UNIVERSITY FOR DEVELOPMENT STUDIES

COMMUNITY NATURAL RESOURCE MANAGEMENT AND POVERTY REDUCTION IN THE LAWRA DISTRICT OF UPPER WEST REGION OF GHANA

BY

FABIAN DOME YELSANG

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DEDICATION

This thesis is dedicated first, to the Almighty God for guiding me through in my life and to all who in diverse ways supported me in my education and the rural people in search for livelihoods.

ABSTRACT

This study is/was an assessment of community-based natural resource management in rural areas and how natural resources enhance community livelihoods in reducing poverty against the backdrop of resource depletion. The study adopted a trans-disciplinary approach to research aimed at gathering the necessary information on natural resource management. Data collection techniques such as review of relevant literature, focus group discussions, in-depth interviews, formal institutional interviews and gender sensitive three generational approach were used and data analysed by the use of Statistical Package for Social Sciences (SPSS) as well as qualitatively techniques approach. The main findings of the study were that: traditional methods of managing natural resources are still much preferred by community members to modem systems. Informal institutions in the form of traditional authorities are more recognized institutions by many in the communities than formal institutions. These informal institutions exist and are very active in natural resource management. Natural resources particularly land might be fairly adequate or inadequate for some community members due to differences in population pressure. Open resources such as fuel wood and grasses are fairly adequate as compared to land which forms their major source of livelihoods. They acknowledged that continues cultivation of the limited land has exhausted its nutrients. Communities both urban and rural depend much more on natural resources for their survival than other sources of livelihood. It was also revealed that gender plays significant role in managing natural resources in the area. Ownership and control in the case of land is in the hands of men but not women. GOs and NGOs also play their roles in NRM. However, SARI in particular complained that traditional method of farming deplete soil nutrients and advised it should be discouraged. Low adaptability by community members to new varieties of crops is a serious challenge in the study area. The study concluded that ensuring sustainability of natural resources means a combination of formal and informal methods of natural resource management. That is endogenous development should be advocated strongly.

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CBNRM .....Community-Based Natural Resource Management

CPR .....Common Property/Pool Resources

DA .....District Assembly

DMTDP .....District Medium Term Development Plan

EPA .....Environmental Protection Agency

FGD .....Focus Group Discussion

FSD .....Forest Services Division

FWLP .....Forest and Wild Life Policy

GNFS .....Ghana National Fire Service

GO .....Governmental Organization

GSS .....Ghana Statistical Service

IKS .....Indigenous Knowledge Systems

IUCN .....International Union of Conservation and Nature

LI .....Legislative Instrument

MOFA .....Ministry of Food and Agriculture

NADMO .....National Disaster Management Organization

NADRIDEP .....Nandom Deanery Rural Integrated Development Programme

NGO .....Non-Governmental Organization

NPC .....National Population Council

NR .....Natural Resources

NRM .....Natural Resource Management

PNDC .....Provisional National Defense Council

RCB .....Resource Conserving Behaviour

RDB .....Resource Degraded Behaviour

SARI .....Savanna Agricultural Research Institute

SNS .....Sacred Natural Sites

SPSS .....Statistical Package foe Social Sciences

UNCED .....United Nation Conference on Environment and Development

UNDP .....United Nation Development Programme

CHAPTER ONE (1)

1.0 Introduction

Africa is a continent rich in natural resources, such as forests, wetlands, wildlife, minerals, fisheries, and many others. Effective systems of management can ensure that these resources not only survive, but also in fact, increase while being used rationally, thus providing the foundation for sustainable development and for a stable national economy (Steiner *et. al.*, 2004). Natural resources have for centuries been an important part of peoples' diet, economy, and culture. For people living in or near forests, plants and animals have provided food, medicine, hides, building materials, incomes, and served as sources of inspiration and spirituality. Rivers have provided transportation and fish, and water and soils have provided a permanent source of sustenance (ibid). Access to and use of natural resources, and notably land, has been and still is the key means to survival for a majority of the peoples in Sub-Saharan Africa, (Lars-Erik, 1993:3). The control and use of land and other natural resources has been the way to sustain the family or the household, to maintain the clan and to enrich the people or ethnic groups. Forms of marriage and inheritance rules have evolved in response to the needs of social organization to secure access to and exploitation of land. Access to and control of natural resources is a prime source of social position and power (Lars-Erik, 1993:3).

Studies show direct and indirect links between natural resources, food security and poverty (Millar, 2003). According to Millar (2003), in areas of abundant natural resources such as fertile lands, good water sources, and forests in northern Ghana, there tends to be abundant food. In areas of chronic food shortages, natural resources are used to directly bridge the food gap. There also exist very direct links between natural resources and their role in alleviating poverty, as noted by the community, anybody with abundant natural resources such as land, water points, and forests is a rich man (ibid). Almost all incomes of households are obtained directly or indirectly from natural resources- largely emanating from woodlands (Millar, 2003).

Rural people have historically depended on resources from within protected landscape for subsistence and income. Close inter-relationships among people, wilderness areas and their

resources are central elements of traditional cosmologies and cultures. Human interaction with protected area ecosystems began long before officially designated conservation status was known, and in some cases pre-date even modem statehood (Middleman, 1995a; Eder, 1997), in Middleman, 2001. Fishing, hunting and foraging have long been integral components of traditional resource management and livelihood strategies. Until recently harvest patterns were within the limits of ecosystem regeneration capacity. Forest and marine products harvested from natural ecosystems continue to provide important contributions to rural livelihoods. However, population growth and migration to natural resource frontiers combined with substantially increased material expectations and commercial off take have impelled a rapid increase in resource degradation. Harvest rates now frequently exceed species and ecosystem regeneration capacity. Different people derive livelihoods from varied natural-resource use and management activities, ranging from game hunting, livestock and crop production, to the collection of thatch grasses, medicinal plants and marine resources (Leach, Mearns and Scoones, 1999).

Analysis using the environmental entitlements framework shows how access to and control over natural resources is mediated by a set of interacting and overlapping institutions, both formal and informal, which are embedded in the political and social life of the area (Leach, Mearns and Scoones, 1999). Certain resource use practices result in ecological outcomes which are detrimental to others' livelihoods; for instance burning land for grazing destroys the thatch grass collected by women (ibid). Yet other resource use is more mutually compatible; thatch grass collection appears to be in tune with many nature conservation objectives. An understanding of this complex set of institutional relationships, by making conflicts and complementarities explicit, is shown to be a vital precursor to exploration of any co-management options for the nature reserve (Leach, Mearns and Scoones, 1999).

Under traditional or customary (ethnic) law, land and the fruits of the land belong in the first instance to the spirit world (Abu, 1998; Millar, 2001) cited in Millar 2001. The first settlers through spiritual intermediation of their leaders would enter into covenants with the spirits of the land to gain user rights in exchange for certain ceremonial rites. This covenant is then passed down over time through the 'Tindamba' whose spiritual role binds the community with the spirits, the ancestors, the present and future generations and regards

human and physical objects such as mountains, trees and rivers as a continuum of the same ancestry. The use of natural resources, both plant and animal, was done with respect to and guided by conservation requirements of never using more than what would provide sufficient seed for the future (Abu 1998; Millar 2001) cited in Millar 2001.

From the above it could be concluded that traditional communities derive both their socio cultural and spiritual identity, in part, from the land. The respect for the land was built into the use of the land. Indigenous practice was based on a sense of harmony with the natural environment, which resulted in sustainable practice and sustainable use. The traditional use of natural resources was based on traditional values.

The image of the family therefore finds expression in how people relate to their shrines and groves as well as the entire environment. Families and communities have extended family relations with their shrines and groves that they regard as their ancestral origins and will not disobey or wrong as a management strategy to ensure livelihood sustainability. The living thus sees themselves as the children of shrines and groves because of these close bonds. By their regulatory prescriptions for natural resources exploitation and prohibition from exploitation of others totem, they ensured there was peaceful co-existence between humans, vegetation, trees, animals and other forms of life on earth. Stones, rocks, mountains, rivers and the aquatic life they contain were similarly protected or regulated in their use as the ancestors passed on.

The resilience of shrines and groves, despite the religious battles against them and their survival, in spite of the varying levels of degradation, call for policy attention to traditional religion as a way of conservation, management and sustainable utilization of natural resources. Millar (2002:7) observed that people still respect and revere shrines and groves for what they stand for. This is why they have survived the test of time and are still relevant in the community-based organization.

In many developing countries, the use of natural resources such as land is necessary for the well-being of their people. For centuries, their way of life has comprised mechanisms of conserving or ensuring sustainable utilization of such resources through a system of values and taboos (Steiner *et. al.*, 2004).

In relating the above assertion to societies such as the Dagara of the Lawra District of Ghana, fairer distribution of income is possible, both at the inter-generational and intra-generational levels, because the communities themselves respect the temporal dimensions of the exploitation of these resources. The resources belong to the communities, and thus they exploit them keeping in mind the interests of future generations. Under traditional resource management regimes, redistribution is an accepted practice. Communities usually pass on their indigenous knowledge of resource management to the next generation through oral transmission. The continuous existence of such systems of managing natural resources depend heavily on the passing down of this knowledge. Hence, the continuity and transmission of that knowledge and its associated culture from one generation to another, and its more effective distillation into practical applications that are socially and economically beneficial, are critical factors in the survival and dynamics of the culture. Sustainability of these natural (cultural) resources is therefore necessary for mankind in Africa, Ghana and more especially the study area as a whole.

Problem Statement

The development-environment nexus has been contentious and debates still rage regarding the objectives, scope and strategies to link environmental (natural resource use) and development (Kendie and Guri, 2006). The consensus in the wake of the United Nations Conference on Environment and Development (UNCED) suggests that the implementation of what has come to be known as “sustainable development” should be based on local-level solutions derived from community initiatives (Ghai and Vivian, 1992; Ghai, 1994, cited by Leach, Mearns and Scoones, 1999). The poor conservation outcomes that followed decades of intrusive resource management strategies and planned development have forced policy makers and scholars to reconsider the role of local communities in resource use and conservation. A healthy conjunction between humans and nature is essential for the success of development planning. This demands the prudent management of natural resources, their conservation and development (Singh and Lal, 2001). The poverty-environment problem can best be understood according to World Bank (2008), that poor countries are much more

dependent on natural resources as assets than rich countries. This I agree with the assertion because, it is common fact that local people in rural communities depend largely on these resources for their livelihoods.

As a break from previous work on development which considered communities to hinder progressive social change, current writing champions the role of community in bringing about decentralization, meaningful participation, cultural autonomy, and conservation (Chambers and McBeth, 1992; Chitere, 1994; Etzioni, 1996 in Leach *et. al.,* 1999). The community is seen as an appropriate body that carries out restoration and care of the local environment surrounding them, and envisaged as being capable of acting collectively toward common environmental interest. For instance, "primary environmental care", is seen as a process by which local groups or communities organize themselves with varying degrees of outside support so as to apply their skills and knowledge to the care of natural resources and environment while satisfying livelihood needs (Pretty and Guijt, 1992:22 in Learch, Mearns and Scoones, 1999).

Agriculture and resource-based activities constitute the foundations of rural livelihoods, establishing a close relationship between the welfare of the rural poor and the availability of biomass for soil fertility, energy, water and other essential goods (Laube, 2001). Ensuring access to environmental resources is central to the livelihoods of rural poor. Simply increasing the rural poor's access to environmental resources under certain circumstances can actually lead to environmental degradation and aggravate poverty rather than the opposite (ibid). Careful understanding of the type of poverty and the types of environmental degradation is a requisite for identifying strategies and interventions that promote income growth and environmental sustainability (Reardon and Vosti, 1995 as in Laube, 2001:63). Without stable access to land and the natural resources on it, however, the rural poor would be denied of their livelihoods. Their poverty situation would be widening when these resources are not put to efficient use. Though the concept of community rarely receives the needed attention or analysis from those concerned with resource use and management in enhancing rural livelihood, the pivot of rural life however is centred on the community in Africa and the study area as a whole. Community is however not much considered when development agents in resource management in rural areas are

advocating. I therefore seek to redress this omission by investigating "community" in work concerning resource conservation and management and offering suggestions if possible.

Hence the problem this research intends to address is the extent to which people in rural communities manage the available natural resources to enhance their livelihoods and reduce poverty against the backdrop of natural resource depletion.

Therefore, this research intends to answer the following questions;

1.2 Main Question

The general research question is: how can natural resource management in the Lawra District be enhanced using local knowledge systems in order to ensure livelihood sustainability for poverty reduction?

1.2.1 Sub-question

1. What local (traditional) knowledge and systems exist in the Lawra area on natural resources managements?

2. How do the local knowledge(s) and systems compare with those of formal institutions (state/local government), what are the synergies and disjuncture?

3. What are the sustainability (livelihoods, environment, cultural rights/dignity etc); and related issues regarding the two knowledge(s) and systems of management?

4. What options, possibilities, challenges exist for sustainable management and development?

1.3 Research Objectives

1.3.1 Main Objective

The general objective is to examine ways in which natural resources are been managed within local (traditional) community's context in order to ensure sustainable livelihood and poverty reduction.

1.3.2 Specific Objectives

1. To identify the traditional natural resource management systems and how they can contribute to livelihood enhancement and poverty reduction.

2. To find out the extent to which traditional and modem knowledge act on each other in sustainable management strategies for natural resources.

3. To determine the opportunities available for indigenous knowledge institution in the sustainable management of their natural resources in recent times.

4. To recommend community-based natural resource management options for improving livelihoods and reducing poverty in communities in the District.

1.4 Justification of the study

Globally, natural resources are been depleted due to population/human pressures. There is therefore the need to conserve the available resources for sustainability through good management processes. Conventional resource management approaches have more or less not yielded the desired results in conserving the environment. Local peoples' livelihoods are dependent on the environment, their knowledge/perception is therefore necessary if the available resources are to be properly managed for future generations. Common property (common pool) resources are defined as a class of resources for which exclusion is difficult and joint use involves subtractibility (Berkes, 1989, in Coop and Bruncknorst, 2001). These resources form part of the environment needs conservation in order to enhance livelihoods for rural people in Africa particularly the study area. They are resources for which excluding outsiders is difficult, no matter who actually has the right to use the resource and also anything one user takes reduces what is available for anyone else. Buck (1998:3) therefore argued that "to understand commons and common pool resources (CPRs), we need to understand the differences and connections between resources, resource domains, property, and property regimes". In the same vein, Mahendra (2001, in citing Jodha, 1992) also sees Common Property Resources (CPRs) as those resources in which a group of

people have co-equal rights, specifically rights that exclude the use of those resources by other people. Rivalry exists in consumption of the resource within the group as they compete for them.

In the case of free access resources, everybody has access to the resource and therefore exclusion is not possible, though rivalry in consumption remains. In view of this contention, it is necessary to note that the connection between local knowledge and natural resource management are entrenched in local community institutional structures and worldviews which together define the domains of local community resources as well as the rules and regulations for extraction or use for sustainability. The social research units are the traditional management institutions/systems, which are made up of sets of households based on lineages as well as females within the households because I used three generational analyses as part of my approaches. New knowledge was generated with deeper understanding of the linkages between local peoples' perceptions and natural resource management.

Secondly, it gives outsiders a different view as to how local people perceive their environment and the natural resource management strategies put in place in the rural areas for their survival. Also, today research practice is changing the world over from unidirectional to multidirectional which researchers are now advocating for transdisciplinary approach to knowledge which takes into account local people's perceptions in addressing local problems. Tran-disciplinary research are given when knowledge about a socially relevant problem field is uncertain, when the concrete nature of problems is in dispute, and when there is a great deal involve for those concerned by these problems (Pohl *et. al.*, 2007). Finally, it also serves as a learning process for me as a future fellow in the academia and development research by augmenting my knowledge in doing field research in rural areas as well as appreciating at first hand ways in which local people perceive their own ways of development amid expert interventions in contemporary era.

1.5 Delineation/Scope of Study

The research was carried out among the Dagaral Dagaaba ethnic group in the Lawra District which comprises the two traditional areas of Lawra and Nandom. They occupy the area stretching from the northwestern fringes of Lambusiel/Kaani district to the Black Volta River down to Lawra to the south bordering the Jirapa district in the Upper West Region of Ghana. The focus of the research was on traditional or indigenous perceptions on natural resources and how these resources can be managed to enhance livelihoods and reduce poverty, particularly common property (common-pool) resources (CPR).

The scope of my research was on common-pool resources and common property resources largely because they are generally prone to over use and over exploitation merely because they are in open access and hence the cost involved in monitoring the use of such resources is often too much. Open access are environmental public goods which once available in abundant quantities often grow increasingly scarce due to the sheer scale of exploitation (Barbie *et. al.,* 1992). Barbie and associates further argued that, open access or unrestricted use of natural ecosystems can ultimately threaten the environmental public goods or common pool resources produced by these systems. Lockie *et. al*. (2001) opined that natural resources are understood as both symbolic and material entities constructed through processes of social interaction. The issues discussed centred more on the natural resource diversity available in the study area and the local knowledge systems available in harnessing them.

CHAPTER TWO (2)

THEORETICAL PERSPECTIVE

2.1 Theoretical Framework

That society in rural Ghana has experienced multifaceted changes over the past three to five decades, affecting the institutions governing the use and local management of natural resources, is now a well-established fact. One consequence of such change is observable in the decline of the role played by the village leadership in managing the community's natural resource base. In turn, this has contributed to the depletion of common property resources. Community pastures have declined over the decades probably as a result of population pressures. These resources contribute to the well-being of the people in every society. I will therefore explore some theoretical basis by examining the environmental entitlements, regimes and the relationship that exist between the environment and society in the study area. In my view, I have chosen endogenous development theory as a single theory owing to the fact that, natural resource management issues would be examined from a traditional management point of view. Some key concepts have been operationalised to support the research that will enable me look at natural resource management systems both formal and informal, and their related livelihood systems with the view to enhancing poverty reduction efforts in the study area and Ghana as a whole.

2.1.1 Environmental Entitlement Theory

That community cannot be treated as static or undifferentiated, make up as they are of active individuals and groups. The environment, equally, needs to be disaggregated into its constituent parts, and viewed dynamically. Sen (1981) draws on entitlements analysis, to explain how it is that people can starve in the midst of plenty, resulting in his attributions to a collapse in their means of command over food. Undue emphasis on aggregate food availability, Sen (1981) argues, diverts attention from the more fundamental issue of how

particular individuals and groups of people gain access to and control over food. Thus, "scarcity is the characteristic of people not having enough ..., it is not the characteristic of there not being enough. While the latter can be the cause of the former, it is just one of many causes" (Sen, 1981, p. 1 cited in Leach *et. al.,* 1999).

In comparison, entitlements analysis is useful in explaining how the consequences of environmental change in general, and access to and control over natural resources in particular, are also socially differentiated (Leach and Mearns, 1991; Mearns, 1995b, 1996a, cited in Leach *et. al.,* 1999). Regarding the food and famine debate, the environmental debate has been dominated by a supply-side focus often giving rise to Malthusian interpretations of natural-resource depletion and degradation. But, Leach and associates (1999) agreed with Sen's observation that absolute lack of resources may be only one of a number of reasons for people not gaining access to the resources they need for sustaining livelihoods. It is important not to polarize this distinction excessively, however; as others have pointed out in the context of famine analysis, resource availability and access are often interconnected. Conflicts over access often intensify when the resources in question become scarce in absolute terms (Devereux, 1988; Nolan, 1993).

Command over food, rather than overall availability, is key in explaining famine. Hence, Sen (1981) emphasized entitlements in the descriptive sense. The term entitlements therefore does not refer to people's rights in a normative sense - what people should have but the range of possibilities that people can have. In Sen's words, entitlements represent: "the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces" (Sen, 1984: 497). They arise through a process of mapping, whereby endowments, defined as a person's "initial ownership", for instance, of land or labour power, are transformed into a set of entitlements. According to Sen, entitlement mapping is "the relation that specifies the set of exchange entitlements for each ownership bundle" (Sen, 1981: 3). To Sen, these entitlement relations may be based on such processes as production, own-labour, trade, inheritance or transfer (Sen, 1981: 2). Sen's concern was therefore to examine how different people gain entitlements from their endowments and so improves their well-being or capabilities, a

descriptive approach to understanding how, under a given legal setting; people do or do not survive.

Given these concerns, I adopt the following definitions of key terms. First, endowments refer to the rights and resources that social actors have. For example, land, labour, skills and so on. Second, entitlements, following Gasper (1993), refer to legitimate effective command over alternative commodity bundles. More specifically, environmental entitlements refer to alternative sets of utilities derived from environmental goods and services over which social actors have legitimate effective command and which are instrumental in achieving wellbeing. The alternative set of utilities that comprise environmental entitlements may include any or all of the following: direct uses in the form of commodities such as food, water, or fuel; the market value of such resources, or of rights to them; and the utilities derived from environmental services, such as pollution sinks or properties of the hydrological cycle. Entitlements, in turn, enhance people's capabilities, which are what people can do or be with their entitlements. For example, command over fuel resources derived from rights over trees gives warmth or the ability to cook, and so contributes to well-being.

There is nothing inherent in a particular environmental good or service that makes it a priority either an endowment or an entitlement. Instead, the distinction between them depends on empirical context and on time, within a cyclical process. What are entitlements at one time may, in turn, represent endowments at another time period, from which a new set of entitlements may be derived.

An emphasis on the "effectiveness" or otherwise of command over resources highlights two issues. First; resource claims are often contested, and within existing power relations some actors' claims are likely to prevail over those of others. Second, certain social actors may not be able to mobilize some endowments (e.g., capital, labour) that are necessary in order to make effective use of others (e.g., land). For instance, kinship-based institutions that regulate command over labour may embody power relations structured around gender and age that leave young men, and especially young women, strongly disadvantaged in their ability to control their own labour and to call on that of others.

By "legitimate" I refer not only to command sanctioned by a statutory system but also to command sanctioned by customary rights of access, use or control, and other social norms. In some cases, these sources of legitimacy might conflict, and different actors may espouse different views of the legitimacy or otherwise of a given activity.

The environmental entitlements framework therefore links both macro and the micro levels of concern. It situates "a disaggregated (or 'micro') analysis of the distinctive positions and vulnerabilities of particular [social actors] in relation to the 'macro' structural conditions of the prevalent political economy" (Jenkins, 1997: 2).

An institutional focus highlights relations of power in the mapping processes. An extended entitlements approach sees entitlements as the outcome of negotiations among social actors, involving power relationships and debates over meaning (Gore, 1993: 452), rather than as simply the result of fixed, moral rules encoded in law. In the study area, shea and dawadawa (locust bean) fruits as well as dry firewood from the plants are commonly collected by women and used at home and sold widely for income. In addition, the medicinal components of these trees are not left out where the leaves and the tree bucks are associated with treatment of particular illnesses. These include, pneumonia, chronic sores among others. Men equally use them for building purposes in the form of roofing houses and burning charcoal for income.

Building on the above assertion, the plants become endowments - people gain rights over them - in different ways depending on whether they lie inside or outside farmlands or in the bush. In the bush, the plants are usually the common property of a village, with an actor's endowment mapping depending on village membership. Where the plants are found on farmland depending on whether the farm owner is the landlord, collection rights are acquired through membership of, or negotiation with, the appropriate land-holding family or farm household. Those in the bush, endowment mapping depends on the landlords of the community's permit system, with both women and men often using established traditional relationships as a source of access and control of the resources. Without such a permit, gathering of the plant products is illegitimate from the community's perspective, although it

may be sanctioned by customary tenure arrangements grounded in different definitions of reserved land as ancestral farmland.

The set of entitlements derived from shea and dawadawa trees may include direct use of the leaves and bark for medicinal purposes, fruits for immediate consumption, or the nuts in extracting oil and dawadawa as a food supplement, firewood for cooking, logs and sticks for roofing houses or cash income from their sale. In practice, most women involved in gathering the fruits prefer to sell them as an important source of seasonal income. In entitlements mapping, both labour and marketing issues are important. Women may have to negotiate with their husbands and co-wives - in relation to other farm work and domestic duties - for labour time to collect the fruits though not all that necessary.

The utilities derived from the cash sale of the products contribute to a woman's capability to ensure that she and her children are well-fed and to satisfy other cash-dependent basic needs. In particular, the fruits offer a timely source of rainy season income when money is otherwise scarce. But whether a woman can keep control of the income, and how it is used, depends on intra-household bargaining arrangements, such as negotiations with husbands over expenditure priorities and responsibilities for providing food.

A further important addition to Sen's (1981) analysis offered by my institutional focus was the introduction of a dynamic, historical perspective, over different time scales. In the process of actors gaining legitimate, effective command over a resource bundle, negotiations over labour or land may take place which in turn transform the nature of certain actors' land or labour rights. Over longer time frames, a process of commoditization of certain resources might serve to increase the role of the market as a key institution in endowment and entitlement mapping. This dynamic and historical perspective therefore informs my interpretation of endowment and entitlement mapping processes and, in turn, my approach to the institutional analysis of environmental change, a subject to which I now turn.

2.1.2 The Tragedy of the Commons Theory

Jensen (2000) explained how communities are able to avert the tragedy of the commons, drawing from Hardin (1968). 'Tragedy of the Commons Theory'. "Freedom in a commons brings ruin to all", Hardin (1968) wrote, adding that the only way to prevent such tragedies was for resources to either be privately owned or regulated by the government. This is based on the fact that where individuals enjoy open unregulated access to a resource in common property, privately rational behaviour can lead to the overexploitation of the resource to the detriment of the long-run interests of everyone.

That means that, 'what is every body's property is nobody's property'. A situation referred to as 'Social Trap' and defined as a situation that:

... exists wherever the rational decisions of individual agents necessarily leads to an outcome that is inconsistent with the best interests of society. These are circumstances in which the signals guiding individual choices are distorted by the informational, institutional or temporal parameters of the decision-making process (Constanza and Perrings, 1990:2).

Hardin (1968) holds that the unsustainable management of common resources is mainly because of the lack of institutional governance and coercion to enforce sustainability measuring and avoid free riding. He therefore advocated for institutional governance in the management of common pool resources such as rangelands, waters and forests lest they suffer from individual insatiable quest to maximize benefits there from resulting in degradation resulting in the tragedy of all the commons. As such common property should be privately owned or managed by a central body like the state (Hardin, 1968).

Rees (1994: 270) however argued that, Hardin's assumption that common land was open to all is misleading. It was in fact only open to those within specific communities, governed by specific rules of social conduct and collective responsibility. In other words, social institutions existed when private economic control incentives were not strong enough to prevent serious external losses. 'Common property of natural resources in itself is no more a tragedy in terms of environmental depletion than private property. It all depends on what social institutions…. are guiding resources uses' (quoted in Clawson, 1974: 61). Common

property resources describe who has rights over the resource, whereas common pool resources indicate the characteristics of the resources themselves (Jensen, 2000). In addition, they are resources accessible to the whole community and to which an individual has exclusive property rights. Village pastures, community forest, waste lands, common threshing grounds, rivers and riverbeds are some of the common property resources (Lal *et. al.,* 2001: 23). It means that, any type of resource may be governed by different property rights regimes in different locations, because the property rights are a function of the legal system's characteristics, not the resource's characteristics. Jensen in supporting Gibson says that if something is common property, a specific group of people may use the resource legitimately-and equally legitimately prevent outsiders from using it. It therefore stands that natural resources such as dawadawa (locust bean) and shea trees and other resources on the land are open access-a situation in which anything goes because no one has defined rights to the resource. However, open access to resources is somehow absent in African traditional society. Activities of individuals and groups are regulated by a host of norms, practices and beliefs. That is why resources never can, traditionally, suffer from the tragedy of the commons. The free- for-all concept does not exist in traditional society and individuals are not at liberty to use the resources as they please. Individual interests are subordinated to the will of the majority. Traditional management approaches do not allow for privatisation of natural resources. Privatisation is seen as dangerous because it can allow the individual to exploit the resource as they please without concern for and control from the community (Sibanda, 1997). This means that as formal institutions favour privatisation of common pool and common property resources as effective management strategy, traditional institutions see management of these institutions to be part of the norms, practices and beliefs in their society.

2.1.3 Property Regime Theory

Kramer, (1982) looked at the nature of regimes from a global perspective and says they are a set of implicit or explicit principles, norms, rules, and decision-making procedures around which actor expectations converge in a given area of international relations. Within the context of human-environment relationship, the theory of entitlements has stressed more the effects of the different actors on environmental goods and services. Ambiguity and negotiability are typical features of resource regimes in Africa, as they are highly contested. From pre-colonial times until present, the control of natural resources has served as a means to establish control of people and their social and economic activities (Meillasoux, 1972; Rey, 1973 cited in Laube, 2006: 30). However, local perceptions of ancestral heritage and identity as well as religious beliefs pertaining to natural resources, have continued to prevail. A history of struggle over the control of vital resources, of different perceptions and identities paired with legal pluralism has led to a situation in which the management of natural resources has become a highly ambiguous exercise (Benjaminsen and Lund, 2002; cited in Laube, 2006: 30). Access to resources does not necessarily depend on the actors' legal position but rather on their ability to negotiate. Actors may therefore be more interested "in strengthening their ability to participate in and influence negotiations rather than acquiring exclusive control over resources and severing connections which are not immediately profitable". (Berry, 1993: 14 cited in Laube, 2006:31). Therefore, any effort to understand local resource regimes and the practices, strategies and underlying rationalities of actors has to carefully take stock of the historical, political and institutional constitution of the particular 'semi-autonomous social field'. Thus, within a community there are normally points for both convergence and divergence in property resource regimes. Therefore, Buck (1998: 30) sees regime theory as grounded on two basic assumptions. That institutions are limiting factors; that is, existing institutions constrain policy options of individual actors. That therefore makes institutions independent variables as they may establish their own rights for the different actors in a relationship of interest to all involved but such rights are limited in eligibility and exercise - only to be determined by regime itself. This implies that different actors are constraint in their roles as there are bottlenecks within the functional structure of institutions. Secondly institutions can also be dependent

variables if they emerge out of individuals' and/or societal needs. In viewing institutions from the management of common property resources context, Buck (1998) agreed with Young (1989) who posited regimes that they are social institutions governing the action of those involved in specifiable activities or set of activities;. . . [They] are practices consisting of recognized roles linked together by clusters or conventions governing relations among the occupants of these roles.

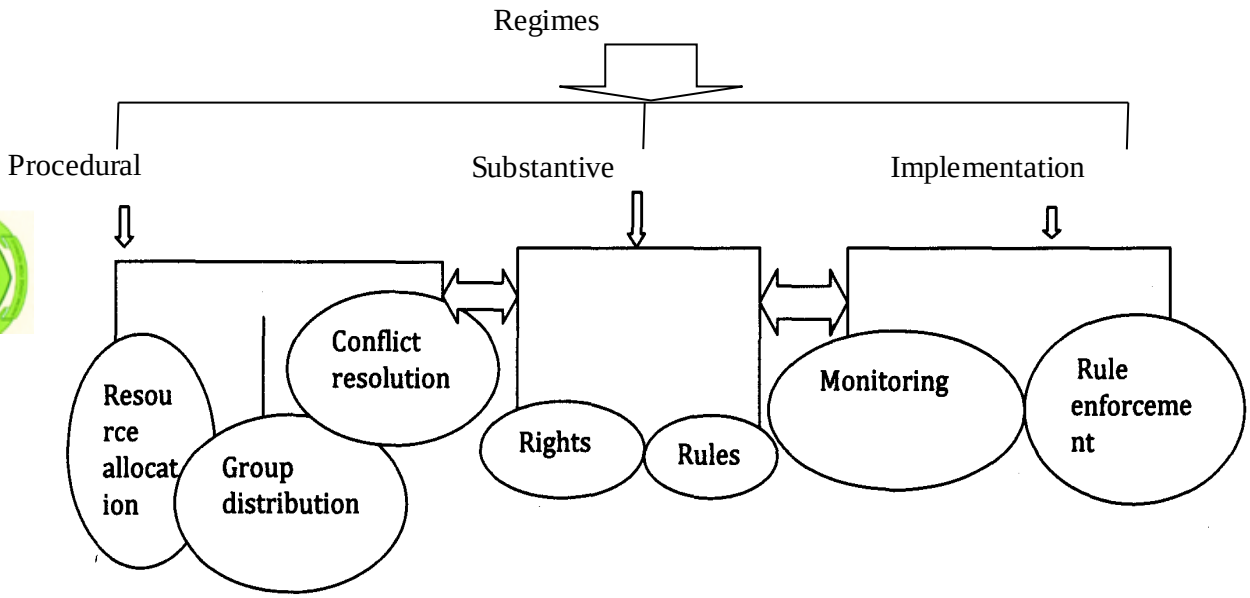
Institutions are thought of as "the rule of the game in society," then organizations may be thought of as the players or, "groups of individuals bound together by some common purpose to achieve objectives" (North, 1990: 5 cited in Leach *et. al.,* 1999). De Janvry, Sadoulet and Thorbecke (1993: 566 in Leach *et. al.,* 1999) assert that institutions are "complexes of norms, rules and behaviors that serve a collective purpose". They are practices consisting of recognized roles linked together by clusters of rules or conventions governing relations among the occupants of these roles. Institutions are mediators of people-environment relations (Leach, Mearns and Scoones, 1999). They are "regularized patterns of behaviour between individuals and groups in society" (Mearns, 1995a: 103), rather than just community-level organizations. Institutions matter as they define the sanctioned room for behaviour and provide the frame of

"Local law" and local natural resource regimes are characterized by a multiplicity of institutions and authorities, actors and interests embedded in the wider social, economic, political,

Beckmann 1989, von Benda-Beckmann *et. al.,* 1996b in Laube, 2006:4). This makes the outcomes of interventions highly unpredictable and potentially problematic. Especially, if - like in many developing countries - local resource regimes are highly complex and governance structures ambiguous. The ambiguity of governance structures is such that they are often characterized by despotic command structures and elite capture in domains of high economic and political interest (Bayart, 1993: ibid), but carry a high degree of laissez faire

or neglect with regard to the general implementation and enforcement of national policies in areas or domains of less political or economic importance (Migdal, 1988 in Laube, 2006:4). It is based on this assertion that, Buck (1998) supported Young, (1989) who posited three key components of regimes, namely, substantive, procedural and implementation from resource management point of view whether at the local, national or international level. Figure 1 depicts the three components as per the theory discussed. My assertion is that an institution should be one that sufficiently accounts for all three components in order to achieve appropriate natural resource management. The believed is that if the linkages are recognized and been harmonized all three components could lead to a minimization of conflicts between different title holders to available environmental goods and services in the local communities once they are considered open access.

Figure 1: Regimes and their Components in Relation to community



Source: Adopted and collated from Buck (1998)

Buck (1998:30) sees the substantive components of regimes to include rights which encompass anything to which an actor [individual or otherwise] is entitled to by virtue of occupying a recognized role while the rules are guides to action, defining resource use

through administrative regulations and incentive systems and outlining liability and procedures for daily activities. To Giddens (1984: 21 cited in Laube, 2006: 13), rules are perceived as institutionalized practices that are deeply embedded in social systems over time and space. They are practices continually repeated. At the same time, rules are the "techniques or generalizable procedures applied in the enactment/reproduction of social practices. They are the conditions as well as the consequences of agency. The procedural component is at the aggregate level where individual actors must make some collective choices. These decisions govern the allocation of resources; second, the distributive functions of the group; and finally, the resolution of conflicts or disputes. The third is the implementation components where deal compliance is affected by monitoring and enforcement (Buck, 1998:30). A recurrent criticism of both international relations and international law is that effective enforcement is virtually impossible because there is no routinized sanction mechanism (Buck 1998: 31). Clearly, the analytic structure of small scale common pool resource regimes is similar to that of the global commons and can be applicable to the context of local communities in their management of Common Property Resources.

Although regime theory is clear on the key components, ambiguity and negotiability are typical features of resource regimes in Africa, as they are highly contested (Laube, 2007:30). If Young sees regimes as practices consisting recognized roles linked together by clusters of rules or conventions governing relations among the occupants of these roles, then the components are not different from the institutions which by his definition are an integral part of regimes themselves. In real life situation, components can either be institutions themselves or part of a complex of institutions linked together. In the latter situation, the nature of the institutional networks may determine whether or not a particular component is important in influencing the processes within and between the components and a particular regime as a whole. Ostroem (1990) have observed that regime theory parallels some important aspects of institutional analysis in two main respects -first, is the levels of institutional choice and second, the design principles. (See Table 2).

Table 2.1 Institutional and Analytical Development Framework for the Global Commons

Levels of Institutional Choice
1. Operational choice: appropriation, provision, monitoring and enforcement.
2. Collective choice: policy making, management and adjudication.
3. Constitutional choice: formulation, governance, adjudication and modification.
Design Principles for sustainable Regimes
1. Clearly defined boundaries for User pool/appropriator and resource domain.
2. Operational rules congruent with local conditions and regulate user inputs for resource maintenance.
3. Collective choice arrangements to ensure user participation in setting the operational rules.
4. Monitoring to be done by appropriators or and agents of appropriators.
5. Graduated sanctions should be applied to appropriators who violate operational rules.
6. Conflict resolution mechanisms should be readily available and be legitimate.
7. Recognized rights to organized regimes.
8. Nested enterprises for larger common pool regimes/systems.

Source: Adapted from Buck (1998: 35). Also see Edwards and Steins, "Developing an Analytical Framework"; McGinnis and Ostrom, "Institutional Analysis"; Ostrom, (1990) Governing the Commons

Sustainable management of the global commons requires an analytical framework that recognizes the fundamental institutional characteristics that define all common-pool regimes (ibid: 35).

In property rights regime, when people have open access to forests, pastureland, or fishing grounds, they tend to overuse them (Human Dev. Report, 1992). When land and water have been nationalized by state governments and traditional management arrangements abandoned, the environmental consequences have often been severe. Traditional common property systems seem to promote sound management of natural resources and open access systems result in excessive exploitation. Human institutions that have built-in adaptiveness and resilience are capable of responding to, and managing, processes in a fashion that contribute to ecosystems resilience. Many common-property institutions have proven records that extend over long periods and generally consist of self-governing associations of local users managing common property records (CPR) or 'commons' (Berkes and Folke, 1998; Bromley, 1992; Ostrom, 1990 in Brunckhorst *et. al,* 2001). Commons were important structure for the early agrarian communities which consisted of common property managed by a self-governing association of local users. Many of them successfully endured for hundreds of years (Brunckhorst *et. al.*, 2001). By nature, it therefore suggest that, most rural communities in Africa manage their natural resources as a result of the fact that, man depends verily on nature for his livelihood. Many of these communities evolved their self-governing associations because of the mutual relationships between man and nature.

Table 3: Common-Property Institutions -Ownership, Rights and Duties

Institution	Ownership	Ownership rights	Owner duties
Private Property	Individual	Socially accepted uses; exclusive control of users	Avoid socially unacceptable uses
Common Property	Collective	Exclusion of non-owners; local regulation of users	Maintenance; constrain rates of use
Government/State Property	Citizens	Decide rules	Maintain social objective
Open access (non-Property)	None	Capture	None

Source: Hanna *et. al.,* (1995) as cited in Brunckhorst *et. al.,* (2001)

From the above description, it is clear that, local level institutions effort in managing natural resources is more appealing and flexible than the governmental unit. These local management principles by the people help them enhance their livelihoods though they combine the centralized system of management. This is confirmed by Lawrence *et. al.*, (2001) who assert that learning from local-ecological systems and combining insights gained in adaptive management in western science may counteract many of the prevailing crises of conventional resource management.

Contemporary studies on enduring commons and their communal governance institutions are beginning to provide some valuable principles for natural resource management. This is because; members of a community have shared a past and have anticipated sharing a common future (Ostrom, 1990). It is based on this that, Brunckhorst *et. al.*, (2001) agreed with Netting (1976:145) that communal tenure 'promotes both general access to and optimum production from certain types of resources while enjoining on the entire

community the conservation measures necessary to protect these resources from destruction'. This necessitates assessing natural capital (notably, land, water, trees/forest, animals and human beings) across an ecological landscape that equates also with the collective of landholders who are willing to share, nature, conserve, restore and harvest across the entire area. As a way of enduring social-ecological institutions, Jodha (1998) in Brunckhorst, *et. al.,* (2001) identified three elements that individually or jointly strengthen social-ecological system links and contribute to natural resource-friendly traditional management systems. These are; first, a total dependence-driven stake in protection of natural resource; second, close proximity and a functional knowledge-driven approach to resource use; and, third, local control-determined sanctions and facilities governing resource use. These strengths serve as control measures for common property resources (CPR).

One other control mechanism which Brinkley *et. al.*, 2004 in Lawrence *et. al.,* (2004) considers as the final choice of method for controllability (that is, avoidance of the tragedy of the commons) requires that control complexity and design complexities be matched. The relationship between the two complexities governs the stability of a complex adaptive system. Therefore, property rights to a given resource domain may be held by a variety of groups or individuals who intend to exercise those rights in rather different ways as a control measure. In a commons, access to the resource domain is established by the property regime, but appropriators who have access rights may still be seeking different resources or planning to put the resources to different uses (Buck 1998: 34). Local people by their nature had/or have constituted their own ways and means in addressing local issues. Once their lives depend directly on the environment, if they are given the opportunity to take their own decisions on resources that support them, they will institute measures that will enable the management of the environment sustainable. This is supported by Ribot and Larson, (2004) that by granting local authority or peoples their importance and historical uses and claims, local knowledge and input become highly relevant to their environmental resource management, thereby, making the local authorities good candidates for decentralized management and use of locally available natural resources for their livelihoods.

In relating the above to 'new resource management paradigm', Drengson (1994 in Lawrence *et al.*, 2001 suggest that resource forestry management be entrusted to community-based ecoforestry and community economic systems. Management of commons today is seen by many as a multi-dimensional issue because, communities alone may not be able to effectively manage these resources hence many scholars now advocate for institutional changes to include governmental and non-governmental bodies to be part of the management process. Meynen and Doornbos (2004) in Larson and Ribot (2004) assert that, in recent years, there has been a considerable restructuring of the institutional arrangements governing natural resource management (NRM). They added that these institutional changes 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. With the involvement of both these modern institutions, local communities are able to participate in resource management at every level within their communities to ensure sustainability of NRM to enhance their livelihoods. The 'new resource management paradigm' proposed by Drengson 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.

The poor conservation outcomes that followed decades of intrusive resource management strategies and planned development have forced policy makers and scholars to reconsider the role of community in resource use and conservation Agrawal and Gibson (1999). Effective resource management policy requires an understanding of the links between the social, biophysical and economic drivers of behavior Lawrence *et al.*, (2001). Institutional arrangements among commons are necessary as such institutions function individually and mutually exclusive. Traditional institutions thus function according to norms, values and conventions as opposed to modern institutions which are based on codified laid down rules and regulations but both aim at achieving the same goal. Diverse institutions, both formal and informal, and often acting in combination, shape the ways in which differentiated actors access, use and derive well-being from environmental resources and services and, in so doing, influence the course of ecological change (Leach *et al.*, 1999). Under most

regimes, community-based rules and customs dictate rights of access, and institutions co-evolve to enforce them. It would therefore appear that a combination of attributes will provide an enduring sustainable system, both socially and ecologically.

2.1.4 Sustainable Rural Livelihoods Framework

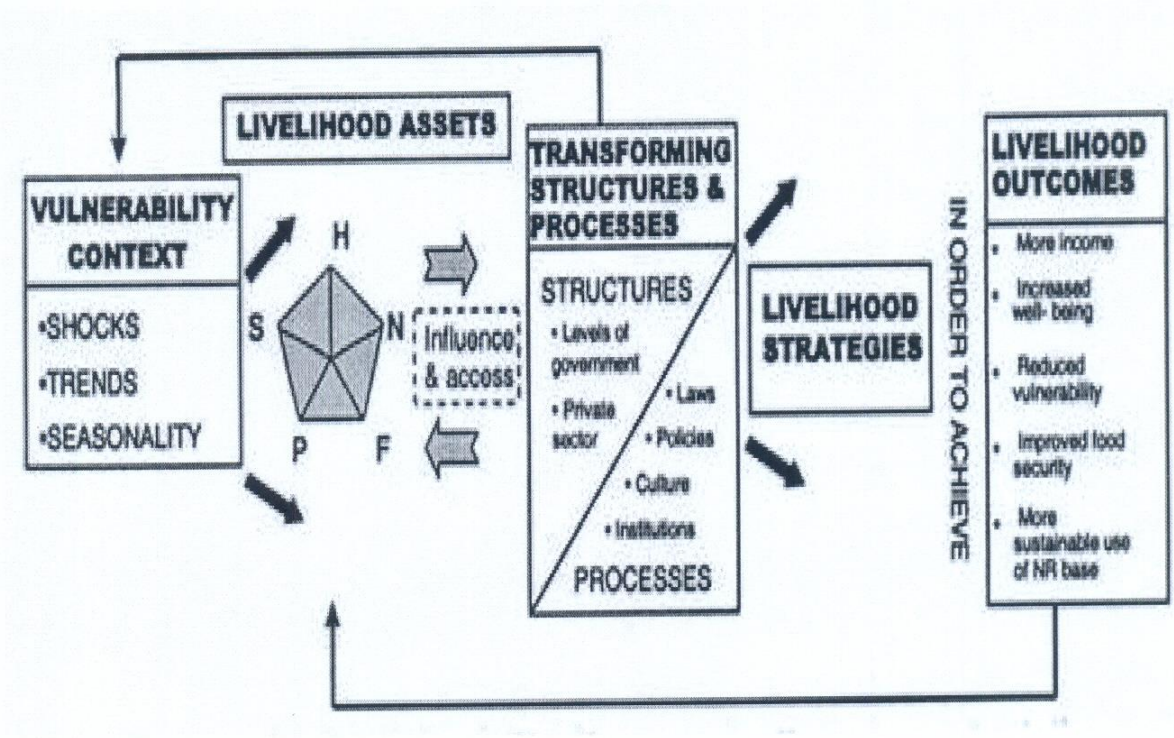
Livelihood and natural resources are closely interlinked. The survival of humankind depends primarily on both the availability of natural resources and the ability to use them sustainably and economically to improve the quality of people's life. This is what natural resource management is all about. The argument here is that, we cannot act outside nature. We can only act within the limits, boundaries and laws as set and allowed by forces of nature (Achoka, 1996). Livelihood is a sustainability function of culture but it cannot be achieved without the requisite natural resources and an enabling environment. Nature provides normally rich, diverse resources for use by people to sustain livelihood but whether this is done is an issue for discussion (ibid). One premise on which livelihood and management of natural resources are founded is that people have knowledge, apply skills, derive values and see the usefulness of natural resources.

Sustainable livelihood approach probably, is the best known analytical framework to incorporate many of the common concepts of assets, capabilities, and entitlements in assessing local peoples' livelihood and vulnerability (Moser, 2008). The emphasis of the framework is on livelihoods, and defined as the capabilities, assets (including both material and social), and activities required for a means of living (ibid). Thus, Carney (1998:1) defines a livelihood as sustainable when it can cope with and recover from stresses and shocks and can maintain or enhance capabilities and assets both at that time and in the future, while at the same time not understanding the natural resource base. A livelihood thus comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household (Cain *et al.*, 1988). Natural resource management in enhancing livelihood is the centre piece of the discourse which convinces me to agree with the above definition. The approach is founded on the

belief that people require a range of assets to achieve positive livelihood outcomes, with no single category of…. The understanding that income definitions are inadequate to layout the complexities of experiences of poverty and how poor people ensure survival owes much to the work of Robert Chambers. Vulnerability and well-being are two key concepts in his understanding of rural poverty, and both are defined in terms of poor people's own perceptions. Rural people seek to counter the vulnerability arising from high levels of risk and uncertainty through deploying tangible and intangible assets. These assets according to Choka, are the natural resources at the community level comprising water, natural bush with diverse species of plants (medicinal, fruits, habitat for insects and other forms of life), grassland and soils, among others. A living is thus made through a portfolio of activities, so that households and individuals are flexible and can adapt to a wide range of misfortune and external shocks.

The basic fundamental element in any livelihood systems is a vital need among villagers, in fact among all human beings, for a pattern of meaning and an order of things that assures a reasonable degree of reliability and predictability in whatever occurs in life (Anorsky, 1981 in Reudi *et al.*, 2004). The connections between livelihoods, natural resources and environmental entitlements rest on the type of environmental resources that avail in a particular area. All livelihoods approaches for me are actor-focused and emphasized the deliberate and strategic behaviour of the rural poor whose living depends more on nature In view of this assertion, Bebbington (1999) therefore links assets to Sen's (1980) capabilities and sees the poor as potential agents of change: '... people's assets are not only a source of sustenance and meaning - they are also a source of power'. The institutional level and the wider linkages beyond households are parts of the environment that mediate access to resources and which may constrain house holding. This can be illustrated on the framework below.

Figure 2: Sustainable Rural Livelihoods Framework



Source: Ashley and Carney 1999:5 adopted by World Bank, 2008: 70

The concept of sustainable livelihoods focuses on creating opportunities for the poor as opposed to providing protection. Thus, it addresses directly the critical role played by assets and capabilities in improving individual and household social and economic well-being and associated poverty reduction (Moser, 2008). The assets of the people of Lawra district is predominantly the natural resource base of the area. As they harness them for their livelihoods, it is important that these resources are properly managed to create the necessary opportunities available to enable them enhance their survival. Though, they need the support of the other capitals, natural capital which Moser (2008) agreed with Bebbington, (1999) is more relevant to indigenous people in rural communities. It includes the stocks of environmentally provided assets such as soil, atmosphere, forests, minerals, water, and wetlands. In rural communities, land and its landed properties are critical productive assets for the poor because, their lives depends directly on them. The

environment therefore determines the livelihood of the people in the study area. Changes in people's livelihood strategies are fuelled by changes in their environment, (Kees, 2004:76). Changes in a natural environment in a particular area, changes the livelihood strategies of the people in that area. Adaptations are therefore necessary.

2.1.4.1 Vulnerability Context

Within the context of the livelihoods framework, vulnerability is a dynamic notion, which captures the sense of a threat posed by adverse events. These events can take several forms, and include spasmodic as well as long-term trends or shifts relating to environmental and natural resource, economic, social and health conditions (World Bank, 1995). When viewed from a people-centered perspective, vulnerability is the risk that a household or an individual will experience a shock caused by an event over which she/he has no control.

While these shocks are 'external' in the sense that those who are vulnerable have no control over them, the impact of these events are internalised and affect the asset base on which individuals, households and communities depend. As described by Moser (1998):

"Vulnerability is therefore closely linked to asset ownership..... The means of resistance are the assets and entitlements that individuals, households, or communities can mobilise and manage in the face of hardship..... The more assets people have, the less vulnerable they are, and the greater the erosion of people's assets, the greater their insecurity".

The poor are managers of complex assets portfolios. Different household capital assets contribute to well-being outcomes, with the associated capacity to manage assets cushioning household and limiting the impact of shocks. Within the specific context of Ghana, the most vulnerable to external shocks are the rural poor, who rely heavily upon their natural resource asset base, and are thus susceptible to environmental events, whether one-off, seasonal or part of a long-term trend. A major cause of vulnerability highlighted, particularly by men, are poor rains on which the rural poor are dependent for crop production. Natural or environmental hazards such as bushfires disproportionately affect the housing of the poorest, commonly constructed of wood and thatch which are from

natural resources. The rural poor by their perception see vulnerability as not as their cause of damage to the environment, but as a punishment from God or their ancestors.

Holistic understanding of livelihood

According to Long (1997, quoted in Appendix 2001: 24-25), livelihood "best expresses the idea of individuals or groups striving to make a living, attempting to meet their various consumption and economic necessities, coping with uncertainties, responding to new opportunities, and choosing between different value positions ..... ''. In the latter, in particular, I find an indication that the understanding of livelihood has to go further than the economic or material objectives of life. Livelihood should be seen as a dynamic and holistic concept, which is best illustrated by Bebbington (1999: 2022):

"A person's assets, such as land, are not merely means with which he or she makes a living: they also give meaning to that person's world Assets are not simply resources that people use in building livelihoods: they are assets that give them the capability to be and to act. Assets should not be understood only as things that allow survival, adaptation and poverty alleviation: they are also the basis of agent's power to act and to reproduce, challenge or change the rules that govern the control, use and transformation of resources".

A person who has no access to natural resources as a means of survival, through his/her relations with others can access them since some resources such as shea and dawadawa and other plants either in the bush or farmlands are common property resources. Livelihood activities are not neutral, but engender processes of inclusion and exclusion. I conclude that livelihood is organized in arenas of conflicting or co-operating actors.

2.1.4 Endogenous Development Framework

Endogenous development framework would be applied to support the theoretical perspectives that have been surveyed to sufficiently address the complexities that underlie NRM in Ghana and the study area This is so because; it can accommodate both indigenous

and western-orthodox theories in dialogues on academic as well as practical relevance. Haverkort *et. al.,* (2003:31) argued that, 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). Before the advent of this theory, the natural science which derives mostly from Decartes' theory of rationality recognized only the natural and social worlds but not the spiritual. Millar, (2005) also assessed that, 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. Haverkort *et. al*., (2003) therefore defines 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 is therefore based on the ground that the theory has systems in place for communities to learn locally and experiment, build the local economies and hold on to the benefits that accrue from it in the local area. According to van't Hooft (2006) the term endogenous means 'growing from within'. By these definitions therefore, endogenous development is development based on peoples' own resources on the environment surrounding them, strategies use to harness these resources for their wellbeing and the values that are associated with these resources on the environment. In supporting endogenous development, therefore, implies that there is the need to strengthen the local resource base of the people, and improving their ability to incorporate selected external elements into the local practices. The aim is development based on local needs and capacities, in order to broaden the options available to the people, without idealizing their local views and practices. The objectives of endogenous development theory are to strengthen the local market systems, organisations and their traditional knowledge systems.

Generally, peoples' livelihood depends on the environment in which they live and their value and belief systems are defined by the resources around them. The cultural and spiritual values of a people are determining forces in managing natural resources in a rural community in Africa but these communities often find it difficult to represent themselves in decision-making processes in terms of these resources. Verschuuren, (2007) postulated that

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. In view of this 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. It therefore behooves on orthodox institutions to see communities as part of the decisions that are taken when it comes to the issue of managing natural resources which serves as a source of living for the communities. Verschuuren (2007) further 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 bio-cultural 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.

In his Economic and philosophic Manuscript of 1844, Marx defined nature as "man's inorganic body", pointing out that "man lives on nature" and he takes from nature all the means necessary for his existence. This is historical reality because through the process of growth of science and technology, his conscious and purposeful activity has constantly exploited the substance of nature in order to satisfy his ever-growing needs. At the close of the twentieth century, man has realised that the use of practically all known irreplaceable resources of nature cannot be considered infinite nor can they keep up with the ever-

2.2 Natural Resource

growing needs. Moreover, it is also witnessed that man's interference in natural processes can cause considerable shocks in the whole biosphere. As the natural resources are extracted, the ecological balance is being upset and the environmental hazards increase (Mishra, 2001). Society since time immemorial has developed complex natural resource management systems that until recently have ensured their survival. There is the need to operationalise what is meant by 'natural resources' in the context of this study/writings. Buck (1998:3) postulated that, a resource is anything that is used to meet the needs of an organism. Some resources are natural resources, that is, material that has economic or social value when extracted from its natural state she added. In economic terms natural resources are those things found in nature that have value. However, this is not necessarily confined to economic value in the context of production and marketing. The value of a natural resource depends on how it is valued, who uses it, and for what purpose it is used. Different land users can place a different value on the same resource. To a farmer trees might seem useless unless as they hinder cultivation, while to a pastoralist they can have value as important forage for livestock. Natural resources can also have non-use value (Lane & Scoones 1991 in Lane 1992). He further argued that, what is fertile ground for a farmer might also have important spiritual value to a herder (Lane 1991 in Lane 1992). Also, the significance of burial sites, sacred groves, meeting places, rest or shades areas, can be every bit as important to them as its economic value he added. These disparities of view might seem obvious but they reveal an important dimension of natural resource management that has yet to be fully understood by development planners in rangeland areas of Africa. Scoones 1991; Abel & Blaikie 1990 in Lane (1992) because of the often scarce and variable nature of natural resources, pastoralists and farmers have devised land use systems that reflect their diversity. By tracking resources according to seasons they are able to utilise forage when it is most productive, and then move on, allowing it to recover after use.

Interest in Community-Based Natural Resource Management (CBNRM) derives from a combination of frustration and optimism. The frustration comes from the shortcomings of efforts to preserve vulnerable natural resources that ignored the needs and interests of local communities and that failed to enlist their cooperation and capabilities in managing those

resources. At the same time, there are a number of encouraging experiences with community involvement in natural resource management. Natural resource management is advocated to combat such deterioration and to promote the sustainable use of resources, the regeneration of those resources that are depleted, as well as the creation of new resources. The most sustainable avenue for such management supposedly involve a community-based participatory approach in which people take the initiative, form a council and set the agenda (Smita *et. al.*, 2003).

As the population continues to grow and common resources are under-monitored and overused, the natural resources available to the rural poor are being depleted and polluted. Continued deforestation causes the erosion of arable topsoil and makes firewood a scarcity and the pollution of reservoirs results in the spread of disease (Smita *et. al.*, 2003). Natural resources which constitute land, the flora and fauna on it need to be adequately conserved for the wellbeing of the people in the study area in order to reduce poverty and enhance wellbeing. Mishra (2001) argued further that, land is not only the solid part of the earth but also a natural complex of soils, minerals, water and forests. Therefore, the use of land should not be treated in isolation from that of soil, minerals, water and forests which have direct bearing upon the man-nature problem. The resources that abound on the land serve as a livelihood for the populace and it is from these resources that, man derives all other means. It worth therefore that, the fauna and flora needs some efficient management to enhance peoples' livelihoods because there is a saying which goes that "when the last tree dies the last man dies".

2.3 Natural Resource and Savannah

Pearce *et. al.*, (1994: 172) observed the natural resource base of Nepal and concluded that it consist of its cultivable land resources, forest resources, soil and water resources and its natural areas, which are of great scenic and biological value. Apart from the latter, the other resources are critical to the livelihood of the mass of the people of the country, and likely to remain so for the foreseeable future. Therefore, it is imperative that rural people in sub-Saharan Africa in comparing to the Nepalese livelihood depends largely on these natural resources, hence the need to access and conserve them for the future.

Natural resources globally have been declining and this has gained major grounds not just because of the mere numbers that are lost annually but also because of the socio-economic, cultural and general environmental impacts that come along with it. To Bhargava, (2006) about 1.2 billion people (including more than 400 million in Africa) rely on open woodlands or agroforestry systems that help to sustain agricultural productivity and generate income in developing countries. The people in the savannah region depend on medicines derived from plants or rely on common-pool resources for meeting essential fuel wood, grazing, and other needs. Resulting from this assertion, there is the need for sustainable management and use of these resources which serve as major sources of livelihood to the people of the study area.

This notwithstanding, there is enough indication of the rich faunal and floral diversity of the district. Millar (2007:1) has observed, for instance, that largest National Park - Mole National Park - covering nearly 5000 sq.km is found in the Northern region. The Northern region has 21 forest reserves with a total perimeter of 1160.43 km; Upper West has 16 reserves with a total perimeter of 525.72 km and Upper East has 89 forest reserves and community woodlots with a total area of 2,010.68 hectares. However, there are at least two reserves found in the study area managed by the forestry commission in addition to woodlots dotted around which continue to serve as source of life to the people. Apart from these two, the resources on both farming lands and fallow reserves also constitute sources of livelihood to the people and hence need conservation for generations to come.

2.4 Natural Resource Diversity

Over the last decade, cultural and spiritual values have come to be recognised as crucial elements in nature conservation. Today, the major nature conservation agencies all work with representatives of faiths and spiritualities (Verschuuren, 2008). According to him, the International Union for Conservation of Nature (IUCN) defines sacred natural sites as ‘areas of land or water having special spiritual significance to peoples and communities’. Examples include mountains, groves of trees, springs and caves. In addition, sacred natural sites are often safe havens for biological and cultural diversity, and represent long-standing

relationships between human and nature. They offer examples of how people connect to nature in meaningful and often spiritual ways. This means that the survival of these local people rest on nature and the resources both flora and fauna available to them. This is supported by (Ntiamoa-Baidu 1995; 2003), biodiversity refers to the variety of life forms and measured in terms of biomass (e.g. tropical moist forests, coastal wetlands), ecosystems, species and genetic varieties, and the interaction between them. She referred to biodiversity in Ghana to the myriad of plants and animals that make up the savannah, forest, wetland and marine habitats in the country. Ghanaians have, intrinsically, always recognised and appreciated the value of biological resources in terms of the contribution of such resources to food security, household items and income as well as the role plants and animals play in their culture and religion (Ntiamoa-Baidu 1992; 1995 in 2003). In addition to the traditional strategies, significant attempts have been made by both the colonial administration and subsequent governments to conserve the country's natural resources. However, despite all these commendable efforts, the nation's natural resources continue to be threatened by over-exploitation, wanton destruction and degradation. In Ghana, and the study area as well, resource diversity is eminent as shown by the numerous species of flora comprising plants, grasses and shrubs. The lives of the people are largely dependent on flora and fauna which constitute rich nutrients and carbohydrates for rural people to survive on. This rich plant life is heavily exploited for food (e.g. wild fruits, roots sweeteners and spices) as a source of income such as building materials, fuel wood and household items. A wide range of plant species as well as grasses have medicinal properties and many people in Ghana depend on herbal medicines for treatment of a diverse range of ailments. This is visible in the study area as these areas as these resources

2.5 Natural Resource and Poverty

Many people think of the relationship between extreme poverty and environmental degradation as an inescapable and vicious cycle. The image that springs to mind is that of the poor practicing slash-and-burn agriculture where rainforests once grew or eking out a

living on a barren hillside. On the surface, this seemingly common-sense assumption about poverty being a main cause of degradation is logical and obvious. Evidence, however, shows it is frequently misconceived (UNDP, 2004). How poverty affects the environment depends upon many factors, including local distribution of resources and the degree of community participation in decision-making. While there are, to be sure, instances where poor people and their environment have become locked in a downward spiral, this situation is not inevitable. In fact, most environmental degradation is caused by the production and consumption patterns of the non-poor. And the poor, whose life and livelihood choices are profoundly shaped by their physical surroundings, have a strong vested interest in protecting rather than destroying the environment, which is enhanced when they have some part in its management and use. The reality is that the relationship between poverty and environment is complex and context-dependent, and simplistic models and unexamined assumptions often lead to inappropriate policy choices.

Cotula (2002) therefore argued that, access by the poor to natural resources (land, forests, water, fisheries, pastures, etc.), is essential for sustainable poverty reduction. The livelihoods of rural people without access, or with very limited access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating other assets, and recuperating after natural or market shocks or misfortunes. Simply put natural resources are essential therefore for the lives of the people of sub-Saharan Africa directly or indirectly if not the world as a whole including the study area. Even sophisticated frameworks aiming to analyze rural resource use emphasize access to environmental resources and ultimately convey an image of rural people making their living from natural resources (Leach, Mearns and Scoones, 1998, p. 7).

The need therefore arose for the conservation of these resources by the people. To Africans, poverty is reduced when one is able to feed all year round by depending on the resources available to one. Once their lives is dependence on these resources, Africans from time immemorial have design ways and means of conserving them to help improve their wellbeing and the future generations to come that goes a long way to reduce poverty.

UNDP (2004) further posited that shifts in the way governments and development practitioners understand poor people are required; the poor have to be seen as part of the solution rather than as part of the problem. The emerging consensus is that sound environmental management is critical for poverty reduction and that poverty reduction is compatible with maintaining environmental assets. At the heart of both achievements is empowering the poor with the assets, rights, and entitlements they need to manage their natural resources sustainably and to reduce their vulnerability to environmental shocks, hazards and conflicts. Taking from the discussions above, Sibanda 1997 agreed with Nyathi that, African people are committed to the environment and to sustainable resource utilisation. Religion and religious beliefs have played and continue to play critical role in resource utilisation and conservation. That African religion encourages the user to nurture the environment and to use only that which is necessary. It therefore concludes that poverty can be minimised if the available resources are properly conserved as the rural poor depends on the resources. Nyathi went on to say that, Africans have conserved wildlife and other resources for centuries but the white man brought guns, plough, other sophisticated equipments to destroy our environment and turn round to accuse us of destroying the environment. Sibanda said African spiritualism creates respect for animals, reverence for forests, rocks, mountains and rivers. Our life is seen as being sustained by natural resources as we also sustain them he emphasized. It is not necessary to understand the science of it to understand that abusing resources results in the destruction of the environment and life support systems.

2.6 Common Property Resource

Common property resources (CPR), like forests and lakes, plants and other related products can provide a significant share of food and household income for the poorest families in society (UNDP, 2004). The environment often has religious, cultural, and restorative value to communities and individuals. When these elements of society are disrupted, communities may feel that their natural laws and livelihoods are threatened. Common pool resources are an important component of the natural resources endowment of village

communities in developing countries. They are those resources in which a group of people have co-equal rights, specifically rights that exclude the use of those resources by other people (Jodha, 1992 in Mahendra 2001). There exists rivalry in consumption of the resource within the group. In free access resource case, everybody has access to the resource and therefore exclusion is not possible, though rivalry in consumption remains. Jodha (1986, 1992 in Mahendra 2001) has studied the CPR situation in the dry tropical regions of India and tried to estimate the benefits that poor people derive from CPRs to meet their basic needs. Jodha found out that,

(a) The rural poor receive the bulk of their fuel supplies and fodder from CPRs;

(b) CPR income, although likely to be under estimated, accounts for 14 to 23 per cent of household income from all other sources in the study villages in India;

(c) CPR product collection is an important source of employment and income, especially during the periods when other opportunities are almost non-existence; and

(d) The inclusion of CPR income in total household incomes from other sources reduces the extent of rural income inequalities, as indicated by lower values of the Gini coefficient.

He made an interesting observation-in the case of rural poor, per worker employment days generated by CPR-based activities were higher than the days of employment on their own farm or on public works under the anti-poverty programmes. This is no different from the case of the study area - Lawra District. The harnessing of these natural resources by the rural folks for their livelihoods is enormous and contributes significantly for their wellbeing. It contributes to their feeding from gathering fruits as well as leafs from the wild, the sale of these in addition to firewood helps in improving their income base etc. A property right is then seen as "a claim to a benefit stream that some higher body - usually the state will agree to protect" (Bromley, 1992:2 in Vedeld, 1992). I tend to agree with Vedeld who supports Godelier (1984:71-121) that, property rights regime is "a legitimate and coherent system of formally or informally enforced rules and practices used for everyday appropriation of culturally necessary means of subsistence... whose local structure is dependent upon the structure of local government and the incentives of

individual users" (Swallow and Bromley, 1991:3). He therefore identified four types of property regimes; 1) state property regimes, 2) private property regimes, 3) common property regimes and 4) non-property regimes or 'open access' (Swallow and Bromley, 1991).

Most of the natural resources in the study area would by most people be categorised as 'common resources'. This will range from situations where resources for all practical purposes are open for anybody to use (open access) to situations where resources are managed by individuals or local groups as if they were ordinary private property (controlled access). Under a 'common property regime' there will be more than one decision maker with a legitimate right to the benefits arising from the use of these resources.

2.7 Conceptual Scheme

The interaction between human society and nature leading to different aspects of the man-nature problem has posed the most consuming question in natural resource management (Mishra, 2001). This gives a threefold but conflicting objective in the domain of natural resource management: productivity, equity and sustainability. Objectivity pleads for maximizing output per unit of resource or input he said. The equity question of natural resource management does not mean an equal access to natural resources and their use but fair distribution of benefits from the use of natural resources among people in the framework of Pareto efficiency. The objective concept of sustainability is generally understood as environmentally sustainable uses of natural resources. The market regime based on the private property structure knows nothing except the language of profit--making. Attwater, 1997 in Subrata, 2002 therefore see property as a three way relationship between the holder of the property entitlements the particular resource complex and the collective, state or social norm which gives legitimacy to the entitlements. Property may thus be one of the most comprehensive yet at the same time most elusive concepts in the natural resources management debate. "Property is not about things, but about relationships between and among persons with regard to things. Property is thus a rubric which provides

a focus on how access to, use of, and control over "things" or resources are organised in society (Lund *et. al.*, 2001: 14). Generally, natural resources can be held under anyone of the three property regimes: communal property; private property; and state property. These formally, should determine who the managers are, but of course what is formal and what is actual, may well be different. It is therefore imperative to establish conceptual clarity about concepts such as natural resource management and local institutions because, the choice between different conceptual approaches has a bearing on what one wants to unearth and on what to emphasize. Natural resource management is seen as to cover resource allocation, use and development, not just resource conservation. In this context, it is useful to distinguish resource management from conservation, as observed by O' Riordan:

Resource management is a more comprehensive and positive term than conservation, and may be defined as a process of decision making whereby resources are allocated over space and time according to the needs, aspirations, and desires of man within the framework of his technological inventiveness, his political and social institutions, and his legal and administrative arrangements (O' Riordan, 1971:19).

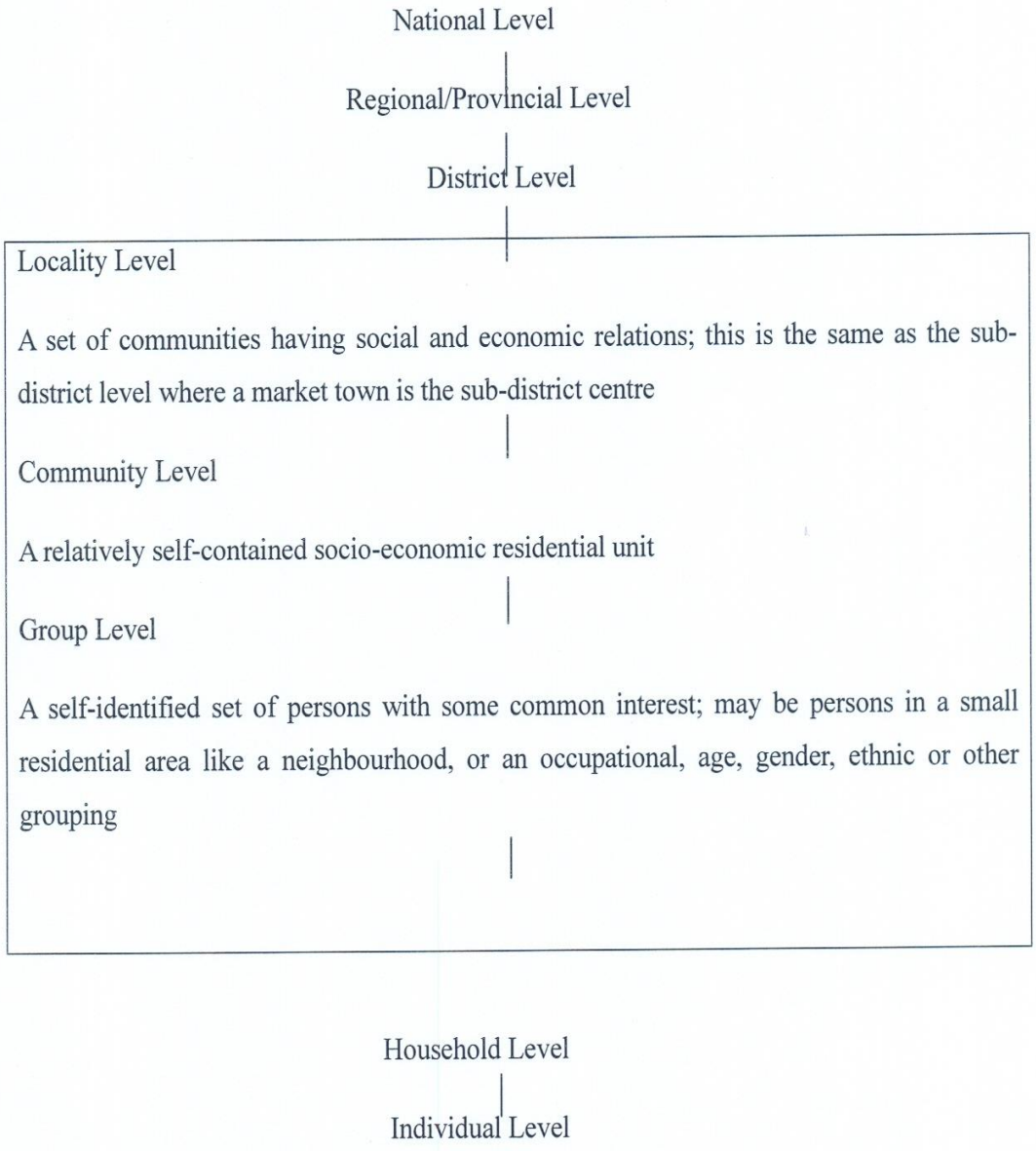
I have decided to avoid with regard to the concept of institution some of the narrow definitions which restrict the term to mean just formal organisations as pointed by Uphoff (1986):

When planners and managers remark that "local institutions" are weak, they are usually referring to the so-called "modem" institutions that have been assigned specific development tasks by the government. Localities vary in the extent and vitality of their so-called "traditional" (indigenous, formal) institutions, evolved and supported by rural people to deal with diverse problems-economic, social, cultural, religious, political etc. Some such institutions almost always exist though they may be hard to find or to work with (Uphoff, 1986: 6).

For this study, I support Maganga who agreed with Gunnarsson's (1991) definition of which institutions include" rules, norms and customs and their enforcement characteristics, which determine rights and obligations between people". Local institutions can be conceptualized in different ways. "Local" could be ecological, geographical or political. I

then tend to agree with Uphoff's (1992) categorization of institutions according to levels of decision making and activity to be suitable for this study and very helpful by adopting his conceptual framework.

Figure 2.3: Conceptual Framework on Institutions



Adapted from Uphoff 1992:5 and modernised

Many policy studies concerned with relationship between local institutions and natural resource management have attributed poor management to intrusive state policies which are alleged to have interfered too much on the local scene and undermined local institutions, hence preventing these local institutions from playing their role in regulating resource use. Maganga (1992) agreed with Bromley and Cernea (1989) that colonial and post-independence political and administrative changes seem to have undermined local regulation of resource use, hence opening way for unregulated exploitation and even abuse of resources. He further supported Lawry (1989) that, however effective they were previously, local institutions now face significant constraints as far as mobilizing collective action is concerned, and hence they cannot be relied upon alone in resource management.

Most Sahelians' livelihood and fortune depend on their access to natural resources and on their own production (Lund and Benjaminsen 2001:8 (eds.). This is no different from the study area since it lies closely to the Sahelian zone. Hence, production systems and questions of property rights directly and indirectly impinge upon the political agenda.

The human-nature problem in the context of natural resource management is organically interwoven with the socio-economic, political and ideological contradictory conditions characterising the contemporary world and bear the imprint of the class position and the attitudes and themselves exert an ever-increasing influence on the attitudes and activities of the masses (Mishra, 2001). Hence, given the global concern and different use-patterns of natural resources, the question of natural resource management has also to be understood in the context of nature-man problem specific to a given space on the globe, not in an integrated form. The question of natural resource management can be resolved by conserving and preserving those which are not replaceable, and using and managing the replaceable ones which could yield maximum benefits ensuring distributive justice. Mishra further argues that the participatory management of natural resources requires appropriate institutions and their corresponding methods and policy programmes. In this regard, the state as the constitutional authority and the guardian of the society has to play its promotional role. Institutional arrangements may be formal or informal. Formal institutions

like traditional councils in the study area can take up the responsibility to use locally available knowledge for managing the natural resources like land, water and vegetative biomass which local people have acquired over time from one to another generation in succession, given the agro-climatic conditions. They know as to how their physical existence is reproduced and as to how the nature-imposed necessity causes material exchanges between them and nature. For instance, they know how to preserve economic trees such as dawadawa and shea using traditional norms.

There may also be informal institutions involving local people and their knowledge for managing the locally available natural resources. Such institutions may not succeed in making participatory management effective if the local people do not have direct participation in them.

2.8 Natural Resource Management Systems

Competition to control access to land, water, forests and other natural resources in rural Africa is growing. This is particularly true for common property resources that are used by many people to meet their basic needs. These resources provide millions of people with grazing for their livestock, timber and fuel wood for their homes and a wide range of other products such as famine foods, fruit, medicines and honey for domestic use and sale. Poor people, or those on the margins of society or without easy access to land, are especially dependent on these resources for their livelihoods (iied, 2002).

The term ‘community-based’ distinguishes the emerging approaches from an earlier concept of community natural resource management, which refers to communities having full and generally autonomous responsibility for the protection and use of natural resources. This approach has derived from or been modeled after indigenous systems of natural resource management, where local knowledge, norms and institutions have co-evolved over long periods of time with the ecosystem in question. This often makes for well-attuned management regimes though it does not invariably make for a commitment to the conservation of natural resources. (Uphoff, 1998). Vedeld (1992) also sees natural

resource management as all aspects of rangeland and water management. This include the operation of water and land rights, resource use conflict resolution, range patrolling, regulation of transhumance, adjustment of stock rates, herd splitting and changes in species composition, regeneration of pasture, fire control, tree protection - as well as management of crop - livestock integration (labour - animals, use of manure, stall feeding, fodder harvesting and production).

There are situations where community NRM is more feasible, and more desirable: where human populations and ecosystems are co-adapted and not under stress, and where communities are not confronted with new conditions or new pressures, e.g., from climate change, rapid population growth (natural or due to in-migration), availability of new 'technologies, weakening of local institutions, new tastes and demands within communities, or changed legal regulations and policy directions. This listing does not suggest that community NRM is invalidated by such factors but that it is less likely to tenable where such factors are present (ibid). It should be realized that many changes in resource status are not primarily the result of human action or intervention, as seen in West African savanna and forest regions (Leach and Mearns 1996). It needs also to be appreciated that how resources are viewed and used is conditioned by political and power relationships, not just by abstract or inexorable trends in biophysical or demographic terms.

Recent advances in ecological theory suggest ... that many more environments than was previously thought are characterized by high variability in time and space. This has important implications for managing natural resources and environmental risk, and suggests that understanding environmental change involves looking beyond natural resource depletion or degradation in the aggregate.

Similarly, local communities may be shown to be dynamic and internally differentiated, and the environmental priorities and natural-resource claims of social actors positioned differently in power relations may be highly contested. These factors point to the importance of diverse institutions operating at multiple scale levels from macro to micro, which influence who has access to and control over what resources, and arbitrate contested resource claims. (Leach *et. al.*, 1997: 5- 6).

The circumstances that favour purely local and autonomous resource management are becoming more restricted. Local ecosystems are usually linked significantly with larger ecosystems, so one can argue that conserving, as compared to extractive; management requires larger rather than local schemes. Moreover, if the conservation of particular resources is justified not just as a local good but as something that the whole world community has a stake in, then that larger community should be expected to contribute to the cost of maintaining that good.

This means that conserving management is likely to be less supportable or even desirable in isolated areas, even if responsibility for this could be discharged by persons living in close proximity to the resources rather than remotely from them. It is appropriate that beneficiaries who reside far from the resource nevertheless be involved in some way in covering the cost of maintaining the benefit, which is difficult to arrange with autonomous local management systems.

CBNRM as a strategy reflects in social and policy terms the parallel nestedness of organisms, species, associations and ecosystems in the natural universe. Biological systems, because they do not exist in isolation, need to be maintained within conceptions that comprehend the connectedness between micro and macro levels.

For natural resource management, the community broadly conceived is where most of the decisions and actions that directly affect natural resources are made. At the same time it highlights a need to remain cognizant of higher levels of social organization and ecosystem analysis and to relate these clearly to lower levels, a strategic vision expressed by Rene Dubos' admonition to "think globally, act locally." To endorse decision-making at local levels is not to argue that the decisions taken there are necessarily or always the most crucial ones. Certain decisions and actions taken at regional, national or international levels are going to be more deterministic. Accordingly, one should not focus exclusively on local arenas for management. The converse of Dubos' advice is also true: think locally, act globally. What appear to be local problems often cannot be solved at local levels. But local decisions and actions collectively and cumulatively shape the course of ecosystem conservation or degradation in pervasive ways. It is mostly within the purview of

communities that forests are cleared, land is cultivated, wild flora and fauna are collected, and water sources are affected by resource management practices. Impetuses for these practices may come from outside communities, but communities are where "the rubber meets the road".

Not all community decisions and actions with regard to natural resources are benign. They can range from resource - degrading to resource-conserving, and sometimes resource - enhancing. This makes it all the more important that local understanding and support for conservation objectives be gained and maintained, since government abilities to enforce decisions favouring natural resource protection are so often limited. Not all resource degrading behaviour comes from communities. Much stems from 'outsiders'. Focusing only on communities can overlook important threats to the environment. But such threats make enlisting local understanding and support all the more important, as communities can be vigorous defenders of natural resources that they believe they have a stake in, though it is true that they can be stymied or bought off, especially if local structures of decision making are weak or unaccountable.

A community-based approach recognizes and reinforces the stakeholder role of people living in, on and around vulnerable natural resources, both for these people's sake and for that of future generations, for people living in the immediate area but also in the rest of the country and the rest of the world. Where local perceptions or interests do not favour resource conservation and where a strong case can be made for preserving particular ecosystems in terms of objectives discussed below, there may be justification for other agencies or organizations to become involved more directly with their management, providing financial and other resources as compensation or incentive to support the preservation of natural resources. But even then, the approach is more likely to succeed if negotiated and linked, with rather than in opposition to local residents.

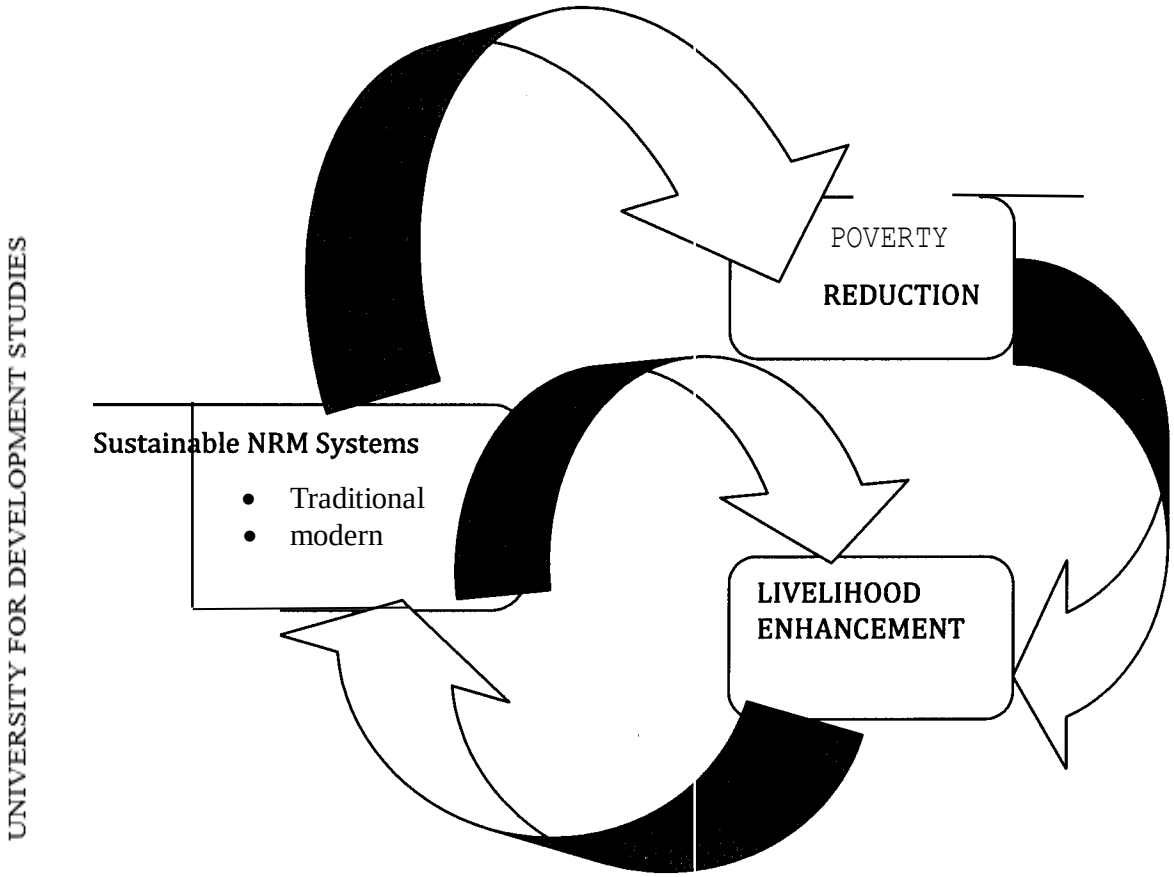
CBNRM assumes that processes of resource inventory and appraisal, consensus building and conflict management can inform and empower communities to engage in collective action to utilize and sustain natural resource endowments. This will lead to a system of management that is superior to what could be achieved by purely outside decision-making

and initiatives. Second, natural resources themselves are quite heterogeneous. Community management of harvested resources such as timber or fish is quite different from community conservation of biodiversity. The former is management of directly utilized resources which produce immediate value to those extracting them from nature, while the latter provides only indirect, delayed or cultural value. Communities may be quite able and motivated to undertake the former in ways that ensure the continued availability of economically-valued resources, while at the same time International CBNRM Workshop, Washington, D.C., May 1998:5 having little interest in the preservation of 'extraneous' biological resources.

2.8.1 CBNRM Strategy

CBNRM presumes that local residents can understand and will support larger interests and principles of conservation, factoring these into their economic, social and cultural considerations about how natural resources should best be treated. It should not, however, idealize or romanticize local resource users, who for a variety of reasons - economic, social or cultural - may be more disposed toward resource-degrading behaviour (RDB) than resource-conserving behaviour (RCB) (Uphoff and Langholz, 1998). Sometimes communities may preserve the resources within their own jurisdiction by diminishing those of neighbouring communities, as in the case of the Madan Pokhara panchayat in Nepal (Acharya, 1984). Threats to natural resource sustainability can come from any level, from micro to macro, so decisions are not entrusted entirely or exclusively to higher levels or to lower ones. CBNRM is a system of natural resource management, especially because there may be need for higher level support for enforcement of local management efforts and restrictions. The essential feature of CBNRM is starting with communities, taking them into confidence and having confidence in them. It engages their ideas, experience, values and capabilities on behalf of resource conservation objectives, at the same time it seeks ways for communities to become better remunerated and better served.

Figure 4: Link between Natural Resources, Poverty and Livelihoods



Source: author's construct, 2009

As stated in the introduction earlier, there is a direct link between natural resources and poverty reduction. In figure 4, if communities embark on sustainable management practices of these resources, poverty will be reduced which will go a long way to enhancing their livelihoods. It is therefore prudent for communities in the study area to conserve the available resources for the generations to come.

2.8.2 Women and Natural Resource Management

People in every rural area are keenly aware that their standard of living is dependent on land and natural conditions. As population continues to grow and common resources are under-monitored and overused, the natural resources available to the rural poor are being depleted and polluted. Continued deforestation causes the erosion of arable topsoil and

makes firewood a scarcity and the pollution of reservoirs results in the spread of disease (Smita *et. al.*, 2003). In view of all these repercussions, people must make the preservation of their environment a priority. Natural resource management is advocated to combat such deterioration and to promote the sustainable use of resources, the regeneration of those resources that are depleted, as well as the creation of new resources. Sustainable natural resource management presents a great challenge and calls for strong leadership (ibid). From the perspective of women's leadership, their share of decision-making and leadership at the global level is small. It is necessary and desirable for women to have greater participation in leadership in order to incorporate their perspectives, needs and interests (which are different, and also reflect the needs of children d families) in decision-making (Comer, 1997). In West Africa, and Ghana in particular, omen face special constraints with regard to land and natural resources beyond those that men face: notably, limited property and political rights (Agrawal, 1994; Chen, 1993).

The linkages between women and natural resource show three common patterns. First, natural resources are central to the livelihoods of poor rural households. Second, women are the primary gatherers and managers of bio-ass goods in poor rural households. And third, women's roles and responsibilities are pivotal not only to the management of natural resources but also to the management of the domestic economy (Chen: 1993). Typically women, rather than men, maintain closer physical ties with the natural resource base. They have in-depth knowledge and know-how about e properties and uses of different biomass species (Chen, 1993:35). They are therefore recognized for me, to be more conservationist than men and to more readily perceive the negative consequences of the degradation and destruction of forests and grasslands. Shiva (1998) argues that there is an intimate link between degradation of women and degradation of nature. She focuses on the challenge that women in ecology movements are creating and argues that their struggles constitute a non-violent, non-gendered and human inclusive alternative to the dominant paradigm of development based on science and technology.

However, not all women are engaged in resource based activities and not all women share the same perspectives on natural resources. Men and children also engage in the collection of biomass goods. There is no conclusive evidence, however, that women's needs and

preferences are always different from those of men. Women lack knowledge about decisions taken concerning the resource they use; this fact cuts across class divisions. They are not aware of the functioning of the forest committees. As they do not understand meetings, they cannot participate and speak up. Therefore only men go to the meetings (Hobley, 1991). Further, there is no cultural tradition of women coming together to solve their problems. While the interest of rural women living within the subsistence economy in sustainable management of natural resources is obvious, it does not automatically result in them taking the initiative to reverse the process of degradation. They are kept isolated and devoid of access to information. Decisions regarding land are within the domain of men (Sarin and Khanna 1993:161 cited in Smita *et. al.*, 2003). The role of women/gender in natural resource management in the Lawra district is built on the above premise indicating their significance and constraints.

2.8.1 Formal Institutional Ways of Managing Natural Resources

African societies evolved various institutions to guide natural resources management. Kendie (2006) agreed with Silverman (2000) that, 'institutions comprise a wide variety of formal and informal relationships that enhance societal productivity by making people's interactions and cooperation more predictable and effective'. Social groups of various kinds are increasingly involved in natural resource management (NRM) in many rural areas of Africa (Adams and Anderson, 1988; Little *et. al.*, 1987; Shepherd, 1992 in Ole 1993). Kinship, locality, or "traditional" political institutions, not wider ethnic or class based associations, tend to form the organizational basis for such groups. They are often limited in membership and geographical scope. Some institutions have organizational form, while others have more diffuse patterns of norms and behavior about which there are social consensus. Involvement of social groups is often a necessary condition for sustainable NRM. Although much celebrated (Chambers, 1991) it is not sufficient. Often NRM problems involve actors above the locality (Atkinson, 1991; Toulmin, 1986 in Ole, 1993). Frequently groups and individuals using a resource often neither control nor have effective corporate power over it: village use of forests are interfered with by central government; migratory pastoralists and sedentary agriculturalists compete for the uses of land (Arntzen, 1990; Moris, 1988); upstream water users affect downstream users (Boesen and Hansen,

1991); parastatals or absentee landlords colonize common land (Atwood, 1990). Local groups therefore often have pressing needs at the aggregate level of the district or above. This requires inclusive institutional arrangements above the locality that can serve as platforms for interest group aggregation, actions, and struggles. Institutions are thus understood as complexes of norms and behaviours that persist over time by serving some socially valued purposes. They thus provide shared understanding of the cultural meaning of activities. Governmental and non-governmental organizations within the district therefore have the legitimate power to be part of this resource management process as an important condition for their involvement in NRM based on consent.

With the advent of European rule in Africa, traditional forms of natural resource management was considered may be outmoded and was downplayed by these Europeans. Today, there is an outcry for collaboration between the two as they have come to realize that one approach is insufficient for effective management of these resources. Rural people survive in their environment sometimes, where they never had any contact with Europeans. It goes to tell us that, environmental management of the local people is sustainable as they have survived with time. Conflicting ideas emerged between traditional forms of management and modem forms as the rights of local people in terms of their control over environmental resources and cultures are tempered with.

This modem system of managing natural resources permeate in the fabric of Ghanaian societies till date with government institutions such as local government, forestry commission among others playing lead roles. In Ghana's :forestry sector for instance, Leach, Mearns and Scoones, (1999) assert that, following a history of reserve-based exclusionary approaches, there is currently much interest among government and NGOs in community-based and co-management approaches which involve local communities in forest management and conservation. These concerns echo recent international debates concerning joint forest management. The approach in Ghana earlier on focused on protection and conservation practices but later shifted to community-based natural resource management Kendie and Guri (2006). Recently, most natural resource interventions by donor agencies encourage co-management in order to yield efficient resource conservation in Africa and Ghana as a whole. This is as a result of the realization by McCallum and

Humphrey (1990) that community-based resource management in the 1990s was the combined result of two factors: the failure of local government agencies to adequately address environmental problems with their own limited resources, and a public sector management philosophy increasingly centered upon efficiency and cost recovery. It is justified that, rural people are better placed to know their own problems and consequently seek their own solutions representing a shift in government policy. Kendie and Guri (2006) argued that 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. 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). Recent approaches to natural resource management are now been seen including cultural norms which connect both traditional and modern 'systems showing how they mutually affect each other in the context of environmental protection and nature conservation. The failure of natural resource management systems according to Coop and Brunchorst (2001) in Lawrence *et al.,* (2001) has in recent years often been greater in magnitude than those observed historically. Current resource management has clearly failed to safeguard the dynamic capacity of ecosystems or to manage ecological and social systems for resilience and sustainability. There is considerable evidence of poor management of ecosystems with many conventional prescriptions of resource management now known to be unsustainable. In the process of natural resource management decision making, it is important to combine the influence of institutional structures; the distribution of social, environmental and political values; and the functional-ecological connectivity between landscape components as three essential building blocks of resource governance.

2.8.2 Traditional Institutional Ways of Managing Natural Resources

Traditional institution has been understood as local, collectively agreed upon social arrangements that govern the interactions among members of a given group (Bacho, 2004). Traditional institutions evolve over time, and thus reflect the time, place and experiences of the group. Under traditional tribal law, land and the fruits of the land belong in the first instance to the spirit world. The first settlers through spiritual intermediation of their leaders covenanted with these spirits to gain user rights in exchange for certain ceremonial

rites. This covenant was passed down over time through the 'Tindamba' whose spiritual role binds the community with the spirits, the ancestors the present, the future generations and regards man and physical objects such as mountains, trees and rivers as a continuum of the same ancestry. The use of natural resources, both plant and animal was done with respect and guided by conservation requirements of never using more than what would provide sufficient seed for the future (Abu 1998, Millar, 2001 cited in Millar, 2003). Millar further argued that the image of the family found expression in how people related to their shrines and groves. Families and communities had extended family relations with their shrines and groves that they regarded as their ancestral origin and could neither wrong nor disobey.

The living thus saw themselves as the children of shrines and groves because of these close bonds. By their prescriptions for natural resources exploitation and prohibition from exploitation of other totems, they ensured there was peaceful co-existence between mankind, vegetation, trees, animals and other forms of life on earth. Stones, rocks, mountains, rivers and the aquatic life they contain were similarly protected or regulated in their use as the ancestors passed on. Traditional form of managing natural resources for me is nothing other than the arguments advanced so far above.

Not only that, Haverkort, *et. al.,* (2003) also emphasized that; religious consideration dominates the ordering of daily life in African societies. The beliefs in mystical powers exist. This is reflected in the existence of institutions in the rural setting such as the Tindamba as well as the modem chieftaincy institutions in the study area. These traditional institutions are structured and exist in every community. Building relationship with them leads to the establishment of a form of cooperation and respect (Haverkort and Millar, 1994). These institutions which form part of the indigenous knowledge systems of a people are imperative for development since they influence the selection and integration of externalities into the local practices (Dessein, 2005). Until recently, this view has been incapacitated by colonialists thus limiting the capacities of rural people to solve their own problems and developing technologies and skills that serve their own needs (Haverkort, *et. al.*, 2003). Millar 2003, further argued that the resilience of shrines and groves despite the religious battles against them and their survival, in spite of the varying levels of the

degradation calls for policy attention to native religion as a way of conservation, management and sustainable utilization of natural resources. He made the observation that people still respect and revere shrines and groves for what they stand for. This is why they have survived the test of time and are still relevant in the community-based organization. In his conclusion, modem governance systems tried to take away traditional role of local leaders including spiritual leaders as the owners and custodians of natural resources on behalf of the people that brought conflict into natural resource exploitation which I agree with. Probably the reason been for effective management of these resources but rather tend to overexploitation by themselves. However, in the case of the study area, though those modem institutions exist, their influence on traditional management of these resources is not much felt as compared to the forest areas of the southern belt of Ghana. In traditional set up the main rule governing access to these natural resources is that insiders has the right of access to resources for free, while outsiders has to pay a tribute to the insiders in the form of proceeds from farms and more often than not tree fruits such as dawadawa and shea are not to be harvested by the outsiders.

CHAPTER THREE (3)

Research Methodology

3.1 Introduction

The view of what constitutes a methodology and under what circumstances a research model becomes a methodology as well as the number of methodologies that deserve a place in the context of social research is a contentious issue (Sarantakos, 1998:33). He therefore sees methodology in at least two ways. One, it is identical to a research model employed by a researcher in a particular project, including basic knowledge related to the subject and research methods in question and the framework employed in a particular context. The other he relates the nature of methodology to a theoretical and more abstract context, and perceives it in conjunction with distinctive, uni-dimensional and mutually exclusive theoretical principles. This, Panneerselvam (2004:2) agreed with by defining research methodology as 'a system of models, procedures and techniques used to find the results of a research problem'. My methodological approach that enabled me investigate the problem on natural resource management by communities themselves in the Lawra District of the Upper West Region is built on the definitions above. The methodological approach begins with a general approach/research design to the research which outlined the entire research process followed by a situational context of the study area; the data collection procedure including the sampling methods, sample size, and the specific tools and techniques used to collect the data in the field. It ends with the data presentation and analytical tool/methods and also outlined the research plan.

3.2 General Approach/Research Design

Qualitative and quantitative research differ in many ways, but they complement each other, as well (Neuman, 2006: 151). The nature of data depicts the differences between the two styles. Other differences are different assumptions about social life and different objectives

(ibid). These differences can make tools used by the other style inappropriate or irrelevant. It is best to appreciate the strengths each style offers on its own terms. Qualitative research often relies on interpretative or critical social science while quantitative research relies on a positivist approach to social science. They emphasize precisely measuring variables and testing hypothesis that are linked to general causal explanations (ibid). As my research is composed of both qualitative and quantitative methods, it was: not appropriate for me to use one form of style. It would not communicate well for those who would read the work as readers might be conversant with only one style. In my attempt to use both methods, linking a worldview to a particular method will be disastrous in the sense that, any method can be used to explain a research issue depending on the research area or topic. This currently is the problem being faced by social scientists the world today.

Corbin and Strauss (2008) argued that qualitative research allows researchers to get at the inner experience of participants, to determine how meanings are formed through and in culture, and to discover rather than test variables. This view is supported by Osuala (2007:174) that because of the need for the researcher (me) to maintain close association with both participants and activities within the setting, the researcher gains an insider's view of the field which often allows him to see and document the qualities of social interaction too often missed by scientific, more positivistic inquiries. Such close relationship can reveal subtleties and complexities that could go undetected through the use of more standardized measures.

To Osuala (2007:174) since no one method can answer all questions and provide insights on all issues, he argued that both methods are required. There is more than one gate to the kingdom of knowledge. Each gate offers a different perspective, but no one perspective exhausts the realm of 'reality' whatever that may be. There is therefore the need for multiple methodologies including gender sensitive three generational analyses to verify and complement one another. Twumasi, (2001) agreed with the multiple methods and added that it also helps to detect data inconsistencies.

The research was intended to make use of both quantitative and qualitative methods in addition to other methods in the field that I felt relevant to the study. Both methods address

general and specific research needs (that is, to facilitate, enrich or refine the study). Each group of methods possesses certain qualities that are appreciated within and outside their own paradigm (Sarantakos, 2005:50).

By understanding both approaches, the researcher will know about a range of research and can use both in complementary ways (Neuman: 14). He further agreed with Ragin 1994a: 92) who explained one way they complement each other as:

The key features common to all qualitative methods can be seen when they are contrasted with quantitative methods. Most quantitative data techniques are data condensers. They condense data in order to see the big picture.... qualitative methods, by contrast, are best understood as data enhancers. When data are enhanced, it is possible to see key aspects of cases more clearly.

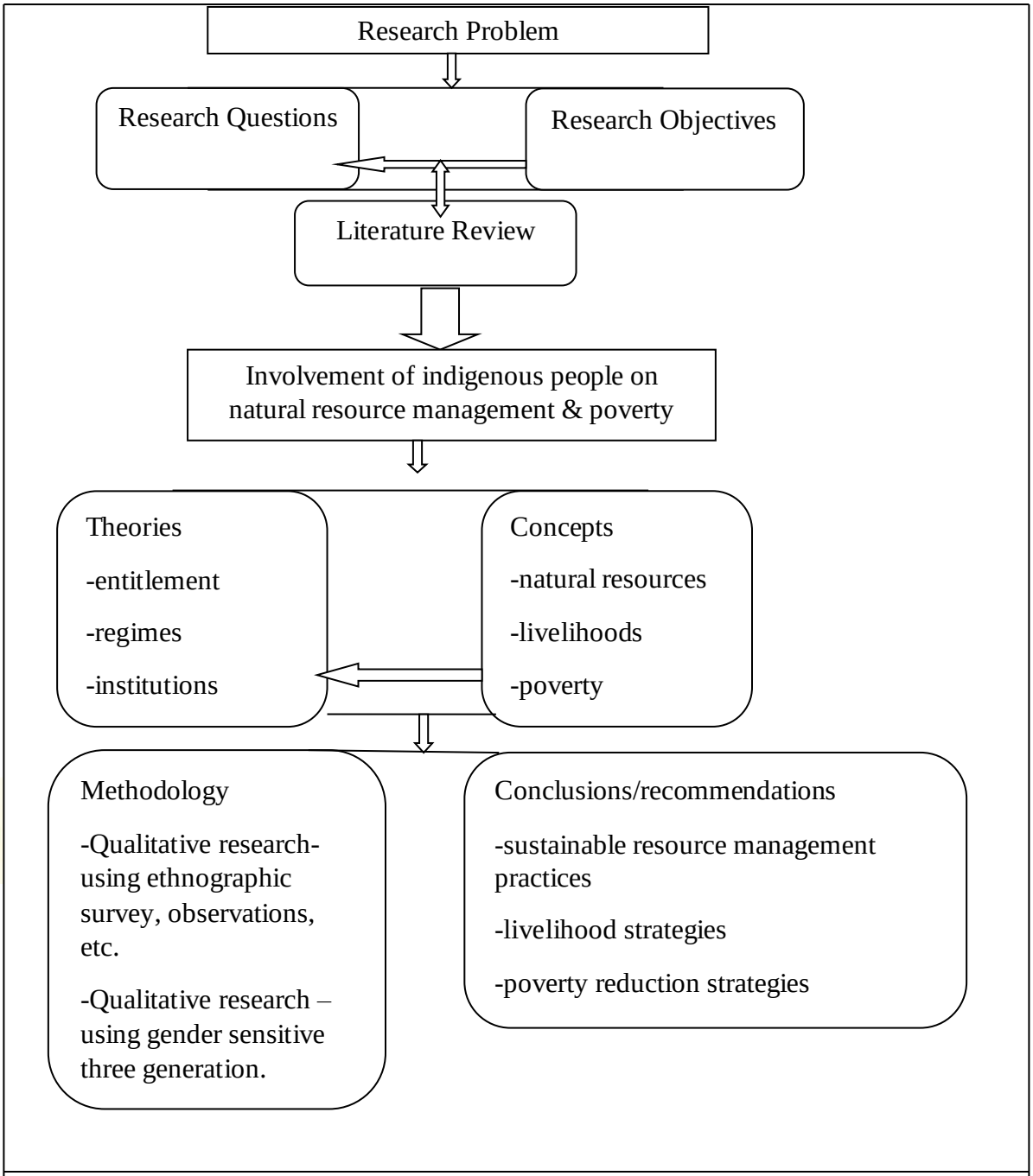
From the analysis above, it is obvious that neither the qualitative nor the quantitative approach to research alone can suffice the study. The study of various social phenomena would be enhanced if researchers in the various fields of social and behavioral sciences combine the two I hope. Both research models are valuable in their own context and are highly useful (Sarantakos, 2005:49). It suggests therefore that a new philosophy would therefore emerge to take care of the new methodology as researchers have recently been advocating for a mixture of the two researches. This new philosophy then becomes a third research philosophy that comes to bridge the contention between the two. Johnson and Onwuegbuzie, (2004) argued that, where the researcher mixes or combines quantitative and qualitative research techniques into a single study describes the philosophy above. It uses the logic of deduction associated with quantitative, induction associated with qualitative and the third logic of abduction which delve into the intricacies of a research.

A combine ethnographic and survey techniques to gather both quantitative and qualitative data was employed during the research. According to Osuala (2007: 254), the survey researcher is interested in the accurate assessment of the characteristics of whole populations of people. This will enable the researcher (me) to infer the corresponding characteristics in the population. Community and household (individual) level survey was conducted for the purposes of this research in each of the selected communities. The focus

group discussions which formed part of the community level survey, local people who are considered experts in natural resource management practices were drawn from within the selected communities to discuss the issues on resource diversity and existence. With gender sensitive three generational approaches as part of the households' survey, individuals - males and females - including family heads in the generations were interviewed using questionnaire that answered issues on local resource management systems. These surveys enabled me gather information about the community members' perceptions, their relations with the environment and how natural resource management systems enhance their livelihood to reducing poverty in each of the communities and the district as a whole. However, stories and narratives that will be recorded on indigenous natural resource management practices would be involved in the ethnographic survey as well as information and philosophies taken from key resource managers such as Chiefs, Tindaanas (Earth Priests), Kumber(e) (Elders/Clan heads), Soothsayers and Diviners. As stated earlier, the combination of both approaches - ethnographic and survey research would help me synthesize the perceptions of the people in the communities.

Research designs are an integral part of any systematic investigation, and serve to guide the course of the research process. They are set by the researcher himself, and in reality contain directions or reminders about how it was decided to conduct the research (Sarantakos, 2005:114). This helps the researcher (me) to have .a sense of direction in the research process. Therefore, I considered the two approaches - qualitative and quantitative methods which data are contained within the perspectives of people that are seen as those with vested knowledge in resource diversity and resource management both local and exogenous institutions as well as individual/group participants. The peoples' socio-cultural background was also taken note of in the data collection process once I used ethnographic survey which delved into the lives of the people. The research was conducted through the following process shown below in Figure 1 as follows.

Figure 3.1: The Research Process



Source: Authors Construct, 2009.

The methodological design above depicts that: the research problem is associated with some issues that need some in-depth knowledge to clarify them. This knowledge can only be tapped by relying on the people's worldview which enabled me gather my findings, drew the conclusions and recommend appropriately as to the issues of resource management within the district where these resources serve as the lifeblood of the people. Here attempts are made to understand participants' involvement and views of social realities which describe phenomenology by Ertmer (1997) in Leedy (1997: 161). For him the purpose is that phenomenologist hope to gain a better understanding of the meaning an experience has for others, as well as for themselves or himself (me).

In doing this research, the social networks of the people were paramount because, they served as my source of correspondence in granting me the needed information. Much attention was placed on people with knowledge regarding natural resource management 'yesterday and today' that is, the past and present. It therefore means that, the research gave me a better understanding of the experiences of the people in the study area as well as myself.

3.3 Study Area

The study area covered the political administrative district, location and natural resource environment, socio-demographic characteristics as well as governmental and non-governmental organizations in natural resource variations available in the Lawra District.

3.3.1 The Political Administrative District

The research was carried out in the Lawra District of Upper West Region of Ghana. Lawra District is one of the few districts that were created during the colonial regimes in the then Northern Territory of Ghana. The district was made up of four traditional areas namely; Lawra, Nandom, Lambussie and Jirapa forming the Lawra Confederacy. As part of bringing development to the grassroots, the Provisional National Defense Council (PNDC) through its decentralization derive created the then Jirapa/Lambussie District in the 1980s out of the Lawra District and subsequently, the New Patriotic Party government in 2008

further separated it to Lambussie/Kaane District with the capital at Lambussie. The Lawra District now comprises the two traditional areas of Lawra and Nandom with one constituency. As shown in table 4, the district's demographic characteristic is diverse which give each ethnic group some specific features in their perceptions of natural resource management within their respective resource domain.

3.3.2 Location and Natural Environment

The Lawra District now is bordered by both the Jirapa district to the southeastern and southern parts, and on the northeastern is the Lambussie/Kaane District. The west and the north are bordered by the Republic of Burkina Faso. It is one of the nine (9) districts in the Upper West Region and derives legal existence from Legislative Instrument (L.I) 1434 of 1988. It lies in the north westem comer of the Upper West Region between latitudes 2° 25" W and 2° 4"W, and longitudes 10° 20''N and 11° 00''N (District Medium Term Development Plan 1996-2000, 2009). The total area of the district is 1051.2 square kilometers. This consists of 5.7% of the region's total area of 18,478 square kilometers representing 12.7% of the total area of Ghana (GSS, 2005).

The ecological zone to which my research area belongs is generally referred to as 'Guinea savannah woodland'. Kees, (2004:80) described the ecological area as 'Orchard bushland', 'tree savannah', 'Sudanese parkland', 'savannah woodland' and 'interior savannah zone'. Kees therefore argued that, the area is covered with savannah grasses, shrubs and scattered trees. The vegetation is characterized by the guinea savanna type with scattered drought resistant trees such as the Shea, the baobab, locust bean (dawadawa) ebony and torn. Kees agreed with Nsiah-Gyabaah (1994: 135-136) that generally the density of trees decreases where population density increases, GSS (2005) assert that, the heterogeneous collection of trees provides all domestic requirements for fuel wood, charcoal, construction of houses, cattle kraals and fencing of gardens which serve as sources of livelihood to the people. The shorter shrubs and grass provide fodder for livestock. I tend to agree with this assertion in the sense that man depends on nature for his survival.

The climate of the district is that of tropical continental with the mean annual temperature ranging between 27 and 36 the period between February and April is the hottest. Between April and October, the tropical air mass which blows over the area gives it the only wet season in the year which is common to the rest of northern Ghana (Dickson and Benneh, 1988). Bacho, (2001) therefore agreed with Dickson and Benneh (1988) that, there are two seasons in the year - the dry and the wet seasons. The dry season commences from early November to late March, with cold and hazy harmattan winds: particularly during the nights and early morning and high temperatures by mid-day.

3.3.3 Socio-Demographic Characteristics of the Lawra District

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. Within the region, Lawra District is by far the most densely populated. 'With 83 inhabitants per km2 in the year 2000, its population density is above the national average even though there are no large urban centres in its territory (Kees, 2004:74). When calculated over the 'usual resident population' the population density in the year 2000 amounted to 90 and 34 inhabitants per km^2 for the district and the region respectively. The district is clearly an island of high population density in a region with low population density (ibid). The rest of the people live in rural areas and are largely dependent on the natural environment for their livelihood. The people of the district are predominantly subsistent farmers as about 84% of them are employed in agriculture and related work (GSS, 2005).

Traditionally, the Lawra District is diverse as shown by the number of people who inhabit the area. The main ethnic groupings, however, have form the basis for delineating between the cultural units at the district level as shown in table 4

Table 4: Ethnic Groups in the District

District	Ethnicity	Population	Percent
Lawra District	Dagaaba	79,210	90.5
	Sissala	263	0.3
	Waala	1,313	1.5
	All others	6,739	7.7
	Total	**87,525**	**15.2**
Total Population for UWR		**576,583**	**100**

Source: Computed and Compiled from GSS (2005)

By depicting these ethnic differentiations, it enable me understood various means by which natural resources are managed in the context of livelihood in the district. Because a people's culture determines their relationship with and perception of nature, it therefore means that natural resource management vary within different cultural settings and as the culture transforms overtime. In many research situations, cultural boundaries are defined by either clan ethnic groupings or sometimes by linguistic or dialectical differences.

The Lawra District in terms of religion reflects the three main religions of Ghana. The Table below depicts the religious distribution of the population in the district.

Table 5: Religious Afflilation in the Lawra District

Religion / District	Religious affiliation in the district as a %
	Lawra District Assembly
Christianity	56.4
Islam	6.0
Traditional	34.1
Others	1.1
No Religion	2.4

Source: GSS (2005:29)

From the table, the district is predominantly Christian, follow by African traditional religion with Islam ranking third and they are mostly in the two major towns of Lawra the capital, and Nandom. These religious connotations could have some implications for analysing natural resource management issues in the context of livelihood diversities in the district.

3.3.4 Governmental and Non-Governmental Organizations in Natural Resource Management in the Lawra District

There are several organizations that work in different ways to conserve the natural resources available in the district and also promote local knowledge in managing these resources in the area. Environmental Protection Agency (EPA), Forestry Department, Ministry of Food and Agriculture (MoFA), Ghana National Fire Service (GNFS), are some of the governmental organizations that are involved in managing local natural resources in the district. However, there are also non-governmental organizations that are contributing to this national objective. Prominent among these NGOH are CARE International in collaboration with Nandom Agricultural Project in Nandom, and various Christian and other religious organizations such as Nandom Farmers Cooperative Society. I chose EPA, Forestry Department, MoFA and Ghana National Fire: Service (GNFS) as focal organizations for interviews because they deal either directly or indirectly with managing natural resources either through education or directly involved in managing these resources. My interest specifically, was to ascertain whether there is collaboration between traditional peoples' way of managing natural resources and modern systems. I included SARI because it is purely on research that draws largely from Western scientific enquiry. Issues relating to any NGO(s) working within the district were not realized in the course of my research.

My quest to find out during the fieldwork, from the sample communities about the local presence or knowledge of any of these and/or other external bodies that they collaborate with to manage local natural resources and also the nature of the collaboration proved the presence of some of these organizations in some communities, Interviews were conducted in such organizational outfits with individual heads or delegates to ascertain their role in NR management.

3.4 Sources and Technique of Data Collection

The research aimed at gathering both primary and secondary data from the field to enable me address the research questions. Leedy (1997:99) defines data as those facts that any particular situation affords or gives information or impressions to an observer. Leedy (1997:101) went further to categorise data into primary and secondary. Primary data he defines 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 he added. I agree with his assertion by discussing below the tools and techniques that were applied to collect my primary and secondary data.

3.4.1 Primary

The research relied on primary data which became my main sources of data and are mainly community level surveys and ethnographic studies. Survey according to Leedy (1997:190) means "to look or to see over or beyond" the casual glance or the superficial observation. Neuman (2006:276) said it is often correlational which begins with a theoretical or applied research problem and ends with empirical measurement and data analysis. Sarantakos (1998:223) concludes that, generally, surveys are methods of data collection in which information is gathered through oral or written questioning. Ethnographic survey on the other hand were purely qualitative in the forms of stories and narratives that were taken in the field as a result of the local people's cultural patterns, involvement and the natural settings in which culture manifest in natural resources and the environment. Babbie (2005:302) agreed with White (1943) that, ethnographic study focuses on detailed and accurate description rather than explanation. In-depth interviews were therefore used to gather information of this kind with some key natural resource managers (both local and external) and custodians of culture such as the Tendanas (spiritual heads of the communities that were sampled) and key informants(mostly clan and household heads) within the communities. (Kumekpor, 2002), sees in-depth interviews as relatively fewer questions considered to be of greater importance to the object of study selected and pursued in much greater detail, both intensively and extensively.

I therefore used this technique (ethnographic study) extensively to collect data from household heads during questionnaire administration that enabled me probe into the intricacies of sustainably managing natural resources in the district to enhance livelihood.

My type of research (i.e. ethnographic research) for me involves two people; the interviewer and the interviewee (respondent) in which the latter is the expert with vested knowledge in the subject area, while the interviewer is considered the enquirer who attempts in using leading questions to ascertain the truth - in-depth interviews. This is because, the researcher is interested in delving into the intricacies of the topic under consideration and the interviewee supposedly is the best to supply such intricacies for the needed result(s). One therefore asks questions that would lead to follow-up questions by the respondent in order to probe further. No one is however compelled to provide specific answers for the fear that one would be victimized in giving information on the issue at stake (i.e. the respondent). In In-depth interviews, interviews are carried out on face-to-face and involve the interviewer and the interviewee. It takes many forms such as phone conversations and interviews with more than one participant.

Tendanas were treated as key informants for managing natural resources in the in-depth interviews and in-depth studies. I used in-depth studies because I will like to know much about my cultural traits on natural resource management as I hail from the study area. Tendanas are the custodians of the lands in their communities thereby setting the rules that governs or conserves the resources available.

Throughout the data collection stages in the field, I made use of these guiding principles to ensure quality, reliability and validity of the information that I take. This I achieved through self-assessment and reflection, close monitoring and discussions with my research team and by probing issues raised by participants or informants in the field.

As I already indicated, community level surveys involving representatives of groups of different interests such as clan heads, household heads and spiritual heads (Tendanas) were conducted within the selected communities. Focus Group Discussions (FGDs) and controlled observation were the main tools for the primary data. A distinctive feature of focus groups is that they create research data by generating social interaction. This is done

by assembling a group of participants to discuss a specific topic and then observe how the ensuing discussion evolves (Boddy, 2005). The underlying assumption is that meaning is created in social interaction (e.g., Wilkinson, 2001). Organized and focused group discussions provide a context for participants to articulate the meaning of their experiences and elaborate on them in a collective sense making process. Of course, focus groups are also used to obtain individual viewpoints; it is typical to instruct discussants that the aim is not to reach consensus, but to explore the different viewpoints that emerge. By observing, recording, and analyzing the interaction in the group, researchers can also gain an understanding of how the participants approach the topic and what kind of language they use to frame the issues. Interaction also allows participants to pose questions to each other and to redefine their own views as the discussion evolves. 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 meet as a group to discuss a given research topic. These sessions are usually tape recorded, and sometimes videotaped. 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, field notes were taken during discussions so as to capture and report the details of the discussions as accurately as possible.

A household survey using questionnaire was the second level of field surveys that dealt with the research. The concept of household, however, can be seen differently in research with different meanings. The GSS (2005:2) defines a household as; "a person or group of persons who live together in the same house or compound, share the housekeeping arrangements and are catered for as one unit." The emphasis is on living together in the same apartment and sharing common necessities for living, without considering the family size and relationship. This definition is relevant because, the research aimed at measuring

livelihood systems as a result of the available local natural resources that persist in the study area. In the study area, the term house is frequently used to refer to these networks of complex relationships usually derived from the patrilineage, In this research the term is that are connected together as one big house/family. The oldest person available in any of such identifiable unit was chosen to respond to the questionnaire. Such a person however had the free hand to seek for some responses or clarifications from other members of his units.

The household surveys were conducted using carefully designed questionnaire for selected households that emerged from systematic sampling techniques. The questionnaire consisted of both closed and open-ended questions that collected personal data of household heads and the characteristics of households including their social/cultural networks, attitudes and relationship with the environment. These were both quantitative and qualitative in nature. This information was then combined with community-wide perceptions on natural resource diversities that analyzed the challenges and prospects confronting decentralized regimes in managing resource diversities within local communities.

The data from the above sources were complemented with information taken from controlled observation of the state of the local environment, Sacred Natural Sites (SNS) and heritage sites as well as other on-going social, cultural and economic processes with the local community. According to Peil *et al.* (1982), observation is a classic scientific method that varies in continuum from complete participation to complete non-participation of the researcher. It is always almost combined with casual or formal interviewing techniques during fieldwork or interaction. During observation, the researcher or observer is generally free to examine events as they happen, trying to understand how social relationships reflect values and beliefs and the meanings people give to what they do and why. For the purpose of this work direct rather than participant observation was used.

3.4.2 Secondary

With this data, both qualitative and quantitative data methods were applied which enabled me gather information on the research. The District Profile of the study area became a source of information on quantitative data where information was extracted. Interview with relevant official from Forestry Division in the district was of assistance to me. However, other documents such as those related to natural resource: management in the forms of journals, reports amongst others were reviewed as qualitative information for the purposes of the study. These secondary data sources therefore provided a contextual background of the study area, a theoretical and conceptual review of the existing literature and above all justified the choice of the approach and methodological tools and techniques being adopted in this research. I then focused primarily on identifying the changing trends and perceptions and how these fed into natural resource management systems as a basis for analyzing resource management trends in the research area and the way forward so as to understand resource diversities that reflect local people's worldviews and need.

3.5 Sampling Procedures

According to Singleton and Straits, 1999:134 cited in (Ahuja, 2001:155) a sample is a portion of people drawn from a larger population. Ahuja (2001:156) agreed with Manheim (1977:270), that “a sample is a part of the population which is studied in other to make inferences about the whole population”. Sampling is therefore according to (Osuala 2007:114) taking any portion of a population or universe as representative of that population or universe. In view of this, I used both non-probability and probability sampling procedures such as purposive, cluster, snow-ball and systematic sampling techniques to select the communities that I studied and those relevant people who provided adequate information for the study. These techniques are described below.

Samples are chosen in such a way that the demand for representativeness and generalization is not compromised (Sarantakos, 2005:153). In this sense, studying fewer people can be strength and not a problem. Both local and modem institutions as well as individuals with vested knowledge in resource management in the district were identified and made use of during the research process.

3.5.1 Purposive

Sarantakos (2005:164) argued that, the choice of respondents is guided by the judgment of the investigator in purposive sampling. The researcher therefore purposely chooses subjects who, in his opinion are relevant to the project. This will enable the researcher (me) to identify particular types of cases for in-depth investigation (Kreuger *et al.* 2006:211). Purposive sampling is adapted to the needs of local communities and can also be formed in collaboration with indigenous communities. Interviews were arranged with such managers and institutions as key informants. Household surveys, were mainly based on indigenous households in the process of using systematic sampling. In particular, the various ethnic groupings as stipulated earlier in the study area formed the groups from which participants were selected that enabled me identify and compare variations in local natural resource management across these people and how this impacts on their livelihoods to reducing poverty.

3.5.2 Cluster

Sometimes, it is not feasible to make up a list of every person living within a particular area and, from that list, to select a sample for study through normal randomization procedures (Leedy, 1997: 216). A map of the area was secured showing subdivision of the study area into the two paramount divisions of the district. I then subdivided the area into smaller units. In cluster sampling, it is important that each cluster be as similar to the others as possible and that, within the clusters, the individuals be heterogeneous (ibid).

Since the study area consists of only two urban towns namely, Lawra, Nandom and much of the cluster type consist of rural communities under these towns, it enabled me compare the rural setting management systems with that of the urban settings. Natural resource management practices are more likely practiced in rural areas than that of urban because, a peoples' culture can best be studied at the rural settings than urban. The two urban areas (Lawra and Nandom) served as the central points upon which four communities each were selected in addition to these two urban settings. I arranged in such a way that communities that were selected became easily accessible for the research in order to minimize cost. Motorable feeder roads linking any of these urban centres to the communities became the

medium for selecting these communities though this was not Limited. Any other community that I deemed necessary apart from the criteria chosen was given the chance of been selected. With this intention, communities selected reflected the management systems pertaining to the area which go a long way to enhance the livelihood of the people.

3.5.3 Snow-balling

In as much as I got key people relevant for the research in either the chosen communities or from any other communities in the district, I deemed it useful to use snowball sampling. This is because these key people served as experts in the management of natural resources as windows which opened one after the other. Snow-ball sampling is a method in which the researcher chooses a few respondents, using accidental sampling or any other method, and asks them to recommend other people who meet the criteria of the research and who might be willing to participate in the project (Sarantakos, 2005:165). This method is employed when the target population is unknown or when it is difficult to approach the respondents in any other way (Ahuja, 2007:181). (Mack *et al.*, 2005:15-16) argue that the technique is often used to find and recruit "hidden populations," that is, groups not easily accessible to researchers through other sampling strategies. This, I agree, because, this approach is going to target mostly the elderly in society who are believed to have much knowledge in resources management. Upon contacting the first person (either the person might be an expert or someone to assist me fined the expert), it became easier for me to get such caliber of people whom I interviewed one after the other. I pleaded with them to justify their choice based on the network of relations, specialized knowledge on issues on natural resource diversity and management, history or other reasons which from their perspective are critical to the subject of study. Bailey (1996), Holloway (1997), and Greig and Taylor (1999) consider the one who volunteer assistance as key actors or key insiders and the experts as gatekeepers. Neuman (2000:352) qualifies a gatekeeper as "someone with the formal or informal authority to control access to a site," a person from whom permission is required. Key insiders often adopt the researcher. There is therefore the likelihood that such adoption may isolate the researcher from some potential informants or subjects which Bailey (1996) cautioned. My suggestions to the persons to be interviewed are that, those with knowledge on natural resource related position or people with special knowledge in

indigenous natural resource management practices were the ones whose names and particulars that were required. There is also the tendency that those who are vocal or friendlier in the communities might influence the research if care is not taken by the researcher. This is confirmed by Neuman (2000) who cautioned that the most accommodating gatekeepers would to some extent influence the course of the research as it is unfolding by, for example, steering the researcher to look into both indigenous and expert knowledge processes, systems and institutional processes as well as the interrelationships between them. This biasness I noted of in the research process by cautioning my interviewers to investigate thoroughly to know who really could give relevant information pertaining to the issues at stake.

3.5.4 Systematic Random Sampling

This method is a procedure in which the sampling units are not only chosen randomly but which are also integrated with the choice of another sampling unit (Sarantakos, 2005: 157). I see this method appropriate for selecting households that included in the community field surveys during the research. Since the method is obtaining a collection of elements by drawing every nth person from a pre-determined list of persons (Ahuja, 2007), the sampling process involved every third house in the community from the point of entry by the research team during the research process. The African cultural settings permit people to stay together in large numbers within the same compound without necessarily been one household. This is no different in the study area. Not that most families in the research area only live together in compounds that sometimes consist of more than one household but they are also more complex in terms of identification as to what constitute a household. In other to avoid such complexities, only one household from each selected third house was interviewed preferably the landlord who often becomes the house head but that now involved a grandfather, father and a son and vice versa for gender. The interview depended on the availability and willingness of these people who participated at the time of the enumerator visits to the house. The choice of limiting my research to only one household in every compound was to make my total sample size for the field surveys as small as possible so that it could effectively complement the other field data.

3.6 Sample Size

As stated earlier in the cluster sampling technique, the research carried out covered a total of 10 communities in the district. I also covered three focus groups and eight (8) key informants for the ethnographic data. I also surveyed 50 individuals in addition to the ethnographic data by soliciting the opinions of the people on the state of natural resource diversities in their respective communities or environments. By this, both probability and non-probability sampling techniques were adopted for the study. Probability sampling gives each and every unit within the population an equal chance of being selected. In non- probability sampling procedure, there is no known way of estimating sampling errors. The method means that the selected sample is not representative of the population because the units in the population are not given the chance to be included in the sample. The researcher decides to take what he thinks is the representative unit of the group Twumasi (2001).

3.7 Data Presentation and Analysis

There is the need to reiterate from my earlier submission that data are those facts that any particular situation affords or gives information or impressions to an observer (Leedy, 1997: 99). Also, data according to (Krueger and Neumann, 2006:07) are the empirical evidence or information that one gathers carefully according to rules or procedures which can be quantitative - expressed as numbers or qualitative - expressed as words, pictures, or objects. These data after collection are then synthesized by using the appropriate tools and techniques design by the researcher (me) to arrive at the issues under study. This is supported by Panneerselvam (2004:14) who asserts that "after data is collected, proper tools and techniques should be used for classification and analysis of data." I used both descriptive in the form of narratives and deductive tools and techniques for the presentation and analysis of the results. According to Osuala (2005), descriptive research is that which specifies the nature of given phenomena which can be complex or simple. The importance clearly implies complexity of phenomena. But, the need for systematic ways of telling what a situation is means that the situation is no longer simple (ibid).

As I indicated earlier in my methodology, ethnographic survey was used as field notes taken down from respondents narrated stories were synthesized to reflect their perceptions on natural resource management and how these resources help in enhancing their livelihood in the communities. Osuala, 2005 argued that, descriptive research is basic for all types of research in assessing the situation as a prerequisite to inferences and generalization. The major goal of it is to describe events, phenomena and situations (Ahuja, 2007:131). Sampling techniques make possible the conducting of otherwise impossible studies by selecting representative units from the population, BO results can be used to draw inferences about the total population (Osuala, 2005:118). The ethnographic survey which is qualitative, the data and descriptive tools ensured that responses or narratives were cross validated using methods of triangulation at the time of data collection as means to improving data certainty and reliability. In processing the data and during the analysis stage, information on ethnographic data was typically grouped into thematic areas using stories from which inferences were made.

Statistical Package for Social Science (SPSS) was used as my analytical tool in the case of quantitative data. This statistical tool (SPSS) for me seems appropriate because, it gives one a variety of computer software options to enable one process data, transform and manipulate them and not doing without their analyses. A spread sheet was designed for the data on computer software; I then coded and input the data from the field survey questionnaires and the analysis of the data was then run. This data was explored to detect possible data problems resulting from either recording or inputting errors and an eventual generation of a final output in the form of percentages, tables and graphs for further descriptive and inferential analysis was realized.

CHAPTER FOUR (4)

FINDINGS AND DISCUSSIONS/ RESULTS AND DISCUSSIONS

This chapter elaborates the findings from the field survey through the use of different methods and techniques as indicated in the methodology. Structured household questionnaire were used as well as in-depth interviews, key informant interviews in addition to focus group discussions. The analyses therefore begins with the socio-demographic characteristics using the structured household questionnaire followed by other data methods mentioned above, in-depth interviews, key informant interviews and focus group discussions.

4.1 Socio-Demographic Characteristics

The questionnaire was specifically designed to seek information on how communities manage natural resources within their areas vis-á-vis their livelihoods. This was aimed at seeking information from household heads, both male and female pertaining to natural resource management and their livelihoods which seek to reducing poverty in their households. The essence of the questionnaire is to ascertain some information from individuals as a complement to the qualitative method of the research through in-depth interviews, key informant interviews and focus group discussions in order to address the research problem. Between 40 and 50 questionnaires were administered to households and the results discussed below.

4.1.1 Gender Distribution of Respondent

Out of 41 households interviewed, 58.5% and 41.5% of respondents were men and women respectively. This depicts the relevance of gender in natural resource management in a predominantly agrarian society. First, partly because natural resources are central to the livelihoods of poor rural households, secondly women are the primary gatherers and managers of biomass goods in poor rural households, and thirdly women's roles and responsibilities are pivotal not only to the management of natural resources but also to the management of the domestic economy (Chen 1993:31, cited by Smita *et al.*, 2004). The

percentages for the two sexes confirm the role of gender irrespective of the patriarchal nature of the research area.

Table 4.1 Sex of Respondents

Gender	Frequency	Percent
Male	24	58.5
Female	17	41.5
Total	**41**	**100.0**

Source: Field Survey, May 2010

4.1.2 Age of Respondent

Age by far is a major determining factor in assessing natural resource management of a people. By physical observation and practice, experience people that is, older people are better placed in natural resource related issues than the younger ones as the latter learn from the former. As indicated in the table below, the adult class sum together constitutes 70.7% as compared to 29.3% youthful and children classes. This shows that the adult class is much engaged in natural resource management than the rest. 'Experience it is said is the best teacher'. All the age groups were represented including gender pointing out the relevance of both sexes. The challenge faced in these communities is that cultural rules are been violated presently as compared to the pass. This is as a result of the influence of Western values through education and religion-Christianity. From the data 27 out of 41 respondent do not adhere to traditional rules as before. Presently many of the youth as a result of education and religion have lost traditional touch even at their homes. Much of the culture is Western influence.

Table 4.2 Age Distribution by Groups

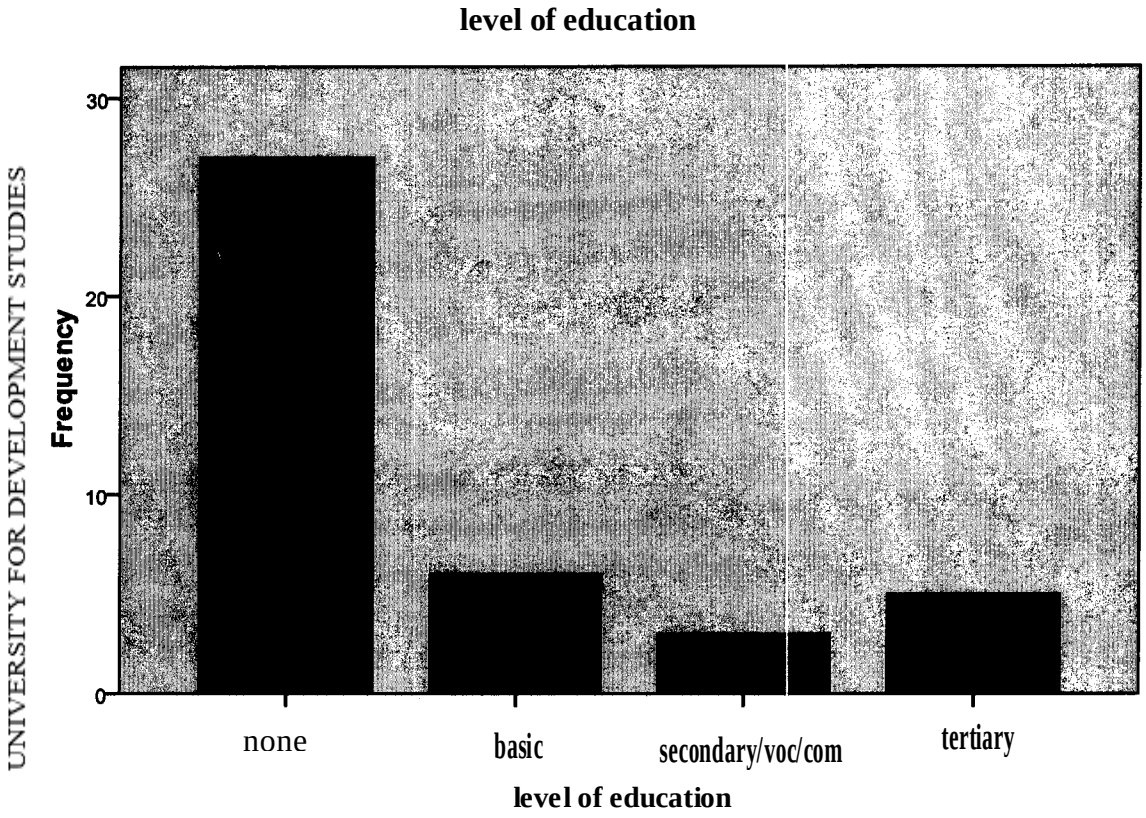
Age	Frequency	Percent
below 20	3	7.3
21 - 40	9	22.0
41 - 60	21	51.2
61 - 80	7	17.1
81+	1	2.4
Total	**41**	**100.0**

Source: Field Survey, May 2010

4.1.3 Educational Status of Respondents

The educational distribution of respondents to the questionnaire is presented below. From the graph, the data depicts that, 27 of them had no education and 6 of them had basic education. 3 and 5 of them had some form of secondary and tertiary education respectively. From these figures, it shows that majority of the respondents who had little or no education would much more use traditional management practices than those with education which through Western values has some influence on the behavior of people. From the graph, it shows that there is still high level of illiteracy in the area. It is obvious that the few educated are dominated by men as against women since literacy began with men. In a patriarchal society such as that of Lawra District, women are somehow marginalised in terms of access to natural resources particularly land. If given the opportunity to attain higher education, the problem of not having access or control over natural resources would be minimized if not eliminated.

Figure4.1: Educational Status

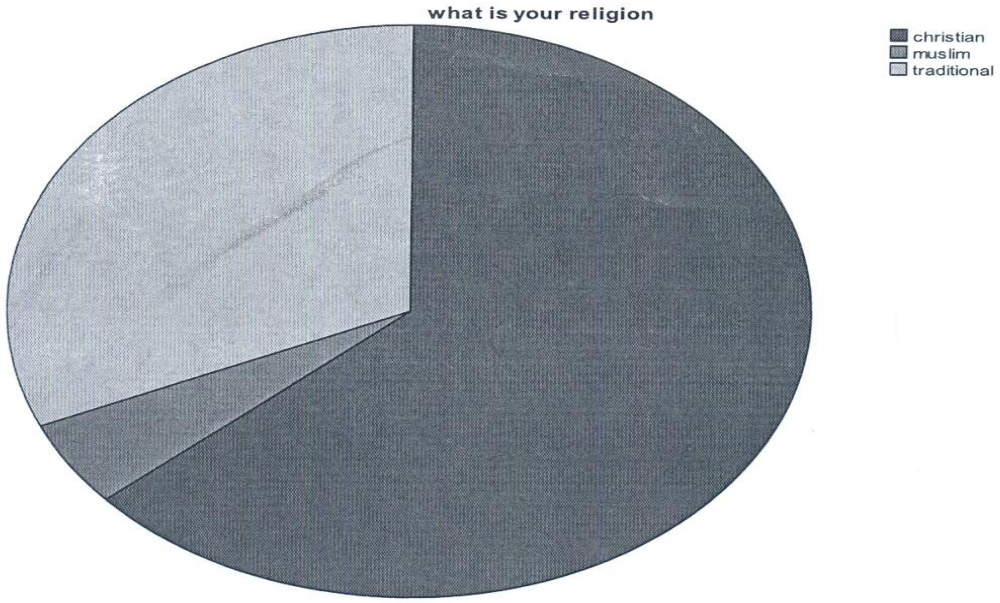


Source: Field Survey, May 2010

4.1.4 Religious Denomination

Three main religions co-exist in the study area, namely, Christianity which dominates with 63.4% follow by African Traditional religion with 31.7% and Islam 4.9%. The followers of each of these religious denominations are influence by their practices and also have some form of influence in managing natural resources,

Figure 4.2: Religious Distribution



Source: Field Survey, May 2010

The dominance of Christianity is as a result of the Nandom Traditional area with its Catholicism as against the Lawra area which is more dominated by tradition. Islam can be found mostly in the towns of Lawra and Nandom with few in some villages particularly Lawra area. It shows that foreign religion dominates and has some influence on how people perceive things today as compared previously towards their culture. Europeans through their religion have often perceived African ways with a Eurocentric view and give negative connotations about Africans. This is confirmed by Haverkot (2003) and Goduka (2001) who asserted that most African value 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. In African mythology, violation of the rules guiding natural resources has its negative repercussions as offenders could be punished in many ways such as payment of fines or death. Laws were and are usually put in place to curb the destruction of these resources in order to enhance their livelihoods once their lives depend on them, However, the intrusion of

Western values have and continues to erode the values of Africans thereby weakening their powers.

4.1.5 Marital Status of Respondents

From the table below, married respondents constitute (29)70.7% follow by widow (9) 22.0% while single is made up of (3) 7.3%. Most of the widow respondents are females which go to tell the disadvantage associated with access, control and inheritance. Access and control is usually through inheritance and is associated with land inheritance which is done by males. It means that women would be missing out in terms of inheritance and participation in decision making processes.

Table 4.3: Marital Distribution

Marriage	Frequency	Percent
Single	3	7.3
Married	29	70.7
Widowed	9	22.0
Total	**41**	**100.0**

Source: Field Survey, May 2010

In African traditional parlance, access, control and ownership leading to inheritance is largely in the hands of men as against women. Even if a woman becomes the household head, that aspect remains silent and all decisions are taken by a man.

4.2 Traditional Natural Resource Management Systems

This section looks at the traditional institutions that are available and managing natural resources within the study area and the adequacy of these resources in enhancing rural livelihoods.

4.2.1 Available Traditional Systems

Data from the survey indicates that African traditional systems exist and are active in the study area comprising Chiefs and Elders, Tendanas (Earth Priest), Landlords/Clan/Family heads. Youth groups are seen as modem; therefore do not exist in almost all the communities. Even where they exist, they are not active in natural resource control in terms of decision making. From the data, Landlords/Clan/Family heads constitute the most active group of traditional authorities in the study area probably because of the 'acephalous' nature of the people. That is (segmentary lineage systems) of the people before the advent of Europeans.

68.3% of the respondents admitted that Landlords/Clan/Family heads has much control over natural resources particularly land, simply because they owe the land and all the resources on that piece of land. Chiefs were introduced in the early twentieth century by the Europeans as warrant chiefs who had no and still have no and or limited power in controlling natural resources within their jurisdiction. As a result they only collaborate with the Tendanas and Landlords/Clan/Family heads that constitute "Tengan dem" (Spiritual head and his council of elders made up of Landlords/Clan/Family heads). The Tendanas are been assisted by the Landlords/Clan/Family heads in his spiritual executions of issues concerning the community. Women are again marginalized as 'Tengdem' are made up of only males in the study area. However, their contribution to the management of resources cannot be left out. They act in advisory capacity and observers and report to their men any destruction of the environment since their livelihoods surround the resources as they are the primary gatherers. One other important system that is not captured by the questionnaire but relevant and came up during the in-depth interview discussions is 'Tengsob or Tengsogsob' (Landowner or Landlords that is the person who owes the land in some communities) which is different from Tengansob or Tendana (spiritual head). In some instances, the

Tengsob might wild the powers of both the landlord and the spiritual head but in others these powers are separated. All these people together formulate and impose laws on the management of natural resources through spiritual invocations on offenders and outright punishment in the form of fines. Though they are now faced with the challenge of adherence to the rules these sanctions are meant to conserve the resources aim at enhancing rural livelihoods and reduce poverty in the communities.

4.2.2 Natural Resource Adequacy

Natural resources according to the respondents are made up of land, forest resources and water bodies as well as wildlife among others. Land is used for agricultural purposes and forest resources such as dawadawa (locust bean) and shea trees complement the livelihoods of the community members through food supplements and income. Food supplements and nutrients are derived from water bodies as well as income through the sale of fish from rivers. From the data, agricultural land is fairly adequate as it is only 46.3 % that is adequate for community members. This is substantiated by the 2000 population and housing census of a population of 576,583 for the Upper West Region, Lawra District is made up of 87,525 with 83 inhabitants per kilometer square its population is above the national average even though there are no large urban centres in its territory (Kees, 2004:74). When calculated over the 'usual resident population' the population density in the year 2000 amounted to 90 and 34 inhabitants per km^2 for the district and the region respectively. The district clearly is an island of high population density in a region with low population density (ibid). The total land area of the district is 1051.2 km^2 making up 5.7% of the region's total area of 18,478 km^2 representing 12.7% of the total area of Ghana (GSS, 2005). By comparing the land area to that of the population one will conclude that natural resources are scarce leading to out migration of the inhabitants to other areas.

From the data, 51.2% of respondents for forest resources, 63.4% of respondent for water bodies and 43.9% respondent for wildlife among others are fairly adequate or inadequate from community to community. The Black Volta serves as the boundary between Ghana and Burkina Faso with some of its tributaries passing through the district. For that matter,

water bodies dry up immediately after the wet season which ends in October each year. As land and forest resources are inadequate, wildlife resources that depend on them becomes scarce too. Livelihood systems more often are eroded. It therefore means that the people would have to adopt alternative means of enhancing their livelihoods may be through remittances from relatives among others.

4.3 Sustainable Management Strategies by Traditional and Modem Knowledge Systems

Apart from institutions in charge of managing natural resources and the adequacy of these resources, the study also looks at the sustainable management strategies by both traditional and modem systems in enhancing livelihoods in the various communities of the area. Traditional methods from the analysis are the appropriate strategy for managing natural resources within the area. 68.3% from the data assert that traditional method is still the best option and serves as a control measure because of the spirituality attached to it that deters people away from the destruction of these resources. Secondly, they argue that cost of agricultural inputs and implements are dearer that they cannot afford in the case of land for agriculture which is the main source of their survival. However, they also argue that sustainability can be enhanced if both methods are combined on the grounds that these resources are very important to their individual households and the community as a whole. 87.8% responded that the combination of modem methods and that of the traditional methods will enhance sustainability of these resources for the future generations to come. And only 12.2% disagree with the combination but neither said only traditional nor modem methods is appropriate.

From the field questionnaire the data reveal that almost everyone has access to these resources in one way or the other. Access takes the form of ownership through inheritance, open access in terms of other resources for instance economic trees such as dawadawa and shea depending on their location except land, begging/leasing among others. It can be concluded that access to these resources largely depends on a plethora of family and community networks systems that are operating in the area by people seeking for a particular resource.

The rights and level of access to a particular resource one gets depends on the decision of the owner. He is notified earlier to enable him consult with his family members in the case of land since it is usually communally owned. For the case of land, people who are considered illegitimate children, that is born to their maternal homes often grow up to be landless with their mothers and sometimes widows with no male child or if their fathers died without owning a piece of land through inheritance. There are some families that are landless as a result of historical factors among others. The right to use lies with the owner. Access to land is not so much an issue despite its limitation. Landless people have the right to use a piece of land but the use right is limited because as part of management strategy, land owners retrieve the land lease to tenants when they realize the land is been degraded. From the data 39.0% responded to have access through inheritance while 31.75% have access through open access which is much related to forest and water resources and women are much more in this group of open access because they are mostly primary gatherers and also do not owe land.

4.4 Natural Resources and Livelihoods

It is a fact that communities in the study area largely depends on natural resources as their major source of livelihoods. Aside natural resources been their main sources of livelihood, 21.7% of respondent from the data had other sources of livelihood in the form of rearing amongst others. 4.9% are engaged in public sector jobs as a means to a living though some of these 4.9% also involve in some menial farming. They mentioned the major resources as their source of livelihoods to include; agricultural land, forest resources/grasses, water bodies. These resources since creation have been of significance to man as they form part of nature. By this, Marx postulated in his *Economic and Philosophic Manuscript* of 1844 in (Mishra, 2001) where Marx defined nature as "man's inorganic body", pointing out that "man lives on nature" and he takes from nature all the means necessary for his existence. It can therefore be concluded that, these resources which are vital to man's existence if destroyed would have negative repercussions as many lives would suffer. Therefore, management of these NRs is relevant to the people of the study area. From the data, 61% of

respondents depend solely on these resources as against 39% who through other means earn their living.

4.5 Traditional and Modem Institutional Relations in NR Management

Despite the fact that the society in the district is culturally inclined in nature, there exist modem institutions of governmental and non-governmental organizations such as DA, GNFS, FSD, NGO, NADMO, MOFA and EPA that are engaged in and collaborate with traditional institutions in managing these resources for the survival of the people. Data from the field indicates that, 58.5% of respondents confirm the presence of these organizations as against 36.6% who says no because they either do not know about their operations or otherwise. These modem institutions establish some relations with their traditional counterparts because they cannot operate in isolation. Only 4.9% asserted that there are no relations between the two which shows the level of relations that exist in managing NRs in the district as majority indicate the presence and relations between the two. The relations are aimed at sustaining the resources in order to enhance the livelihood of the communities in the district. Gottret (2007), agreed with Long (1997a) that, 'livelihood' best expresses the idea of individuals and groups striving to make a living, attempting to meet their various consumption and economic necessities, coping with uncertainties, responding to new opportunities and choosing between different value positions. This definition fits well with the study as individual families strive for a living together with the community (ies) in total. The presence of modem institutions either by the state or other stakeholders is aimed at ensuring individual families to improve their wellbeing. The traditional authorities also protect these resources for the community for the future generations to come.

4.5 Opportunities Available for Indigenous Knowledge Ins1titutions

Traditional authorities had and continue to use various means of indigenous knowledge institutions in the management of resources surrounding their environment aim at enhancing the livelihoods of the people, hence reducing poverty. Institutions are seen as humanly regularized patterns of behaviour that emerge from underlying rules in use on

society that structure humans and social interaction, are constantly made and remade through people's practices, maintained by people's active 'investment' in them, and legitimized by informal norms that change only gradually Gottret (2007:39). Through theses indigenous institutions, rules and regulations are made by authorities pertaining to the environment for the community members to protect and conserver the available NRs in the community. As stated by Gottret in her definition, it indicates institutions are informal institutions made up of structures which allow them to govern their own affairs in culturally acceptable ways through which their traditions are transmitted to future generations. Leach et al. 1999:238 supported by Gottret, 2007 asserted that, regularized practices, performed over time, eventually constitute institutions, which may be formal or informal, i.e.:

[f]ormal institutions maybe thought of as rules that require exogenous enforcement by a third-party organization. Informal institutions, however, maybe endogenously enforced; and are upheld by mutual agreement among the social factors involved or by relations of power and authority between them.

Table 4.4: Available Opportunities

Opportunities	Frequency	Percent
Use of Customary Laws	37	90.2
Adhere to Taboos and Totems	4	9.8
Total	**41**	**100.0**

Source: Field Survey May, 2010

The analysis above confirms the table where indigenous institutions formulate laws for their communities on their environment. The study shows that 90.2% of respondent use their customary laws in the management of natural resources which is an enormous opportunity for the people. Though 9.8% of respondents adhered to taboos and totems they necessarily do not constitute laws. They serve as ethical norms that are binding the people naturally

against the destruction of these resources. Their survival is dependent on the resources in their environment.

4.6.1 Traditional Institutions and Modern Management Strategies

Resource management is neither solely in the hands of one institution be it formal or informal. Resource sustainability can be enhanced if there is fusion of ideologies from both formal and informal settings. Knowledge and technologies are constantly being reworked 'to fit with the production strategies, resource imperatives and social desires of the farmer or farm family in relation to agriculture, Long and Villareal, 1994: 47, cited by Lawrence *et al.* 2001. This is because governmental strategies are applicable to every community in Ghana.

Table 4.5: Modern Management Strategies

Modern Strategies	Frequency	Percent
Yes	24	58.5
No	17	41.5
Total	**41**	**100.0**

Source: Field Survey May, 2010

Out of the data gathered, it is revealed that 58.5% of interviewees attest that unlike previously where resource management was solely in the hands of traditional authorities, that is now taking a swipe with modem governance systems. Now there is some collaboration between local knowledge systems and modem management strategies. The state through its decentralization process establishes District Assemblies that set out by-laws governing their jurisdictions where these local knowledge systems operate. Policies formulated by the central government are binding on every institution or person in the country. Transcending these policies to the Assemblies means that traditional institutions must abide by them in every field including NR management in the form of collaboration. Form the data, 14.6% use District Assembly By-Laws in NR management and 26.8% use

community by-laws and 14.6% also use NGO initiatives. This really shows the collaboration in the district in NR management. The effectiveness of this fusion of knowledge is much appreciated by both formal and informal institutions in the district.

4.6.2 Traditional Management Process

As stated earlier, before modem institutions, resources were managed by the local people through their own ways and were accepted. When community members were interviewed how resources were managed in the pass 25-50 years, 92.7% agreed that cultural rules and regulations were the norm which were passed down from generation to generation onto them and was suitable. Ethical sanctions as well as taboos and totems together constitute 7.3% of the management process. They argued that, in the case of land which is their most important resource, traditional tillage system is much preferred as tractor ploughs usually overturn the top soil thereby denying the crops of the needed nutrients for growth.

Table 4.6: Pass Management Process

Pass Management	Frequency	Percent
Through cultural rules and regulations	38	92.7
Through taboos and totems	2	4.9
Ethical sanctions	1	2.4
Total	**41**	**100.0**

Source: Field Survey May, 2010

From the table it is clear that majority of respondents favour the use of cultural rules and regulations in NR management because the soil texture within the area is not suitable for modem management systems.

4.6.3 Current Management Practices

Natural resource management has evolved over time as different actors get involved in the process. In the past, communities have developed complex natural resource management systems that until recently have ensured their survival. Though it is seen from the table that there is a combination of modem and traditional management systems, the use of cultural rules and regulations still dominates. The data shows that 90.2% of respondents adopt traditional methods ranging from land tenure systems to open access resource management.

Table 4.7: Current Resource Management

Current Management	Frequency	Percent
Through cultural rules and regulations	37	90.2
Through District Assembly Bye-Laws	2	4.9
Others specify	2	4.9
Total	**41**	**100.0**

Source: Field Survey May, 2010

The exercise of District Assembly Bye-Laws constitute only 4.9% in managing these resources probably, many of the people might not know of the Bye-Laws or refuse to abide by them. They however admit that, through some NGOs particularly church based organizations land conservation is now practiced in addition to their old practice. The task of management involves virtually every individual in each community as 95.1% interviewed are involved in the form of preserving some valuable trees such as locust bean and shea trees as well as sacred groves in the farms or assisting traditional authorities in making laws for their preservations.

4.6.4 Gender and NR Management Process

The linkages between women and natural resources show three common patterns. First, natural resources are central to the livelihoods of poor rural households. Second, women are the primary gatherers and managers of biomass goods ill poor rural households. And third, women's roles and responsibilities are pivotal not only to the management of natural resource but also to the management of the domestic economy (Chen. 1993:31 in Smita *et al.*, 2004). It is an undeniable fact that women contribution to NR management is relevant. Women do not contribute in terms of decision-making in natural resources management directly, but as individuals their contributions is seen in preserving some valuable trees that are relevant to human survival.

Table 4.8: Gender Management Process

Women	Frequency	Percent
Yes	40	97.6
No	1	2.4
Total	**41**	**100.0**

Source: Field Survey May, 2010

Statistics from the data shows 97.6% of respondents agreed women take part in the management processes of natural resources in one way or the other. Resources that constitute open access mostly are in the hands of women in that they are more or less free to every woman. Resources such as locust bean, shea fruits, grasses for weaving mats for sleep, trees/or shrubs for firewood among others fall within open access category. They are mostly open because, control of them is limited depending on their location and ownership.

4.6.5 Challenges in Natural Resource Management

Community resource management in the study area cannot be left without challenges. Challenges such as unwillingness of people to adhere to community norms as a result of modernization through education and Christianity among others and fear of hatred by fellow citizens is very eminent. From the data, it is acknowledged that, 65.9% and 14.6% respectively agreed with the former and latter as challenges to resource management.

Table 4.9: Management Challenges

Challenges	Frequency	Percent
Fear of hatred	6	14.6
Unwillingness of people to adhere to community bye-Laws	27	65.9
Others specify	6	14.6
No response	2	4.9
Total	**41**	**100.0**

Source: Field Survey May, 2010

The introduction of modem farm implements and inputs to a greater extent deplete soil fertility they shared their views. Modernization to them is the major challenge in resource management. Other challenges constitute 14.6% which they could not specifically point out with 4.9% forming no response during the interview.

4.7 Possible Community-Based Management Options

As stated earlier, traditional institutions form the bases for community-based management systems in Africa and in Ghana as a whole. Institutions according to Gunnerson (1991) in Maganga 1993, broadly defined them to include 'norms, rules and customs and their enforcement characteristics which determine rights and obligations of people'. Traditional

authorities set out these rules, norms and customs pertaining to their environment which serves as their source of livelihood. From the questionnaire, as much as 90.2% of interviewees attest the presence of community-based systems in the study area with only 7.3% refuting probably they might not have understood the question.

Some of the local systems they realized to be effective in the management of these resources comprise Tengandem (spiritual heads) which constitute 85.4% as the community land in general is entrusted to them to invoke spirit on people who offend the gods in violation of the set rules. Chiefs and their elders were not left out and also constitute 68.3% of effectiveness in managing NRs as well as Tengsogsob (landlord- that is, the one who owes the land) that form 80.5%. The landlords are really the managers of NRs because; there is the need to protect the lands which belong to them for the generations to come. Even if land is leased out to another person, they determine the use rights to whom land is leased to by having the use rights to some economic trees such as locust bean (dawadawa) but give the use rights to other trees such as shea. It is only when one fell some of these trees indiscriminately that the Tengandem, the chiefs and elders sanction one for the offence to serve as a deterrent to others. These institutions impose sanctions against felling of some valuable trees as mentioned to which 65.9% of respondents say it is effective. Sanctions against bush burning, preservation of natural water points and destruction of shrubs is not as effective may be as a result of population pressure or modernization.

Asked whether NR management should purely be community-based, 63.4% disagreed with the argument that, time is changing hence the need for combining tradition with modernity for sustainability. Central government policies on NRs through the District Assembly could be a source of booster in preserving these resources as every citizen is obliged to abide by them. Mean while, 34.1% still argue that community-based management strategy should be encouraged for the reason that they might lose their resources with the inclusion of modem systems in the case of land. Local knowledge systems to them is a form of monitoring the available resource, it also helps in avoiding conflict and preservation of the resource for generations to come. In terms of gender, they acknowledge their contribution to NR management with the reason that gender contribution enhances sustainability. Some have therefore advocated institutionalizing gender to be part of the main system because

they are the primary gatherers of most of the resources in question especially open access resources.

Table 4.10: Combination of Modem and Traditional Methods

Reasons	Frequency	Percent
Sustainability of the resource	22	53.7
Others specify	2	4.8
Not applicable	16	39.0
No response	1	2.4
Total	**41**	**100.0**

Source: Field Survey May, 2010

From the table above, 22(53.7%) goes to confirm the 63.4 percentage point combination of the two methods in order to enhance sustainability. It is therefore clear to conclude that, NR management can be effective and sustainable if there is a blend of both modem and local knowledge systems. This will enable communities to have ownership of their resources.

4.7.1 Gender Ownership of Natural Resource

Ownership of a resource signifies control and utilization of that resource. Women in the study area are marginalized for one reason or the other when it comes to ownership and acquisition of land for instance due to the fact that land is usually owned by males. Respondents, during the research admitted that, if women are given the opportunity to owe and control land it will serve as a social security and income generation for family livelihood thereby reduce poverty. Women in the study area are not represented in the traditional political settings, be it at the household level or community level. Access to resources that are opened is easier than land as the latter is usually owned by men. Women productivity is more or less not realized because they do not have access to land for their own crops. Even when they need a piece of land to cultivate, marginal lands are given them. Children were not left out in the research as 63.4% confirm as less effective in

taking part in NR management. They only serve as observers and probably report to elders of the destruction of valuable trees on farm lands.

Traditional authorities through customary laws wield much control over NRs in Lawra district as the data indicates. As much as 95.1% agreed that they have enormous control with the invocation of spirituality as a control measure and for effective management. However, one does not need to consult Tengandem, chief and elders in order to have access to these resources all the time particularly land. The reason been that these two groups of people do not necessarily owe the land and the resources found on it. They can only consult them in the event that they have ownership of the land and at the same time being the spiritual leaders of the land or in the event that land is been usurped by others within their jurisdictions.

Table 4.11: Natural Resource Ownership by Gender

Land	Frequency	Percent
They could generate income	25	61.0
As a source of social security	14	34.1
Against tradition	1	2.4
Others specify	1	2.4
Total	**41**	**100.0**

Source: Field Survey May, 2010

4.8 Role of GOs and NGOs

4.8.1 Role of District Assemblies in NRM

Rural livelihood is dependent on natural resource availability and utilization by households and the community. These resources are co-managed by traditional and modem institutions which Lawra District Assembly is one. Assemblies are enjoined under section 79 of the Local Government Act, 1993, Act 462, to enact bye-laws in the best interest of promoting local development. Through this Act, Lawra District Assembly enacts bye-laws on bush burning, sand weaning, and indiscriminate felling of trees among others to protect and conserve the environment within the district. Without these laws natural resources which constitute the environment would be destroyed, hence, communities' livelihood systems would be lost. The Assembly recognizes natural resources to be the flora and fauna which until recently is been depleted as a result of population pressure. Therefore in its role in promoting rural development, it seeks to collaborate with other stakeholders - agencies, NGOs and traditional institutions as well as community members in the management of these resources through bye-laws. Women form important component in the management of NRs through these bye-laws because they are the vulnerable and primary gatherers of these resources. It is therefore clear that, Assembly blend modem and local methods for sustainable NR management which would enhance the livelihood of the people as a whole. The challenge however is non-adherence to these by-laws and the inability of the Assembly to enforce these laws probably due to cultural collectivity- where a relative of the authorities goes contrary to these laws and is let go.

4.8.2 Forest Services Division in NRM

As indicated above, NR management takes the effort of many stakeholders including Forest Services Division (FSD) of Ghana. The Forest and Wildlife Policy document of 1994 in Ghana stipulates all forest management related legislation, strategies, and programmes. 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 policy objective is the

involvement of all stakeholders for efficient forest resource management. Therefore, FSD is charged with the responsibility protecting, managing and developing the nation's forests at all local levels. The service in collaboration with other stakeholders - DAs, Traditional Authorities, communities, NGOs and other organizations ensures effective management of forest resources in the district. This is done with recognition of the peoples' culture which is vital to the management of these resources. The service admitted that there has been resource depletion presently than previous times probably due to population pressure and suggest awareness creation and logistical provision to enable them educate the populace on the hazards of resource depletion.

4.8.3 Role of Ghana National Fire Service

Ghana National Fire Service is not left out in the study in terms of managing NRs. The primary aim of the service is to prevent fire disasters both domestic and bush burning within its catchment area. It has however diversified into shea fruits picking as an income generation activity. Shea trees and their products constitute an important source of resource to rural communities in terms of livelihoods. Sustainable management of these resources together with community members and other organizations will help preserve and conserve them for generations to come. NR diversity is seen as the flora and fauna as well as all the minerals available on land which aid in the livelihood of a people. Management of these resources using endogenous development to the service is appropriate because, the culture together with external knowledge systems is relevant for sustainability, It is however, recommended that policies on bush burning and appropriate farming practices should be strengthened in order to preserve the resources.

4.8.4 Role of NGOs – NADRIDEP & FARMERS COOPERATIVES

Protecting the environment which consist of the NRs in it is part of the works of Nandom Deanery Rural Integrated Development Programme (NADRIDEP) and FARMERS COOPERATIVES which are Catholic Church NGOs operating in the district. These

organizations were set up in the mid 70s by the church to cater for the food security needs of the people.

Food security can be achieved if degraded resources are preserved in the district by working primarily with rural people. The livelihood of rural people is largely dependent on NRs by harvesting wild fruits, leaves, wood and tillage of the land among other things in order to eke out a living. These organizations both engage in agriculture in the forms of providing extension services, cooperatives, education and animation, advocacy and micro-credit schemes, tree planting and conservation agriculture among others for the farmers. In collaboration with other stakeholder organizations GOs and NGOs as well as traditional authorities, indigenous knowledge is built upon in managing these resources for sustainability particularly land where conservation methods are applied. Population pressure according to the respondents is a major issue leading to resource degradation. Local people often find it difficult to adapt to changes which is a challenge to these organizations in their quest to improving the lives of the people. Women form the salient group of people that they are engaged in because, they are mostly primary gatherers of these resources to sustain the family. Any attempt to exclude them would lead to a failure of their projects the organizations admitted. From the data, respondents admit that the blend of modem and local knowledge systems in NR management yield some positive results and should be encouraged to bring about sustainability. They however, remarked that, continues sensitization on policies relating to climate change and environmental conservation should be strengthened by policy makers and implementers as a way of sustaining these resources for the future.

4.8.5 Ministry of Food and Agriculture (MOFA)

It is a fact that peoples' livelihood is dependent on land as a resource and all those resources found on it. In Ghana, the Ministry of Agriculture is one state institution charged with the supervision and development of Ghana's agriculture in order to meet the nation's food requirement. Charged with this role, MOFA is engaged in extension services to provide technical training to farmers through the use of appropriate technology on crop production and animal rearing. The target of MOFA is to ensure biodiversity conservation

by working to ensure proper cultural practices both in the development of crops and livestock.

Apart from the above, farmers' production levels are basically dependent on factors such as soil fertility, vegetation and climate. Agricultural development and food security is a foundation stone for Ghana's economic growth which over the years MOFA has been engaged in. The area under study however is within the degraded areas in the region thereby making it difficult for MOFA to achieve its objective. From the data it was realized that farmers today still use traditional methods in farming which they argue is appropriate than tractor because the soil is shallow. Challenges to resources are pronounced in the area because there is resource depletion hence the need for intensifying policies on these resources. They also advocate that endogenous development should be encouraged in managing these resources.

4.8.6 Savanna Agricultural and Research Institute (SARI)

Soil preservation is the role of SARI in the Upper West Region which my study area is part. The institute basically sees the farmer at the pivot of land, soil conservation and water management, because, livelihood centres on it in reducing poverty in rural communities. SARI in collaboration with other institutions develops technologies and transfers them to the farmers through traditional authorities on conservation farming methods. This is done as a way of improving deteriorating resources in Ghana as soil fertility, water bodies and other resources on the land are been depleted due to human activities. Conservation agriculture, drought resistance variety of crops and international soil management are some of the programmes put in place by the institute through strategies such as participatory technology development and participatory rural appraisal methods in managing the available NRs for sustainability to reducing poverty.

Despite the fact that the institute collaborate with traditional authorities, reaching out to women is a difficult task as tradition plays significant role in NR management. Traditional systems are seen as worst offenders in nutrient management despite the fact that their tillage method is appropriate for sustaining the environment. The farmer is only interested in staple yields but not necessarily conserving the soil when especially the land does not

belong to them the institute observed. It was also reveal that spirituality and women participation is very vital in resource management. If women are left out the likelihood that poverty reduction will be successful is high as they constitute: the bulk of the population in farming. All these organizations see endogenous development which is a blend of modem and traditional methods feasible if meaningful resource management is to take place. During the interview it was concluded that NRs are long term issues which should be preserved but farmers are usually interested in immediate yields at the expense of these resources. Farmers in the area still tick to their traditional crops and methods of farming because, early yielding varieties do not meet their spiritual needs as they are harvested earlier before time. A case in point is a traditional festival in Tong which is celebrated late November every year in the Lawra Traditional Area, an early millet variety was introduced by SARI but the people objected to it because it falls short of their spiritual needs. Judging from this, local knowledge systems played and still continue to play significant role in NR management in reducing poverty and enhancing livelihoods in the study area.

4.9 Local Knowledge Systems in Managing Natural Resources in the District

The livelihood of rural people is directly and indirectly dependent on NRs within their environment. The use of local knowledge systems has been of tremendous importance in the management of these resources in enhancing livelihoods in rural communities such as those in the study area. Therefore, social groups of various kinds have been involved including kinship, locality, or traditional institutions not wider ethnic or class based associations which tend to form the organizational bases for such groups (Ole, 1992). Involvement of these social groups is often a necessary condition for sustainable natural resource management. Although much celebrated (Chambers, 1991), it is not sufficient. Often NRM problems involve actors above the locality. 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). Knowledge on these resources has been entrenched in the traditional cosmologies of the people as well as their practices

which differentiate the importance of NRs and their uses. This indigenous knowledge enables them to prescribe different management systems for natural resources.

Communities have put in place different measures in managing natural resources available in their environments. The research as indicated covers all the ethnic groups including the three major ones; Dagaaba, Sisaala and Wala. However, only Dagaaba were captured probably the interviewers did not take note of the others during questionnaire administration which is a research problem. Some other ethnic groups who are Muslims were however captured but not necessarily Sisaala or Wala as they are predominantly Muslims. Natural resource management among the Dagaaba is seen from their belief systems in the forms of taboos, folklores, ancestorship, proverbs and other symbols associated with spirits as well as ethics. Traditional authorities through the powers granted them impose these belief systems in the forms of values and norms on the people through socialization.

There are as numerous species of trees and animals which are taboos to the DagaabaJDagara as you can think of but the trees are not necessarily totems. Tengan (1994, 1997) observed as many as about twenty five (25) different totems for the Dagaaba of double descent around Lawra and Nandom which is the study area. NRs for the purpose of this research are centred on land, trees, water ponds and grasses which are associated with taboos but not necessarily totems as others believe. These resources are given different meanings by different cultures particularly the Dagara with different knowledge and understandings depicting how they are being managed in the area.

Every culture has guiding principles with regards to NR management. Dagara in the study area for instance depend on their traditional cosmologies in managing these resources as expressed in their totems or taboos, myths and/or spirituality as well as ideas about their sacred natural sites which include rivers, water ponds, shrines, ancestorship among others. Traditional cosmologies featured in the interview guide, focus group discussion and the in-depth interview. Spirituality is prominent in NR management which is associated with some trees such as the ebony and ‘kalinzugr tie/daa’ - a yellow berry tree which serve as wild fruits and leaves for human and animal consumption. These trees are considered Tengan trees and are widely tabooed burning as fire for cooking food. Not only that, they

are also considered to harbour some form of spirits. The wed stick of the ebony tree is use in banishing people who are considered nuisance to the community or a house, likewise the 'kalinzugr' as it is in the form of a shrub. The ebony stick is usually pecked on either the person's house - in the case of a nuclear family or farmland in the event of the incident as data from the field revealed. Where there are contested land issues the ebony is more appropriate to determine the rightful owner of the land they said. Some other specific trees such as thorn trees and even the ebony tree in some communities are usually considered to be the tengan-tie (earthly tree) or tengan-tug (earthly grove) as well as some found on individual farmlands considered to be the guiding spirits of their lands. These are preserved by both the tengan-sob (Earth Priest) and the individual households or clans from destruction which is a management strategy for NRs. Water ponds, rivers and sacred groves serve as places of sacrifice for individual clans and/or families all geared towards the conservation and management of natural resources in enhancing livelihoods.

Economic trees such as 'dawadawa' (Locust bean) and shea are persevered by communities one, for their economic reasons as wild fruits are gotten from them as a supplement to their income and food in enhancing their livelihoods. Secondly, they serve spiritual purposes either in the clan lines or tengan line because, a particular dawadawa tree in some communities serves as the tengan-tie while shea and thorn trees in some clans are carved down in rooms as ancestors. The study revealed that land which is their main source of livelihood is preserved by these institutions as over depletion would affect the lives of the people at present and in the future.

Response from the data revealed that, these resources are inadequate compared previously due to increase in population and modernization. The resources they confirm are in open access depending on the use rights except land. In as much as traditional authorities control the resources, acquisition is in the form of inheritance/ownership and leasing in the case of land. The trees and water ponds as well as rivers are those mostly in open access depending on where they are situated and the use rights of the resource. With particular reference to dawadawa and shea trees, an interview with a tendana by name Dadi Gouo, attest that, *these trees have been as valuable to the lives of the people since creation as we were told by our grandparents. They provide food supplements for the survival of the people in times*

of famine as a result of invasion by insects such as army worms or in the invent of drought where crop failures are experienced. The flour of dawadawa fruits is usually preserved by women yearly to combat any eventuality in the case of famine. Even, the flour sometimes were used in exchange for human beings and lands as well as animals during famine we were told. Apart from this the tree as a whole server many medicinal needs of the people in areas such as pneumonia, chronic sores among others not forgetting alkaline that is derived from it for cooking. Shea fruits also serve similar purposes as butter is extracted from it for domestic and medicinal use as well as the raw seed for pneumonia. These are some of the reasons for the ancestors to preserve these resources he concluded.

Local knowledge systems in NR management is relevant till date as modern knowledge sometimes is disadvantageous to the environment as the indicated in the case of land where they see the use of tractor to overturn the nutrients of the top soil as compared to the hoe which is appropriate. Effective control as realized as women to contribute in taking part in managing these resources especially, those with open access. Traditional farming methods to them

CHAPTER FIVE (5)

SUMMARY AND CONCLUSIONS

5.1 Introduction

Socio-demographic data of the respondents indicate that gender is much more pronounced in natural resource management within the district despite the patriarchal nature of the society. Access, ownership and control through inheritance of natural resources especially land lies in the hands of men. Gender access is found only on marginal lands and open access resources such as woods, grasses for mats, and water amongst others. Female participation in natural resource management is minimal hence, the need to involve them in the decision-making process. From the data, 41.5% of respondents were women signifying their involvement in managing these resources particularly open access resources but are not part of the decision-making process as a result of culture. In terms of education, as many as 85.9% of the 41.5% of respondents who had no formal education, are women. They are solely into domestic issues and helping their husbands in the farms with some few into other menial petty trade.

Settlers have no control over land but can only have access to it through begging from land owners because they do not occupy traditional positions in the communities. These settlers coincidentally are Muslims. Widows are also left out in terms of access, control and ownership.

5.2 Traditional Natural Resource Management Systems

This section looks at the traditional institutions that are available in managing natural resources within the study area and the adequacy of these resources in enhancing rural livelihoods.

5.2.1 Available Traditional Systems

African traditional systems exist and are very active in the study area comprising Chiefs and Elders, Tendanas (Earth Priest), Landlords/Clan/Family heads as indicated by the findings. Landlords/Clan/Family heads still constitute the most active group of traditional

authorities in the study area. This was realized when 68.3% of respondents corroborated that they have much control over natural resources particularly land, simply because they owe the land and all the resources on that piece of land. Chieftaincy institution is however, not a major determining factor in managing natural resources because, it is considered alien. Chiefs only collaborate with the "Tengan dem" (Spiritual head and his council of elders made up of Landlords/Clan/Family heads). Women act in advisory capacity and observers and report to their men any destruction of the environment since their livelihoods surround these resources as they are not represented in traditional institutions. Management of these resources requires the collective efforts of all institutions including traditional ones. 'Tengsob or Tengsogsob' (Landowner or Landlords that is the person who owes the land in some communities) which is different from Tengansob or Tendana (spiritual head) also came up during the in-depth interview. In some instances, the Tengsob might wild the powers of both the landlord and the spiritual head but in others these powers are separated. The 'Tengsogsob' is the one who demarcates the boundaries of the community land to be administered by the Tendana and the chief. Communities in the study area do realized that, effective management of NRs lies in the hands of all these institutions. Together, they formulate and impose laws on these resources through spiritual invocations on offenders and outright punishment in the form of fmes and some calamities. They are however, wary of modernization which makes it difficult for people to adhere to these binding rules in conserving these resources for the future.

5.2.2 Natural Resource Adequacy

Available and adequate natural resources in a society are major determining factors in rural livelihoods enhancement. Abu-Juam (2002) corroborated the above that, the availability and management of natural resources are crucial for the sustenance and livelihood of communities of Northern Ghana as their socio-cultural, health status and economic activities are very much dependent on the natural environment. If these resources are properly managed and harnessed, they provide all the basic necessities of life including shelter, food, nutrients, and water amongst others to the people. From the study area, land, forest resources and water bodies as well as wildlife among others constitute natural resources. Agricultural land is fairly adequate as only 46.3% is available for community

members in the district. This is substantiated by the 2000 population and housing census of a population of 576,583 for the Upper West Region, Lawra District is made up of 87,525 with 83 inhabitants per kilometer square its population above the national average even though there are no large urban centres in its territory (Kees, 2004:74). When calculated over the 'usual resident population' the population density in the year 2000 amounted to 90 and 34 inhabitants per km^2 for the district and the region respectively. The district clearly is an island of high population density in a region with low population density (ibid). By comparing the land area to that of the population one will conclude that natural resources are scarce leading to out migration of the inhabitants to other areas.

The data revealed that, forest resources 51.2%, water bodies 63.4% and wildlife 43.9% of respondents attested that NRs are fairly adequate or inadequate within the district. Rivers in the district which constitute the tributaries of the Black Volta dry up immediately after the wet season which ends in October each year. Clearly, natural resources are woefully inadequate from the findings, meaning, livelihood systems are been threatened for the people within the district.

5.3 Sustainable Management Strategies for Traditional and Modem Systems

The failure of natural resource management systems in recent years has been greater in magnitude than those observed historically, (Brunckhorst and Coop, 2001). Every environment requires sustainability in order to ensure sustainable development which is, meeting the needs of today without compromising the needs of the future. The carrying capacity that is the ability of an ecosystem to sustain a certain population and distribution of people and animals if exceeded will cause basic natural resources such as soil to degrade or deplete (CIDA, 1992). Sustaining ecological processes and services requires resilience across multiple scales of complex systems that are influenced by human activity (Brunckhorst and Coop, 2001). Therefore, sustainable management strategies are required if peoples' livelihoods is to be enhanced in the study area. The data revealed that 61 % of respondents depend solely on natural resources as a livelihood source and 39% also depend on other sources for their existence. It was also revealed that traditional methods of tilling

the land is still appropriate in enhancing rural livelihood because, the nature of the soil do not require sophisticated farming implements such as tractor plough among others in the case of land which is the major source of their livelihood. These traditional methods involve cultural rules and regulations formulated by traditional authorities through the institutions available in the various communities. It also came up that, there is collaboration between traditional and modem institutions in the process as policies relating to the environment are embedded in the status books of the country. However, conservation agriculture is been practiced by some farmers particularly the Nandom area where NGOs are engaged in farming practices.

Local institutions still have the opportunity when it comes to natural resource management in the area. This is so because, the use of customary laws by traditional institutions are relevant to the people even till date according to the findings. As a control measure and being able to sustainably manage these resources efficiently, customary laws were and are still used as they fear that modem management principles might take away their resources. Many of them either does not know or are not even aware of modem management principles operating in the area. The data indicated 90.2% of respondents acknowledging the use of customary laws for natural resource management which is indicative of the level of use. Traditional practices are still relevant in today's modem era in managing natural resources despite the use of bye-laws by the assembly as well as the central government.

5.4 Gender and NRM

Chen, (1993:35) argued that women maintain closer physical ties with natural resource base than men and have in-depth knowledge and know-how about the properties and uses of different biomass species. They are recognized to be more conservationist than men and to more readily perceive the negative consequences of the degradation and destruction of forests and grassland she added in Smita *et al.*, 2004) and Shiva, (1988) argues that there is an intimate link between degradation of women and degradation of nature in Smita *et al.*, 2004. Gender plays very important role in natural resource management both direct and indirect ways according to the findings. As primary gatherers of common property

resources such as dawadawa, shea- *Vitellaria paradoxa* (Hall *et al.,* 1996) or *balanites aegyptica* (Shanks, 1991) in Abu-Juam (2002) among others, they directly conserve the resources by preventing their destruction. But indirectly, they conserve those resources that they do not have dominion over such as land and trees that are on it. Women do not owe land in the study area and do not also form part of the traditional institutions existing in the communities. Therefore, their roles in managing these resources are limited to only common property goods.

5.5 Government Agencies and NGOs Responsibilities in NRM

In the increasing search for agricultural and grazing land, fuel-wood and charcoal, the land area, including forest reserves, is being continually invaded to the extent that the fragile ecosystem is now seriously threatened (National Population Council, 1994). This calls for a policy direction on the nation's rapid population growth pressure on natural resources since 1994 by the government. The savanna belt is currently facing the serious threat of devastation as a result of population pressure according to the policy paper. Government agencies operating in the district such as DA, FSD, SARI, GNFS and MOFA are mandated by the government through this policy to ensure that NRs are well preserved to enhance the livelihoods of the people that they serve. NGOs also complement this policy by engaging in conservation agriculture aim at tilling the land efficiently as well as tree planting in the study area.

These organizations together acknowledged that the culture of the people is so much revered when it comes to natural resource management. Because, rural people everyday lives revolves around their culture which is a way of life of a people. Traditional farming methods are still much preferred to modem methods. Adaptability is a major challenge to these agencies and NGOs because; new varieties of crops that are normally introduced with the aim of enhancing their livelihoods are ignored. The reason has been that, these varieties do not meet their cultural and spiritual needs. They also fear that these new varieties might erode away their traditional crops and even rather lead them to hunger annually. To them endogenous development which is a mixture of modem and traditional knowledge should

be encouraged in order to ensure sustainability of these resources. Policy-makers to them should sensitize community members on intensive NR conservation and management as a way of curbing environmental degradation which is eating up the environment. This will help solve the problem of climate change which is a current debate the world over the organizations emphasized. SARI in particular acknowledged that traditional farming systems erode soil fertility particularly when the land does not belong to the farmer. He is only interested in staple yields and do not conserve the soil. Gender role in NRM is very vital because, women contribute significantly to the family up keep in every household in rural areas through these resources as food supplements which the study area is part.

5.6 Possible community-based management options

Ghai and Vivian, 1992; Ghai, 1994 in Leach *et al.* (1999) observed that, the consensus in the wake of the United Nations Conference on Environment and Development (UNCED) suggests that the implementation of what has come to be known as "sustainable development" should be based on local-level solutions derived from community initiatives. Therefore, any meaningful NRM in the study area should emphasize much on community members' role in arriving at the above assertion. The data revealed 63.4 percentage point combination of the two methods in order to enhance sustainability of natural resources in the environment. NR management can be effective and sustainable if there is a blend of both modern and local knowledge systems thus; endogenous development as well as institutionalize gender institutions in every aspect at the community level where necessary. This will enable communities to have ownership of their resources. Communities therefore have the options ahead in managing their available resources if they follow these assertions in addition to sensitization of members on the dangers involved in natural resource depletion. Adherence to rules and regulations made by both formal and informal institutions by communities is an option in managing natural resources.

CHAPTER SIX (6)

RECOMMENDATIONS

Every research is carried out to ascertain a fact about a phenomenon. (Kumekpor, 1995; Bacho, 2001) argued that 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. The study is aimed at assessing NRM issues in rural communities and how these affect their livelihood systems. In this vain, the following recommendations are made in addressing the findings that emerged from the research.

6.1 Emphasis on Endogenous Development Approach to CBNRM

The use of endogenous approach in natural resource management will be of significance to communities' livelihoods. This is so because, blending both traditional and modern methods in managing these resources helps in sustaining the environment. Haverkort *et al.* (2002:256) defined endogenous development to be "development based on but not exclusively, on locally available resources, local knowledge, culture and leadership, with the openness to integrate traditional as well as outside knowledge and practices". Therefore, CBNRM should be centered on endogenous development approach by looking at Indigenous Knowledge Systems (lKS) that are relevant and integrate them with modern knowledge. Once community members' livelihoods revolve around these resources in the form of food, shelter, medicine among others, depletion of these resources due to population growth means livelihood systems will be eroded. Therefore, local knowledge systems and that of modern knowledge systems need to collaborate in solving this problem.

6.2 Changing Attitude/Sensitization of Community Members towards Cultural Re-ignition

Communities since creation have evolved strategies in managing resources within their environment through cultural constructions before the advent of Europeans. These strategies have been maintained and seen as effective because of the dangers involve in violating customary laws. Modernization to them has been much a bane on their environment than a blessing to many. Unlike people fearing the calamities of traditional sanctions, they tend to ignore such invocations on the destruction of natural resources. However, not all aspect of the tradition is considered bad. There is therefore the need for people to be sensitized to change their attitudes towards culture and take the good ones relevant for preserving the environment. Children should be given awareness either through formal or informal means to enable them grow up with positive attitude concerning the environment.

6.3 Freedom of Operations in NRM by Community Members

Rural livelihoods are dependent on the environment which is made up of the flora and fauna. They see the environment as a gift of nature from God to enable them ends their living. Therefore, any form of means by which rural people are not been able to have total control of their environment is an affront to their survival. Government agencies are always seen as exploiting the available resources to the detriment of the people. Traditional authorities today tend to be passive because of policies by government through the various agencies. NRM To them should be in the hands of traditional authorities as well as community members who owe and control their resources for generations to come. Government agencies should rather empower these authorities by building their capacities through modern means to enhance livelihood.

6.4 Institutionalising Gender in NRM in Decision-making

Mamphela, (2004) asserted that, Indigenous Knowledge point to the substantial contribution of women to maintaining agro-biodiversity. In their role as principal providers of food in the event of food shortages, women have developed coping strategies to maintain food security at the household level. They often rely on minor crops or semi domesticated plants, more tolerant to droughts and pests, providing a reserve for extended periods of economic hardship. Many of the plants women use also have medicinal value. However, women's indigenous post-harvest technologies, such as storage, and processing practices related to under-utilized plants, are in danger of disappearing. Today for instance, harvesting dry dawadawa fruits and storing the flour is difficult to come by. The environment is fast degrading as a result of population pressure.

However, in the traditional parlance, women are neither owners nor part of the decision-making processes in managing natural resources. It therefore suggests that the wealth of knowledge that women can provide in resource management are been underestimated. Been primary gatherers of these resource they wield enormous knowledge that when tabbed could contribute effectively for managing these resources. Base on the argument above, if gender is institutionalized in rural communities in areas that are relevant, it would increase women participation by allowing them to involve actively at all levels of decision-making in natural resource management.

6.5 Effective Collaboration between Formal and Informal Institutions in NRM

Institutions both formal and informal are obliged by law or customs and norms to preserve and conserve resources (natural) within their areas of operation. Modernization and foreign religion according to community members have intruded into the fabric of their institutions today. They recount the effectiveness of traditional norms and ethics that were use some few decades back in curbing immoralities in their communities against environmental degradation. However, these suddenly have been eroded owing to modernity. Formal institutions involvement in natural resource management is sometimes seen as an intrusion in their traditional value systems though some laud the idea. They often fear that their

resources would be taken away from them particularly land which is a major source of livelihood.

Bye-laws formulated by formal institutions such as the district assembly I suggest should take into consideration traditional values and norms that exist in the district. Traditional authorities should always be consulted in the formulation of these laws such that, they can give their inputs pertaining to natural resources conservation and management. If this collaboration is done, sustainability of natural resources would be enhanced hence, livelihoods would be improved.

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