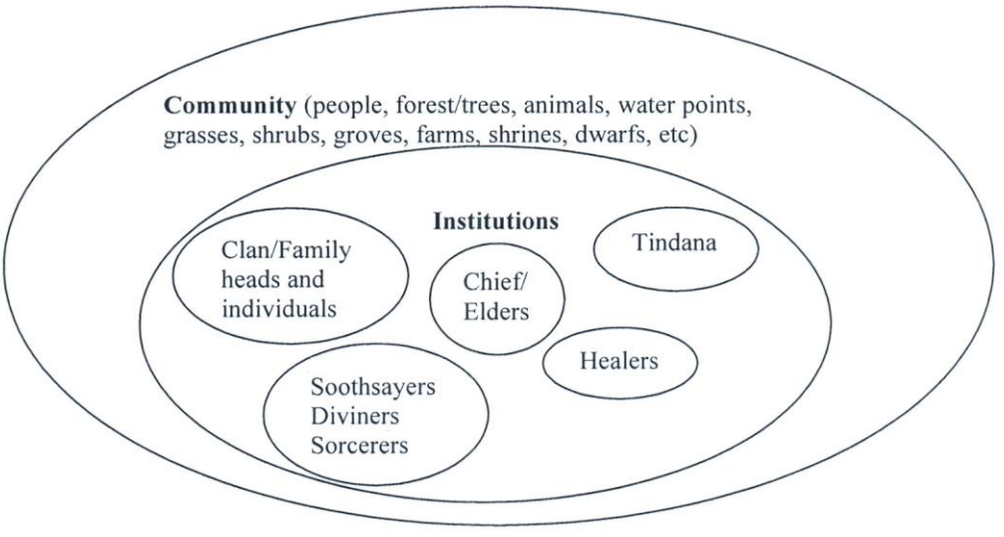
All communities are made up of institutions of various kinds to serve different needs of community people. According to Laudon (1985) an institution may be defined as a set of widely shared values and interests pertaining to areas of strategic and social importance. These values and interests are served by specific organizations through the allocation of status and roles, and they are internalized by individuals or groups through lengthy socialization carried out by organizations or communities. Some distinctions have been made between different types of institutions to the extent that those that are co-evolved and by indigenous people to suit their own needs have become widely known as 'informal' institutions. Thus, indigenous communities consist of 'informal' institutions made up of structures which allow them to govern their own affairs in culturally

acceptable ways. These institutions also serve as reservoirs or repertoires of the local people's worldview, cosmovisions, traditions, and histories which they transmit to generation to generations either through apprenticeship, folktale, stories, songs, proverbs, arts and culture.

According to Hodgson (2006) informal institutions are made up of substantive aspects such as organizational routines, collective memory, and other aspects of the institution as a social organism. They store and support both tacit and explicit knowledge of which those of the past becomes accredited in the customs and traditions of the people. Within the context of the Upper West Region, there are different structures within communities which together function as informal institutions. These institutional arrangements exist in different clusters among the Dagaaba, Sissala and Wala people although they tend to perform similar functions in terms of NRM. In terms of NRM, these distinctions of clusters as illustrated below are based more on the functions or role performed by the cluster rather than the mere name of the cluster itself

Among the Dagaaba, there are five distinct informal institutional clusters for the local administration of communities and available natural resources as illustrated in Figure 4.6.

Figure 4.6: Informal Community Structures for Managing Natural Resources among the Dagaaba



Source: Focus Group Discussions, 2008

As shown in the diagram, the community is perceived to be composed of the people themselves, land, forest or trees, animals, water points such as streams, ponds, rivers and wells, grasses, shrubs, farms, groves, shrines, dwarfs and other supra-human including spirits. In all the oral traditions, it is believed that spirits can manifest themselves by assuming the form of natural resources such as land, trees, animals or a water body. To be able to identify which form a particular spirit has assumed requires the competences of gifted people like the sorcerers and diviners. It can also be done through consultations with soothsayers. The manifestation of spirits in the form of natural resources gives credence to the imposition of restrictions on the utilization of such natural resources. Generally, soothsayers, sorcerers and diviners play a significant role in the drafting of these restrictions. They help to identify the active and inactive periods as well as the likes and dislikes of a spirit and hence it becomes a medium for restrictions to be imposed. It also helps to create avenues for sacrifices or pacification rites to be made.

From the diagram, entitlements and management of community natural resources are in the hands of people who are socio-culturally and spiritually differentiated. The hierarchies may be determined from the type of issue one may want to examine. It also has its own internal differences as one moves from one locality to the other. The family of the Tindana is generally observed as that group of people who are the original settlers of the village. The Tindana defines the boundaries of the community and hence the natural resources within such confines remain the prerogative of him and immediate family. They also define resource rights and can sometimes bequeath ownership rights to other people. Generally, the Dagara have to take into account their relationship with their human, physical and supra-human neighbours. Without attention to any of these vital relationships could mean that one can build a house and never live in it peacefully (Tengan, 1994). Before the Dagara first contact with European, anyone seeking to build a house in any community has to first contact the Tindana. Tengan (1994:6) asserts that:

> *as the first settler of a place, he must have discovered the likes and dislikes of the particular Tengan such that he has been able to live peacefully on it till now. It is he who shows (...) where to dig out the soil (...) some drinks may be offered to the (...) ancestors on the spot and offer any piece of advice (...) to the new-arrival with regard to how to live in harmony with the land.*

With respect to land resource management, the participants in the interviews observed that the power and authority of every Tindana within the culture and traditions of the Dagaaba is very significant because he is not only regarded as a resource owner but also a spiritual mediator within his jurisdiction. Land generally may be viewed as an embodiment of other resources - forest/trees, water points, farms, habitats for both humans and animal as well as the sacred natural sites (SNS) of the community. Consequently, the plot that person obtained within the settlement from the Tindana to construct a place for habitation also usually include a 'midden for cultivating vegetables and some maize' (ibid). This was then later followed by the off-settlement or bush farm meaning an extension limited rights to natural resources from the immediate environs of the household or compound to those of distant farms. In both cases, such a person was also given the right to managed the trees as well as where and when to go for water and

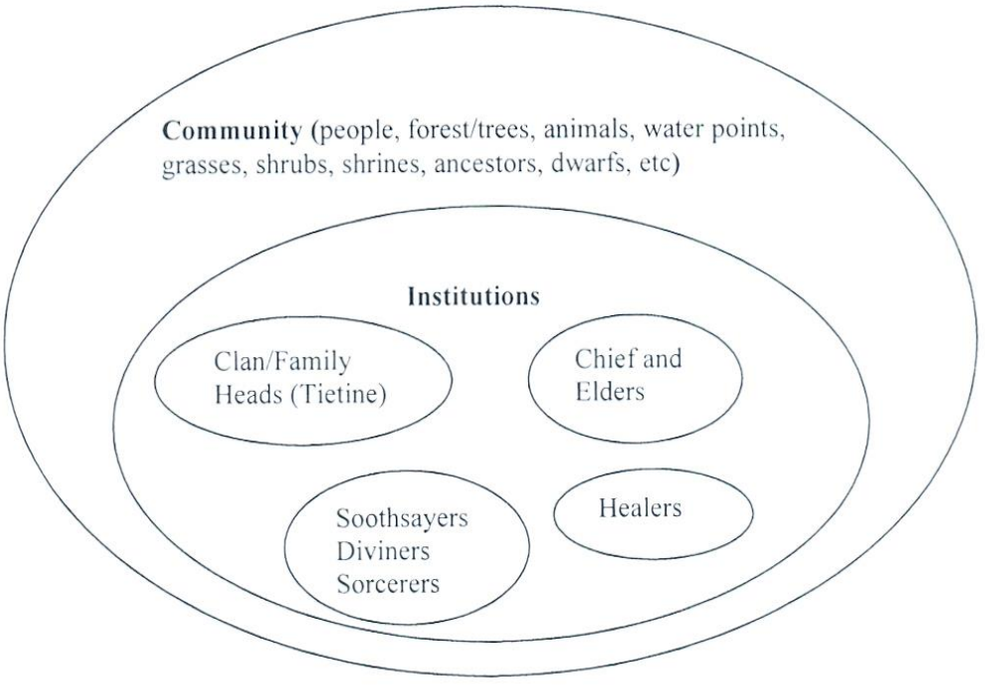
the kinds of game and wildlife to hunt for meals. Any abnormality or bad conduct was to be reported immediately to the Tindana on one's volition before it gets to his realization. In this way, the Tindana is able to exert a tremendous amount of power over his community members on how to use natural resources. As communities grew over time, some of these rights became bequeathed to clan or family heads and in much recent times to even individuals. In some of the communities, settler groups are made to know the totem of the Tindana and his social house. As a sign of respect, therefore, these settler families restrict themselves not to extract totemic species. Even when they wish to use it as food, it is very limited and sometimes done in secrecy.

The Dagaaba like many other cultures belief that the gifts of the spirit by God Almighty to each single person born is never the same. Throughout the interactions in the field, it came out that some people are gifted to see beyond the physical or natural. Such people are able to see beyond the present and to tell the future in various ways including some manipulations of the forces of nature and going beyond them to offer remedies. These different talents in communities include soothsayers *(locally referred to as bagr-bogre or bogr-bugro),* diviners (or *niminyere or kontonnir/kontonnie)* and sorcerers *(suoba/suobo).* There is a great role played by this category of people both individually and as a collective group. According to the narrations by some Dagaaba Elders, sorcerers and diviners for instance can tell about the presence of spirits and even the kind of natural element that it uses as a habitat. Some of them are also spiritually connected to some tree and/or animal species and hence regulates the way such people relate with it.

In terms of the management principles or mechanisms both the Sissala and the Wala are traditionally not operating a different system from that of the Dagaaba. However, the administration of their communities and for that matter NRM are carried out using four cluster with some modifications. In the case of the Sissala, the prominence of the Tindana (totina) as in the case of the Dagaaba is somewhat fused with the cluster of clan/family heads. According to one informant in Lambussie, unlike the Dagaaba, the Sissala do not have a single person who exercises an overall control of land and other natural resources within the village. Rather, there are many farm or land owners who are collectively called *tietine* (singular: *tietina)* meaning land or farm owners. They exist more or less as a

council to administer on land issues and also oversee natural resources within their area of control. Within this council is one who presides and he is called the *totina.* The totina leads in the performance of sacrifices or any purification rites within the village including performing libation

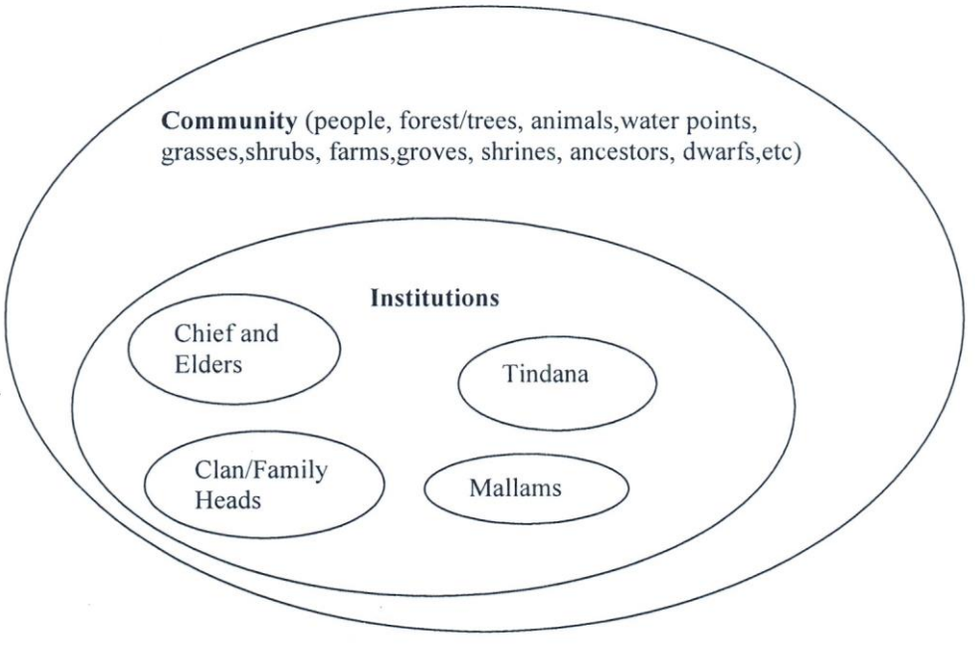
Figure 4.7: Informal Community Structures for Managing Natural Resources among the Sissala



Source: Focus Group Discussions, 2009

Like the Sissala, the Wala also have a four (4) cluster community arrangement for managing land and natural resources. The discussions with the Wala, however, revealed some distinguishing characteristics from that of the Dagaaba and Sissala as illustrated in Figure 4.8.

Figure 4.8: Informal Community Structures for Managing Natural Resources among the Wala



Source: Focus Group Discussions, 2009

From the figure above, prediction of the future, consultation for healing and divine blessings as well as casting away bad spirits are the roles for Mallams. Thus, it stands arguably that the roles of healers, soothsayers, diviners and sorcerers in the case of the Dagaaba and Sissala have been annexed to that of the 'Mallams' among the Wala due largely to the Islamic practice. An interviewee told me that a Mallam simply means a leader or teacher. From the discussions, it came out that beyond leadership and teaching Mallams tend to play several other roles. In fact, according to one Elder, two kinds of Mallams can be distinguished-the Scholarly Mallams and the 'local' Mallams. The Scholarly Mallams are those that are learned in the Quran and can use this knowledge of the Quran to predict the future, prescribe solutions to problems and also provide healings which fundamentally is the role of the latter group. From the discussions, it appears that

any Muslim Wala with the ability to provide healing of any kind in the community qualifies to be called a Mallam.

4.9 Indigenous Knowledge Systems in Management of Plants and Wildlife

Traditional knowledge systems are vital for the survival of every society within its own environments. Indeed, it is usually such knowledge which provides the basis for entitlements by differentiated actors (Agrawal and Gibson, 1999; Leach, Mearns and Scoones, 1997). It also enables people in local communities to identify resources and products that are vital for their sustenance (Oduro and Sarfo-Mensah, 2007; Tabuti, 2006; Gadgill *et. al.,* 1993; Kendie and Guri, 2006). Ntiamoah-Badu (1987:4) asserts that *"language, art, philosophy and social structure in Africa are also strongly influenced by their association with wildlife. This is demonstrated in folklore, proverbs, names and symbolism.* "In the Upper West Region, this knowledge can be said to cover all other NRs. The indigenous people of this area, for instance, have adept knowledge entrenched in their traditional cosmologies and practices which allow them to determine and distinguish between different NRs and identify the essence and uses them. This knowledge combined with other ethno-botanical, ethno-veterinary, ethno-zoological, traditional medical and spiritual requirements all become the basis upon which indigenous people can prescribe varied and numerous conservation or protection measures for natural resources.

Communities have put in place varied measures that safeguard the locally available resources. Among the Dagaaba, Sissala and Wala NRM has found expression in many different ways. Belief systems such as totemism and ancestorcentrism, taboos, folklores, proverbs and other forms of symbolism provide avenues for local community institution to imprint the values and norms on the minds of people through processes of socialization. In fact, they were prominently featured in the interviews and focus group discussion with some variations across cultural barriers.

Among the Dagaaba, numerous animal and tree species including some non-living objects such as 'empty bowls or empty calabashes' exist as totems of many social houses.

Tengan (1994, 1997) observed as many as about twenty five (25) different totems for the Dagaaba of double descent around Lawra and Nandom. Some of these which feature from the data compiled from the questionnaire and interviews include the monkey, crocodile, python, squirrel, leopard and red dove. These offer a potential for protection and conservation of these resources. For the Dagaaba, the social protection rules regarding these natural resources is built on a logic of some sort of reciprocity whereby the history of many totems are linked to various kinds of protection that they offered their ancestors sometime in the past and hence the need to also protect them. Similar, stories exist among the Sissala and also the Wala. Unlike the Dagaaba and Wala, however, the narrations among the Sissala are much more vivid and date beyond the era of the slave raids. At the same time they go beyond the protection of trees and animals to include land and water points as SNS. The Wala on another hand have also extended Islamic practices into their traditional cosmologies and totemism. The various cultures give different attachments and meaning to different types of natural resources, namely, trees, wildlife, water, land and fire, within different contexts. As a result, there exist diverse ways knowledge and understanding about natural resources and this impinges on the way(s) in which these resources are managed by people each in the area.

Box 4.2: An Oral Account on Management of Trees among the Dagaaba

When the hunger was eventually over, our great grand parents thought it wise to impose some restrictions on the food trees in particular by imposing various restrictions on them. For food trees such as dawadawa, baobab and shea restrictions which took the form of oaths or vows invoked by the traditional Earth Priest or Tindana were used to govern all food trees. Some of them were mystified to put fear into people and this worked. Taboos were placed on others while some were also restricted from being cut except after the fulfillment of certain rituals by the Tindaana. These restrictions have since remained and the Elders continue use them and to mystify, any of such trees whenever they perceived it to be endangered. It is these restrictions which have become the governing principle for local management of trees. (An Interview with Mr. Ferah of Lawra-Yikpee)

4.9.1 Forest/Tree Management

Forests/Trees are generally perceived to be abodes for spirits or gods (Oduro and Sarfo-Mensah, 2007). This view point cuts across the different cultural-linguistic groups of northwest Ghana of which the Dagaaba, Sissala and Wala are not an exception. Although

some distinctions may exist, the principles guiding the management of forests or trees depend on the traditional cosmologies of the people as expressed in their totems or taboos, myths and/or spirituality as well as ideas about their sacred natural sites including rivers, groves, shrines and ancestorcentrism. Among the Dagaaba, there are some trees or plants that are tabooed some clans or social houses. It, however, appears that such social houses are in the minority and their actions impact on just few trees locally known as *kadazugr or kalinzugr, vaga/vogaa* and *kontuo.* The practice of having trees as totems of patri-houses was not found among the Wala and Sissala. A rather widely spread practice is the situation whereby some myths or spirituality is created around particular types of trees. This was more profound among the Wala and Sissala than the Dagaaba. It was observed that traditional values regarding natural resources are strongly upheld among the Sissala than the Wala and Dagaaba. Among the Sissala myths are created around trees such as baobab and Ebony. It is widely believed even among the Dagaaba and Wala too that baobab trees harbour some spirits or gods. Similar sentiments are also expressed about the ebony tree. Where there are contested land issues, an ebony stick is used to peck the piece of land in contention by the party that believes that he/she is the true owner of the land. Culturally, the Dagaaba say that the party that does not own such a land but tries to remove such an ebony peg would die. The Sissala are very peculiar in the way they associate trees with myths and/or spirits. In areas around Lambussie, any tall tree by a compound house be it an indigenous tree or not, is believed to be an abode of spirits and hence tabooed to fell. Such spirits may be good or bad. No special reasons were given for this belief as the respondents could not go further to assign the rational. But the Sissala generally, celebrate the final funeral rites of very elderly people through what they called *gualla.* These rites mostly draw crowd from all around the area to sing, dance and make merry. It is conjectured that these myths about tall trees by houses is intended to protect such trees to provide shade for visitors during the *gualla.*

Another way through which indigenous people manage trees is recognition of certain designated areas as sacred natural sites. Such trees may exist as groves or protected covers of shrines. The Dagaaba usually talk about the *tengan-tie* (Earthly Tree) or *tengan-tug* (Earthly Grove). Every *Tengan-tie* or *Tengan-tug* serves as protected covers

for the *tengan-kuur(i)* (or Earthly Stone) which symbolize the unity and autonomy of every community. These are sacred places believed to be the abodes of the gods or the land and/or the ancestral spirits. Trees in such areas are forbidden to be cut and offenders can face very grief sanction from the Tengan-sob or Tindana. Sacrifices are made at this point on annual basis by the Tindana of every community. These sacred sites also serve as locations for the Earth Priest or Tindana to invite the gods and ancestors to witness the beginning of new rules or codes of conduct for the community people and their accompanying sanctions. It is the point where they swear and invite the gods to sanction or expose any wrong doers who put the name of the community into disrepute. Similar practices exist among the Sissala but in the case of the Wala much of it tend to come under the cover of Islamic practices. Apart from those trees or groves that harbour the *tengan-kuur(i),* there are instances across all locations where groves exist and play some cultural significance and protect the specific sites as well. In some cases, such groves are by natural water points such as streams or rivers, ponds and wells. In such events, it is probable that the logic and mythologies that restrict cutting of the trees are also intended to protect the water body.

The belief in ancestors also creates another opportunity for indigenous people to manage trees. In the Dagaaba tradition, every ancestor in the community is represented by a special wood carving in the family house. From both focus group discussions and key informant interviews, it was realized that not every tree qualifies to be used to carve the ancestors. There special trees for this purpose and these are forbidden to be cut for other purposes. Accounts pointed to trees locally referred to as *saalzie, saalguoh, saal-duorpireh, kankyel-tie and taan-tie* as those that are mostly used. According to Mr. Ferah, *'the particular type to be used for a particular ancestor is usually determined through soothsaying. (...). Where a taan-tie (or shea tree) is suggested and used, it means that the particular ancestor stands no chance of being upgraded to a full ancestor'.* This could be due to reasons that otherwise nearly disqualified the deceased to become an ancestor.

4.9.2 Game and Wildlife Management

Like forests or trees, different cultures have established intricate relationships with different kinds of animals in the wild based on diverse experiences gained overtime. Most of the relationships ultimately forbid certain clans or patri-houses from eating such animals that are associated to them. As a result, the animals become taboos and regarded as totems. Animals as totems are more widespread in the study location than trees or plants. The totemic phenomenon is also more profound among the Dagaaba than the Sissala and Wala. There is however some semblance between totems and the history of totems among accounts of the Dagaaba and the Sissala. For instance, the crocodile, monkey/baboons, python, leopard, vulture and squirrel are taboos of some patri-clans of Dagaaba and also Sissala. From Dagaaba accounts, it appears most of these relationships were evolved and enhanced over the period of the *bong* or slave raid. Although similar references are made with respect to the Sissala and their totems, some Sissala accounts depart significance from the history of slavery and how it led to the establishment of such intricate relationships between humans and their non-human counterparts to providing some insightful details on these relationships. For example, the people of Samoa taboo to the monkey because they claim it is their non-human relative or totem. According to the oral tradition of the people of Samoa, there existed two brothers who were farming together. But the younger of the two brothers was very lazy and never liked to do any hard work. As a result, he always found an excuse to dodge work on the farm. One day, while on the farm, he excused his brother to go to toilet behind some nearby grove. Upon long periods of working and waiting for him, the other decided to go and find out what was happening. When he went behind he did not see his brother except a monkey that was sitting there. He called but never got a response. He was not to be found again and upon consulting the elders and the gods, they were told that it is that lazy brother that turned himself to a monkey. The people since then have regarded the monkey as their brother and are forbidden to eat it.

The Wala have few of wild animals as their totem. Most of the animals they taboo are due to Islamic laws. But most of them claim that from their ancestral history the red dove is their totem. Among the Emoala/Ewaala-another social house of Dagaaba mostly

found in Charia and other fringe communities around Wa the red dove is equally a taboo to eat.

Generally, it appears that regardless of the historical accounts to establish relationships different animal stock based on some logic that tend to restrict the way people will hunt and kill these animals to satisfy their needs. Certainly not all species of animals within the environment were usually covered by the belief in totems. There were also restrictions and rules guiding the way in which people can hunt game. Periods for hunting activities are decided by the Chief, Elders and the Earth Priest. There were times that the activity was banned and usually an announcement was made to lift the ban on hunting. The story of my informant in Lawra, continues in Box 4.3 as:

Box 4.3: An Oral Account on Management of Wildlife among the Dagaaba

In the case of animals, there were rules for hunting. These were such that they ensured sustainability or continuity of wild breeds. It was prohibited for any hunter or group of hunters to kill young and pregnant animals. Like trees, there were myths and stories created to ensure compliance and sanctions were also prescribed for offenders. For instance, it was the belief that women who eat the meet of pregnant game would die during delivery when they got pregnant. Hence, the purpose of killing pregnant animals especially large animals during hunting was in a way limited It was also somehow a mechanism for monitoring and tracking of offenders. (An Interview with Mr. Ferah of Lawra-Yikpee)

In the Sissala area, especially around Samoa and Naawie myths and taboos are largely use to complement each other to manage trees, animals, land and water resources. Most of these myths are tales about the great grand ancestors of the people and are often centered on the encounters of these ancestors with other great forces in the past whereby both the physical and spiritual prowess of these ancestors became supreme. Examples of baobab trees represent an ancestor was found in Samoa village and similar others were said to be dotted around other villages.

Box 4.4: An Oral Account by the People of Samoa

The monkey is our totem. We learnt from the traditions of our ancestors that long, long ago, there lived two brothers from the family of the first settlers in Samoa who used to farm together. The younger brother of the two siblings, however, was lazy - he did not like to do any hard work So, this younger brother always found excuses to dodge work anytime the two went to the farm. One day, while on the farm, he excused his elder brother to go to toilet behind nearby thick bushes. After waiting for long hours in vain, his senior brother decided to go to find out what might have been happening to his junior brother but all he found was a monkey sitting there. All other efforts to get his brother proved futile. Upon consultations with the village elders, the ancestors and gods of the land, it was revealed that it was their brother who turned into a monkey in order to avoid hard work Subsequently, the autochthonous people of Samoa have since been forbidden to either kill or eat the monkey because they belief that it is their brother/sister kin. (Focus Group Discussions with Chief and Elders of Samoa on....,2008)

In Naawie village the totem of the indigenous Sissala is crocodile. In this community, there are uncultivated parcels of land designated in the name of the powers of the spirits of their ancestor. These parcels include the *yigbirito* (literally meaning 'stay till sunset') and *bibar* (meaning 'do not farm'). Trees in all these parcels of land are forbidden to be cut. Thus, not only are such pieces of land preserved but also the trees and other natural vegetation are all protected and conserve. It is believed that any attack on the people or any person from Naawie village would be guaranteed safety upon gaining an entry into any of those grounds. This notwithstanding the area served as grazing grounds for the community livestock while providing the needs of the biocultural diversity.

Additionally, there are sacred groves/forests in Naawie which are also prohibited areas for harvesting any wood. For one of them, the oral tradition as narrated by the Chief and his Elders have it that one of their ancestors tried to fell a tree from that site and just when he was almost about to cut it down his axe got stuck in the wood and was so firm that he could no longer remove it from the wood. He went to the village to tell his story to his brothers who then accompanied him to find out what a mystery it was but as they got back there the axe had disappeared and the tree was standing without any wound much to their surprise. It was concluded then that the area must be an abode of a god any tree around there has since been forbidden to be cut. There are several such examples cited in Naawie alone as well as mention of other Sissala communities in the area. This was found to be unique among the Sissala people and it has been very effective for managing

the natural resources in question as already discussed. In fact, traditional natural resource management practices are found to be stronger in the culture of the Sissala who also appear to live in the more biologically diverse parts of the Upper West Region than that of the Dagaaba and Wala.

4.10 Traditional Healing Practices and Natural Resources

Like most African societies, the curative value of plants, wild animals and their by-products in physical and mental illnesses, and also ante-natal care especially among the indigenous peoples of the Dagaaba, Sissala and Waala cannot be underestimated. Until date, areas where access to healthcare is difficult or non-existent, the people rely heavily on traditional medicine based on plants and animal products. These healing practices which vary from physical and psychological to spiritual and have coevolved with the people and their knowledge systems are still surviving though with some eminent challenges.

In the Upper West Region, traditional healers rely heavily on natural resources to provide a diversity of services to their clients. Some of the animal species (parts or whole) which are being used to provide healing to people in the area include the katur and bazuoo. Plant species noted with similar values include lonetie, vuurongtung, *kadazugr or kalinzugr*, *vaga/vogaa, kontuo, saalzie, saalguoh, saal-duopureh, kankyel-tie and taan-tie, gaah*, and *gozang or zizanna* among others. Traditional medical practice is dotted across villages and towns or communities throughout the area. However, these are undergoing some gradual changes because some practitioners are now combining a hitherto more clandestine practice with orthodox. Throughout the interviews with herbalists, they converge that some important medicinal species are either completely lost or are now difficult to come by. In Naawie and Fian, my informants were found to have gained assistance from some NGOs to establish their own cranes where they grow some of the species they need but lack in order to provide all the services that their clients often require. The absences of the species they need were thought to be resulting from frequent bush burning and sometimes over exploitation of the resources by herbalist themselves. It

was noted that though some of them now own cranes where medicinal plants are propagated, there were some other species they claim all effort to propagate them using both the seed and vegetative parts proved futile and so far consultations reports passed through the herbal association have not yielded any results.

4.11 Forest Administration and Interventions in the Upper West Region

The 1994 Forest and Wildlife Policy (FWLP) of Ghana is the principal document from which all the forest management related legislation, strategies, and programmes in the country are derived. The policy is aimed at *'conservation and sustainable development of the nation's forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of* society' (FWLP, 1994). The main objective of the policy is the involvement of all stakeholders for efficient management of the forest resources. Consequently, the FSD is charged with the responsibility of protecting, managing and developing the nation's forests and promote public awareness and understanding to support forest resources conservation at all local levels. In the Upper West Region, the FSD has been building and continues to build collaborative relations with DAs, Traditional Authorities, communities, NGOs and other organizations for effective management of forest resources. It is also to provide effective and efficient finance and administrative services.

There are sixteen (16) forest reserves currently in place in the region. Together these reserves occupy a total area of 938.91sq.km representing about 5% of the land area of the region. Administratively, the activities within these reserves are overseen by two (2) forest districts, namely, Lawra and Tumu which were created primarily to protect the tributaries of the Volta River but have since been observed to serve other environmental functions as well. The activities embarked upon to execute the mandate of the FSD in the region are provided in table 4.10.

Table 4.10: Forest Intervention Strategies in the Upper West Region

ACTIVITY	PURPOSE
Protection	■ Protecting the forest reserves by maintaining their integrities through effective maintenance of the boundaries ■ Engage the service of some of the forest reserve fringe communities in cleaning the portions of the boundaries on contract basis
Management	■ Draw up management plans (strategies and interventions) for effective management of the reserves and their resources
Development	■ Pursue plantation development projects ■ Promote the establishment of individual woodlots
Promotion of Public Awareness	■ Collaborate with DAs, GNFS, and some NGOs to inform, educate and sensitize communities on fire prevention, reforestation, afforestation and the negative impacts of illegal felling of trees
Participatory Management with communities	■ Involve stakeholders in management processes through participation in planning, implementation and monitoring of proposed activities by the FSD
Public Relations	■ Act as a one-stop shop for people to lodge complaints, queries and questions for adequate redress ■ Act as a fulcrum to the collaborative approach to management

Source: FSD, Wa

In an interview with representative staff of the FSD in Wa, it was realized that plantation development in the Region has taken place in both in the form national and government plantation projects in the region whereby the strategy has been two-fold-regeneration planting and planting of degraded lands.

Table 4.11: Plantation Development in the Lawra Forest District (2002-2007)

Type of Project	Location	Period Established	Total Hectarage	Species Used
National Plantation	Kamba Forest Reserve	2002-2007	349	• Eucalyptus • Ceiba • Teak • Mahogany
	Kulpawn Tributaries	2002-2003	63	• Eucalyptus • Ceiba • Mahogany
	Nuale	2002-2007	341	• Eucalyptus • Teak • Mahogany
	Bangwon Bawo	2002-2003	20	• Eucalyptus
Government Plantation (HIPC Project)	Bangwon Bawo	2004-2007	400	• Eucalyptus
	Wa Town Forest Reserve	2004-2007	58.5	• Eucalyptus
Total	All locations	2002-2007	1231.5	

Source: FSD, Wa, 2008

Even though it was said that the FSD pays attention to issues of admitted rights of fringing forests communities, it may be said that this is only limited to core services that they are able to provide to members of these communities with respect to those resources that existed and became part of the reserve area before these reserves were created. It does not guarantee inputs by the community people in the event of any modification of the forest environment such as regeneration planting and plantation development. Hence, the people's spiritually and attachments to forest resources which were not covered by their admitted rights at the time of creating the reserve stand to be lost forever. Locally people are collaborators in the execution of the activities to safeguard, protect and conserve the forests but not in the processes that generate the activities. They are not

consulted in the choice of species for planting both within the reserve and off-reserve areas although there are claims of participatory forest management practices. As shown in table 4.11, development of plantations have all involved the use of exotic tree species which according to most of the local population are not only unknown to them but also are of little value to them because they do neither offer little opportunities for any medicinal uses as well as other cultural and spiritual significance. Indeed, the rationale for the development of plantations is observed *"as the most reliable way of meeting fuel wood needs of the future and also the quickest way to regain extensive vegetative cover taking into consideration the rate of deforestation and desertification* "(Profile of the FSD, Wa, 2008). From the interviews with the staff of the regional office of the FSD, it came out that the approach used by the FSD in plantation development in the Upper West Region is the recommended agro-forestry technology on the modified Taungya system. By this approach selected farmers from reserve fringing communities are permitted to intercrop tree species with a given arable crop for a period specified by the FSD. This is, however, restricted to the reserve portions that are severely depleted and being re-afforested. Thus, the FSD does not provide opportunities for developing and/or enhancing any cultural and spiritual value system which for some reasons are not captured by their admitted rights.

4.12 Role of Ministry of Food and Agriculture in NRM

The Ministry of Food and Agriculture (MOFA) is one state institution primarily tasked with the supervision and development of Ghana's agriculture in order to meet the country's food requirements. In line with this function, MOFA undertakes agriculture extension to provide technical services to farmers in the pursuance of their overall national objective. The operations of MOFA can be set to fall under two basic units, notably, crop services and animal husbandry. At the core all MOFA's activities is biodiversity conservation by working to ensure proper cultural practices both in the development of crops and livestock.

Apart from proper agronomic practices, farmers' production levels depend on several other factors including soil fertility, vegetation and climate. Over the years, appropriate

technology development and application has become a sine qua non in agricultural development and food security. Mr. Huudu, the Upper West Regional crops officer observed although climatic differences across my study sites are non-existent, the region can be divided into three (3) agricultural zones based on soil condition. These include

- Fertile areas - around Wa East and Tumu;
- Moderately Fertile areas - around Wa Municipal, Wa West, and parts of Nadawli and Lambussie; and
- Degraded areas - around Lawra-Nandom, Jirapa and parts of Lambussie and Sissala

This classification corroborates well with those observed from the response gathered with the questionnaire during the field work. Farmers in all these environments still use traditional methods to produce crops and livestock. Presently, there are many environmental challenges confronting farmers due NR depletion and the kinds of cultural practices that have existed overtime.

4.13 Role of District Assemblies in NRM

Environmental issues have become a major developmental issue to both the Lawra District Assembly (LDA) and various stakeholders since the creation of the Assembly in 1998. Under Section 79 of the Local Government Act, 1993, Act 462, DAs are enjoined to enact by-laws in the best interest of promoting local development. A look at the LDA's by-laws on environmental issues since 1998 showed that the existing by-laws in the district were in respect of five (5) main categories, namely, stray animals, construction of kiosk, sanitation, collection of stones, gravel and sand and also bush burning and indiscriminate felling of trees. Be that as it may, it can be gainsaid that the role of the Assembly on environmental issues have little to do with natural resources as 60% of all the categories listed are concentrated on regulating human activities within the built environment rather than the natural. The rest of the 40% of all the categories is split equally between issues relating to the collection of stones, gravel and sand and that of bush burning and indiscriminate felling of trees. These undoubtedly have degrading

effects on the natural environment. Gravel and sand weaning activities generally tend to destroy the habitats of species of fauna by stripping affected areas of vegetation. Similar effects are also triggered by bush burning and indiscriminate felling of trees and the combined impact is that there is loss of biodiversity. Although there are natural resources, it is clear that such by-laws are mostly concerned getting economic returns from extractive activities. There are no conscious plans to apply the revenue generated from fees charged and fine to regenerate these resources especially renewable ones. The result therefore would be that eventually resources of cultural significance stand the risk of being lost.

4.16 Role of NGOs – SUNTAA -NUNTAA

The activities carried out by Suntaa-Nuntaa are part of a desertification control initiative in the administrative region of the Upper West Region (UWR) of Ghana. In the local language, Suntaa-Nuntaa means “Help one another, Love one another.” This for me tells a lot about an organization that is particularly interested in the sustainability of the environment and matters of natural resource management because it is widespread among the indigenous worldviews of the people that people, nature (natural resources) and spirituality are intricately linked.

Suntaa-Nuntaa was set up in 1990 to fight the degradation of resources in the Region, working primarily with rural women. Faced with domestic and farm duties, women are still confined to secondary status in this highly male-dominated society. Women also largely draw their livelihoods from the environmental resource by harvesting wild fruits, leaves and wood among other things in order to eke out a living for themselves, their children and family. Suntaa-Nuntaa’s programmes are very diverse, covering agriculture, tree planting, bushfire control, fodder banks for cattle, improved livestock farming and drama for development. According to the United Nations Environment (UNEP) report (2002), the approach is both demonstrative and participatory. Between 1994 and 1998, women's groups were mushroomed in all the districts of the Region and geared to improve natural resource management in village lands. Drama for development *(see* Box 4.5) plays a vital part in raising women’s awareness, giving them space to express

themselves and find solutions to the problems caused by the degradation of the natural environment.

Box 5: The concept of Theatre for Development

Suntaa-Nuntaa introduced popular drama to convey useful messages that draw awareness to its programmes in the promotion of an agenda for sustainable development. Popular drama is a practice drawn from the theory of Participatory Learning in Action and based on the idea that people get involved first and foremost in the issues that directly affect their daily lives.

Drama performances are given by grassroots communities in order to convey messages related to environmental and resource management. They are inspired by problems encountered by women's group in daily life and follow rather strict rules organization monitored by leaders accepted by the members. Drama performances are often followed by discussions within the community, facilitated by Suntaa-Nuntaa agents to identify thethe major issues raised and solutions suggested.

Drama groups are a vital element in the Suntaa-Nuntaa approach, providing significant leverage to motivate groups to get better organized to manage environmental and development problems and solve conflicts. It also makes it possible to maintain a conducive atmosphere for creativity and inspiration.

Source: Culled from UNEP (2002)

The UNEP (2002) reports that the approach is very effective and replicable as it are inspired by traditional values of sharing and collective action-chena and susu-which have produced very original forms of organization. The report notes that although certain aspects of Suntaa-Nuntaa's actions in the field need to be strengthened, by promoting new attitudes towards natural environment, its use and protection, the NGO has made headway in controlling land degradation and combating desertification.

In an interview with the Director of the project, Naa Bob Loggah, he observed that a major distinguishing factor between the approaches of Suntaa-Nuntaa and other partner organizations that they collaborate with, such as FSD, MOFA, EPA and DAs, is that the project tries as far as possible to incorporate what he notes as *"traditional value systems, the people's ways of knowing, their mythology and spirituality"* into the delivery of programmes in the field. He adds that *"it is these that put fear in the way people relate with the environment on daily basis."* Regrettably, communities are increasingly being

wiped off of these values to the extent that some have disappeared. Contrary to practices that can promote and enhance the development of biodiversity, Naa Bob Loggah noted that practices such as *"commercial forestry, monocropping and use of exotic species for enrichment planting and re-generating of degraded areas"* are not friends of biodiversity. This observation was later corroborated with data from the FSD, DAs and also some aspects of MOFA.

In the savanna area where fires are recurrent and often devastating, bushfire control practices are also geared towards environmental protection. Fires are almost always related to human activities such as slash and burn, hunting, honey gathering and end of year festivities among others. In some indigenous communities of northwest Ghana, fire is perceived as a spirit. In such areas, bushfires are sometimes linked to actions by the gods or spirits. A popular mythology is that bushfires are intended to drive away bad spirits that might have come closer to the village during the rainy season when the surroundings of the community usually get bushy. Suntaa-Nuntaa organizes drama performances by the groups that provide an opportunity to carry clear, precise and focused messages to effectively control bushfires in the area in the most convenient and culturally acceptable way.

CHAPTER FIVE
SUMMARY OF FINDINGS AND CONCLUSION

This chapter presents a summary of the research context and methodology, the research findings and conclusion on the issues of biocultural diversity, indigenous knowledge and natural resource management practices in the Upper West Region of Ghana based on the evidences by the field data.

5.1 Summary

This study examined the issue of biocultural diversity and the use of indigenous knowledge systems to manage local community natural resources among three cultural-linguistic groups of the Upper West Region of Ghana, namely Dagaaba, Sissala and Wala. It considered the ways in which both formal and informal systems function both as separate entities within different worldviews of knowledge and sense making and also how formal and informal institutions operate together to manage natural resources in a more sustainable manner. This summary intends to re-visit the problem that was investigated, the methodology used, the finding arrived at and to highlight some challenges and limitations.

5.2 Methodology

This research was carried out in multiple locations across three (3) cultural-linguistic groups - Dagaaba, Sissala and Wala - in the Upper West Region of Ghana. It was intended to investigate how indigenous worldviews have contributed to the management of natural resources among the different cultural set up and find out the extent to which governmental and non-governmental institutions have taken advantage of traditional value systems to enhance the various approaches that they adopt to ensure sustainability of the natural environment in general and those of biodiversity in particular.

The research was premised on the endogenous development framework. It examined each of the cultural-linguistic groups as a separate case unit using mixed methodologies which combined multiple case studies with small surveys. The case studies used FDGs and IDIs to collect qualitative data whereas questionnaires were used to conduct the surveys which

generated most of the quantitative aspects of the data used. Table 5.1 shows the distribution of the respondents according to the tool or technique that was applied.

Table 5.1: Distribution of Respondents by Gender and Technique Applied

Technique/Tool Used	Number of Respondents		Total
	Male	Female	
Questionnaires	20	10	**30**
IDIs (Traditional institutions)	5	1	**6**
IDIs (GOs/NGOs)	7	1	**8**
FGDs	37	6	**43**
Total	**69**	**18**	**87**

Source: Fieldwork, 2008

As shown above, a total of 87 people consisting of 69 and 18 males and females respectively were engaged in the entire process to collect data in all case study sites. Within each cultural context, this study sought to investigate both the formal and informal systems and structures that exist in each case site to enable people to manage natural resources. It also examined the extent to which the different systems and structures are interfaced as being exhibited by the type of management practices and approaches in place by both the GOs and NGOs on the one hand and the local communities themselves on another.

5.3 Research Findings

The following are the findings from this research on biocultural diversity, indigenous knowledge systems and management of natural resources in the Upper West Region of Ghana.

5.3.1 Diversities in Ethnic. Methodologies for NRM

It was realized that linguistic differences do not constitute a good proxy for determining diversities in local cultures in the area. The basic principles guiding the use of local

community people's worldviews and knowledge systems to manage natural resources is basically the same across the Dagaaba, Sissala and Wala.

It was noted that though spirituality is an integral part in the people's worldviews and their perceptions of natural resources, in many it was not perceived the main driving force guiding the people's behavior and attitudes towards natural resources. From the questionnaire, it was observed that only 3.3% meaning one (1) out of the thirty respondents saw spirituality as a distinct key intra-cultural factor for the enhancement of biocultural diversity and NRM.

However, there are differences in the structural arrangements across all three cultural groups upon which the local communities construct their philosophies and adapt conditions for managing natural resources within their biocultural context. Among the Dagaaba, the structure is in five folds whereas it exist in four folds across the Sissala and Wala. In the case of the latter, the role of soothsayers, sorcerers, diviners and healers are more or less amalgamated into a single unit and annexed as an integral part of the practice of mallams.

Also, traditional people are getting increasingly aware of the dangers posed by the declining levels of their natural resources not only to their survival but also to the sustenance of even their most revered cultural values that have enabled them to endear over the millennia. But it appears they have little to offer themselves. In most of the interview sessions, there were some lamentations about the way modernity and population explosion has constrained the linkage between biological and cultural diversities globally. There is an ever increasing Westernization of local cultures and this appears to be accelerated by a rapid diffusing of most cultures especially the dominant ones across the world. In some instance, it has led to an endangering of other smaller and less aggressive cultures and this will require a firm action to deal with.

Additionally, the collaboration between governmental and non-governmental institutions on the one hand and traditional informal institutions on the other has not been effective in

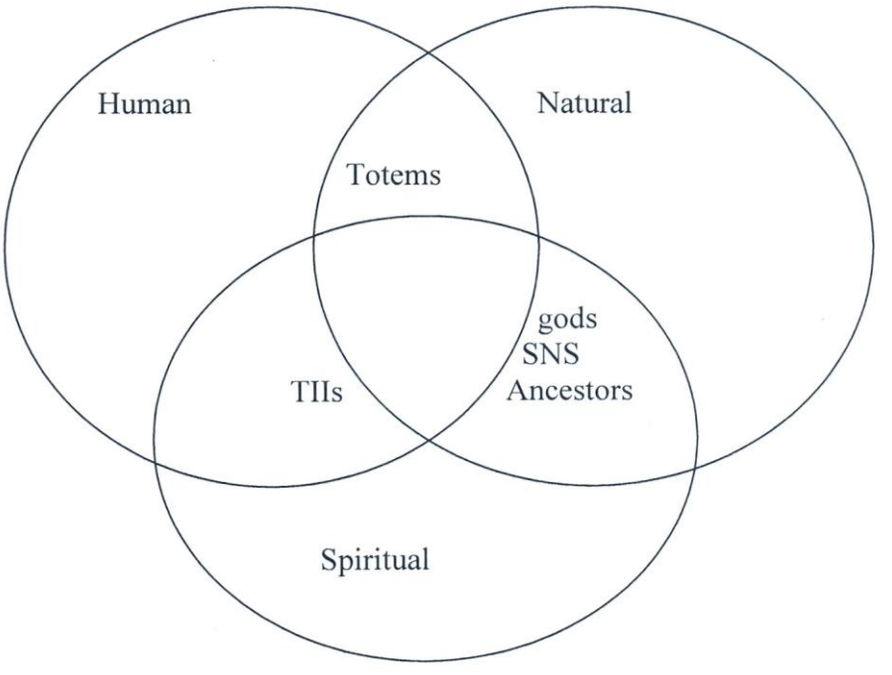
playing a role to enhancing biocultural diversity and natural resource management ideals. Communities are increasingly being co-opted into natural resource management programmes led by the formal sector in the name of participation and co-management. The issue of benefits sharing has become a mere cliché in the entire process as local people tend to gain less both socio-culturally and financially. Their cultural and spiritual needs are mostly less accounted for through the introduction of exotic or improved species into their domain. This also ultimately leads to a loss in the vital local species in both plants and animals.

Generally, formal institutions in NRM are much concern about the aesthetics of the environment, development of the hydrological cycle and long term financial benefits to be derived. They care less about culture and spirituality but they know that recognizing these factors and persuading them are just one sure means to this end.

5.3.2 Endogenous Development and NRM in the Upper West Region of Ghana

Many common-property institutions have proven track records that extend over long periods and generally consist of self-governing associations of local users who manage them (Berkes and Folke, 1998; Bromley, 1992; Ostrom, 1990). Throughout the interactions with research participants in the field, it was evident that the self-governing associations that emerged to manage natural resources in the local communities were generally evolved out of symbolic relationships between people and the rest of the natural environment. Endogenous development framework is premised on a holistic worldview of African worldviews, cultures and cosmovisions. Within the worldviews of the indigenous Dagaaba, Sissala and Wala, knowledge culture and natural resources is complete when it recognizes or embodies three interrelated sides of knowing, namely, the idea of recognizing totems or the totemistic phenomenon, the knowledge of the existence, purpose and working of traditional informal institutions (TIIs) and the idea and roles of the gods, ancestors and sacred natural sites. It is these that explain the entirety of the human, natural and spiritual life of a community people among the Dagaaba or Dagara, the Sissala and the Wala.

Figure 5.1: Indigenous Worldviews and NRM in the Upper West Region



Source: Adopted from Haverkort *et. al.* (2003)

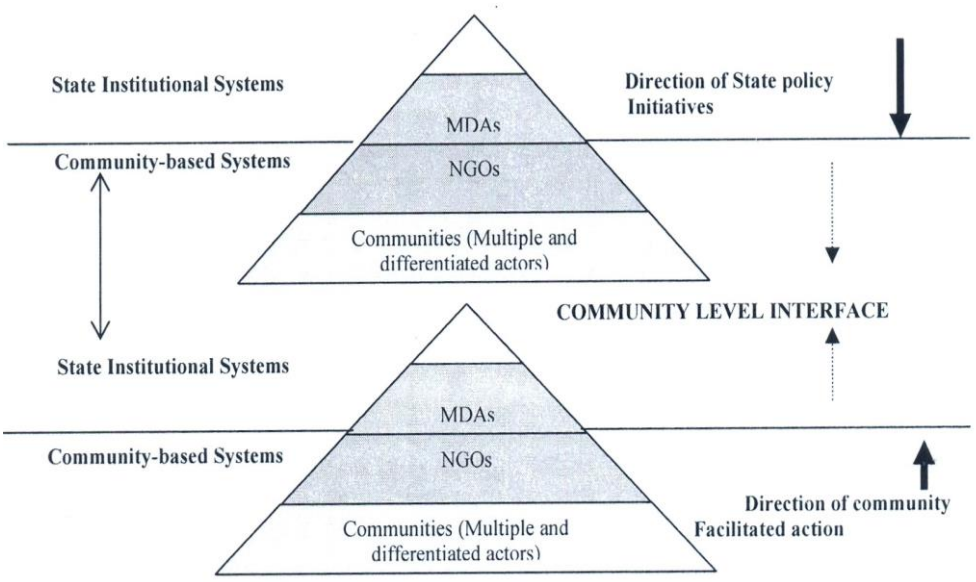
From figure 5.1 above, three (3) out of the total of seven (7) constellations for interpreting African people's worldviews have emerged as critical entry points for interventions into NRM in local communities. These are:

- ***Socio-natural or Socio-physical realm*** where totemism or the totemistic phenomenon pre-dominates;
- ***Socio-spiritual realm*** where traditional informal institutions play a significantly diverse and yet very complementary roles to determine the underlying principles that safeguard natural resources; and
- ***Physico-spiritual realm*** where local community gods, ancestors and other SNS or mediums through which people show their solidarity or reverence and commune with nature and God are widely expressed.

5.3.3 Interfacing Formal and Informal Knowledge Systems for Managing Natural Resources in a Biocultural Context

Although GOs and NGOs recognize the important role of local cultures in NRM management concerns, little is done to sufficiently integrate the core values of these cultures and the spirituality of people into contemporary NRM efforts. A critical look at the roles or functions of formal institutions such as the FSD, MOFA and the Das show that they are still largely top-down in their thinking and approaches to NRM. Most NRM policies often tend to treat local people as if they are just one homogenous group. By so doing they ignore that local cultures define certain roles based on gender and such roles become vital in the way people appropriate natural resources and arbitrate issues of conflict on them. Figure 5.2 suggests that by bringing top management systems into closer contact for purposes of collaborating to design, plan and manage natural resources, NRM institutions can then be able to incorporate community specific cultural values, worldviews and preference into the management regimes and outcomes.

Figure 5.2: Interfacing Formal and Informal Knowledge Systems for NRM



Source: Authors Construct, 2008

Figure 5.1 depicts that two knowledge systems are distinguishable in all the approaches to NRM at the institutional level. These are the state institutional systems which are

usually manifested through the establishment of formal structures such as Ministries, Departments and Agencies (MDAs) and the community-based systems which comprise an amalgam of informal community or traditional institutions and other more formal systems under the control of NGOs or CSOs.

In Ghana, NRM practices reflect an interaction between State apparatuses and those of multiple and differentiated actors including NGOs, CSOs and CBOs at the community level. With respect to the natural environment and NRs, the state usually designs policies and provides guidelines for MDAs to implement and monitors to ensure sustainability of natural resources. Over the years these have been achieved through various approaches and policy frameworks notably, protectionism, conservationism, CBNRM and a resurgence of protectionism as observed by Kendie and Guri (2006). These historical transformations in NRM can be broadly categorized under centralized and decentralized systems. Early approaches to protect and conserve natural resources were highly centralized. The state used legislations to designate areas as protected forests and game and wildlife reserves as a means to protect and conserve natural resources throughout Ghana. These protected or reserved areas are still being managed by MDAs such as the FSD and the GWLD which are primarily responsible for protecting, conserving and managing forests and wildlife resources in Ghana. Government policies in Ghana today remain the single most important source of prescription to legislations with regards to natural resources and the environment. In almost all cases, the building up to policy and the eventual legislations are largely top-down guided by international best practices and protocols as well as the interest of the government in power with little considerations for local cultures which are very diverse in nature. The multiple dimensions of local cultures are less reflective of national laws meant to safeguard and ensure proper management of the environment and natural resources.

Since the 1980s, decentralized natural resource management has been vigorously pursued to reflect the on-going structural decentralization in the governance systems across the world (Ribot and Larson, 2004). Although this transformation became necessary, it has so far failed to synchronize NRM and governance systems and to allow the grassroot to truly participate and make choices or decisions that would lead to a stronger link between

people, communities and natural resources. Under the DAs concept in Ghana, all districts are to formulate bye laws to reflect the local needs and peculiarities in culture. For many years, traditional authorities or local natural resource managers in many communities in northwest Ghana are still continuing to rely on government to take decisions for them to implement. Of course, such attitudes can be viewed in the context that forest fringe communities around Lawra, Nandom, Lambussie, Piina, Samoa and Wa have lived over decades of state imposed restrictions to their own local forests or savanna resources. The Chiefs and Elders in these areas complained that most people especially the youth do not respect the community laws or rules made by them. They attribute this mainly to new religions such as Christianity and Islam that have come into the area. Local population has admitted rights to forests resources within all protected or reserved areas for noncommercial purposes. All commercial uses of natural resources within forests reserves come under law and require permits from the FSD. Felling of trees off-reserve area also require such permits. In an interview with a representative of the FSD in Wa, it came out that participatory community approaches have led to the evolution of co-management practices of both reserve and off reserve areas. The collaborations between the FSD and communities are implemented through the CFCs and the improved taungya system. Primarily, these collaborations are to enhance wild fire management, curtail illegal encroachments into the forests environments and also to provide limited opportunities for food crop production through increased access to land.

In all these processes, high levels of poverty and deprivation remains one major challenge regarding the way people will obey government legislations. Generally, there are no cultural barriers to the adoption of techniques by people to 'improve' their lifestyles even if the long-term sustainability of their resource base is threatened (Redford, 1990; Redford *et al.*, 1990) although they could be holding certain cultural values in high esteem. Despite the intrusion of many NGOs and CSOs with alternative livelihood strategies and sustainable forest/agricultural practices, forest resources are still under serious threat within Upper West Region of Ghana. Thus, the situation suggests that current NRM approaches are still deficient in achieving the sustainable outcome for long term forest management and wildlife management. Hence, the community level interface

for NRM should create a greater interaction and dialogue between community-based system and state institutions. This interface should create space for the use of cultural values and indigenous systems to play a key and leading role in an integrated CBNRM structure that is aimed at devolving NRM issues to traditional authority and only allows the state to play and monitoring responsibility.

5.3.4 Implications of Biocultural Diversity for NRM in the Upper West Region of Ghana

Traditional indigenous communities are changing (often rapidly) due to the impact of socio-economic processes such as the increase in diversification of rural livelihoods and of rural and urban linkages. This notwithstanding, even people who have migrated to urban or peri-urban areas and become involved in modern economic sectors, still to varying degrees, maintain certain cultural practices, including the use of wild resources for maintaining a sense of well-being and identity.

It has been observed that approaches to conserving biodiversity that are based on cultural and religious values are often more sustainable than those based only on legislation or regulation (McNeely, 2000; Cunningham, 2001; Infield, 2001; Berkes, 2001; Cocks, 2006). The recognition of the role of indigenous value systems has greatly contributed to the development of community-based natural resource management schemes (Fabricius *et. al.*, 2004). In the Upper West Region of Ghana, this needs to be re-energized. There is, however, the need to be a little cautious of the uncritical belief in the inherent superiority of indigenous resource use systems for sustainable use and preservation of plant and animal diversity. Amongst the Dagaaba, Wala and Sissala cultures, for instance, there are no cultural barriers to the adoption of techniques to 'improve' their lifestyles even if the long-term sustainability of their resource base is threatened. Such improvement strategies might include the sale of rights to indigenous lands and commercial exploitation of flora and fauna, and invitations to tourists to observe 'traditional lifestyles', among others (Cocks, 2006). Although, communities continue to attach a strong cultural value to wild resources, it should not be assumed that they make sustainable use of these resources. For instance, the continued use of wild medicinal plants has resulted in overexploitation in

several cases as was reported by Mr. Zuwereh in Naawie as well as other healers throughout the process data collection in the field. Some medicinal species have completely disappeared within this eco-zone while many others have remained endangered. Cocks (2006) warns that the continued use of natural resources based on traditional cultural values cannot be maintained if traditional livelihood strategies are threatened due to socioeconomic dynamics and increased rates of commercialization. He notes:

On the one hand, the use of indigenous values and practices of traditional communities is often heralded as a means of biodiversity conservation. But on the other hand, the continued use of such values and practices under more modern conditions is often considered to be detrimental to biodiversity conservation.

Hence, it might be more useful to consider an alternative view taking the dynamics in biocultural values as a starting point for additional approaches towards community-based conservation. Such approaches should not only focus on preserving degraded areas, but also on conserving locally-valued biodiversity in agricultural landscapes. In this way, biocultural values could contribute towards the creation of diversified landscapes which transcend the accepted dichotomy between degraded areas and cultured fields (ibid). Within such local context, local people may purposefully conserve the biodiversity which they value.

Under the circumstances, it is important biodiversity conservation programs in the Upper West Region of Ghana develop awareness campaigns which illustrate the link between cultural and biodiversity conservation as well as the diversity and dynamics of cultural values regarding biodiversity. Biodiversity conservation programs should include a careful adaptation of the multitude of cultural values regarding biodiversity to newly emerging socio-economic conditions. Local communities and individuals as well as conservationists need to be made aware not only of the link between the loss of the natural habitat and their cultural practices, but also of the options for incorporating cultural values into novel biodiversity conservation approaches. Such a strategy can lead

to a far greater success than species-focused conservation approaches which have been largely pursued by governmental and non-governmental institutions or their agencies.

5.4 Conclusion

More recent discourses on natural management advocate for a more pragmatic approach that stresses the practicality and urgency of coordinating local communities and conservationists (Orlove and Brush, 1996). Infield (2001:801) argues that "promoting conservation in the context of local culture would endow protected areas with significance that an emphasis on biological diversity, landscape, or economies does not." Although spiritual norms continue to form the basis for indigenous people to conserve and protect natural resources, the local cultures upon which they thrive have come under serious threat by Western values and much recently the forces of globalization. Overexploitation of natural resources is threatening to destroy the traditional and cultural value systems in many areas which are otherwise valuable for the development and maintenance of a viable biocultural system.

On the one hand, community people's knowledge has been deteriorating over the year due to influences of Western cultures and the annexation of NRM responsibilities by formalized state institutions and NGOs which ultimately ignore and 'subvert' traditional and informal local management systems. This calls for new ways of re-visiting those cultural values of the past that promote good NRM practices within the local communities. On another hand, the problem of spirituality as an integral part of NRM might just be difficult to see through in terms of policy preparation and implementation. Although, Millar (2005) contends that people are converted into their spirituality through birth, experiences built in their life time by public or private practice, this thesis is of the view that further to these are the emotional attachments that people build and give to certain objects, living or non-living, and thereby they tend to derive some inner satisfaction from such attachment. Spirituality is a conundrum. It deals largely with invisible pieces of evidence which are only visible to those gifted in it. Its manifestation may become visible but it has no one logic, even in very similar circumstances. It may emerge as a non-habitual thing in the process of life, although its manifestations may

become habitual-the need to visit the shrine every morning before brushing the mouth, specific or routine visits to the forests or bush at specific time periods, visits to the river sites and watching the water flow while pretending to fish, etc. Spirituality is born out of 'natural love'. These complexities notwithstanding, it is the view of this thesis that sustainable NRM approaches can be achieved from a biocultural standpoint.

CHAPTER SIX
RECOMMENDATIONS

The essence of every research is to contribute to knowledge, policy and practice as well as offering suggestions for future investigations into the subject studied on the basis of the data and the conclusions reached (Kumekpor, 1995; Bacho, 2001). In line with this viewpoint, this thesis makes the following recommendations in order to address the pertinent issues that have emerged from the research.

6.1 An Endogenous Approach to Community Forestry Programmes

So far, community forestry programmes under both the HIPC and Government Projects of the FSD have sort to the use of exotic tree species mostly because these trees are not only fast maturing but also because of the socio-economic and aesthetic values that they offer to the detriment of indigenous trees which offer more diverse uses in addition to those such as eucalyptus, ceiba and teak. Thus, Community Forestry programmes need to be designed and implemented from and endogenous development perspective. The approach should begin with action research into IKS and the NRM needs for local community people for the integration of local views and concerns into NRM projects. Regenerating the forest environment needs to consider indigenous trees that promote cultural values of fringe communities. This can help secure people's livelihoods and enhance spirituality which is core to local cultures.

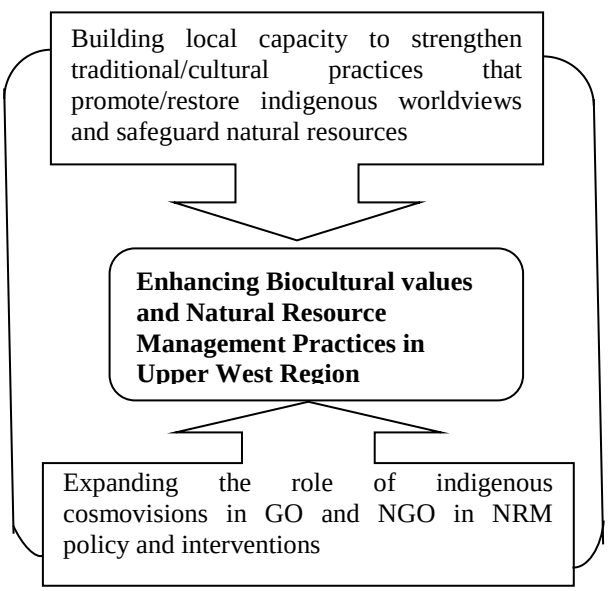
6.2 Development of Totemic Sanctuaries in Rural Communities

Totems are widely recognized among all three cultural-linguistic groups-Dagaaba, Sissala and Wala. This diversity is noticeable among different patri-houses whereby different species of animals and plants in particular are perceived as the supra-human counterparts of people within the physico-religious environment (Tengan, 1994, 1997; Yelfaanibe, 2007). This offers a great potential for a CBNRM programme that needs to be explored. One way to take advantage of this cultural value system is to dialogue with communities and the social houses that exist to develop the natural habitats for the totem species as a prelude to developing totemic sanctuaries.

6.3 Devolution of NRM Responsibilities

At the moment communities are over reliant on government not only to improve their socio-economic well-being but also for the government to take steps to improve their natural environment. To them government is always quick to claim ownership of natural resources within the local environment to pursue their political objectives in the name of gave them and the ancestors the natural resources to make a living out of them and hence any state intrusion and restriction on natural resource is perceived an overthrow of the powers of local authority. As a result many traditional informal institutions have remained and acted as passive participants in NRM strategies leading to systems collapse within the indigenous structures. In the midst of contemporary realities, there is the need to build the capacity of traditional institutions and to empower them to be in the driving seat and lead the NRM process within a devolved structure. To enhance the overall NRM process in a biocultural context the framework in figure 5.3 is proposed.

Figure 6.1: A Framework for Harnessing Informal and Formal Institutional Practices for Sustainable NRM in the Upper West Region of Ghana



Source: Author's Construct, 2008

6.4 Cultural Education

To rekindle those aspects of traditional and cultural value systems that will safeguard the natural environment by emphasizing these aspects in the schools. This might require a review the cultural aspects of the education curriculum that will ultimately aim at changing behaviours and attitudes for improving the natural environment.

6.5 Mainstreaming Gender in NRM and Environmental Governance Decision Making

Traditional informal systems and structures are still largely anchored to cultural practices and value systems which often tend to discriminate between gender. This tends to constrain both state and community efforts in NRM. Decisions on NREG are still the preserve of men and yet it is known that women make the greatest incursions into the natural environment of northwest Ghana to harvest wild fruits, twines, grasses, fuel wood and other non-timber/non-woody forest products from which they eke out a living for themselves and their families in general. From the FGDs and IDIs, it came out that women have an adept knowledge in IKS but usually they are excluded from the decision making process. In Lawra-Gbier, for instance, women were invited to join the discussion with the Chief and his Elders. In the process these women displayed a wealth of knowledge particularly on the history of the village, SNS and natural resources. The Chief/Elders constantly were seeking for the assistance from some of the elderly women on issues that they could not recall. To express my surprise and also satisfy much curiosity, I asked one Elder at the end of the interview, how the women appeared to know so much and he answered:

> *'women generally have a lot of information but when you do not involve them they cannot volunteer it for fear of victimization. You know, they borrow both from their parents' and husband's house and so when they put their knowledge together, it constitutes a lot'*

Indeed, an elderly woman in a royal house arguably would now much of the history of the royal family compared to a much younger Chief or Elder. On the contrary, however, the woman in question was apparently younger compared to most of the Elders of Gbier

and hence the explanation of the Elder as captured above may be said to be more valid compared to other factors like age.

At the moment, women participate as members of CFCs in communities that are fringing reserved area and also where community biodiversity projects exits. In both reserve and off-reserve areas, they are part of fire volunteer groups. Traditionally, however, women are neither owners nor part of any decision making body as far as NRM processes are concerned. In this sense, it appears the competence and knowledge that women can contribute to enhance NRM decisions and action are being greatly under-valued. But just as it was observed in Gbier community, women are able to borrow knowledge and build on experiences particularly in their marital home. They are therefore a wealth of knowledge almost unmatched by their male counterparts. Therefore, there is the need to increase women participation by allowing their active involvement at all levels of NRM decision making.

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APPENDIX A

INDIVIDUAL QUESTIONNAIRE

CODE NUMBER | | | |

A) General Information

1. Date……
2. Home town of respondent……..
3. Location of the interview: (Town)……..District……

B) Bio-data of Household Head

4. Name of respondent……
5. Ethnicity: Dagao/Dagara [ ] Waala [ ] Sissala [ ] Other *(specify)*
6. Patriclan (e.g. *yiilu*)……..Totem Animal/Plant……
7. Matriclan (e.g. *Bellu*)……
8. Gender: Male [ ] Female [ ]
9. Age: 0-19 [ ] 20-39 [ ] 40-59 [ ] 60-79 [ ] 80+ [ ]
10. Religion: Christian [ ] Muslim [ ] Traditional Worship [ ]
    Other (specify)……
11. Level of Education: None [ ] Basic [ ] Secondary [ ] Tertiary [ ] Other Professional Training [ ]
12. Main occupation…….
13. How would you categorize your main occupation above? Public sector job [ ]
    Private Job [ ] NGO [ ] Other (specify) [ ] ..... ……
14. Marital Status: Single [ ] Married [ ] Divorced [ ] Widowed [ ]
15. Are you a household head? Yes [ ] No [ ]
16. If yes, what is the number of people in your household?
    Male:..... Female:.....Total:..... …….
17. Are all the people in your household of the same patriclan? Yes [ ] No [ ]
18. Which of the following best describe the number of your patrikin in this village?

Less than 1/4 of the population [ ]

About a 1/4 of the population [ ]

About 1/2 of the population [ ]

More than 1/2 of the population [ ]

C) Biocultural Diversities, Natural Resource Use and Household Influences

19. How many different languages co-exist in this village?
20. How many different local dialects are spoken in this village?
21. Are there cultural differences between the different language groups in this village? Yes [ ] No [ ]
22. Are there cultural differences between the different local dialectical groups? Yes [ ] No [ ]
23. Apart from your main occupation, do you do any other thing for a living?

    Yes [ ] No [ ]

    23.1. If yes, specify the other thing(s) that you do for a living *(List in order of preference)*

    23.1.1. .....

    23.1.3. .....

    23.2. Are these activities dependent on locally available natural resources?

    Yes [ ] No [ ]

    23.3. If yes, where do you often draw your resources from? (List *all possibilities from below*): Land [ ] Forest/Wild [ ] Water point [ ] Other (specify) [ ]

25. Do other people in your immediate household/compound do other things (different from yours) for a living outside their main occupation? Yes [ ] No [ ]
26. Which natural resource stock is the most critical for the livelihoods of your household? Land based resources [ ] Forest based resources [ ]

    Water based resources [ ] Non-farm Income [ ] Formal/Informal sector wages/salaries [ ] Other (specify) [ ].....

26. Which of the following mostly influence the kinds of livelihood engagements of you and your household members? Culture [ ] Religion [ ] Spirituality [ ] Other (specify) [ ].....

27. Do you belief in dwarfs and the existence of other spirits?

Yes [ ] > answer 27.1 and 27.1.1

No [ ]> answer 27.2 and 27.2.1

27.1 If yes, do they have anything to do with natural resources? Yes [ ] No [ ] natural resources? Yes [ ] No [ ]

27.2 Have you ever heard about the existence of dwarfs/spirits/mythical forces in the wild? Yes [ ] No [ ]

27.2.1 If yes, does the information about the presence of mythical forces in the wild influence the way you draw resources from it? Yes [ ] No [ ]

28. Which of the following natural resource(s) do you own? *[Tick as many as are appropriate]*

Land [ ] Trees [ ] Water point [ ] Domesticated animals [ ]

Other (specify) [ ].....

29. Which of the following do you not own but can always access whenever you want? [Tick *as many as are appropriate]*

Land [ ] Trees [ ] Water point [ ] Domesticated animals [ ]

Other (specify) [ ].....

30. Are these natural resources also own by somebody within or outside your social house?

Yes [ ] >answer 30.1 to 30.7

No [ ] >answer 31

30.1. If yes, are these resources in open access? Yes [ ] No [ ]

30.2. If yes, are there any community rules/laws/regulations that safeguard the use of resource that are in open access? Yes [ ] No [ ]

30.3. If yes, who are in charge of making the rules? .....

30.4. Are the rules mostly respected/obeyed? Yes [ ] No [ ]

30.5. If someone would break a rule will s/he be punished? Yes [ ] No [ ]

30.6. Can someone refuse sanctions? Yes [ ] No [ ]

30.7. If yes, what would happen to him/her? Death [ ] Barnished from village [ ]

Social/ economic hardships [ ] Others (specify).....

31. Are they also own by somebody not related to you? Yes [ ] No [ ]

31.1. If yes, do you always have to get the owner's permission to extract the resource? Yes [ ] No [ ]

31.2. If yes, are you always permitted to extract anytime you ask? Yes [ ] No [ ]

32. Do many people in this village follow traditional/cultural rules now than in the past?

Yes [ ] >answer 32.1

No [ ] >answer 32.2

32.1. .If yes, what mostly led to increase in adherence to these rules?

African socio-cultural values [ ]

Beliefs in mythical forces [ ]

Introduction of Western values [ ]

Other (specify) [ ].....

32.2 If no, what has led to the non-adherence to these rules?

African socio-cultural values [ ]

Beliefs in mythical forces [ ]

Introduction of Western values [ ]

Other (specify) [ ].....

D) Natural Resource Availability

33. Indicate by ticking in the appropriate box level of the resources shown below.

Type of Resource	Amount (now compared to the past)		
	Less now	No change	More now
Land			
Trees/Forest			
Water points			
Game/Wildlife			

34. Indicate by ticking in the appropriate box, the extent to which your household depend on the list of resources shown below.

Type of Resource	Level of household use (now compared to the past)		
	Less now	No change	More now
Land			
Trees/Forest			
Water points			
Game/Wildlife			

35. Do you farm? Yes [ ] No [ ]

41.1. Do you grow more crops now than in the past? Yes [ ] No [ ] Grow the same crops as before [ ]

41.2. Are your crops the same variety as those used in the past? Yes [ ] No [ ] A combination of both [ ]

49.3. If a combination of both, which is more? Traditional variety [ ] Improved variety [ ] About equal proportions [ ]

36. Do you rear animals? Yes [ ] No [ ]

36.1. If yes, are they mostly for spiritual purposes/ancestral sacrifices? Yes [ ] No [ ]

36.2. Do you rear more animals now than in the past? Yes [ ] No [ ] Rear the same animals as before [ ]

36.3. Are your animals the same breed as those used in the past? Yes [ ] No [ ] A combination of both [ ]

36.4. If a combination of both, which is more? Traditional breed [ ] Improved breed [ ] About equal proportions [ ]

E) Cultural Influences on Natural Resource Management

E.1) Traditional Institutions

37. Do you think traditional institutions have influence over natural resource use in this village? Yes [ ] No [ ]

37.1. If yes, how?.....

.....

.....

37.1.1. If no, why? *(Briefly explain)* .....

.....

.....

.....

E.2) Fire and Agricultural Methods/Practices

38. Do you use fire in your farm? Yes [ ] No [ ]

38.1. If yes, for what purpose(s) do you often use fire in the farm? Cook food [Burn crop residue [ ] Clear new farmlands [ ] Others (specify).....

38.2. If no, do other people use fire in the farm? Yes [ ] No [ ]

38.3. If yes, for what purpose(s) do they mostly use fire in the farm? Cook food [ ] Burn crop residue [ ] Clear new farmlands [ ] Others (specify).....

.....

39. Is bush burning common in this area? Yes [ ] No [ ]

40. If yes, what are some of the reasons why people burn the bush? Drive bad spirits away [Control reptiles/snake bites [ ] Hunting [ ] Clear land for farming [ ] Others (specify).....

E.3) Spiritual Beliefs and Natural Resources

41. Are there some trees or plants that you consider as host to spirits? Yes [ ] No [ ]

42. If yes, complete the following

Name of Tree/Plant	Type of Spirit(s) hosted*	What is/are mostly the use(s) /Significance of the tree/plant?

*Indicate as follows: 1=Good: 2=Bad: 3=Either good or bad: 4=Don't Know

43. Are you allowed to fell such trees/plants? Yes [ ] No [ ]
44. If yes, are you always required to perform certain rituals? Yes [ ] No [ ]
45. Is/Are the tree(s)/plant(s) that you taboo to eat still common in this area? Yes[ ] No [ ]
46. Are there also some animals that you associate with spirits? Yes [ ] No [ ]
47. If yes, complete the following

Name of Animal	Type of Spirit(s) hosted*	What is/are mostly the use(s) /Significance of this animal?	Do you or other people mostly eat this animal? Yes/No

*Indicate as follows: 1=Good; 2=Bad; 3=Either good or bad; 4=Don't Know

48. Does one need some supernatural powers to be able to kill such animals? Yes [ ] No [ ]
49. As part of your ancestral culture/tradition, do you taboo to eat any animal(s)? Yes [ ] No [ ]
50. Is/Are the animal(s) that you taboo to eat common in this area? Yes [ ] No [ ]

Thank you for your time

APPENDIX B

IN-DEPTH INTERVIEW GUIDE

A) **General Information**

1. Date……
2. Time of interview: Start ……End……..……
3. Village/Town……
4. Name of Respondent:……
5. Occupation:……
6. Description of work:……

……

……

B) **Personal Details of Respondent**

7. Gender: Male [ ] Female [ ]
8. Age : 0-19 [ ] 20-39 [ ] 40-59 [ ] 60-79 [ ] 80+ [ ]
9. Ethnicity : Dagara/Dagao [ ] Sissala [ ] Waala [ ]
   Other (specify) [ ]……
   (*If the response is other, please, go to #12*)
10. If #8 is not other, do you belong to a patriclan? Yes [ ] No [ ]
11. If yes, which patriclan do you belong to? (*please specify*)……
12. What is your totem?……
13. Do you also belong to a matriclan? Yes [ ] No [ ]
14. If yes, specify the matriclan that you belong to? (*please specify*)……
15. Religion: Christian [ ] Muslim [ ] Traditional Worship [ ] Other (specify)…
    ……
16. Marital Status: Single [ ] Married [ ] Divorced [ ] Widowed [ ]
17. Highest Educational Achievement: None [ ] Basic [ ] Secondary [ ] Tertiary [ ]
    Other Professional Training [ ] (*please specify*)……
18. What is your own understanding of spirituality? (Briefly explain)……...
    ……
    ……

.....

.....

19. Does spirituality enhance your personal work? How/why/why not.....

.....

.....

.....

.....

C) Checklist for Key Informant Interviews

1. Briefly explain how you came to attain your present status.
2. What kind of services do you render in this village? And who are mostly your clients
3. How would you categorize your services: *spiritual, physical, psycho-social, cultural, etc.*
4. What kind of resources do you use in your operations? And why? And where do you draw these resources from?
5. What endowments (environmental goods and services) do you have in this village? *Please, categorise them into socio-cultural, spiritual, economic, aesthetic, etc resources.*
6. Identify the people in the village that are entitled to the resource endowments so categorized.
7. Identify (if any) and explain the links between the biological and cultural diversities of this village. State the one(s) that influence the others most.
8. Mention the different groups of natural resource managers of this village and identify the kind of resources that they manage.
9. Explain whether or not the position of resource manager is influenced by ones different cultural background. Why and how this is mostly achieved?
10. What do you often do to ensure a continuous supply the biological/cultural resources that you use?
11. Do you or do not you share knowledge with other local experts/GOs/NGOs? And why? Specify those that you share or do not share your knowledge and this is done?
12. Kindly, explain how such collaborations enhance the development or otherwise of biological and cultural diversities.

13. Could you suggest some ways for the development of biological and cultural diversities? How can a practical link between biological and cultural diversities be forged in local communities such as yours?

Thank you.

APPENDIX C

FORMAL INSTITUTIONAL INTERVIEWS

A) **General Information**

20. Date……
21. Time of interview: Start ……End……..……
22. Village/Town……
23. Name of organization……
24. Type of organization……..
25. Project Area……..
26. Number of Technical Staff……....

B) **Personal Details of Respondent**

27. Gender: Male [ ] Female [ ]
28. Age : 0-19 [ ] 20-39 [ ] 40-59 [ ] 60-79 [ ] 80+ [ ]
29. Ethnicity : Dagara/Dagao [ ] Sissala [ ] Waala [ ]
    Other (specify) [ ]……
    (*If the response is other, please, go to #12*)
30. If #8 is not other, do you belong to a patriclan? Yes [ ] No [ ]
31. If yes, which patriclan do you belong to? (*please specify*)……
32. What is your totem?.....
33. Do you also belong to a matriclan? Yes [ ] No [ ]
34. If yes, specify the matriclan that you belong to? (*please specify*)……
35. Religion: Christian [ ] Muslim [ ] Traditional Worship [ ] Other (specify)
    ……
36. Marital Status: Single [ ] Married [ ] Divorced [ ] Widowed [ ]
37. Highest Educational Achievement: None [ ] Basic [ ] Secondary [ ] Tertiary [ ]
    Other Professional Training [ ] (*please specify*)……
38. Office Portfolio:……
39. Rank :……
40. What is your own understanding of spirituality? (Briefly explain)……..
    ……
    ……
    ……
    ……
41. Does spirituality enhance your personal work? How/why/why not……
    ……
    ……
    ……
    ……

INSTITUTIONAL KNOWLEDGE ON BIOCULTURAL DIVERSITY AND NATURAL RESOURCE MANAGEMENT

1) What basically do you do?
2) What is your goal/mission?
3) Who are mostly your clients? And what are their cultural values for managing natural resources?
5) Who are your main stakeholders and partners?
6) What are your key activities?
7) What are the roles/responsibilities of stakeholders and beneficiaries in this project?
8) What Kind(s) of diversity/diversities is your organization involved with (E.g. cultural, biological, etc)?
9) How would you describe the situation of this diversity (before/now)?
10) Is this diversity related to other diversities that you know of? What are they and how are they related?
11) What is your working approach? And what relationship (if any) do you have with other institutions working in other areas of diversity?
12) What are your best practices?
13) Any challenges/lessons learnt/experiences?
14) What is the way forward?
15) Does your organization belief in issues of spirituality? Why/why not?
16) In your own opinion do you think spirituality works and if considered can enhance delivery in NRM within your organizational framework?
17) Institutional knowledge/experiences on the role of gender in different cultures and how this impacts on the management of natural resources
18) What would you recommend to enhance policies on NRM and make their outcomes more sustainable?
19) Kindly provide your candid opinion on the following propositions:
    a. *Differences in natural resource endowments is a direct product of cultural diversities*

b. *Marginalization of women in patriarchal cultures/societies of northwest Ghana accounts for systems failures in natural resource management*
c. *Spirituality and social protection rules in indigenous cultures a sine qua non in planning, designing and implementing successful natural resource management projects/policies in local communities*
d. *Indigenous African knowledge systems do not often find space in contemporary natural resource management strategies*

20) Any comments/suggestions/remarks?

Thank you for your time

APPENDIX D

INTERVIEW GUIDE FOR COMMUNITY GROUPS/TRADITIONAL INSTITUTIONS

A) BACKGROUND INFORMATION

1) Date:……
2) Time:……
3) Name of community:……
4) Description of community:……
   ……..
   ……..
5) Group Characteristics: Male [ ] Female [ ] Mixed [ ]
6) Number of persons in the group: Male .....Female..... Total
7) Average Age of group members……

B) General Questions

a. In what way(s) has 1) biological and 2) cultural diversities impacted on NRM forms/systems in this community/area?
b. Are there any stories/folktales, proverbs, images/objects, songs, etc that people in this area try to use to describe your natural resources/environment? Tell me more about them.
c. Are these indigenous knowledge forms useful? Are they improving/ declining?
d. If western views were not introduced to this community, would NRM have been better than it is today? Why/why not

C) FOCUS GROUP DISCUSSIONS

1. How many linguistic (include dialectical) different groups are in this area or paramouncy?
2. Are there or do you remember any language or dialect that used to be spoken by people of this area but which is currently not spoken or heard again? If any, mention and explain how this has come to be.
3. Is there any difference between the indigenous languages spoken now and in the past? Explain any difference and how they came to be. In your opinion how has

these differences influenced people in their NRM behaviours/environmental attitudes.

4. what things do perceive within this environment to of value to you (both individually or as a group)
5. Traditionally, what are the rules that guide the use of the following NRs in this community?—forest/trees, water points, agriculture/range lands, game and wildlife, etc. how did they start or come about? Are these rules still effective? Why/why not? Do different people/groups in this community apply similar/different rules to NRM? Who are they and why? Is your community very different in doing this than other communities elsewhere?
6. Knowledge on the existence of GOs/NGOs/CBOs in NRM within community/ district/region.
7. Find out about the level(s) of their collaboration (if any) with the community. Who are those involved? Where are they? And what is the nature of the collaboration?
8. What is the extent of their collaboration with other local resource owners/managers/users?
9. What are the kinds of rules and/or regulations in place and how do they work?
10. Which things make your community unique (in terms of culture/traditional values, etc).How do you often achieve that? Seek both commonalities and differences.
11. What changes would you like to see in the current structure or institutional arrangements to for better management of biocultural diversities? What can be done to ensure proper CBNRM practices in this village?

D) Women and Community Natural Resource Management Strategies

12. Are women involved in natural resource management decisions?
    - If yes, how? And what kind(s) of resources are they mostly involved in?

- If no, why not? Is there need for a shift in local thinking or not? 13. What is the role of women in the way natural resources are managed? And why?

Any other comments?