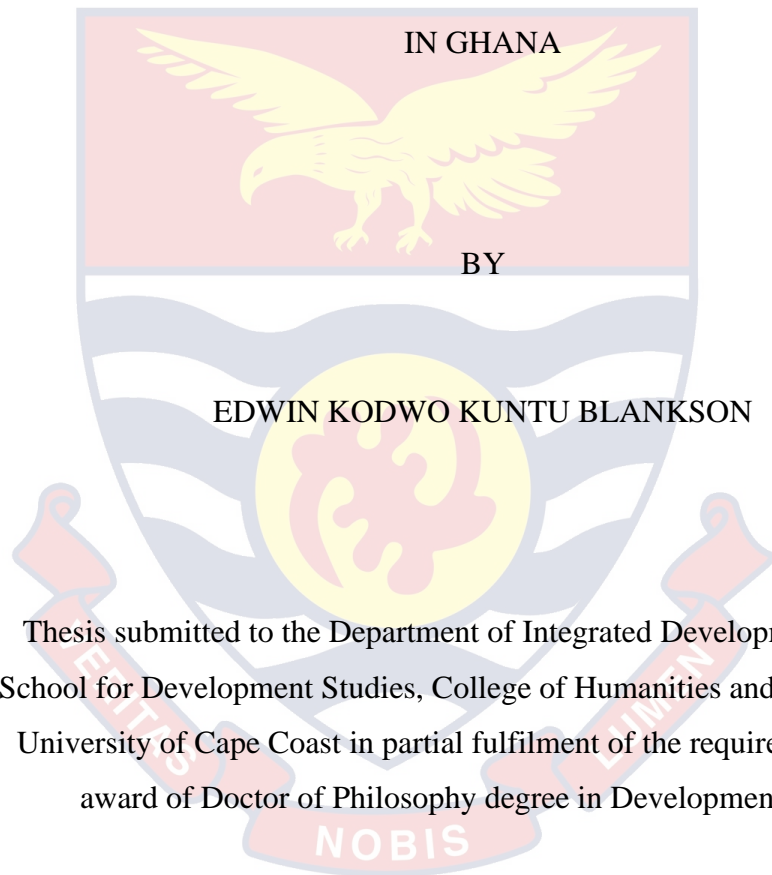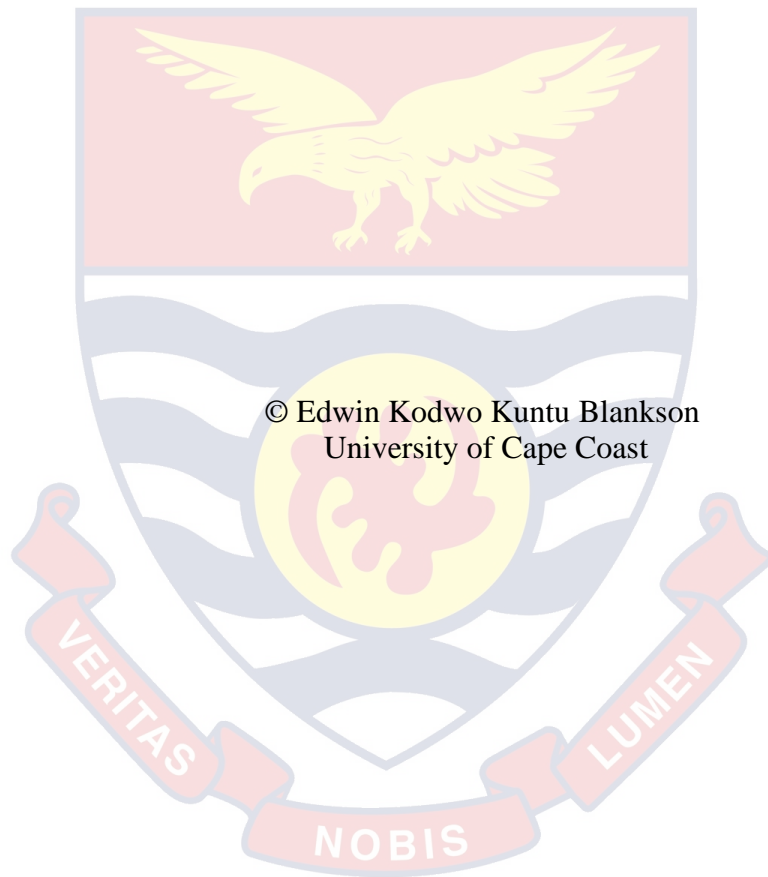UNIVERSITY OF CAPE COAST

TRADITIONAL ECOLOGICAL KNOWLEDGE AND NATURAL

RESOURCE GOVERNANCE: A STUDY OF SELECTED COMMUNITIES

IN GHANA

BY

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Thesis submitted to the Department of Integrated Development Studies,
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award of Doctor of Philosophy degree in Development Studies

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DECLARATION

Candidate's Declaration

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

Candidate's Signature: ....   Date: ....

Name: Edwin Kodwo Kuntu Blankson

Supervisors' Declaration

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

Principal Supervisor's Signature: .... Date: ....

Name: Prof. S. B. Kendie

Co-Supervisor's Signature: ....   Date: ....

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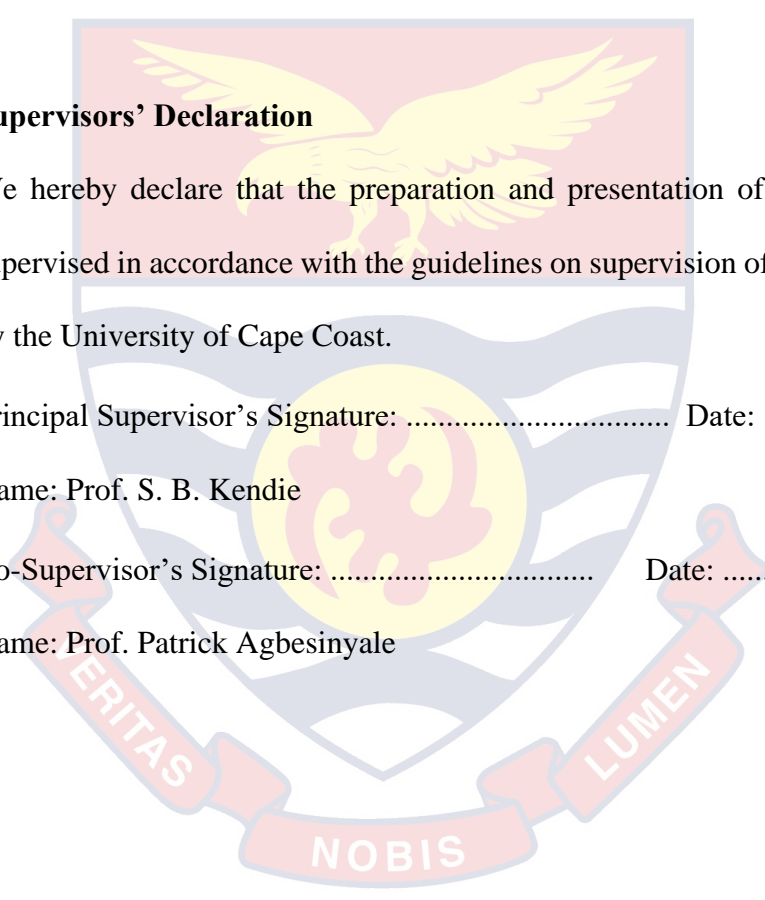
ABSTRACT

Traditional Ecological Knowledge (TEK), according to the writings of Posey et al., (1995) is viewed as a treasured source of environmental information that allows traditional communities to protect and preserve their way of life and their natural resources. The study set out to examine the TEK and the natural resource governance (NRG) systems in Boabeng - Fiema, Tafi - Atome and the Amansuri resource areas. The specific objectives were to explain TEK, examine the NRG system and learn lessons from the integration of TEK into NRG at the three study areas. The study explored these objectives based on endogenous development, the assurance problem and the resilience theories. The study employed a multiple-case study approach using a qualitative study design. A combination of convenience and purposive sampling were used to select the respondents. Data collection was by interviewing, group discussion and observation. Qualitative data analysis involved thematic analysis, discourse analysis and cross site analysis. The TEK was founded on their cosmovision, history and traditional religious beliefs. The TEK of three study areas were also under the custodianship of the chieftaincy, the fetish priesthood and clan institutions. The major differences were the Spiritual deities to which they bear allegiance, the ecological restrictions and TEK processes. The family was the main agents of socialization in all three study areas and the motivation for their governance system was for; spiritual harmony, promotion of eco-tourism and social development. All three study areas had their governance system oriented towards observing age old traditions and making their communities exceptional eco-tourism centers. The lessons learnt centered on the effects of a resilient TEK on adaptive governance system. Major recommendations were that there is the need for the traditional authorities to fully document their TEK to facilitate public education on TEK. Additionally, there is the need for the Chiefs and governance stake holders in the three study areas to review their governance bylaws and make copies readily available for members of their community to improve transparency, accountability and participation.

KEY WORDS

Accountability

Foundations

Institutions

Participation

Rule of Law

Transparency

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DEDICATION

To my wife Linda A. Blankson and my late parents Mr. and Mrs. Blankson.

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LIST OF ACRONYMS

ACID   Amansuri Conservation and Integrated Development

AE   Allocative Efficiency

AFD   Agence Francois De Development

BFMS   Boabeng - Fiema Monkey Sanctuary

CA   Community Association

CBD   Convention on Biological Diversity

CBNRM   Community-Based Natural Resource Management

CBO   Community-Based Organisation

CCDD   Convention to Combat Desertification and Droughts.

CFM   Collaborative Forest Management

COMPAS   Comparing and Supporting Endogenous Development

DANIDA   Danish International Development Agency

DfID   Department for International Development

EC   European Commission

ED   Endogenous Development

EEZ   Exclusive Economic Zone

EPA   Environmental Protection Agency

FBO   Farmer Based Organizations

FJMC   Fisheries Joint Management Committee

FSD   Forestry Service Division

GDP   Gross Domestic Product

GFWP   Ghana Forest and Wildlife Policy

GIS   Geographic Information System

GNP   Gross National Product

GOG   Government of Ghana

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GWS	Ghana Wildlife Society
IDA	International Development Association
IMF	International Monetary Fund
ISRDS	Integrated Sustainable Rural Development Strategy
IUCN	International Union for Conservation of Nature
LDCs	Least Developed Countries
LOs	Local Organizations
MEA	Millennium Ecosystems Assessment
NGO	Non-Governmental Organisation
NR	Natural Resource
NREG	Natural Resources and Environmental Governance
NRG	Natural Resource Governance
NRM	Natural Resource Management
NRMP	Natural Resources Management Programme
PID	Participatory Innovation Development
PLA	Participatory Learning and Action
PTD	Participatory Technology Development
RNG	Royal Netherland Government
SES	Social Ecological Systems
UDS	University for Development Studies
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
WCED	World Commission on Environment and Development
WNTC	Western Nzema Traditional Council

WWFN   World Wide Fund for Nature

CHAPTER ONE

INTRODUCTION

Natural resource governance (NRG) in traditional communities have been studied to help identify the factors that promote or affect the effectiveness of the governance system. Theoretically, the importance of integrating traditional ecological knowledge (TEK) into NRG has been encouraged by some scholars such as Berkes et al (2003) and Millar (1999) as a key requirement for promoting endogenous development. There is however a theoretical gap with regards to the functionality of endogenous development theory in a changing world taking into consideration the assumptions of the resilience theory and assurance problem theory.

Studies such Ntiamoa - Baidu (1995) and Attuquayefio & Fobil, (2005) have examined the blend of traditional and modern governance systems, however empirical evidence on the nature of the integration of TEK into NRG in Boabeng – Fiema, Tafi – Atome and Amansuri with regards to cosmovision, TEK institutions and TEK processes remain unexamined. The study examined TEK and NRG at the three study areas and explored the integration of TEK into NRG with key interest in governance principles and how the lessons learnt from the dynamics and integration TEK and NRG should influence policy making on NRG and development in traditional communities.

Background to the Study

Natural resources have huge influence on the culture, livelihood, economy and religion of societies globally (Trosper & Parrotta, 2012). The huge contributions of natural resources to the socio-economic development of countries have motivated a universal need to protect them from over exploitation

(UN, 2008). For most societies, the practices and approaches used in ensuring the sustainable use of their natural resources depend on their knowledge and local philosophies on nature and ecological relations, generally referred to as - Traditional Ecological Knowledge (TEK) (Barthel and Isendahl, 2013). Brockman, Masuzumi, and Augustine (1997), define traditional ecological knowledge as a body of knowledge built by a group of people through generations of living in close contact with nature. Globally, the philosophies behind TEK systems have dwelt on the cosmovision of the people.

Cosmovision is a complex view or understanding of the world especially with the view of time and space and in relation to human beings. For most African societies, the philosophy of TEK is embedded in the African cosmovision which is based on the interconnection between the natural, human and the spiritual worlds (Millar, 1999). The Shona world view, for example expresses that, the natural world provides the habitat for the spirits and sends messages from the spiritual world to the human world (Gonese, 1999). Gonese also posits that the spiritual world provides guidance, punishment and blessing to the human world. Based on these philosophies, people therefore have to relate to both the natural and the spiritual world in order to develop a balanced ecology where there is harmony among the worlds.

Millar (1999) also reveals that in the general traditional African worldview, land, water, animals and plants are not just a production factor with economic significance but are considered as major elements within the sanctity of nature. Modern western societies, however, rely on scientific knowledge which dwells on experimentation, empirical evidence and eschews sources of knowledge which are not measurable in time and space (Lertzman, 2010). There

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are however several similarities between traditional or indigenous knowledge systems and formal scientific management. In support of this view, Cajete (2000), has described TEK as a native science which focuses on the study of natural laws of interdependence.

Environmentalist in recent times are championing the concept of resource governance rather than natural resource management. This shift has come about as a result of the fusion of social science and biological science concepts and perspectives (IUCN, 2010). Natural Resource *Governance* refers to oversight and decision-making related to strategic direction, financial planning, and bylaws on the use and conservation of natural resources (Bruhn, 2009). Bruhn, further elaborates that, natural resource governance also includes the set of core policies that outline the community's purpose, values, knowledge systems and structures employed in the governance process.

Natural Resource Governance is considered a better alternative to state led management approaches because it imbibes major principles such as transparency, rule of law, accountability and participation (IUCN, 2010). The governance decisions and policies provide guidelines for natural resource management. Natural Resource Management refers to the routine decisions and administrative work related to the daily operations of the governing body (Michel, 2002). According to Minteer and Corley (2007), management decisions should support or implement goals and values defined by governing bodies such as the Board of Directors and documents such as the bylaws. In some cooperatives and communities, according to Moller, Berkes, Lyver and Kislalioglu (2004), all members participate in the management of the resources with each member of the community being assigned simple tasks within a

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specific location. In other cooperatives, one or more specialized managers make operational decisions. These managers are often elected by members of the community or hired and supervised by the governing body.

Another debate in the governance of natural resource has to do with the concept of conservation 'wise use' and preservation 'deep freeze' concepts (Minteer and Corley, 2007). The 'conservationist' inspires a common-sense position which places equal importance on the need for replenishing the earth's natural resources and the human need to make use of those resources. The 'preservationist' on the other hand, conveys a far less attractive position, describing a person ''who believes nature should remain untouched – preserving exactly what we have'' (Luntz, 2003, p. 142). Luntz further explains that, the preservationist lauds the spiritual and aesthetic qualities of wild nature, adopting a firm stand on complete abstinence from any form of exploitation.

Conservation, according to Norton (1986), can be understood as referring to the prudent use of natural resources, with an eye to the maintenance of future availability and productivity. Preservation, on the other hand, denotes the protection of an ecosystem or resource base from resource production (Norton, 1986, p. 200). He therefore describes Conservation and Preservation as practical philosophies of environmental management rather than competing value positions in environmental ethics. According to Norton, Conservation and Preservation are models of management action that can be driven by a variety of underlying interests, from human consumptive and non-consumptive values (e.g., resource extraction, recreation) to non-anthropocentric claims (Norton, 1986).

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Before colonial rule, natural resources were purely governed through the functions of traditional institutions such as chieftaincy, fetishisms and family systems using traditional knowledge and principles and rituals. In the Gold Coast, the colonial government instituted the first formal forest policy in 1948 to establish protected areas or forest reserves and wildlife conservation areas in its colonies which often excluded and displaced rural communities from traditionally-owned lands. As a result of this, natural resource governance issues in developing countries were founded on exogenous oriented models and theories such as the tragedy of the commons, while the contribution of indigenous cultures and institutions were overlooked (Fairhead & Leach, 2004).

In 1994, Ghana developed a Forest and Wildlife Policy to replace the Forest Policy of 1948. This policy was formulated for the conservation and protection of the forest reserve estates (MLNR, 2012). The main policy thrusts of the 1994 Policy were environmental protection, sustainable production and use of forest and wildlife resources, involvement of local people in management and benefit sharing. Other objectives of the policy were institutional restructuring and promotion of research and human resource development. The implementation of the 1994 Forest and Wildlife Policy introduced a number of strategic initiatives and sector reforms, which sought to improve and develop the forest resource base and integrate good governance, transparency, equity and poverty reduction into the forest and wildlife sector (MLNR, 2012). However, after two decades of implementing the policy, Ghana's timber and non-timber forest resources were being over-exploited and continue to decline both in quantity and quality (UNESCO, 2010). In order to ensure a sustainable natural resource governance system, a revised policy was needed to take advantage of

these emerging opportunities to maximize the rate of social and economic development and provide adequate means of livelihood from the forestry sector to all Ghanaians. As a result of this, the Ghana Forest and Wildlife Policy (GFWP) was introduced in 2012 as a new approach and a paradigm shift from the past policies

Objective 4 of the 2012 policy aims at promoting and developing mechanisms for transparent governance, equity sharing and peoples' participation in forest and natural resource management (MLNR, 2012). The 2012 policy employs approaches which involve consultation, needs assessment, investigation, synthesis and consensus building aimed at ensuring equity and the fair distribution of benefits and efficiency in the execution of forest management prescriptions. The policy also promotes collaborative forest management (CFM) approach which promoted the establishment and institutionalisation of several community-based forest resources governance projects. Despite all the approaches and strategies, there are no legislative supports for the collaborative forest management which has led to poor implementation of these community-based resource governance programme described in the 2012 policy resulting in loss of forest resources and biodiversity (UNESCO, 2018).

Despite the lack of information on the full coverage of the biological resources of Ghana, in such areas as the marine and other aquatic ecosystems, Government records from 2010 reveal that, there are about 2,974 indigenous plant species, 504 fishes, 728 birds, 225 mammals, 221 species of amphibians and reptiles. Three species of frogs, 1lizard, and 23 species of butterflies have been reported to be endemic. Sixteen percent (16%) of Ghana's land surface area has been set aside to conserve representative samples of her natural ecosystems

in the form of forest reserves, national parks and other wildlife reserves including various traditional forms of conservation (Republic of Ghana, 2016).

To better secure Ghana's natural resources, it is important to promote adaptive governance systems which employ multiple approaches. Adaptive governance is best understood as an approach that unites those environmental and natural resource management approaches that share some or all of the following principles: polycentric and multi-layered institutions, participation and collaboration, self-organization and networks, culture centred, learning and innovation (Djalante, Holley & Thomalla, 2011). Before the advent of modern or "introduced" biodiversity, conservation methods, indigenous societies relied on TEK Systems which are complex religio-cultural belief systems that used traditional norms, myths, taboos, totems and closed seasons to preserve certain critical natural resources (Ntiamoa-Baidu,1995; Abayie-Boaten,1998; Attuquayefio & Fobil, 2005). Brockman, Masuzumi, and Augustine (1997) define traditional ecological knowledge as a body of knowledge built up by a group of people through generations of living in close contact with nature. According to Brockman, Masuzumi, and Augustine (1997), traditional knowledge is cumulative and dynamic. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual and political change. Brockman, Masuzumi, and Augustine (1997) further propose that TEK must be understood in a manner which encompasses knowledge about the cultural, economic, political and spiritual relationships with the land. There is, however, a school of thought that suggests that such traditional edicts only inadvertently promoted natural resource conservation but was strictly adhered to, in order not to incur the wrath of deities or ancestral spirits. It is, however,

generally agreed that no matter the original intention of such belief systems, their influence on natural resource governance is enormous (Amanor, 1994; Gyasi, 1997; Arhin, 2008).

Grenier (1998) attest that, generally, the dominant means of knowledge dissemination and preservation are oral, through demonstration in practice and through incorporation in cultural artefacts, traditions and ceremonies. Within the last century, undesirable factors like deforestation, natural resource over-exploitation, and pollution, introduction of exotic species, population increase, poverty, urbanization and weak legislative, or institutional structures have greatly threatened the conservation of natural resources (Attuquayefio & Fobil, 2005). These worsening environmental conditions are direct consequences of increasing non-adherence to long-held traditional beliefs, due to the advent of western technology, growing influence of foreign religions and beliefs, lack of modern regulations to enforce traditional rules, and problems of migration, urbanization and resettlement (Ntiamoa - Baidu, 1995).

Ohmagari and Berkes (1997) revealed that not all traditional practices and belief systems have been ecologically adaptive; some became maladaptive over time due to changing conditions. Ohmagari and Berkes also state that some traditional ecological knowledge systems and practices have led to the loss of natural resources; a typical example is the slash and burn methods of farming and shifting cultivation which lead to the destruction of large ecosystems in attempt to produce food for human consumption. Regardless of these allegations against TEK and traditional resource management practices; the high levels of biodiversity found in indigenous peoples' territories have made them focal points for environmental conservation.

The challenges of the state initiated natural resource governance approaches elicited the need for community based natural resource governance as a suitable alternative. The International Union of Conservation and Nature [IUCN] (2011), defines natural resource governance as the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say in the management of natural resources - including biodiversity conservation. The sustainability of a natural resource governance system is highly dependent on a resilient TEK system (Resilience Alliance, 2010). A resilient TEK system is capable of adapting to change in the social-ecology without losing its ability to perform its social function (Folke, 2006).

TEK centred natural resource governance experiences in some African countries have been very effective. Menzies and Butler (2006) reports that in Kenya the development of community-level wildlife-based tourism ventures on communal and private land is making a major contribution to the total national conservation estate. In Cameroon, revisions to forestry laws have enabled community associations and cooperatives to acquire the exclusive rights to manage and exploit up to 5,000 ha of customary forest, under a 15-year contract, resulting in the creation of over 100 new Community Forests.

In Ghana, 200,000 hectares of forest have been demarcated under the Community Resource Governance Area Policy of 2000. This gives participating communities full authority to control access and harvesting of resources within their management area. These changes are reducing the illegal activities in the areas under this type of governance (Menzies & Butler, 2006). It is however evident that local people have developed a variety of consistent resource

conservation and governance strategies in many parts of Africa in the past that help in regulating their interactions with the natural environment (Shastri, Bhat, Nagaraja, Murali, & Ravindranath, 2002). Shastri et al., (2002) however emphasized the sustenance of traditional ecological knowledge systems as the bedrock for sustainable traditional resource governance.

Sustainable development according to the World Commission on Environment and Development report of 1987, sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). This report recognised three aspects of sustainable development; economic, environmental and social. According to Holmberg (1992), environmentally sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resource systems or environmental sink functions, and depleting non-renewable resources only to the extent that investment is made in adequate substitutes. By their definition, sustainable development includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as economic resources.

The significance of TEK systems in sustainable development and natural resource governance have been substantiated by some social science theories. Key among these are the endogenous development theory, the assurance problem game theory and the resilience theory. The endogenous development theory places sustainable development in the hands of local communities based, though not exclusively on locally available resources, values, knowledge and institutions (North, 1990). The endogenous development theory further establishes the premise that, traditional societies are capable of developing

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community centred, people oriented and culturally inspired approaches to protect their environment and natural resources (Emeagwali, 2010).

The principles upon which endogenous development thrived was however examined by Hardin's (1968) "Tragedy of the Commons" publication. Hardin argued that resource users cannot be left to decide alone on how to use their common resources. According to Hardin (1968), in societies, where there is competition for resources but no structures to control and regulate resource usage, the incentive to conserve is low – people tend to over exploit resources for fear of their competitors taking more than them. This situation according to Hardin results in a phenomenon known as the "tragedy of the commons" (Hardin 1968). This was however strongly contested by Runge in his 'Assurance Problem Theory.

The "Assurance Problem Theory" is based on game and social mutual agreements and postulates that, communities can develop and progress their own resource governance systems which are based on socially accepted rules and restrictions which will ensure sustainable use of natural resources. Runge advocated that, resource management policies based on the top-down 'tragedy of the commons' motivated approach, have failed and thus resource management systems would be more sustainable if they rather seek to support traditional institutions and promote TEK integration (Bonye, 2008).

The effectiveness of TEK to sustain natural resource governance despite changing social variables is explained by the resilience theory (Holling, 1973). Natural resource governance is dependent on the behaviour of the individuals that take decisions and implement the decisions. It can therefore be concluded that a change in the use of natural resources can only be achieved by

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championing positive behavioural change without compromising ecological resilience. The term "resilience" originated in the 1970s in the field of ecology from the research of Holling, who defined resilience as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (Holling, 1973, p. 14). In short, resilience is best defined as "the ability of a system to absorb disturbances and still retain its basic function and structure" (Walker & Salt, 2006, p.1).

The resilience theory explains the principle that for a traditional knowledge system to remain relevant in natural resource governance, it needs to be able to survive social change without losing its ecological significance (Carpenter, Walker, Anderies & Abel, 2001). In Ghana, until 1994, forestry and wildlife resource governance policies and programmes funded and promoted by state institutions marginalized the involvement of traditional institutions and traditional ecological knowledge (TEK) systems. Weak or inappropriate natural resource governance contributes to a wide range of problems that deplete ecosystems of their diversity, abundance, productivity, and resilience (Folke, 2006). People are experiencing the consequences of this in very real ways. In Africa, for example, natural resource extraction has underpinned growth of 4.8% per annum over the last decade, but recent research shows that "lived" poverty remains largely unchanged, with 45% of people experiencing food shortages (World Bank, 2016).

The Forestry Commission-Wildlife Division and the Ghana Wildlife Society, having recognised the weaknesses of the state engineered natural resource conservation and regulations have partnered some rural communities

such as Boabeng-Fiema, Tafi-Atome , Paga, Wli and Tano   in developing a natural resource governance system that formalises traditional and customary laws on the use of natural resources in eco-tourism projects (Ntiamoa-Badu, 1995). The Boabeng – Fiema Monkey Sanctuary, Tafi - Atome Monkey Sanctuary and the Amansuri wetland and forests are three examples of natural resources which are conserved by the communities through their traditional institutions in collaboration with some governmental and non-governmental organisations such as Ghana Wildlife Division of the Forestry Commission (GFC-WD, 2002).

Boabeng - Fiema Monkey Sanctuary is a community-based Sanctuary located at Boabeng and Fiema a twin community in the Nkoranza district of Bono East Region. The sanctuary protects the headwaters of the streams that are consumed in the locality. It has a good number of the Black and White Colobus, Mona, spot nosed monkeys and a variety of birds. The monkeys in the reserve are regarded as the children of the gods of the community; therefore, they are neither hunted nor killed. A system of traditional taboos and community enforcement of the taboos have protected the monkeys for generations (Densu, 2003).

Tafi-Atome Monkey Sanctuary (a sacred grove) is a traditional conservation area backed by statutory enforcement in co-operation with local communities. It is located in the Volta Region of Ghana. Tafi -Atome is the home of Mona and Patas monkeys. These monkeys are found in a remnant patch of forests, which has survived fire and human disturbance around the village. These monkeys are regarded as gods and as such the natives do not kill them (GWS, 2006).

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The Amansuri wetlands and forests, a community protected area that was created through a collaborative partnership between the Ghana Wildlife Society and the chiefs and people of the Western Nzema Traditional Area is located in the western region of Ghana. Faunistic inventories on Amansuri have identified 27 species of mammals, 26 species of reptiles and amphibians, and over 105 species of birds among others (GWS, 2008).

Statement of the Problem

Centralized, bureaucratic resource governance systems where the local people are excluded from decision making processes, have been criticized for leading to ecological collapses and for failing to improve people's lives (Agrawal 1995, 2003). Consequently, attention has been drawn to focus on community-based resource governance processes, which strengthen ecological governance decisions by gaining access to systems of knowledge and governance practices that are better attuned and favourable to local culture, beliefs and economic specifics (Berkes, 1998; Pálsson, 1998). Furthermore, community-based governance approaches are able to increase the efficiency of decision implementation by involving people that are directly affected by the decisions in activities such as monitoring (Hanna 1998, Sheppard & Meitner, 2005). Finally, community based approaches to resource governance increase equity in the decision-making process by moving away from management models that are controlled by a central state that is remote from the needs of local people and from regional and cultural specificities (Persoon & van Est 2003; Pagdee, Kim & Daugherty, 2006).

Natural resource governance (NRG) as proposed by IUCN (2010), encompasses the set of norms, institutions and processes that describe and guide

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decision-making and citizens' engagement in natural resource policy development and how its implementation impacts nature and people. This provides a basis for understanding how governance in the "real world" affects livelihoods, food security, climate adaptation, human wellbeing and how natural resource interventions can facilitate and support positive change (IUCN, 2010; UN, 2015). Natural resource governance in order to be sustainable and adaptive, according to UN (2015), must depend on a resilient traditional ecological knowledge to promote local participation. The success of such governance systems depends largely on successful integration of TEK in the governance laws, institutions and processes (Pagdee, Kim & Daugherty, 2006).

The Boabeng - Fiema Monkey Sanctuary, the Tafi - Atome Monkey Sanctuary and the Amansuri wetlands and forest resource areas have been surviving on traditional ecological knowledge and traditional conservation strategies. This has enabled the communities to survive in a balanced relation with their natural and social environments. The traditional institutions coupled with some support from the other governmental and non-governmental organisations have created ecotourism sites which have drawn tourists globally to these resources. The natural resources have also provided a livelihood for most indigenes and a thriving habitat for its wildlife (flora and fauna).

In recent years, the traditional beliefs, taboos, norms and cultural philosophies underpinning these institutions are being influenced by the dynamics of society due to western styled formal education, religious pluralism, tourism, gender re-orientation and globalization (Stevenson, 1998). Throughout the world, concern has been expressed about the loss of traditional knowledge and learning systems and many have searched for ways to preserve both

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(Warren, Von Liebenstein & Brokensha, 1993). Warren et al however conclude that, preservation is not enough because all knowledge must be dynamic and change in response to changing circumstances. This has triggered the need for studies into TEK globally with much focus on the adaptability of TEK and its integration and compatibility with natural resource governance systems. Unfortunately, the enforcement of this legislation deprived the indigenous people of their perceived God given rights to their livelihoods in the fields of hunting, fishing, farming, etc. (Corbin, 1999). The resulting antagonism between government authorities and local communities, as well as problems of encroachment for farming, illegal hunting and human-wildlife conflict rendered such *in situ* conservation approaches largely ineffective (Kiss, 1990; Hanson & Tchamba, 1993).

Available literature (Afenyo, 2012; Attuquayefio & Gyampoh, 2010; GWS, 2003) have examined the history and institutions of TEK in the three research areas. Their studies, however, did not cover the processes by which TEK is generated as well as the "resilience of TEK", that is the ability and potential of TEK to adapt to changes in society. In addition, Kearney (1989) and Pinkerton (1989) have all attested to the fact that natural resource governance which is not centred on site specific culture and knowledge systems often not welcomed and thus ineffective in ensuring sustainable development. Studies conducted by Afenyo (2012) and Attuquayefio and Gyampoh (2010) have explored natural resource governance in some rural communities such as Tafi - Atome and Boabeng - Fiema. Their studies explored the relationships between the local people and the formal institutions that facilitated the resource governance process in these communities.

Afenyo (2012) and Attuquayefio and Gyampoh (2010), however, were limited in examining the uniqueness of the process of integrating TEK into natural resource governance. These existing studies did not also examine the elements of TEK that may be present or absent to make the governance system resilient and dynamic. The lack of empirical studies on the processes of TEK and the nature of its integration into the natural resource governance system at the three study areas can pose a great threat to the sustenance of their natural resource governance and social development. There are still unanswered questions regarding how, the local cosmovision and the processes of TEK such as knowledge generation, validation, modification and dissemination influence NRG processes and principles.

Furthermore, studies on natural resource governance by Butler et al (2012) in Canada, Okwako (2015) in Kenya and IUCN (2016) report on natural resource governance in Western, southern and eastern Africa confirm that, a major facilitator of a dynamic natural resource governance system, is a resilient TEK which is well integrated into the governance processes. These studies however highlighted the theoretical challenge in explaining how the processes of integration, the components of spirituality in TEK and the principles of natural resource governance can be combined without operational conflicts. There is therefore a theoretical gap on the role of TEK in NRG. This is because natural resource governance is a growing field of social science which combines several disciplines that are evolving with the contributions of research and theoretical reviews (IUCN, 2011). In summary the study seeks to address the problem of lack of empirical studies on nature of TEK and processes of integration of TEK into Natural resource governance at Boabeng- Fiema, Tafi-

Atome and Amansuri resource areas. The study also addressed the theoretical challenges concerning TEK and NRG by helping to refine theoretical concepts and debates as prescribed by the endogenous development theory, resilience theory and Runge's assurance problem theory.

Objective of the Study

The main objective of the study is to assess the role of traditional ecological knowledge (TEK) systems in the natural resource governance of the Boabeng- Fiema, Tafi - Atome and the Amansuri resource areas.

The specific objectives of the study were to:

1. Interrogate the historical foundation and cosmovision behind the traditional ecological knowledge (TEK) of the three selected communities.

2. Explore the institutional structure, processes and products of TEK at the three selected communities.

3. Examine the nature of three pillars of NRG; laws, processes and institutions involved in natural resource governance at the three selected communities.

4. Examine the implementation of four principles of NRG; transparency, rule of law, accountability and participation, at the three study areas.

5. Draw lessons from the integration of the TEK system into the NRG system at the selected communities.

Research Questions

1. What are the historical foundations and cosmovision behind the traditional ecological knowledge (TEK) of the three selected communities?

2. What is the nature of the institutional structure, processes and products of TEK at the three selected communities?

3. What is the nature of the laws, processes and institutions, involved in natural resource governance at the three selected communities?

4. How are four principles of NRG; transparency, rule of law, accountability and participation, ensured at the three study areas?

5. What lessons can be drawn from the integration of the TEK system into the NRG system at the selected communities.

Significance of the Study

The study provides an in-depth knowledge on traditional ecological knowledge at Boabeng - Fiema, Tafi - Atome and Amansuri. The study expands on the existing knowledge on the TEK of the three communities by establishing the uniqueness of their Cosmovision and its influence on how knowledge of the environment is created, appreciated and used for governance purposes. The study explains the TEK at the three study areas by describing the foundation, institutions, processes and products. The nature of the TEK is linked to the cosmovision and examined in the context of natural resource governance. The findings on the TEK are critical to the sustenance and development of TEK. The study also provides practical literature on the natural resource governance of the selected communities with key interest and emphasis on the components of governance (laws, processes and institutions).

The study further interrogates the structures of the governance institutions by describing the status of the individuals, social networks, associations and social groups that are relevant in the governance structure. These findings would be vital for developing theories and policies on natural resource governance. Furthermore, the study also explored the efficiency of governance principles: transparency, rule of law, accountability and

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participation. The study explored the processes that were embedded in the governance system to achieve the principles stated and also how those processes were influenced by the TEK of the selected communities. The study also evaluated the challenges faced by the communities in achieving the governance principles. These findings would educate policy makers and governance practitioners on effective NRG practices for sustainable development.

Finally, the study examines the integration of TEK into NRG at the three selected communities by interrogating the role of TEK (foundation, institutions, processes and products) in the natural resource governance system as practised in the three communities. The unique mechanisms of integration as well as the institutional role played by the chiefs, traditional councils and some governmental and non-governmental organisations were highlighted for theoretical and practical consideration by policy makers and the communities for their general monitoring and evaluation.

Scope of the Study

The study is limited to three resource reserve areas in three different regions across Ghana; Boabeng - Fiema in the Bono East Region, Tafi – Atome in the Volta region and the Amansuri (cluster of communities) in the Western Region of Ghana. Though these communities are endowed with other natural resources, the study focuses specifically on the monkey sanctuaries of Boabeng-Fiema and Tafi - Atome as well as the Amansuri Wetland and Forest reserve area.

Conceptually, the study examines the TEK in the three study areas and explains the uniqueness of the components of their TEK which are; the foundations, institutions, processes and products based on the writings of

Berkes, (1999), Doubleday, (1993), Callicott, (1994) and Posey et al., (1995). The study explores three components of natural resource governance; laws, institutions and processes as proposed by Moore, Greiber & Baig (2010) in IUCN (2010). To better interrogate the natural resource governance system as practised in the three communities, the study examines NRG under four principles; transparency, rule of law, accountability and participation as stated in IUCN (2011).

The study further examines the interactions between statutory laws, customary laws, formal and informal rules and processes through which the tenets are achieved. Finally, the study examines governance network at the three study areas (Torfing 2005). Torfing (2005 p. 307) defines governance networks as 'relatively stable horizontal articulations of interdependent, but operationally autonomous actors who interact with one another within a regulative, normative and cognitive framework that is self-regulating within limits set by external forces and which contributes to the production of public purpose'.

Organisation of the Study

The thesis was organised into eight chapters. Chapter one, is the introduction chapter. It provides a general overview and purpose of the study by stressing and drawing attention to the gaps identified in the existing literature on the nature of TEK and NRG at the three study areas as well as the dynamics of the integration of TEK into NRG. It also includes questions, objectives, significance and scope of the study. The chapter ended with the organisation of chapters for the study.

Chapter two covers the review of theories and relevant conceptual issues for the study. This chapter covers a review of the literature relating to theories

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used for the study which are; The Endogenous Development Theory, The Assurance Problem Theory and The Resilience Theory. From these theories and relevant literature, definitions were developed for the concepts used in the study. Chapter three highlights the review of empirical studies on TEK and NRG from the global, African and Ghanaian perspectives. Chapter three further expounds on gender issues on the subject as well as the integration of TEK into natural resource governance in some African and Non- African countries. The chapter ends with the conceptual framework for the study. The research methodology of the study is discussed in chapter four. The objectives of the study necessitated the use of a qualitative research approach. Accordingly, the reasons underlying the use of a multiple case study approach were presented. This chapter also covered the sampling procedures and how data was collected and analysed.

Chapters five, six and seven documents the findings of the data collected. Chapter fiver covers the first and second objectives, which seeks to interrogate the nature of the TEK in the three selected resource areas. It covers the foundation which includes the history and Cosmovision. It also cover processes, institutions and products of TEK in the three study areas. Chapter six addresses the third and fourth objectives which examines the NRG at the study areas. Finding on NRG laws, institutions and processes as well as the governance principles employed at the study areas are covered in the sixth chapter.

The fifth objective of the study which is to draw lessons from the integration of TEK into the NRG processes at the three study areas is addressed in chapter seven. The chapter looks at the success and failures of the governance system as well as the resilience of the TEK in ensuring an adaptive governance of natural resources at the three study areas. Chapter eight, the final chapter is

made up of the summary of the study, conclusions, recommendations and areas for future research. It also touches on the contribution of the study to both theory and practice. Based on the findings, recommendations are made for policy makers. Areas which need to be further researched into to enhance TEK development and integration into natural resource governance are also provided.
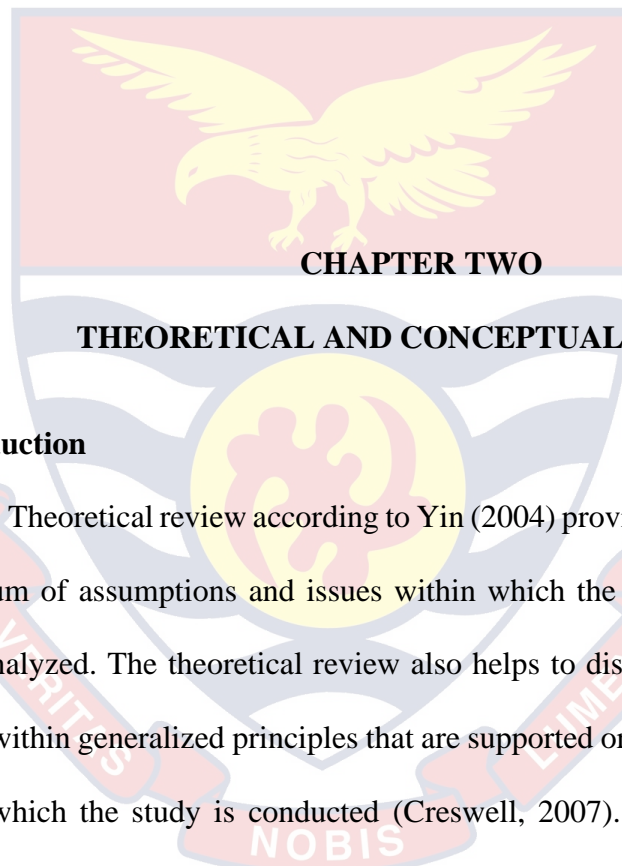
CHAPTER TWO

THEORETICAL AND CONCEPTUAL REVIEW

Introduction

Theoretical review according to Yin (2004) provides a researcher a broad spectrum of assumptions and issues within which the study is conducted and data analyzed. The theoretical review also helps to discuss the findings of the study within generalized principles that are supported or rejected by the theories upon which the study is conducted (Creswell, 2007). This chapter has three major sections; the first section reviews theories used to explain the main ideas in the study. The theories underpinning the study; The Endogenous Development Theory, The Assurance Problem Theory and The Resilience Theory are discussed within the context of the study objectives. The relevance of the theories for the study and their limitations are also discussed. The second section reviews the concepts that explain and inform the scope of the study. The conceptual reviews expand on the nature of TEK; the foundation, institutions,

processes and products. It further describes the components and principles of natural resource governance as explained in the literature.

Theoretical Review

The study is based on the endogenous development theory, the resilience theory and Runge's assurance problem (game) theory. These three theoretical ideologies are explored to help achieve the main objective of the study which is to explore the nature and integration of TEK into the natural resource governance systems at Boabeng – fiema, Tafi – Atome and Amansuri resource areas.

Theory of Endogenous Development

Endogenous Development (ED) is defined as 'development from within, based mainly, though not exclusively, on locally available resources, values, institutions and knowledge (Farmer, 1999). Traditional Ecological Knowledge (TEK) and local institutions are recognized as essential in the sustaining endogenous development initiatives. The proponents of endogenous development propose that sustainable development can be achieved through endogenous development approaches backed by a well resilient knowledge system governing all areas of the community (North, 1990). North also states that endogenous development (ED) is based on local peoples' own criteria of development and takes into account the material, social and spiritual well-being of people.

The importance of integrating local knowledge into development interventions has become broadly recognised under several forms of participatory development approaches. However, many of these approaches

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experience difficulties in overcoming implicit western bias against natural resource governance approaches (North, 1990). The main difference between endogenous development and other participatory approaches is its emphasis on including spiritual aspects in the development process, in addition to the ecological, social and economic aspects (Farmer, 1999). Farmer further describes, Endogenous development is a development approach that is mainly based on local strategies, values, institutions and resources.

According to COMPAS/UDS (2008), the aim of endogenous development is to provide local communities with the needed support and opportunities to take control of their own development process. While revitalising ancestral and local knowledge, endogenous development helps local people choose external resources that best fit local conditions and developmental goals. Endogenous development can lead to increased bio- and cultural diversity, reduced environmental degradation, and a self-sustaining local and regional exchange (COMPAS/UDS, 2008).

According to Hoppers (2002), these positive outcomes can only be possible if endogenous development takes local cultures as a critical starting point and posits those cultures as a central framework for social progress and cross-cultural exchanges. Hoppers further explain that, endogenous development harnesses local resources to mitigate development. It builds on and stimulates local actions for change to occur from within existing system. By this assertion, endogenous development works towards sustainable, functional and people-centred development. In principle, endogenous development is inward looking but not in a negative way. It does not close off external influences such as modern science and technology (Hountondji, 2002). Rather, it works to

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minimise and even eliminate its tendencies of disorienting, undermining, compromising, and even annihilating indigenous or traditional systems.

Endogenous Development despite its flexibility presents a few challenges to communities that pursue it. This is because, traditions, customs and institutions established as part of social organisation often are the locus of controversies and those who uphold them are guided by and adopt particular viewpoints that tend to favour some members but not others (Farmer, 1999). In some communities the conflict may include the disagreements with the functioning of traditional leadership and formal leaders, access to and use of resources, or the position of women, youth and children (COMPAS, 2007). Between local communities and NGOs or national government, the controversies can be on how the interests of the community are represented, sharing and use of resources, or the best way for development to take place. Controversies may also occur between or among religions ethnic groups at national or international level on issues over identity, resource, political and/or human rights (North, 1990).

Endogenous Development and Participation

Over the past two or three decades, many organisations throughout the world, especially NGOs, have developed participatory and farmer-led approaches to development. Examples include, Participatory Learning and Action (PLA) and Participatory Technology/Innovation Development (PTD/PID). Over the years, the importance of these participatory approaches in taking local knowledge into account has become broadly recognised, especially for baseline data collection and problem identification during initial developmental project stages (Hoppers, 2002). However, when it comes to the

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design and implementation of solutions, the methods rarely seek to build on local people knowledge and strategies.

Another merit of endogenous development that set it apart from these participatory approaches is that, endogenous development interrogates and navigates the question of western and elite bias by making local peoples' worldviews, values, knowledge, institutions, initiatives, and locally available resources the starting point for development (Hooft & Van't ,2008). It draws from western and elite sources only to complete local action as a means of facilitation. Endogenous development identifies the value of outside resources and knowledge but works with local people to select and implement those that enhance local conditions rather than isolating them from their own culture (Farmer, 1999).

The endogenous development process starts with a process of self-reflection from both development practitioners and the local social entrepreneurs, as well as a redefinition of the relationship between them. This does not infer, however, that all local values and beliefs should be embraced uncritically and all modern development options rejected.

Endogenous development takes into account both local and external resources, and the main objective is to find the best way to combine these, based on people's own priorities and criteria. The Endogenous development theory however has been criticised by some social scientists as lacking clearly outlined! developmental practices and principles (Farmer, 1999). Some also have described it as a developmental concept which is yet to become a theory due to the fact that in practice, very few societies have achieved their developmental goals purely based on indigenous and traditional practices without adopting

external principles. For such critics the adoption of external developmental practices defeats the concept of endogenous developments as a unique developmental theory (Capello and Nijkamp 2011).

The assumptions underlining the practice of endogenous development according to (COMPAS, 2007) are that, a community pursuing endogenous development must provide privileges for local people to control their developmental processes. Furthermore, developmental institutions within the community must support adherence to cultural values and find a balance between traditional and external resources. Additionally, the community must develop a knowledge system to manage change or social progress in ways that are cultural relevant and appropriate. The study examines the role of TEK in NRG at the study communities based on how the traditional laws, beliefs and culture of the people influences the processes and practices that drives the developmental goals of the communities (Capello and Nijkamp 2011).

A major demerit of Endogenous development is that it relies on an assumption that members of a traditional area will all naturally ascribe to traditional values, beliefs and practices. This assumption is often not the case leading to assurance problems (Bodnár, 2013). Bodnar adds that, the spiritual foundation of endogenous development restricts the general application of taboos and spiritual values to all members of the society. People who feel distant from such beliefs often become sources of contention and conflicts in the general implementation of endogenous development agenda. It is therefore critical that studies founded on Endogenous development, examine the existence and significance of the assurance problem in the society being studied.

The Assurance Problem Theory

The 'Assurance Problem' theory in Runge (1996) was propounded as a means of understanding how rural communities develop and progress their own resource management systems. This theory was in contrast to Hardin's "Tragedy of the Commons" theory (Hardin, 1968). Hardin's tragedy of the commons, explains varied cases of resource over-exploitation, and has a considerable influence on resource policy around the world. Ever since Garrett Hardin's influential article 'The Tragedy of Commons' was published, there has been a great deal of research interest concerned with the eradication of poverty, development and its relationship with environment and natural resource degradation. The principle underlining the theory has been used to explain over-exploitation in fisheries, forests, overgrazing, air and water pollution, abuse of public lands, population problems, and extinction of species, misallocation in oil and natural gas extraction, ground water depletion, and other problems of resource misallocation (Stevenson, 1991).

Hardin argues that resource users cannot be left to decide alone how to use the resources and that their use has to be curtailed to prevent over exploitation. The acceptance of Hardin's theory led to the generally distrustful conclusion that, resource users might not be capable of self-regulation and that, individuals could only be effectively regulated by government authority. To prevent Hardin's tragedy, various governments in Africa, and other parts of the world have, till date, assumed direct control and management of natural resources, such as forest, water bodies, game and wildlife (Runge, 1996). The theory has also guided government policies in their design of codes, and laws in the management of common pool resources. The theory is framed on the

principle that natural resource management policies should seek to support traditional institutions where they are effective, and promote them where they no longer exist in their efforts to manage natural resources (Haverkort, van 't Hooft and Hiemstra, 2003).

The position of Haverkort, van't Hooft and Hiemstra (2003), is premised on the fact that the top-down policies approach where codes and laws on natural resource management are designed by government agencies and pushed down on the people had failed to promote sustainable resource governance (Marsh, 2002). It further argues that the assumptions of the 'Tragedy of the Commons' hypothesis that users of "common pool resources" always bring about over exploitation is unrealistic because rural producers living in the same community often do not practise the same livelihood, thus they do not share the same interests in resources, nor do they act entirely independently of their fellow producers. The theory is further substantiated by the position that, some traditional institutions which are vibrant and organised on the basis of their religion and cultural beliefs to effectively manage natural resources, occupy a unique position in the management of natural resources and are widely accepted by their subjects as the religious, political, judicial and the spiritual embodiment of their communities (Barth, 2010).

Barth (2010) further reveals that, in most African countries, government authorities vis-a-vis formal management institutions have usurped their power and authority relegating traditional institutions to the background as mere custodians of their traditions and custom of their subjects. Fairhead and Leach (2004) argue that the designation of local resource control to state structures among other factors, accounted for resource management failures in most parts

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of the third world. Available literature, Commons (1970); North (1990) & Marsh (2002), demonstrate that, rules recognised by government authorities to manage natural resources have most often been in conflict with the needed right of local residents although most local communities and traditional institutions have been able to establish and maintain organizational structures and enforce mutually agreed rules on the use of natural resources.

Adam and Anderson (1988) and Mkenda (2010) also point to the fact that communities in the past had effective institutions to manage resources and that these institutions are in some places active and effective today. Resource management might include the goal to maintain control over and sustainably manage finite "common pool" resources, as in the case of the nomadic pastoralist (Barth, 2010) or to manage a "public goods" system where the cooperative goal is to gain mutual benefit from jointly produced resources. In both cases, because mutual benefits are gained from the devoted efforts of other group members in tandem with one's own efforts, a group's members will make mutual claims of accountability with respect to each other.

According Stevenson (1991), some characteristics of common properties are that, such resources have boundaries that are well defined by physical, biological, and social parameters. He adds that here is a well-delineated group of users, who are distinct from persons excluded from resource use. Furthermore, Stevenson (1991) adds that, users share joint, nonexclusive entitlement to the *in situ* or fugitive resource prior to its capture or use whiles establishing a well-delineated group of rights holders which may or may not coincide with the group of users.

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Common property as used by Stevenson refers to a social institution, which differs from physical objects that a group can own and govern as common property. Demarcation of the resource, however, is included in the definition of the social institution of common property since the institution cannot exist without the resource it controls (Stevenson, 1991). This is in contrast to open access where everyone is a potential user. Thirdly, common property resources are utilized by more than two people unlike in private property, where there is a single legitimate user. Fourthly, the existence of rules regarding resource extraction to guide the groups of resource users is the main characteristic, which helps distinguish common property from an open access situation (Fairhead and Leach, 2004).

Assurance Problem Theory as a "Game Theory"

The assurance problem theory is based on the ability of natural resource governance institutions to regulate people's behaviour based on the assurance that all the users of the natural resource will equally comply with generally accepted rules (Baland & Platteau, 2006). The failure to assure all users of similar mutually beneficial compliance results in a situation where resources are over exploited. The assurance problem therefore can be said to be based on the Game Theory. The Game Theory is concerned with rational choice in decisions involving two or more interdependent decision makers (Djalante, Holleg and Thomalla, 2011). Its range of applicability is broad, including all decisions in which an outcome depends on the actions of two or more decision makers called players, each having two or more ways of acting called strategies, and sufficiently well-defined preferences among the possible outcomes to enable numerical payoffs reflecting these preferences to be assigned.

In natural resource governance, mutually beneficial rules on the use of resources as well as the protection of common pool resources from over exploitation are tied to people's decisions and preferences regarding their trust in the communal institutions to ensure strict enforcement of rules (Barth, 2010). Contemporary philosophers and game theorists take an even more permissive view, requiring only that preferences should be consistent and in accordance with the overall objective and common good of the people (Runge, 1996). A person's reasons for acting in a particular way are invariably internal, hence an action is instrumentally rational, relative to the agent's knowledge and beliefs at the time of acting. It is therefore common to find that in most traditional communities, communal laws on the use of natural resources are subject to multiple driving factors which could be cultural, spiritual and economic in nature (Baland & Platteau, 2006).

Resilience Theory

The term "resilience" originated in the 1970s in the field of ecology from the research of Holling, who defined resilience as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" *(*Holling, 1973, p. 14). Walker and Salt (2006) also describes a resilient system as one that possesses the ability of a system to absorb disturbances and still retain its basic function and structure. From Carpenter et al. (2001), resilience can be best described by three crucial characteristics first of which is the amount of disturbance a system can absorb and still remain within the same state or domain of attraction. Additionally, a resilient system may be characterised by the

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capability of a system to self-organize after a change and the ability to build and increase the capacity for learning and adaptation.

Resilience thinking is inevitably systems thinking at least as much as sustainable development is concerned (Walker & Salt, 2006). According to Walker and Salt, in this framework where resilience is aligned with systems thinking, three concepts are crucial to grasp. The first concept is that, humans live and operate in social systems that are inseparably linked with the ecological systems in which they are embedded. Secondly changes in social-ecological systems are complex adaptive systems which are not predictable and finally, resilience thinking provides a framework for viewing a social-eco-logical system as one system operating over many linked scales of time and space. Resilience theory according to Berkes et al. (2003) relies on concepts such as thresholds, the adaptive cycle, adaptability, and transformability and dwells on principles that shift policies from those that aspire to control change in systems assumed to be stable to policies that cope with, adapt to, and shape change (Smit & Wandel, 2006).

Resilience Theory and Sustainable Development

In evolutionary terms, a "population responds to any environmental change by the initiation of a series of physiological, behavioural, ecological, and genetic changes that restore its ability to respond to subsequent unpredictable environmental changes" (Holling, 1973, p.18). In Holling's terms, therefore, the viewpoint of resilience emphasizes "the need for persistence". In this perspective, striving for a management approach based on resilience would emphasize "the need to keep options open, the need to view events in a regional rather than a local context, and the need to emphasize heterogeneity [therefore

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requiring] a qualitative capacity to devise systems that can absorb and accommodate future events in whatever unexpected form they may take" (Holling, 1973, p.21).

According to Folke et al. (2010), "resilience thinking addresses the dynamics and development of complex social–ecological systems (SES). According to them, three aspects are central to sustainable integration of TEK into NRG: resilience, adaptability, and transformability. These aspects interrelate across multiple scales. From Folke et al. (2010), one could conclude that adaptability is part of resilience. It represents the capacity to adjust responses to changing external drivers and internal processes, and thereby allow for development along the current trajectory (stability domain). Additionally, transformability is the capacity to cross thresholds into new development trajectories without losing the social function of the system to bring about sustainable change (Walker et al., 2004). Also, transformational change at smaller scales, example at the family and individual level enables resilience at larger scales such as in an entire community (Adger et al., 2005). The capacity to transform at smaller scales draws on resilience from multiple scales, making use of crises as windows of opportunity for novelty and innovation, and recombining sources of experience and knowledge to navigate social–ecological transitions" (Folke et al, 2010).

Traditional Ecological Knowledge Systems

Traditional ecological knowledge is "a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes 1993, p.3). Berkes definition is however premised

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on the assumption that, TEK is an attribute of societies with historical continuity in resource use practices; which are by and large non-industrial or less technologically advanced societies, many of them indigenous or tribal (Berkes,1993). Stevenson (1996) also defined TEK as a body of knowledge and beliefs transmitted through oral tradition and first-hand observation. It includes a system of classification, a set of empirical observations about the local environment, and a system of self-management that governs resource use. Stevenson further explained that Ecological aspects are closely tied to social and spiritual aspects of the knowledge system and emphasized that, the quantity and quality of TEK varies among community members, depending upon gender, age, social status, intellectual capability and profession (hunter, spiritual leader, healer, etc.).

The definition of TEK as defined by Stevenson is firmly rooted in the past, cumulative in nature and dynamic, building upon the experience of earlier generations and adapting to the new technological and socio-economic changes of the present (Stevenson, 1996). According to Dene Cultural Institute (1995), TEK could be characterized as the knowledge claims of those who have a lifetime of observation and experience of a particular environment and as a result function very effectively in that environment. Such individuals may be untutored in the conventional scientific paradigm. According to Usher (2000), TEK is not 'privileged or secret knowledge' and mostly available to all who have interest in knowing it.

The Nature of TEK

Traditional knowledge has developed a concept of the environment that emphasizes the symbiotic character of humans and nature. It offers an approach

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to local development that is based on co-evolution with the environment, and on respecting the carrying capacity of ecosystems (CBD, 2006). Generally, one could conclude that TEK is based on long-term empirical observations adapted to local conditions. This ensures a sound use and control of the environment, and enables local people to adapt to environmental changes (Nakashima & Roué, 2002). Nakashima & Roué also explain that, TEK primarily forms the basis for decisions and strategies in many practical aspects, including interpretation of meteorological phenomena, medical treatment, water management, production of clothing, navigation, agriculture and husbandry, hunting and fishing, and biological classification systems.

African Traditional ecological knowledge, is experiential knowledge based on a worldview and a culture that is basically relational and centred on social cohesion. According to Sarpong (1991), the spirit of the African worldview includes wholeness, community and harmony which are deeply embedded in cultural values. Most African belief systems uphold the belief that, a person becomes human only in the midst of others and seeks both individual and collective harmony as the primary task in the process of becoming a true person (Sarpong, 2002).

The Components of TEK

TEK, according to the writings of Posey et al., (1995) is viewed as an extremely valuable source of environmental information that allows traditional or other isolated native communities to protect and preserve their way of life. According to Callicott, (1994), TEK is the basis for local decision-making in agriculture, hunting and gathering, nutrition and food preparation, resource management, education and health as well as social, economic, and political

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organization. From the writings of Berkes, (1999), Doubleday, (1993), Callicott, (1994) and Posey et al., (1995), TEK can be discussed and expressed based on four components; the foundation, institutions, processes and products

The Foundation of TEK

The foundation of TEK refers to the philosophical underpinnings of the TEK of a group of people. It encompasses their Cosmovision and history. The foundation of TEK also includes the experiences and geographical uniqueness of the owners of the TEK (Berkes, 1993; Doubleday, 1993). Traditional ecological knowledge (TEK) – or sometimes referred to as traditional environmental knowledge – is often described as local and holistic, integrating the physical and spiritual into a worldview or 'cosmovision' that has evolved over time and emphasized the practical application of skills and knowledge. TEK is the product of careful observations and responses to ever changing environmental and socio-economic conditions thereby making it very dynamic and adaptive in principle and practice (Doubleday, 1993).

A major aspect of TEK foundation is the social mechanisms concerning world views and cultural values (Alcorn & Toledo, 1998). Berkes (1999), describes world view or cosmology to include basic beliefs pertaining to religion, ethics and structured observations that produce knowledge and understanding. According to Berkes, cosmology rounds out the knowledge practice-belief complex that describes traditional knowledge. Thus, an essential component for traditional knowledge and practice for ecologically sustainable outcomes is a worldview that provides appropriate environmental ethics. The persistent cosmology of traditional societies according Callicott (1994) is characterized as a "community of beings" that is, world view in which humans

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are part of an interacting set of living things, a view that was also common in Europe up until Medieval times (Callicott, 1994). Also, outside the sphere of ecology, but relevant to traditional knowledge, are cultural values as a social mechanism behind traditional practice.

Cultural values such as respect (for humans as well as for nature), sharing, reciprocity, and humility characterize a diversity of systems of traditional knowledge and practice, including those of American aboriginal groups (Alcorn & Toledo, 1998), Africans (Dei, 1993; Niamir-Fuller,1998), and Pacific Island peoples (Roberts et al., 1995). Some of these values, such as reciprocity, also characterize local systems of management that seem to be operating sustainably in contemporary communities (Hanna, 1998). For the purpose of this study, the foundation of TEK shall be extended to include but not limited to the cosmovision, history, religious background of the communities i.e Tafi - Atome, Boabeng - Fiema and Amansuri cluster of communities.

The Processes of TEK

TEK processes according to Grenier (1998) are the ways in which local people construct and organize knowledge as a means of harnessing the services of the ecosystem. They are both individual and collective processes involving a wide-range of activities and experiences, namely creativity, accumulation, adaptation, and transmission of experiences to deal with, for example, natural resource systems, institutions, world views, enhancing political voices, and preserving indigenous cultures or revitalizing them (Grenier,1998). The production of traditional ecological knowledge and its application takes place in a given socio - ecological context, through pragmatic innovations over a long period of time. It has been suggested that this context influences, and to some

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extent shapes, the world views of people, which in turn influence the heuristics used for generating new solutions and knowledge (Pastakia, 1995).

The debate on the real facilitators of TEK processes and the TEK mechanism according to Moller, Berkes, Lyver and Kislalioglu (2004) can be explored on three main issues. First, not all knowledge production processes, innovations and practices prevalent in a community are communal in nature. This is buttressed on the fact that there exist in every traditional society, individuals who have great expertise in various aspects of local knowledge that is not known at all or known only partly to the local community. Second, not all the knowledge in use by a community is traditional in nature. There are many examples of contemporary innovations by local communities, developed collectively or individually. Third, local knowledge can be conserved perhaps in a more sustainable and dynamic manner if the associated cultural values and ethical institutions contributing to conservation of biodiversity are also conserved and/or strengthened. Based on this, I could conclude that sustainable and dynamic conservation would mean TEK must be produced in a manner that the knowledge grows through constant experimentation and innovation rather than just being maintained as a fossilized form of historical knowledge, produced at one point in time and carried forward by succeeding generations.

TEK Institutions

Ecological knowledge does not function in isolation. It is embedded in institutions and local social norms (North 1990). The structure and dynamics of institutions are critical for implementation of management practices based on ecological understanding in any society (Hanna, 1998). The coordination of appropriate resource use practices is often entrusted with traditional leaders. The

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term "institution" according to the western conception, has been defined as the rules, roles and structures developed by people to organize their joint activities (Kendie & Guri, 2005). Olson (1965) refers to institutions as the collectively agreed upon social arrangements that govern the interactions among members of a given group of people. Berger and Neuhaus (1984, p. 251) refer to these as 'mediating institutions'

Indigenous institutions also refer to the leadership structures within the community (chiefs, queen mothers, *tindanas* – the traditional land-owners - elders, clan heads, etc.) and their functional roles which ensure that the norms and values of the community are respected. It also includes practices such as the rituals and rites of the people, the funerals, the dowry system, festivals, and the shrines or places of worship of the people. Institutions also take the form of Local Organizations (LOs) in which case they refer to the structures that form the units of organization in the community. Uphoff (1988) as well as Olson (1965) describes them as 'organizations which act on behalf of and are accountable to their membership and which are involved in development activities'. Such local organizations may be formally created with official requirements such as constitutions, statutes, common laws and governmental regulations, which may be externally enforced (Pejovich, 1995).

In Ghana, these are variously referred to as community-based organizations (CBOs), farmer-based organizations (FBOs), cooperative unions, etc. These indigenous organizations are self-initiated, self-help groups that are based on traditional norms of trust and reciprocity. The challenge to governments is to overcome the marginalization of these institutions and for

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public policy to seek to utilize these local institutions for the realization of social and economic progress (Kendie, 1993).

TEK Products

Products are social mechanisms for cultural internalization, which may include technologies, songs, documents, symbolic crafts, artefacts, drugs and monuments (Colding & Folke, 1997; Colding, 1998). According to Colding (1998), TEK products also include abstract images and mythical figures which help people to relate, appreciate and remember social values and rules and appropriately interpret signals from their ecosystem. Documentation of all forms such as rock arts, textile designs and body tattoos and other such products of TEK are critical social mechanisms for resource conservation, and have the potential of building resilience in ecosystems (Johannesv, 1978, Chapman, 1985). Chapin (1991) argues that where traditions remain strong, people see no need to make special efforts to preserve knowledge; they simply practise their culture.

Another major product of TEK are the medicines and healthcare techniques obtained from the knowledge of nature (ecosystem). According to Gray (1991), three quarters of the plants that provide active ingredients for prescription drugs came to the attention of pharmacists because of their use in traditional medicine. The potential for the use of such knowledge is immense, as culturally diverse knowledge systems hold valuable information about the diversity of plant species; only one percent of such species have been documented by science for their medicinal or chemical properties (Kloppenburg, 1991). Additionally, farmers have drawn on the diverse plant genetic resources to breed the major crops that feed the world today (Moore & Tymowski, 2005).

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Their knowledge ensured food security then, now and the future. (Ninjar et al.,

2011).
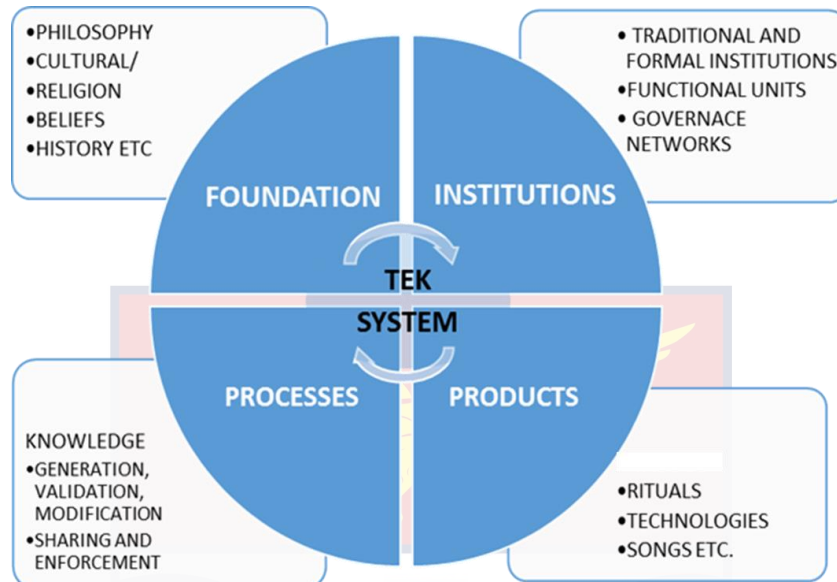
Figure 1: **Pillars of Traditional Ecological Knowledge System**

Source: Author's construct based on Berkes (1999), Doubleday (1993), Callicott

(1994) and Posey et al., (1995)

Natural Resource Governance

Governance according to International Union for Conservation of Nature

and Natural Resources (IUCN) should have a broad definition that is not just

between the State and its citizens, but between citizens themselves and their

respective institutions. In many places where government is weak or non-

existent people manage to govern their natural resources effectively (IUCN,

2012). IUCN further stipulated that, natural resource governance encompasses

the rules and regulations that determine (or govern) natural resource use and the

way these rules and regulations are developed and enforced. Natural resource

governance has been described by some governance experts such as Wiley

(2006) and Hilhorst (2008) as a matrix of processes that revolve around building

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relationships, benefit sharing and distribution of power and responsibility to make and implement decisions regarding the use, conservation and management of Natural Resources. For this study, natural resource governance shall be defined as "the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say in the management of natural resources - including biodiversity conservation" (Graham et al., 2003:2).

Components of Natural Resource Governance

The Natural Resource Governance framework as proposed by the IUCN, 2012, addresses the set of norms, institutions and processes that frame decision-making and citizens' engagement in policy development and how its implementation impacts nature and people. The frame work highlights the following as the components of NRG; Process, Laws and Institutions (Moore, Patricia, Greiber & Saima Baig, 2010). NRG process according to Moore et al, 2010 is a series of actions carried out for the purpose of achieving something. In Natural Resource Governance, processes are required to make decisions and to implement them. According to Moore et al, open and transparent processes facilitate understanding and consensus. When governance processes are closed, it creates the environment for doubting decision makers and implementers of governance decisions (Moore et al., 2010).

Moore et al, further categorise governance processes as formal or informal. According to them, formal processes are usually created by statutory or customary law or institutions. Informal processes are however created by groups of people with similar interests who simply recognize the need for a

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mechanism to make or implement a decision. Major NRG governance processes that may be created by law include; processes that devolve powers to decentralized governance authorities and processes to plan for natural resource allocation and use of benefits. Additionally, the process includes development planning processes on how natural resources and natural users will be affected, Processes for distributing benefits from the use of natural resources and processes for following through on agreements to share benefits from the use of natural resources between customary rights holders and commercial interests.

NRG Institutions

Governance Institutions make and implement laws, and are responsible for processes as well. As decision-makers and implementers, institutions play a key role in natural resource governance and in economic and social development more generally (Mathauer, 2004). In the fields of development and natural resource conservation, 'institution' refers to an organization or body that has responsibility for one or more aspects of natural resource governance or development (IUCN, 2010). Institutions may be formal or informal. Formal institutions refer to institutions that are created or recognized by statutory law such as government ministries and other agencies. Informal institutions however, comprise citizen groups that unite to ensure that they have a voice in decision-making and implementation, but which do not take the step of formal legal registration, and may include community-based organizations working in the field of natural resource conservation (Wallington and Lawrence, 2008).

Formal institutions in Natural Resource Governance make and implement decisions affecting natural resources and natural resource users include government ministries and agencies responsible for sectors that include

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forests, fisheries, wildlife, water resources, marine and coastal resources, and agriculture, among others. Informal institutions may include community groups that use a particular natural resource. Customary institutions may include the authorities who are responsible for monitoring the use of forests, wildlife, pastures, water, and other natural resources (IUCN, 2014).

NRG Laws

Baig (2010) describes laws as the components of governance that create rights, provide the foundation for institutions and processes, and establish the basic principles for how people interact with each other and with natural resources. IUCN (2010) describes statutory law as the written or codified law of a country which is created by national or sub-national authorities with law-making power, usually the legislative and executive branches of government. Statutory law may also specify processes for which those institutions are responsible. Examples of natural resource laws include: Basic or framework environmental law, Forest law, including community or social forestry law, Wildlife law, Water law, Fisheries law and Coastal and marine resources law. Natural resources may also be governed by other types of laws. These may include: Land law, Agriculture law, and protected areas law, Biodiversity law, including access to genetic resources, Administrative law, Civil law and Criminal Law.

IUCN working documents on Natural resource governance describes customary law as laws developed over time by traditional societies usually transferred by word of mouth from generation to generation. There are some cases in which customary law is written down. Customary laws are the basis for decision making about natural resources in many societies, they are usually

collective, but also frequently recognizes individual rights. Analysis of current practice of customary law by IUCN and other researchers such as Colchester et al., (2006) has shown that it is consistent with the definition of governance - it establishes who has decision-making power, who has the power and responsibility to implement them, and who is held accountable and how.
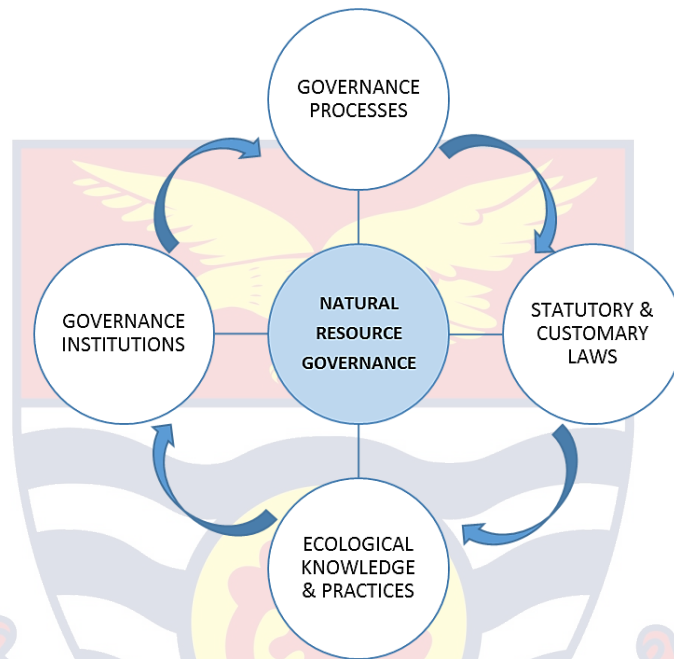
Figure 2: **Components of Natural Resource Governance**

Source: Author's construct based on Moore et al., (2010) and IUCN (2010)

Governance Principles

The IUCN (2010) working document on natural resource governance (NRG) describes the rule of law in NRG as structures that deal with the security of knowing how one is expect to be treated, protected and penalized under the law. It further states that, the rule of law is not or should not be subject to arbitrary action by those who have decision making or enforcement power. It requires laws and rules that are fair, an impartial and incorruptible police force to enforce them, and an independent judiciary to apply them (Bormann & Keller, 1991). According to Bormann and Keller (1991), the establishment and

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persistence of the rule of law depends on lear communication of laws, non-discriminatory application of laws, effective enforcement of laws and predictable and legally enforceable methods for changing the content of laws. Moore et al., (2010) states that in the absence of rule of law, money made from many natural resources and other potential revenues provide incentives for laws and rules to be applied in different ways to different people.

Stone (1989, p. 615) describes community participation as 'designing development in such a way that intended beneficiaries are encouraged to take matters into their own hands, to participate in their own development through mobilizing their own resources, defining their own needs, and making their own decisions about how to meet them'. Stone's description emphasizes the point that those for whom development is meant, should be at the fore of these initiatives. According to Sewell and Coppock (1977), participation does not only help address the specific needs of these people but also ensure that these initiatives are sustained. Participation, according to the IUCN (2010), means effectively taking part in decision-making and implementation, either directly or through legitimate representatives. For local resource users in many parts of the world, participation by all stakeholders in decision-making and implementation processes is a higher priority than it is for governments or the private sector. Mowforth and Munt (1998), posit that, although it is easy for community participation to be promoted, the implementation process is very complex, thus resulting in participation assuming different forms. Under customary law, participation is not an issue if communities are small enough to allow for regular meetings of the adult population, to exchange information and form opinions (Tosun, 2006). Customary practices in some countries can be used as models for

designing mechanisms for the community and collective participation in decision-making concerning natural resources because participatory approaches are already woven into the social fabric (Moore et al., 2010).

Transparent governance systems, according to Van Bodegom et al. (2008), have clear procedures for public decision-making and open channels of communication between stakeholders and officials, and make a wide range of information accessible. Van Bodegom et al. further explain that transparency allows stakeholders to gather information that is critical to uncovering abuse and defending their interests. According to Moore (2011), transparent systems will give stakeholders information on how to get involved in decision-making processes and their implementation.

Natural Resource Governance is strongly tied to availability and access to information about peoples' rights and responsibilities to access and use of natural resources. In the writings of David et al. (2009), where local communities know what their rights are, information about seeking redress through formal processes is also critical for them to be able to defeat any attempt to violate their rights. In small rural communities, information is usually not documented but mostly shared by word of mouth and such smaller communities may be able to hold community meetings for all members to exchange information and form opinions. This may not be possible in large communities, however, customary social networks usually ensure that available information reaches every community member, including the illiterate. In some countries, such as Canada and Australia, the constitution guarantees access to information (Borrini - Feyeraband, 2008).

Accountability, according to IUCN (2010), is the requirement to accept responsibility and answer for actions. Formal and informal institutions as well as individuals may be held accountable (Patlis, 2004). Formal institutions are usually understood to mean government agencies, but may also include private-sector actors and formally established or formally recognized civil society institutions. According to Turner and Hulme (1997), it is ideal for statutory laws to provide clear rules and procedures for determining accountability of public institutions and officials. Turner and Hulme suggest that, guidelines on accountability must answer questions on; who will be held responsible for making decisions, who will be held responsible for implementing decisions, and what are the means for holding decision-makers and implementers accountable?

Turner and Hulme further attest that, where statutory law does not provide clear rules and procedures for determining accountability, it will be difficult for other stakeholders to hold public institutions and officials accountable. Where that is the case, IUCN (2010) suggests that, stakeholders can explore the possibilities of amending the rules and procedures to ensure that there is support for civil society to be able to hold government decision-makers and implementers accountable

Informal and customary institutions may also be held accountable for their decisions. Individual government officials, and individual private-sector and civil-society actors may be held accountable under their own obligations to exercise their responsibilities and to obey the law (Moore et al., 2010). Moore et al further explains that, Informal and customary systems usually have mechanisms for holding individuals accountable for their actions and

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communities may use community meetings as an opportunity to discuss decisions that community authorities have made and hold them accountable.

Lack of accountability can create economic losses at the local and national levels, for communities and for the central government, and opportunities for corruption when there are no mechanisms to hold authorities accountable for how revenues and benefits from natural resources are earned and distributed (Patlis, 2004).

Chapter Summary

The theoretical review in the chapter discusses the issue of vulnerability of common resources as proposed by the tragedy of the Commons by Harding and the resultant debate spearheaded by Runge in his Assurance Problem theory which seeks to promote the fact that owners of common resources are capable of managing their own resources if they agree on collective rules of governance. The chapter reviews concepts and principles under traditional ecological knowledge and natural resource governance. The review covers the pillars of TEK i.e foundation, institutions, processes and products. The review also discussed the components of NRG (law, institutions and processes) under four major principles i.e transparency, rule of law, accountability and participation. The chapter also places resource governance under the umbrella of endogenous development and establishes the fact that for endogenous development to be sustainable, it must be supported by resilient TEK and adaptive governance practices as proposed in the Resilience Theory.

CHAPTER THREE

EMPIRICAL EVIDENCE AND CONCEPTUAL FRAMEWORK

Introduction

The empirical literature review examines relevant policies, programmes and empirical studies on the study subject and objectives. The chapter also draws attention to the gaps identified in the existing literature on TEK and NRG in the empirical studies reviewed. It is from these gaps that a conceptual framework is developed in the section for this chapter.

Ghana's Natural Resources in Perspective

Ghana's rich biodiversity is gradually being depleted due to a variability of factors such as indiscriminate poaching, habitat destruction through deforestation, surface mining etc. UNDP (2018). It is irrefutable that there is a persistent need to domesticate the Biodiversity Convention. This is in view of the perilous biodiversity conditions dominant in Ghana. According to UNDP (2015), it is estimated that over 90 percent of Ghana's high forest have been logged since the late 1940s. The rate of deforestation is 5 percent in off-reserves and 2 percent in on-reserves. The off-reserves have been seriously degraded and fragmented to less than 5 percent of the forested area 83,489km2. The current deforestation rate is about 22,000 hectares (ha) per annum. Ghana, therefore, may face future export deficits and there is the likelihood that the country's forestry sector will die out. The forest and wildlife resources of Ghana also fuels a myriad of tourism related industries that may also suffer if the degradation of Ghana's forests continue.

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According to the Environmental Protection Agency EPA (2015), Ghana generally has 'clean' atmospheric conditions. However, emissions from sources such as vehicles, industries, and dusts from untarred roads, etc. tend to create atmospheric pollutants within their immediate environments. The most abundant greenhouse gas produced and emitted in Ghana is CO2 (EPA, 2015). There are CO_2 sinks in the forested and the reforested land. However, the trend of the total CO_2 equivalent removals shows a significant decline of about 49 percent from 1990 to 1996 due to deforestation (Tamakloe, 2004).

Major eco-tourism attractions according to the Ghana Tourism Authority, (2016) include; The Kakum, Bia and Mole National Parks. There are several community governed ecotourism sites such as the Paga Crocodile Pond, Boabeng-Fiema Monkey Sanctuary, the Amansuri forests and wetlands, the Tano Boase Ecotourism site as well as beautiful beaches, forts, and castles; and many other important national heritage sites (Ghana FSD, 2015).

Ecological Functions of Traditional Ecological Knowledge

Most traditional belief systems and practices are consistent with current conservation practices. According to UNDP (2016), the ascription of supernatural powers to portions of the environment and protecting such places through taboos helps in conserving the environment and protecting natural resources. This is evident in the following ways;

- The demarcation of portions of the environment as home of the ancestral spirits (sacred groves, ponds, earth shrines) encourages the conservation of resources

- Forbidding fishing and protection of aquatic species from sacred ponds encourages conservation of water/aquatic resources

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- Forbidding the consumption of some species of animals also encourages conservation, for example totemic animals and objects

- Lastly, resource users were part of / close to resource managers, hence, effective participation of all citizens in resource management (UNDP, 2016).

African knowledge and methods of knowing have yielded results and contributions that have been discounted by many and even sometimes by the African scholars (Nsamenang 1995). Generally, contributions made by Africa and her people to history and civilisation are conspicuously missing from textbooks for formal education and generally remain unknown to many (Ngara, 2007). Silenced contributions from ancient Egyptian education to philosophy, mathematics, architecture, medicine (Bargblor, 2003) and library science (Zulu, 2008) are just a few. A quick review of the literature reveals that Africa has historically made a host of contributions to world civilisation (Asante, 1990; Derricourt, 2011) which remain unknown especially in the area of traditional ecological knowledge, natural resource management and herbal medicine.

Globally a number of studies have been to ascertain the implications of Traditional Ecological Knowledge on natural resource governance. Laudari (2010) assessed the implication of Traditional Ecological Knowledge on Forest Resources. This study which was carried out in the lower Manang region of the Himalayans sought to explore the role of Traditional Ecological Knowledge (TEK) system and traditional institution in the sustainable management of forest resource in lower Manang. The specific objectives of the study was to explain norms and value systems pertaining to the conservation and management of forest resource in lower Manang. Another specific objective was to describe local processes and actors involved in the communication and exchange of

traditional ecological knowledge system. The third specific objective was to explore the implicative role of religion, cultural values and belief systems for management of forest biodiversity in lower Manang.

The population studied was 4,042 which represented the entire population of lower Manang. The researcher sampled 936 households and an average of 5.4 household sizes from a total of 200 households were considered for this study. The methodology employed were interviewing, administering of questionnaires and observation. Quantitative data gathered from interview schedule were coded, in order to analyse it by using computer software program, Statistical Package for Social Sciences (SPSS) for windows.

Key finding in Laudari (2010) revealed that both the Hindu and Buddhist of lower Manang follow ancestral worshiping and animism in the form of deity worship. Animism was explained in the study as a belief that a supernatural force animates and organizes the universe or the belief that things in nature, e.g. trees, mountains and the sky, etc. (all living and non-living things), have souls or consciousness. This belief system and affection towards nature, as a zoolatry which is the act of worshiping animals) and totemism which is the practice of considering plants and animals sacred have contributed much to the protection of 86 percent of the natural resources in lower Manang. Additionally, although different groups conceptualize traditional ecological knowledge systems differently, some areas overlap. For example the entire respondents explain that traditional ecological knowledge is constructed in the process of local people's adaptation with nature. Also, the lower Manang people's beliefs are centred on the concept of sacred species, sacred groves, and sacred lands. These finding

were in agreement with other studies such as Iwasaki-Goodman (2004) and Usher (2000).

The study, Laudari (2010), also maintained that, in lower Manang forest management is maintained by collective choice decisions of local people who operate under a common property arrangement. Cultural groups have implemented a series of rules (customary law) or social norms, for sustainable management of forest resources. This strongly supports the assumptions and tenets of assurance problem theory. Another finding by Laudari (2010), was that, in Lower Manang females were comparatively excellent on ethno-botanical knowledge systems than their male partners. This is because of spending more time by females for harvesting various forest resources. The study also revealed that, the major factors that contribute to erosion of traditional ecological knowledge systems were modernization and downbeat attitudes towards local institutions. The findings of Laudari (2010) are similar to the findings of Atanga (2015).

Atanga (2015) assessed the role of African Traditional Practices in Sustainable Forest Management and Conservation at the Malshegu Sacred Grove in the Northern Region of Ghana. The study aimed at investigating the contribution of African Traditional Practices (ATPs) in forest management and conservation. The bond between traditional practices in forest management of the study area and a set of socio-demographic characteristics were analyzed. The effectiveness of traditional practices, reasons for adherence to these practices and the challenges faced in traditional forest management were also identified. Participatory Rural Appraisal (PRA) techniques were used to collect data from the community.

A total sample of 105 respondents comprising 94 household individuals and 8 traditional authorities were interviewed. Data analysis were done using mainly descriptive statistics such as frequency, percentages and the pairwise ranking method (was used to determine the effectiveness of the traditional practices). The result revealed that 73% of the respondents agreed that traditional practices were effective in protecting the sacred grove, 15% disagreed and 13% neither agreed nor disagreed to the assertion. Some of the perceptions revealed from the study showed the contributions of traditional practices to forest management and conservation included; the sustainable conservation of the Malshegu sacred grove as a cultural heritage to the people and the chieftaincy system of Dagomba and adherence to traditional practices as a sign of respect to the gods (resulting in bumper harvest and blessings).

Furthermore, the study results showed that only men participated in forest management decisions and related activities. The results also indicated that 28% of the respondents participated in management decisions or meetings, 16% had access only to the sacred grove whiles only 12% had both access and control (direct managers) over it and this category included the Chief, the Gundana (land/forest chief) and the chief/fetish priest. The main policy implication drawn from the findings were that resource managers and policy makers need to be sensitive to create more practical integrated management approach or policies to ensure meaningful participation from forest-dependent communities. The researcher further maintained that the success of this approach relies heavily on a positive relationship between forest-dependent communities and resource managers.

Atanga (2015) also recommended that in designing participatory integrated management approach, differences in socio-demographic variables (gender and age) and capacity building interventions should be considered by resource managers to ensure extensive grass-root participation. The study concludes that traditional practices can still play key role in forest management and conservation if integrated into modern forest management policies given the fact that these practices have stood the test of time. However, poor interest in traditional practices (amongst the youth) due to the stigmatization from the influx of Islam and Christianity and low grassroot participation (because of gender and age biasness) in traditional forest resource management were major lapses or challenges which had limited adherence and control of traditional leaders over their subjects and hence negative implications on the sustainability of forest resources in Ghana especially traditional community forests.

Another study that looked at the role of traditional ecological knowledge and belief systems on natural resource governance was Aniah, Asoglenang, and Bonye (2014). The main objective of the study was to examine the role of traditional belief systems and indigenous knowledge and practices in the management and conservation of natural environmental resources in the Upper East Region of Ghana. In addition, some cultural practices, belief systems, the role of Tindaanaship, Tingaane civilization and how the Tindaanas (chief priest) were examined. According to the researchers, Aniah, Asoglenang, and Bonye (2014) was a cross sectional study which adopted a participatory research approach. This provided a greater insight and enabled local communities themselves to identify their own problems and propose solutions. The approach

involved a triangulation of appropriate participatory tools of enquiry. Apart from secondary data, much of the primary data was qualitative.

The method of data collection used in this research was personal interview, literature review, focus group discussion, and site visitation. The researchers interviewed a total of sixteen persons including the chief, elders, women leaders (Magazia) and chief priest - Tindaana of various community deities. Where the chief or women leaders of any community were too young to know the traditional/cultural practices of their communities, the researchers resorted to interview older members of the community. Additionally, five focus group discussions with community members were organised. Each focus group had seven participants and issues discussed during the FGDs included the question of role of indigenous belief system in resource conservation, the extent to which social change has affected indigenous methods of resource conservation. A total of five (5) communities namely, Yogbeesi, Kunkua, Dalga, Yorogo and Anafobisi were purposefully selected and visited for the study. A total of 7 earth shrines (Tingaane areas) were visited which includes Afessikan, Awaleyaa, Akontingre, Abolinge, Akalosikan, Akubulikan and Ayagezinye Aposaarikan

The finding of Aniah, Asoglenang, and Bonye (2014) revealed that, the attribution of divine powers to some parts of the environment as the home of the gods had significantly helped to conserve the natural environment. The protection of these areas from exploitation promoted conservation of environmental resources. There was however evidence that showed that some traditional belief systems, practices and indigenous knowledge strategies that conserve the natural resources have been eroded or corroded by western cultural

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infiltration and religion. Regardless of this, the study revealed that forbidden areas and natural totemic objects associated with worship immensely promoted conservation of resources.

Further discussions on the findings revealed that Christians had wrong impression about African traditional belief system. However, it was evident that traditional African belief systems had strong elements of conservation techniques that could be adopted for effective conservation of natural resources and the protection of the environment. In almost every traditional African setting or community, just as revealed in this study, every community in the Upper East Region of Ghana had a sacred grove, sacred pond, forbidden animals or earth shrines. The thrust of management, utilization, and conservation of natural resource rested with the traditional institutions. Under the tribal law, land and the related resources are checked or held in trust by these institutions (Chiefs, Tindaanas, clan heads, sectional heads, household heads, women leaders (magazias), and other community leaders.

Natural Resource Governance - Ghana's Experience

In most Ghanaian traditional communities, there is strong interest and demand for the rights of local communities and indigenes in the governance of their natural resources and most of such communities have their culture heritage tied to their natural resources such as mountains, rivers and forests (Mkenda, 2010). Due to this, the Forestry Commission modified the focus of its management system in the 2012 policy to ensure greater consultation with stakeholders, especially local communities that are dependent on the forests and are willing to ensure its maintenance. As part of the implementation of the 2012 policy on Wildlife and Forestry management, the focus of forest management in

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Ghana is shifting from a government-led system to a community - government collaborative management approach (MLNR, 2012).

The fourth objective of the 2012 policy aims at promoting and developing mechanisms for transparent governance, equity sharing and peoples' participation in forest and natural resource management (MLNR, 2012). The policy also promotes Collaborative Forest Management (CFM) approach which adopts the learning-up process and concentrates on devising effective strategies at the conceptual stages. This feature about the policy is aimed at improving community participation in the governance process. Despite all the approaches and strategies, there are no legislative supports for the collaborative forest management.

Empirical studies suggest that collaborative arrangements involving a multitude of actors from various sectors and user groups in management are more likely to establish adaptive processes than other types of systems (Sabatier et al., 2005; Baland & Platteau 2006). Structures of this kind are often referred to as co-management structures in the literature, implying a division of authority and management tasks among various stakeholders, public as well as private (Olsson et al., 2004; Njaya, 2007; Plummer & Armitage, 2007). One major advantage of community based governance approaches that is evident in most studies such Olsson et al., 2004; Njaya, 2007; Plummer & Armitage, 2007 is the reduction in natural resource conflicts.

Competition for territory and resources have been one of the major causes of violent conflicts in history (UNEP, 2011). In Africa, examples of these conflicts can be seen in the resource-rich countries of Congo, Angola, and Sudan all of whom have been affected by civil wars. These countries are rich in natural

resources but are often poor. These conflicts have often been fueled by the lack of trust of the people in their governments in the management of their natural resources (UNEP, 2011). Another example is Sierra Leone, which has experienced a decade of civil war and intense tribal conflicts over exploitation of its diamond fields (Wily, 2011).

Even though groups use conflict as a medium to promote their demands, it has led to more political instability and the increasing loss of lives. The challenge therefore is about how such important resources can be used to improve the standard of living of the people who are directly natives to the source of the resources.

TEK and NRG Integration Institutions

The 2012 GFWP advocates that, traditional knowledge of local resource users must be integrated into the activities of the community based natural resource governance committees. However, the Ghana policy is silent on the process of integration. The Canadian policy clearly outlines the processes of integration with recognised institutions to oversee the success of the integration agenda. Iwasaki-Goodman (2004), a study which examined co-management in western Canada identified several key elements in the meetings of the integration committees. It was observed that, when it came to making integration decisions, discussion were done until a consensus was reached. Additionally, the committee had respect for differences in opinions among members.

To enhance the richness of TEK, the input of traditional knowledge by hunters and fishers and the implementation of their knowledge are ensured by winter meetings in the communities to discuss community problems and priorities for the upcoming year. In addition, traditional knowledge is brought to

the decision-making process through workshops and meetings on specific issues and joint field projects that involve community members as well as outside researchers. The study employed qualitative design and varied data collection methodologies using interviews and focus group discussions. The study focused much on the integration processes but did not look at dynamics and resilience of the TEK and NRG systems. They scope of the study however did not cover the influence of TEK in achieving governance principles.

In Ghana, however, a study by Aniah, Aasoglenang and Bonye in 2014, in the Northern region showed that, TEK and Natural Resource Governance have had a long historic marriage, which is still evident in some rural communities. In northern Ghana, almost all traditional communities or settlements have a Tindaana (Chief Priest), Tingaane (Earth Shrine), or Tinkogre (Mother Earth), (Aniah, Aasoglenang & Bonye, 2014). The Tindaanas were and are still the custodians of the land; they are the link between the gods and the people. Other duties performed by the Tindaana are to make sacrifices to the gods for the whole community in times of communal misfortune (drought, disease and pest invasion of crops and animals, war, outbreak of diseases) and for individuals in times of personal sorrow. All the communities also have something they hold sacred for example ponds, trees, rocks, rivers and many more.

These places are revered as holy or sacred because they are the places of abode or homes of the gods and ancestral spirits. There isn't any community without a sacred grove, earth shrine, mother earth, a river, pond and part of mountain or rocks not delineated for the worship of the gods. According to Hens (2006), sacred groves are pieces of land set aside for spiritual purposes; they are

dotted all over Ghana. The findings are supported by Millar, (2004), Traditional Protected Areas refers to sacred groves, water points, burial sites and sacred hills where shrines may be located near homes or far in the fields. He added that, these sacred places are where trees and plants are allowed to grow undisturbed and where reptiles, birds, fish and animals could have free living without fear of poaching or interference by man. Hence, the management of these areas are restricted to specialized people (Tindanas, fetish priest, rain makers and other spirit mediums). Therefore, there were taboos that restricted access to these sites to particular activities and members of a community. As a result, these sites survived over several years and acted as reservoir for biodiversity despite the religious battle against them (Millar, 2004). These protected areas also harbour different categories of gods responsible for the well-being of the community in the area of health, fertility for men and women and regulate the amount of rainfall in the community (UDS/CARE, (2004).

Traditional clan and tribal totems have also influenced traditional ecological beliefs and practices regarding the conservation of animals which are used as totems. In the Anafobisi community for instance, the clan people do not eat crocodiles because they believe that the crocodile offered assistance to their ancestors by offering its back as a raft when their ancestors were crossing a river. The Kunkua community with the Booyaadoma as the Tindaana's clan do not eat goat. It is believed that the goat saved their ancestors by leading them to a source of water when their ancestors were stranded in a forest. This is confirmed by Hens, (2006). In Ghana, almost every traditional ruler, chief or King has a totem. Many wildlife species are regarded as totems due to their historical or socio-cultural significance.

Totem animals vary significantly over tribes and clans. They include merely mammals (leopard, elephant, lion, monkey, and buffalo) and birds (falcon, raven, and parrot). Turtles, crocodiles, snakes (python), scorpions, crabs and fishes are also considered as totems in some of the communities. This is also supported by Awedora (2002). He argued that certain animals and natural objects are considered as relatives or ancestors of their respective social units. Therefore, killing some kinds of animals believed to be totemic is a taboo. This system is close to the culling practice of sustainable harvesting of wildlife resources among the people of Central Southern Africa. Adhering to taboos and totems ensures the continued population growth of their wildlife resources (Bonye, 2008).

The integration of TEK in Natural Resource Governance has some key conceptual challenges. Some major issues raised by some scholars on the subject are that; some scholars see TEK Research as `Misappropriation of Knowledge'. Smith (1999) attests that TEK has become the next frontier; it is something to discover, to document and to be used to improve western scientific resource management. By this assertion, TEK is only conferred value and validity when it contributes to western science. Smith (1999) describes this activity as 'trading the other' and also notes how indigenous culture continues to be commoditized by this trade. One consequence of 'trading the other' is what Aroha Mead calls the 'misappropriation of indigenous knowledge' and is readily apparent in areas such as the patenting of organisms and products identified and produced by indigenous peoples (Smith 1999).

Similarly, the focus on TEK as 'data' which can be collected and 'integrated' has detracted attention from the existence and efficacy of traditional

systems of land management and the development of alternative ways to meaningfully include Aboriginal people and TEK holders in decision-making regarding resources. Secondary TEK `Data' is understood as disappearing because TEK is currently conceptualized as consisting of 'data' and generally valued in utilitarian terms for what it can contribute to western management systems, there is an accompanying pressure to collect this information before it is `lost'. This notion does not recognize that like any knowledge system, indigenous knowledge has always and will continue to evolve as it acquires new knowledge through "synthesis and hybridization" (Johnson 1992b:10 citing Mulvihill 1988:12).

Another feature of the way TEK is currently framed is that, the information needs to be evaluated against 'expert' knowledge based on western scientific paradigms before it is considered valid and useful. Early efforts to collect TEK focused on evaluating indigenous knowledge against western science. For instance, in their study of the Kung hunters' knowledge of animal behaviour, Jones and Koner (1989) were preoccupied with validation and motivated by the notion that "if we are to use traditional societies as a source of useful knowledge about wildlife, we need a way to evaluate this knowledge."

There is however a school of thought which sees the major challenge with integrating TEK into NRG processes as being the difficulty with integrating traditional organisation and institutions into contemporary development programmes and processes. The success of most traditional resource governance systems have been linked to the effectiveness of traditional institutions. Kendie and Guri (2007) examined the potentials and challenges of integrating traditional and indigenous institutions into contemporary development programmes in

Ghana. Community institutional mapping (CIM) methodology was adopted for this study. This was essentially a participatory baseline study of community-based institutions and organizations.

In the first phase of the study process, community institutional mapping exercises were conducted in eight sampled communities. These communities are well spread out over northern Ghana and included Kalbeo, Bowko, Tanchara, Kpembe, Tangsia, Nangodi/Sakote, Wulugu and Nalerigu. Drawing predominantly on a qualitative research approach, a comprehensive checklist was prepared and administered in each of the eight communities to opinion leaders and community-based groups in the form of interviews. Kendie and Guri (2007) showed that a number of institutional linkages exist among the indigenous community-based institutions and organizations, and between them and non-indigenous organizations. Working relationships between the different hierarchies of traditional authorities in the study communities are generally cordial. The relationship is one of loyalty and obedience on governance and spiritual-related issues evidenced in the system of loyalty to the Kpembewura (paramount chief of Gonja).

It was also observed that there are links between traditional authorities and other community based institutions and organizations. The reason is that some traditional office holders, particularly sub-chiefs, youth leaders and women traditional leaders, are often members of community-based institutions and organizations. Although such kinds of linkages accordingly provide a window for considering the views of traditional authorities in community development initiatives, one cannot conclude that there is a working relationship

between traditional authorities and community-based organizations, given the absence of any institutional arrangements.

The numerous chieftaincy succession problems identified during the study emanated from the lack of a well-documented and streamlined systems of succession. The policy direction for institutional development pointed to an urgent need to develop a reliable documentation system of succession rights for traditional political systems. Lack of documentation on working formalities, duties and responsibilities of organisations and chieftaincy succession plans had led to many cases of chieftaincy disputes as well as poor rural developments in Ghana.

Based on the findings, Kendie and Guri (2007) stressed on the importance of following collaborations for effective integration of traditional institutions in contemporary development programmes and projects; collaboration between traditional authorities and community-based organizations. Another lever of collaboration is that between district assemblies (sub-structures) on the one hand, and traditional authorities and community-based organizations on the other hand.

Kendie and Guri (2007) also emphasize the importance of collaboration between community-based organizations themselves in development efforts as well as the collaboration between traditional authorities and community-based organizations on the one hand, and NGOs on the other. The finding of Kendie and Guri (2007) also shows that, community-based institutions and organizations need, first, to know what these organizations are and, secondly, how to lobby and negotiate on terms favourable and consistent with sustainable development principles. In northern Ghana, the chieftaincy institution, or what

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is also known as the traditional political authority, is pivotal as an indigenous institution for organizing local governance, (Kendie and Guri, 2007).

Integration of TEK into NRG

The value of TEK and its relevance in natural resource governance is globally acknowledged with several research documents such as Pinkerton (1989), Canada (1995) and Berkes, (1997) supporting its potential in ensuring sustainable natural resource governance. In Canada, policy requirements are established to ensure that the knowledge, practices, and beliefs of Aboriginal people are protected and included in resource management. According to Usher (2000), it is a policy in Canada that traditional ecological knowledge (TEK) be considered and incorporated into resource management. To see to the successful implementation of this, provincial, and territorial institutions have committed to the understanding and use of TEK (Posey, 1989). In some cases, the obligations aim to respect, preserve, and promote the use of TEK in managing natural resources (Canada, 1995), and in other cases, the intent is toward the integration or harmonization of TEK with other sources of knowledge (Inuit Circumpolar Conference, 1992).

Additionally, new co-management institutions have also been created across the North to facilitate the inclusion of TEK in resource management (Pinkerton 1989, Berkes, 1997). It is argued that such arrangements are key to a successful incorporation of TEK in providing opportunities for communities, governments, and other stakeholders to work together on an ongoing basis, facilitating communication and learning between parties that were conventionally in resource management conflict (Kendrick 2000, Berkes et al. 2000). Where interactive and mutual learning takes place, co-management

institutions can be arenas for exchanges of ideas on natural systems, (Kendrick 2000; 2003). The change in power dynamics is often critical in the linking of state and especially indigenous knowledge systems (e.g. McCay & Acheson, 1987). The use of traditional knowledge in resource management can bring significant changes to conventional, state management structures since it has the potential to affect the fundamental assumptions of science-based wildlife management (Berkes, 1998). The successes of policies on Natural Resource Governance and TEK integration have also been been tied to the level of awareness and socialisation (IUCN, 2010).

Meinich (2010) studied the impact of increased awareness on forest governance by assessing the Mama Misitu awareness raising campaign in Southern Tanzania. In response to the alarming rate of deforestation and forest degradation caused by illegal forest activities in Southern Tanzania, a collaborative civil society initiative called Mama Misitu was set up to raise awareness at village level regarding good forest governance and to support the implementation of participatory forest management (PFM) (Meinich , 2010). The study looked at how raised awareness influenced the key factors of good governance; participation, accountability and legal enforcement. The study also aims to examine perceptions among villagers in forest adjacent communities where Mama Misitu has been working, in relation to forest value, corruption and local ownership of the forest.

A qualitative approach was employed in this study. An epistemological consideration of interpretivism was used. A case study design, which "entails the detailed and intensive analysis of a single case" (Bryman, 2008) was the research design. This design according to Bryman, however limits the possibility

for generalisation and external validity of findings. Twenty key informants were interviewed consisting of consultants, academics and forest officials. The researcher also attended the presentation of the Mama Misitu Campaign's evaluation report at the Finnish Embassy in Dares Salaam and employed semi-structured interviews using interview guides. Key informants were identified through purposive sampling.

The study found that villagers emphasized conservational values of the forest, but seemed unaware of its market value. Despite this lack of awareness, villagers had a strong sense of ownership of the local forest. This was consistent with findings by Blomley and Iddi (2009). Meinich (2010) further states that increased awareness on sustainable extraction of forest resources and the benefits of these influenced their perception of forest value. Additionally, the study revealed that, the majority of the village dwellers, perceived corruption to be a local problem, affecting themselves and hindering development in their own village. Furthermore, two thirds of the villagers were optimistic when it came to possible impacts they themselves could have on curbing corruption. This is not consistent with the more general perception that the poor view corruption as a vexing, but unalterable fact of life (Lough 2008). The study further concludes that awareness raising will have a positive effect on forest governance, strengthening the local institutions and their power relations with other forest stakeholders.

Gender Issues in Natural Resource Governance

Women play a vital role in conservation and management of sustainable eco-system and have traditionally been involved in protecting and conserving natural resources including those in mountain areas. With their extraordinary

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skills and traditional knowledge, mountain resources which are the basis of survival for families and communities have been managed and sustained by women (Tyagi, 2002). However, women's roles and concerns in mountainous natural resource conservation remain poorly understood and incompletely acknowledged (Adhikari, 2001). It has been observed that though the last 20 years has witnessed rhetoric policies of natural resources, women have become poorer and have progressively lost control over even a bare subsistence base of resources. Furthermore, global ecosystems (including mountains), genetic material and the resources upon which human survival depends have deteriorated, lost and dwindled respectively (Byers & Sainju, 1994).

Some studies have been carried to iron out women participation and the role they play in natural resource sustenance and management in general such as (Byers & Sainju, 1994; Guiriba, 2010; IFAD, 2001; Koda, 2004; Shiva, 1998). However, there in insufficient empirical study on the role that women play in forest resources management and sustenance, especially in sub Saharan Africa. A study conducted by Wiafea and Arkub (2014) to assess the role of women in community based resource management on the Afadjato mountain ecosystem in Ghana revealed that the majority (70%) of women interviewed knew that there was a committee responsible for the management of the resources while 30% did not know about the committee. With those who knew about the committee, whereas 57% knew they considered women in the selection of the management committee membership; 43% said they did not know that they considered women.

The women according to Wiafea and Arkub (2014) state that most governance decisions were taken by men and men were considered to be

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superior in decision-making. They added that, according to women in that community, men perceived women to be poor natural resource managers but good kitchen managers. This was supported by the fact that women as compared to men the community had less formal education. Wiafea and Arkub (2014) also showed that though men did not prevent women from harvesting resources from the mountain, some of the men competed with the women by harvesting resources that were meant traditionally for women. The researchers recommended massive environmental resource management education for the communities living in the mountainous area especially for women to improve the participation of women in natural resource governance. According to Apusigah and Opare (2007), the differences in gender roles of men and women in natural resource governance is also evident in their spiritual and leadership roles.

Apusigah and Opare further explains that, although most traditional leaders are males, occasionally, women serve as Tindaana or women soothsayers as in the case of female-headed households. In their study of some tribes in Northern Ghana, it was revealed that, one of the strongest spiritual authority women have is when they have been elected to serve as spirit mediums (Apusigah and Opare, 2007). Furthermore, in their homes, the husband takes care of the gods on behalf of the wife. According to Apusigah and Opare, the women explain it in this way: "my son or my husband sacrifices for me". I provide the animal for the sacrifice, I speak to the ancestral spirit and tell them the purpose of my sacrifice, but the man does the actual sacrifice. I get the answers for my sacrifices, which satisfies my purpose." The woman, therefore, has a weak link to the spiritual relations both in her husband's home and in her

father's home. This gender restriction on women translates into their restricted

role in the governance of natural resources in northern Ghana.

Conceptual Framework
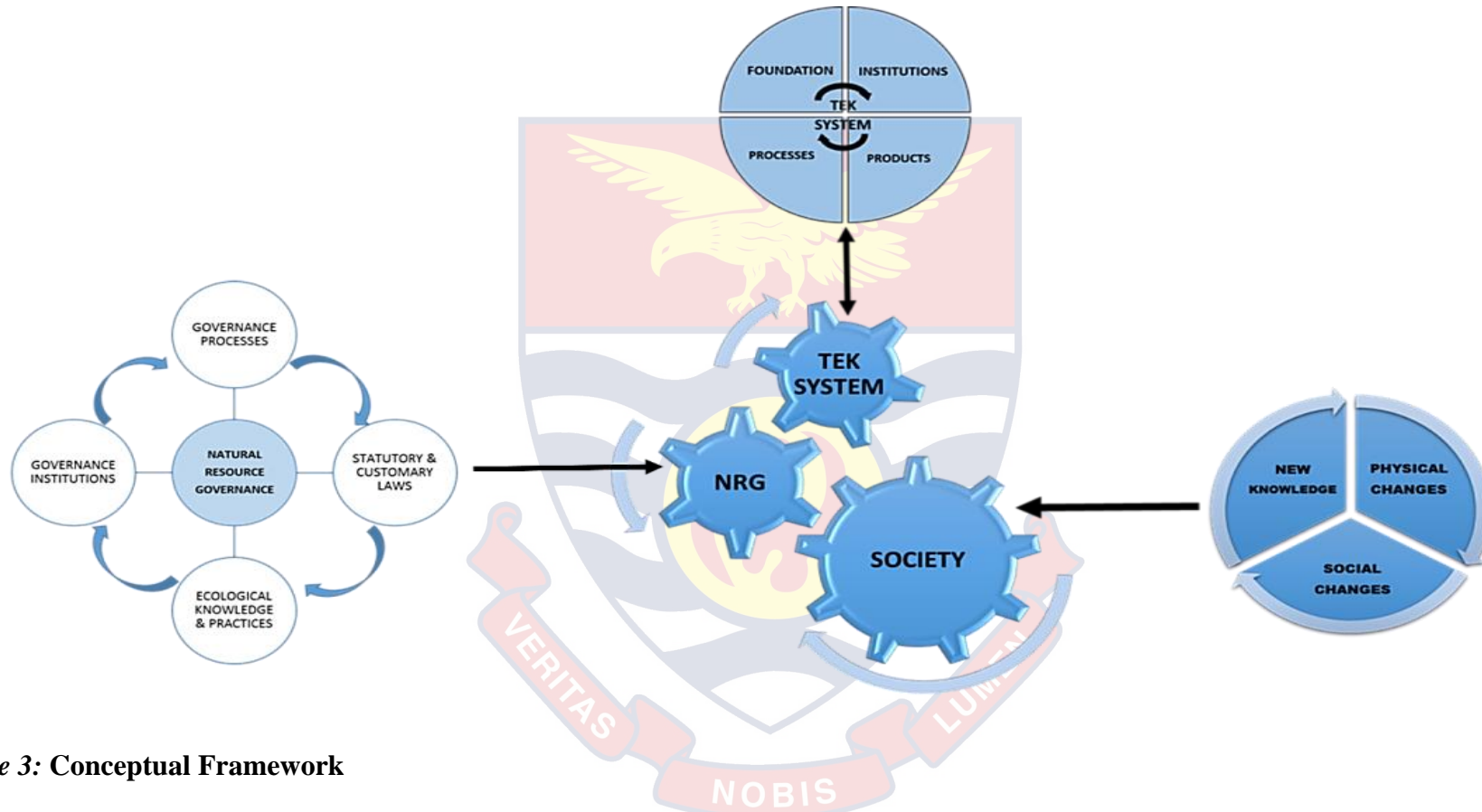
Figure 3: **Conceptual Framework**

Source: Authors' construct based on Berkes (1999), Doubleday (1993), Callicott (1994), Posey et al., (1995), Moore et al., (2010), IUCN (2010), Folke (1997), and Resilience Alliance (2020)

The Conceptual Framework

The conceptual framework, shown in Figure 3, depicts dynamic nature of TEK, Natural Resource Governance and the society as whole. It displays the relationship between, TEK, social change and components of governance as a network of adaptive systems as proposed by Berkes (1999). The conceptual framework also describes the Natural Resource Governance (NRG), Traditional Ecological Knowledge (TEK) and the entire society to be in a dynamic flux influenced directly by the TEK system which is by itself influenced constantly by social and environmental changes. The framework also acknowledges the direct influence of social-environmental changes and foreign culture on the society.

The conceptual framework also depicts the importance of TEK integration into natural resource governance as a dynamic engine which if successful, drives the development of the society. The integration of TEK facilitates the acceptability of governance rules, institutions and processes to the local or traditional society. This is supported by Callicott, (1994) and Posey et al., (1995) that expresses TEK as the key component in sustaining a natural resource governance system and promoting endogenous development.

According to Resilience Alliance (2010), where a natural system is not able to adapt positively to changes in its immediate environment it collapses. The framework therefore displays TEK as an adaptive system however where the TEK System is not able to adapt positively to the socio-environmental changes, it will collapse leading to a breakdown in the natural resource governance process which will result in adverse social conditions, deterioration of the environment, the social structure and well-being of the people.

The framework accepts new knowledge, social and physical changes as a constant but dynamic factor of society which should not be seen as evil but a necessary component of a developing society. This is in accordance with Walker & Salt (2006) that describes a resilient TEK and related governance system as an integrated entity that embraces change and uncertainty as part of the system in order to achieve sustainability.

The framework however portrays the ability of changes in the society to trigger and initiate changes in Traditional Ecological Knowledge (TEK) and Natural Resource Governance (NRG).

Chapter Summary

The chapter reviews concepts and principles under traditional ecological knowledge and natural resource governance. Relevant literature on Natural resource governance in Ghana, national policies, integration of TEK into NRG experiences from the global, African and Ghanaian perspective and gender concerns on the subject were examined from already existing works. The conceptual framework integrates the TEK system into the NRG components and principles by proposing a dynamic resilient relationship as a sustainable way of achieving endogenous development. The conceptual framework integrates the TEK system into the NRG components and principles by proposing a dynamic resilient relationship as a sustainable way of achieving endogenous development.

CHAPTER FOUR

RESEARCH METHODOLOGY

Introduction

Research Methodology describes how the research is conducted and defines the most appropriate methodology for data collection, analysis and drawing logical and valid conclusions. (Kumekpor, 2003; Panneerselvam, 2010). According to Creswell (2003), research methodology also provides the philosophical framework and the fundamental assumptions that relate to the research process and arms the researcher with the necessary procedures and tools needed to evaluate theories, propositions and review work of others.

This chapter described the research paradigm, research design and the study design and methods used to collect data for the study. It had two purposes which were to identify the appropriate methodology for the study, as well as justifying its adoption based on the assumptions. Given the nature and context of the research problems, it was important that a detailed research plan was outlined to explain how the research objectives were achieved. The chapter began with a discussion of reasons for using a qualitative method. Other issues discussed in this chapter included the research paradigm, study area, study design and data sources and methods of validating and analysing the data. Others including the target population, sample and sampling procedures, and data collection instruments were also explained. The processes for pre-testing and field visits were also presented. Finally, ethical issues were discussed.

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Research Paradigm

Kuhn defines research paradigm as the culture with a set of beliefs, values, and assumptions that a community of researchers have in common, regarding the nature and conduct of research (Kuhn, 1977). Mackenzie and Knipe (2006) classify variable theoretical paradigms as positivist (post-positivist), constructivist, interpretivist, transformative, emancipatory, critical, pragmatic and deconstructivist, postpositivist or interpretivist. Gephart (1999), however, classified research paradigms into three philosophically distinct categories as positivism, interpretivism and critical postmodernism.

Positivism research approach is regarded as a research strategy and approach that is rooted on the ontological principle and doctrine that truth and reality are free and independent of the viewer and observer. The self-governing, independent and objective existence of truth can be seen as a definition and meaning of positivism in a number of publications such as those by Goetz and LeCompte, (2004), Gough (2005) and Griffin (2006). A positivist investigator has an idea or notion that the universe or world conforms to permanent and unchanging laws and rules of causation and happenings. The fact that this approach relies mainly on figures, statistics and experimental data to arrive at predictable conclusions (Putman, 2006), makes it inappropriate for this study.

Constructionism holds the view that reality or truth is constructed or formed by the observer or researcher. However, in resistance to earlier constructivism, it opines that reality or truth is a combined construction. It gives more regards to the role of contact and communication in the course of constructing or forming reality (Bailey, 2006). Denzin and Lincoln (2007) therefore placed the key distinction between interpretivism and constructionism

to be the fact that the constructionists are more fundamental and radical and they broaden their ontological observations to all facets of reality or truth while interpretivists restrict it to social truth reality (Creswell, 2002). According to Jonassen (1991), constructivist theorist believe that knowledge is a process of actively interpreting and constructing individual knowledge representations.

An interpretivist research approach however expresses that there is no universal truth (Ogilvy, 2006). According to Tugendhat (2006), the interpretivist researcher comprehends and interprets from his/her own orientation and reference based on his observation and data gathered from the field of study. Creswell (2003) and Yanow and chwartz-Shea (2011) claim that interpretivist researchers discover reality through participant's views, their own background and experiences. Taking account from various scholars such as Cohen and Manion (1994), Creswell (2003) and Yanow and chwartz-Shea (2011), it is theoretically understood that interpretive paradigm allows researchers to view the world through the perceptions and experiences of the participants. In seeking the answers for research, the investigator who follows interpretive paradigm uses those experiences to construct and interpret his understanding from gathered data.

According to Willis (2007), interpretivism usually seeks to understand a particular context, and the core belief of the interpretive paradigm is that reality is socially constructed. The tenets of interpretivism is appropriate for TEK research because TEK is socially constructed and can be best studied from participant's perspective. The study adopted the use of interpretivism as prescribed by Bryman (2008) and used by Meinich (2010) in the study of the effect of increased awareness on forest governance in Southern Tanzania.

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Afrocentric Research Paradigms

African research methodologies have been diverse and complex but had not been given a unique identity until Asante published his works on afrocentric method (Asante 1988). Asante explained 'Afrocentricity', as an appropriate complement to qualitative methodology in research in an African context because the philosophical and theoretical paradigm underlying afrocentricity is consistent with the African worldview. According to Asante (1990), Afrocentricity is founded on the understanding of the African identify as rooted, centred and located in the African culture in all aspects – spiritual, social, political and economic.

In practice, afrocentricity involves the examination of the African reality from the perspective of the African - one that places the African experience at the core, recognises the African voice and reaffirms the centrality of cultural experience as the place to begin to create a dynamic multicultural approach to research (Mkabela, 2005). Afrocentricity is however, not just about Africa or the African culture. Instead, it fundamentally proposes that all cultural centres must be respected and not impaired by colour or geography (Mkabela, 2005). Consequently, Afrocentricity encourages cultural and social immersion as opposed to scientific distance in research as well as the use of tools and methods indigenous to the people being studied.

Afrocentricity warrants that indigenous people are active participants in the articulation of their views, wishes and concerns that they deem important to their cultural context and experience. Social immersion would provide the researcher with knowledge about and familiarity with the history, language, philosophy, and myths of the people under study, and reduce misinterpretation,

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perpetuation of myths and researcher imposition (Mkabela 2005). In effect, the Afrocentric paradigm does not only advocate cultural immersion, indigenisation of tools and methods of investigation that African people can use to make sense of their own realities but also the interpretation of research data from a traditional African perspective.

Following the above discussions, the philosophical assumptions underlying this study are afrocentrism and interpretivism. The study adopts the afrocentric and interperativist approach because it sought to explain a knowledge system which is deeply embedded in African cultural beliefs and practices, traditional knowledge and technologies, traditional religion and scientific believes which are subjective in nature. According to Deetz (1996), where subjectivity is key in a study, the interpretivist approach is required because the approach attempts to understand phenomena through the meanings assigned to them by respondents and not the researchers' preconceived meanings.

Research Design

The qualitative study design is employed in this research because of its ability to elicit in-depth views and perspectives of the participants (Yin, 2004). Yin further states that the qualitative method is the most appropriate research methodology if a study requires capturing the perspectives, ideas and meanings given to real-life events by the people who live them, not the values, preconceptions, or meanings held by researchers. Yin, adds that, qualitative research covers contextual conditions-the social, institutional, and environmental conditions within which people's lives take place. In many ways, these contextual conditions may strongly influence all human events.

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Study Design

The multiple-case study design was used for the research. According to Yin (2004), a multiple case-study is an empirical inquiry that investigates a similar or diverse contemporary phenomenon within their individual real-life context, especially when the boundaries between phenomenon and context are not clearly evident. Herriott and Firestone (1983), however state distinct advantages and disadvantages of multiple-case designs in comparison with single-case designs. According to them, the evidence from multiple cases is often considered more compelling, and the overall study is therefore regarded as being more robust. The conduct of a multiple-case study can however require extensive resources and time beyond the means of a single student or independent research investigator.

Regardless of these challenges stated above, the multiple-case study design was adopted for the research because it gave the researcher an opportunity to study the Boabeng-Fiema, Tafi-Atome and Amansuri communities individually at different times and make deductive and inductive inferences from the study results in comparison and as isolated cases.

Study Areas

The study areas were Boabeng- Fiema in the Bono East Region, Tafi -Atome in the Volta Region and the Amansuri cluster of communities in the Western Region of Ghana. The three study areas were selected for the following reasons; Boabeng-Fiema, Amansuri Communities and Tafi- Atome wildlife sanctuaries all operate on complex religio-cultural belief systems that rely on traditional norms, myths, taboos, totems and closed seasons to preserve certain critical natural resources (Ntiamoa-Baidu, 1995; Abayie-Boaten, 1998;

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Attuquayefio & Fobil, 2005). All three study areas are recognised eco-tourism sites in Ghana and therefore exercise unique forms of governance systems that are aimed at the development of their communities using revenues from tourism. These three study areas were also selected due to some differences which mainly resided in their difference in culture, language, traditional beliefs and governing partners. The differences highlighted were considered essential in giving the study a wider scope for discussing the theories and contextual issues embedded in the study. The differences were also considered as key in making generalised recommendations on governance that could be applicable to any society regardless of the culture, traditions and governance structures.
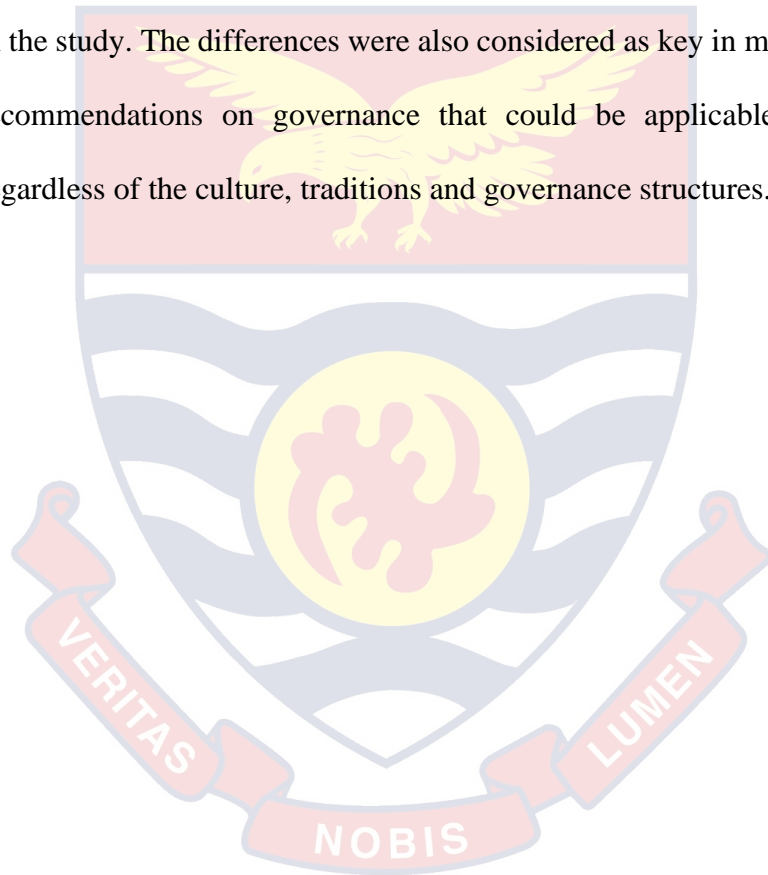
Figure 4: **The Three Study Areas and Other Eco-Tourism Sites in Ghana.**
Source: Ghana Forestry Commission (2012)

Tafi - Atome Monkey Sanctuary

Tafi-Atome community shown in Figure 4, owns and governs the Tafi-Atome Monkey Sanctuary which is a traditional conservation area managed in co-operation with local communities (Densu, 2003). The sanctuary is bounded by four communities; Tafi Atome No. 1, Tafi Atome No. 2 (also known as Tomefa), Dekpor and Ando all located within the Hohoe District of the Volta region of Ghana. The sacred grove is approximately 28 hectares and comprises a semi-deciduous forest which lies within the forest-savannah transitional zone.

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It is immediately surrounded by grassland and cultivated farmland. The grove fits into the IUCN protected area Category IV, a habitat and/or species management area. The monkeys are considered 'representatives of the gods', and protected as sacred (Pleydell & Nuhu, 2005)

A historic account by Ntiamoa - Baidu (1995) revealed that, in 1995, the Accra-based Nature Conservation Research Centre visited the village of Tafi Atome and found the sacred forest in a state of degradation. In 1996, a community-based ecotourism project was started in the village. In 1997, mahogany trees were planted to demarcate the boundary of the sanctuary in order to halt future encroachment of farmland upon the forest edge. 1n 1998, a tourist welcome centre was built to serve as the first point of contact for tourists arriving at the village. The tourist welcome centre was funded by the community and by external donors.

In 2006, the Hohoe district passed official bylaws on the use of forest resources which included restrictions on entry into the forest sanctuary, harvesting of trees, farming within the protected area and killing animals in the grove. This was a way of formalising the traditional ecological laws which had existed for centuries. Ormsby and Edelman (2010) revealed that community members participating in the 2004 and 2006 surveys said the cultural values of the community had improved as a result of tourism promotion. The arrival of tourists has also brought tourism income, which is distributed among stakeholders (e.g. fetish priest, chiefs) and used for community development, payment of compensation to the landowners of the sanctuary, and educational funds.

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Figure 5: **Map of Tafi Atome Monkey Sanctuary.**

Source: Friends of the Earth Ghana (2007)

The Amansuri Resource Reserve Area

The Amansuri wetland, mangrove and lake forest is bordered by the Amansuri cluster of communities. The Amansuri wetlands and natural resource area is a community protected area that is governed by the chiefs and people of the western Nzema traditional area in a collaborative partnership with the Ghana Wildlife Society. The protected area is surrounded by five communities; Benyin, Nzulezo, Ebonloa, Nglekazo and Ekebaku. The wetland is on the western coastline of Ghana, in the Western Region of Ghana. The area is about 360km west of the capital, Accra, with the closest large urban center being Half-Assini,

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35km to the west. The former name of the area in the colonial era was Apolonia, and there are still vestiges of the past, notably the Apolonia fort in Beyin village. The Amansuri catchment area lies within the Wet Evergreen forest zone of Ghana, a forest type restricted to the highest rainfall zones.

The Amansuri wetland, which has an area of more than 100 km², is a relatively pristine complex consisting of a freshwater lagoon, forests, grasslands and rivers, and it has the most extensive remaining stand of intact swamp forest in Ghana. It is the only known peat swamp forest in Ghana and the best example of freshwater swamp forest characterized by black humid waters. More than 70 percent of the site is covered by swamp forest, which makes accessibility in many parts very difficult, a factor which has resulted in significant remnants of unspoilt areas. Faunistic inventories have identified 27 species of mammals, including black-and-white colobus, mona and spot-nosed monkeys, forest squirrel and red river hog, 26 species of reptiles and amphibians, including the slender-snouted crocodile (Crocodylus cataphractus) and the dwarf crocodile (Osteolamus tetraspis), green mamba and black forest cobra, and 26 species of fish.

Furthermore, the area has a relatively rich indigenous avifauna and also hosts various migrant species. According to the inventories, a total of 105 bird species have been recorded, 65 of which are of global and national conservation interest. Due to its ornithological importance, the area has been classified as an Important Bird Area, and it also meets the criteria of the Ramsar Convention as Wetland of International Importance. However, its official designation as Ramsar site is still pending. Another characteristic of the site which further enhances its importance in terms of biodiversity is that the coastal areas

constitute nesting sites for various marine turtle species, such as the rare leatherback turtle (Dermochelys coriacea), Green turtle (Chelonia mydas), and Olive ridley turtle (Lepidochelys olivacea). In terms of flora, 33 percent of the 237 plant species identified are endemic to the wetland.
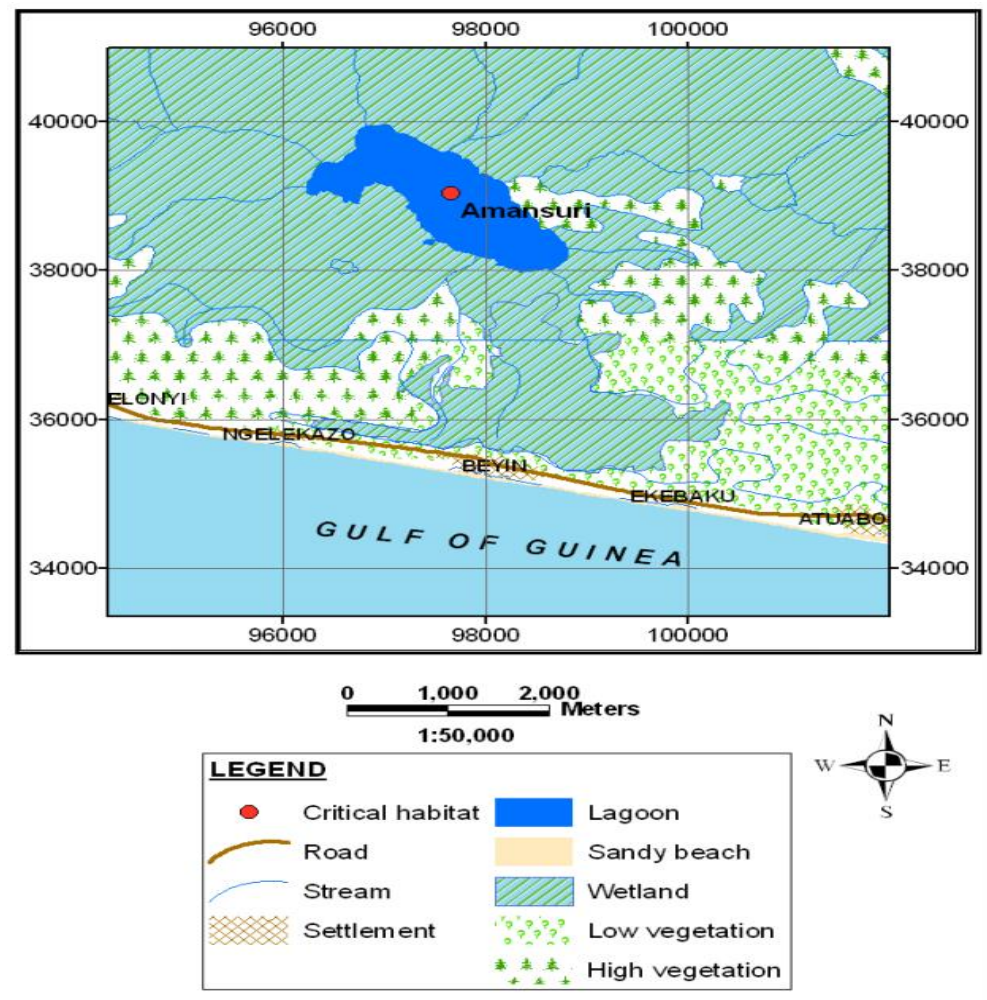
Figure 6: **Map of Amansuri Wetlands and Forest.**

Source: Ghana Wildlife Society (2012)

Boabeng - Fiema Monkey Sanctuary

Boabeng - Fiema Monkey Sanctuary is governed by the Boabeng and Fiema twin communities in collaboration with the Wildlife Division of the Forestry Commission. Boabeng- Fiema is a typical case study of the blending of traditional and introduced wildlife conservation systems. The Boabeng-Fiema

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Monkey Sanctuary (BFMS) provides a habitat for two monkey species, the black and-white colobus (Colobus vellerosus), and mona monkey (Cercopithecus campbelli), which co-exist with the inhabitants of the twin villages of Boabeng and Fiema (Densu, 2003). The monkeys are protected and revered as "children of the gods" by traditional taboos and historic cultural beliefs. Over many generations a harmonious relationship has existed between humans and monkeys to the extent that dead monkeys are buried in special cemeteries with elaborate rituals akin to those of humans (Densu, 2003; Pleydell & Nuhu, 2005). This harmonious coexistence began to crumble in the early 1970s when members of a zealous religious sect, the Saviour Church, came to settle in the area and started disregarding the age-old taboos.

Members of this sect simply had no respect for local traditions (Fargey, 1991; Falconer, 1992; Ntiamoa-Baidu, 1995). Indiscriminate killing of the monkeys drastically reduced their numbers, and rampant illegal logging and encroachment of forest habitats for farming prompted the traditional authorities to seek help from the then Department of Game and Wildlife (now Wildlife Division of the Forestry Commission) to designate the area as national Wildlife Sanctuary with accompanying bylaws to protect the monkeys (Akowuah et al., 1975; Fargey, 1991). A Community Management Committee, comprising traditional elders and wildlife staff, was established. Ownership and management of the Sanctuary were vested in the traditional authorities, while the Wildlife Division assumed supervisory and advisory roles (Fargey, 1991; Densu, 2003).

A previous study (Kwarteng, 2004) revealed that the sanctuary faced several problems, notably (i) a rapidly-increasing monkey population in the

sanctuary, (ii) possibility of dilution of the traditions and culture of the people through eco-tourism, (iii) increasing industrialization and migration, and (iv) escalating human-wildlife conflict with potential negative impacts on conservation initiatives in the area.
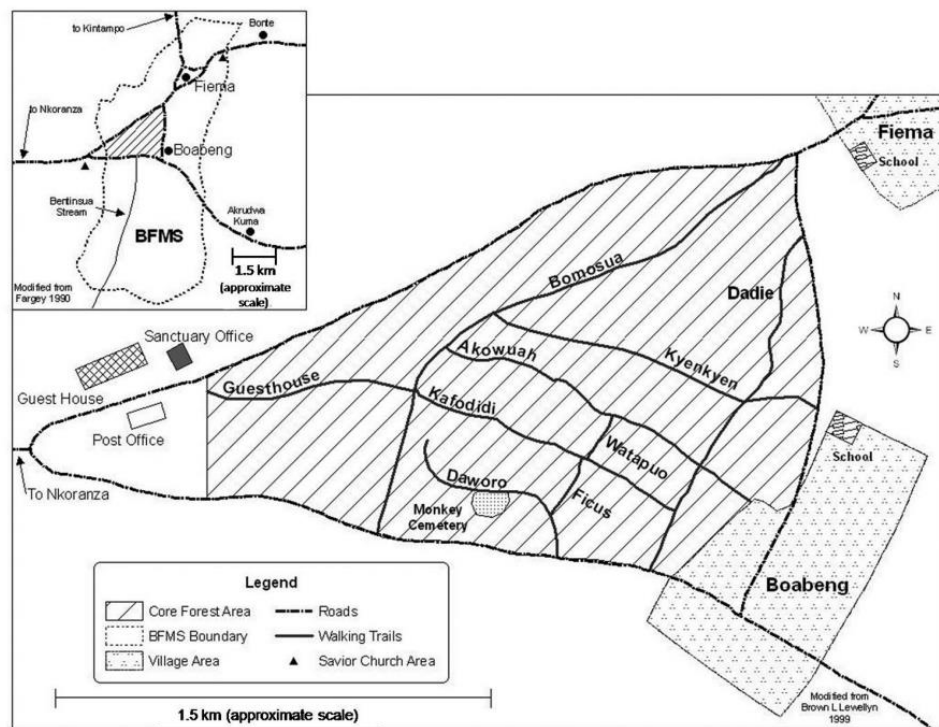
Figure 7: **Map of Boabeng-Fiema Monkey Sanctuary.**

Source: Lewellyn, B. L. (1999)

Population

The target population of this study were the people of Boabeng and Fiema, Tafi - Atome and Western Nzema Traditional Area (specifically the towns of Ebonloa, Nzulezo and Benyin). The study also considered users of the resources and temporary residents who have had some experiences with the TEK and governance processes as part of the population and some were considered for the group discussions.

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Sample and Sampling Procedure

Deflem (1998), states that sampling refers to the systematic selection of a limited number of elements out of a theoretically specified population of elements, from which information will be collected. He added that the selection is systematic so that biases can be avoided. A purposive sampling technique which is a non-probability method was used to source information from key informants. Twumasi (2001) points out that purposive sampling enables the researcher to select respondents who can answer the research question to be included in the sample. In the selection of key informants, relevant knowledge, age, social status and other practical considerations such as accessibility of respondents were considered (Nachmias & Nachmias, 1996). The Snowball technique of purposive sampling which aims to locate information rich persons was used (Isaac & Michael, 1997). Key informants were requested to recommend individuals who were also well knowledgeable in TEK and NRG within the communities. According to Warren (1990) and Koro (2005), elderly people are the custodians of TEK and therefore were of key interest. Key informants for the three study areas varied based on their unique governance system as well as TEK system.

Data Sources

The study relied on both primary and secondary sources of data. The primary data were obtained from the field through interviewing, group discussions and observation. These methods were adopted to give the researcher a personal exposure to the people, events and issues being investigated. It also enabled the development of second - hand knowledge which is key in a case study approach (Yin, 1993). The secondary data were obtained from the Wildlife

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Division of the Forestry Commission and archival documents from the district assemblies, traditional councils and the Ghana Wildlife Society. Stewart and Kamins (1993) as cited in Saunders, Lewis and Thornhill (1997) states that, using secondary sources of data provides some advantages such as the opportunity of prior evaluation before usage and speed. In the light of this, earlier work done by some individual researchers and organizations that provides the required information on the subject matter were reviewed and analysed to help answer some research questions.

Data Collection Procedures

Data collection was done using first-hand information-oriented data collection methods. Clayoquot (1995) states that the recipient of TEK "is an integral part of the ecological system" thus, he concludes that, the researcher of ecological knowledge "is deemed to perform best when attempting to behave objectively as a direct dispassionate observer". Data collection was done through reviewing of relevant documents and archival records, interviewing, direct observation, participant- observation, group discussions and examination of physical artefacts. These methods of data collection are well suited for exploratory research because they allow for discovery of new aspects of the problem by exploring in detail the explanations provided by respondents. According to Yin (2014), the incorporation of these data collection methods into a case study investigation increases its quality substantially.

Research Instruments

Interview guides, group discussion guides and observation check-lists were designed based on available literature on Traditional Ecological

Knowledge (TEK) and Natural Resource Governance such as IUCN (2010) and from empirical studies such as Laudari (2010). The interview guide made up of open-ended questions was used to obtain information on the nature of TEK and NRG systems. The interview guide had 6 sections (section A to Section F) and asked questions on the nature of the TEK; the foundation, the functional organisations, TEK processes and TEK products. Section B elicited interviewees' responds to questions on the nature of the natural resource governance system; the NRG laws, processes and institutions. Section C contained questions that assessed the TEK processes that were linked to the achievements of NRG principles such as Transparency, Rule of Law, Accountability and Participation. Section D posed questions that inquired of the institutions that worked to achieve the natural resource governance principles and Section E contained questions that asked respondents about the laws on Governance principles and Section F assessed TEK positions on natural resource governance principles.

The use of semi-structured interview guide assisted the study to gain in-depth responses from respondents (Saunders et al., 2011). A copy of the interview guide is attached as Appendix A. A group discussion guide with 3 main sections was designed to elicit the views of discussants on the nature and structure of TEK in the study communities, the components and processes of Natural Resource Governance in the study communities and the role of TEK in achieving the principles of governance. The guide also assessed the views on discussants on the efficiency of the governance system in achieving transparency, rule of law, accountability and Participation. An observation guide and checklist made up of three sections was used in order for the researchers to

observe respondents in their real life situations. The sections of the observation checklist covered the environment, TEK processes and products and the resource management and governance processes and protocols. A copy of the observation schedule is attached as Appendix C. The interview guides, group discussion guide and the observation checklists were reviewed by my research supervisors and for reliability and validity before being used. Some equipment that were also utilized during the data collection were tape recorders and cameras.

Table 1: Data Collection Methodology, Instruments and Equipment

Data collection methodology	Instruments	Other equipment
Interviewing	Interview guide	Note pad, tape recorder
Group discussion	Group discussion guide	Note pad, tape recorder
Observation	Observation check-lists	Note pad, tape recorder and digital camera

Source: Field data (2018)

Reconnaissance Visits

Reconnaissance visits were made to the three study areas to acquaint myself with the situations on the ground concerning traditional institutions, entry protocols and governance structure bureaucracies. The visit to Boabeng- Fiema was done on 4th October, 2017. This was preceded by phone calls to the Manager of Tourist Reception Centre to secure accommodation at the guest house. The visit took two days during which I paid a working visit to the Chief's palace to identify relevant persons to be interviewed. I also visited the fetish priest and the assembly member to refine my list of persons for key informant interviews and

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group discussions. All relevant phone numbers were taken to enable me plan adequately for the data collection.

The reconnaissance visits to Amansuri was done on 10th January, 2018 and was preceded by a phone call to the Representative of Ghana Wildlife Society who also doubles as the manager of the guest reception centre at Benyin. The visit enabled me to familiarise myself with the vast Amansuri resource conservation area and identify key persons for interviewing and focus group discussion. On 14th March, 2018, a visit to Tafi- Atome was made to see the manager of the community tourism centre who I had called on phone a week ahead of my visit. With his help, I was able to visit the Chief, the Assembly man and the assistant to the Fetish Priest to secure interview dates ahead of data collection. All necessary phone numbers were also obtained to facilitate planning. These three visits were also used to refine the research instrument and redesign the data collection process.

Actual Data Collection

Data collection was done at Boabeng – Fiema from Monday 30th July, 2018 to Friday 3rd August, 2018. Data collection at Tafi – Atome was done from Monday 5th November, 2018 to Friday 9th November, 2018, and from Tuesday 11th February, 2019 to Friday 15th February ,2019 data collection was carried out at Amansuri study area.

Key Informant Interviews

Interviewing was used to obtain information from key informants such as traditional leaders and other people who were knowledgeable in TEK and natural resource governance systems in the study areas. Interviewing was used for key informants because it helped to solicit detailed information on the study

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objectives as well as provide a wider room to explore the subjects of the study (Chen, Shek & Bu, 2011).

The following persons were interviewed in the various study areas using purposive sampling because of their knowledge and experience on the subject matter. They were interviewed individually and at their own convenient time and place. Table 2 shows the dates, venue and time for interviewing key informants at Boabeng – Fiema.

Table 2: Key Informants Interviews at Boabeng- Fiema

Boabeng – Fiema	Date	Time	Venue
1. Chiefs of Fiema and Representative of Boabeng Chief.	30th July,2018	10 am – 1pm	Chief's palace
2. Fetish Priest	30th July,2018	2 pm	Chief's palace
3. Manager Tourist Reception Centre	31th July,2018	8 am	Tourists Reception Centre
4. Assembly Man	31th July,2018	12 pm	Community Centre
5. Head of Tour Guides	31th July,2018	3 pm	Tourists Reception Centre
6. Community Youth Leader	1st August ,2018	9 am	Community Centre
7. Ghana Wildlife Division officer	1st August ,2018	12pm	Tourists Reception Centre
8. Women Group Leader	2nd August ,2018	10 am	Community Centre
9. District Assembly Representative.	2nd August ,2018	2pm	Tourists Reception Centre

Source: Field data (2018)

At Boabeng – Fiema, nine interviews were conducted between 30th July and 2nd August, 2018. A maximum of three interviews were conducted in a day. Three venues were used for all the nine interviews; the chief's palace, the community centre and the Tourists Reception centre. These venues were chosen

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by the interviewees who preferred to be interviewed at these places rather than in their homes.

At Tafi – Atome, seven interviews were conducted from 5th to 9th November, 2018. A maximum of two interviews were conducted on a day. Three different venues were used for all the seven interviews; the chief's palace, the community centre and the Tourists' centre. The venues and time for the interviews were chosen by the interviewees to suite their work schedule and convenience. Table 3 shows the dates, venues and time for each interview

Table 3: Key Informants Interviews at Tafi - Atome

Tafi – Atome	Date	Time	Venue
Chief's Representative	5th November, 2018	11 am	Chief's Palace
Fetish Priest's assistant	5th November, 2018	3 pm	Tourists' Centre
Manager of Tourists Centre	6th November, 2018	8 am	Tourists' Centre
Assembly Member	6th November, 2018	2 pm	Community Centre
Head of Tour Guides	7th November, 2018	10 am	Tourists' Centre
Community Youth Leader	7th November, 2018	2 pm	Community Centre
Land owners' representative	9th November, 2018	11 am	Tourists' Centre

Source: Field data (2018)

At Amansuri study area, seven interviews were conducted from the 11th to the 14th of November, 2018. A maximum of three interviews were conducted on the 12th of November. Five different venues were used for all the seven interviews. The venues and time for the interviews were chosen by the interviewees to suite their work schedule and convenience. Some interviewees were given some money to compensate for their transportation cost to the interview venue. Table 4 shows the dates, venues and time for each interview

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Table 4: Key Informants Interviews at Amansuri

Amansuri	Date	Time	Venue
Chief's representative	11thFebruary,2019	10 am	Chief's palace
Fetish Priest	11th February,2019	2 pm	Chief's palace
Manager of Tourists' Centre	12th February,2019	8 am	Tourists' centre
Assembly Man	12th February,2019	12 pm	Assembly man's residence
Head of Tour Guides	12th February,2019	3 pm	Guests' Centre
Community Youth Leader	13th February,2019	9 am	Community Centre
Clan Elder (78 years)	14th February,2019	12pm	Elder's residence

Source: Field data (2019)

Group Discussions

Group discussion, according to Yin (2011), is a form of data collection method whereby the researcher convenes a small group of people having relevant attributes and experiences on a subject matter and leads the group in a nondirective manner. The objective was to collect the perspectives of the people in community on the issues that had been addressed by the key informants in their interviews. Another major objective for the group discussion was to get varied opinions on the TEK and governance system from the perspective of ordinary people in the community who were not directly involved in the management or governance processes. Furthermore, non-indigenes, tourists and researchers who had patronised eco-tourism services from the communities or researched into some aspect of the communities TEK and NRG were included in the discussion to share their opinions and experiences. A group discussion

was conducted in each study area in vernacular (Twi) and English. The group discussions comprised nine persons at Boabeng – Fiema, eight persons at Tafi – Atome and nine persons at the Amansuri resource area.

The discussants were selected for the group discussions using purposive sampling. The criteria set for the group discussion was that, the discussant should not be a member of the management committee or board. He or she should not be directly related to any member of the management board or team. However, a discussant must have any of the following characteristics;

i.   belong to one of the social groups within the community

ii. be a resident member of the community or civil servant

iii. be a tourist or a researcher who has experienced the tourism facilities and service protocols in the study community

iv. have basic knowledge and have interest in the governance processes and TEK systems and

v.   willing and available to be part of the discussion

Based on the above stated criteria, the leadership of social groups were consulted to recommend persons who could be useful to the discussions. The major social groups consulted were the youth groups, men's groups and the women's groups. Others included the market women, farmers and fishing groups that were available. Some persons were selected based on their membership of two or more social groups. The constitution of the discussion group differed from one study area to another.

The group discussion at Boabeng – Fiema was held on the 3rd of August, 2018 at 2:20pm. The venue for the discussion was the tourist reception centre and comprised the following persons;

- A market woman (a member of women's association)

- A youth group member (male and leader of anti-fire squad)

- Teacher (female not an indigene) with strong interest in eco-tourism

- High school graduate (male indigene) part time tour guide

- Tourist (female from KNUST)

- Researcher (from University of Ghana)

- Unit committee member (male)

- Farmer (male)

The discussion was done in the Twi language because everyone could speak and understand the Twi language. Questions were posed by the researcher (the moderator) and anyone who has something to contribute on the subject raised was given the opportunity to speak. Multiple views on the subject were encouraged and discussants were given the opportunity to ask for clarifications on the questions and contributions when they showed their hand to request for audience. The discussion lasted for 1 hour 25 minutes ending at 3:45 pm with some slight refreshments.

Group discussion at Tafi Atome was done on the 8th of November, 2018 from 2:15pm to 3:50pm.The venue was the Tafi – Atome Basic School and comprised the following persons;

- A market woman (Aged 43)

- 2 Youth group members (male and female)

- At teacher (female) –with strong interest in the environment

- Tourist (male from Ho Technical University)

- Resident Nurse (Male)

- Unit committee member (male) and

- A farmer (female) – Member of the women's association

The discussion was done in the English language and Twi. Although there was a tour guide who was assigned the role of interpreter. He had very little work to do since all the discussants could speak and understand the Twi and the English language. The discussions were moderated by the researcher going strictly by the discussion guide. The discussants were keen on anonymity and so did not allow the taking of pictures and audio recording of the discussion. The researcher therefore had to resort to the writing down of the various contributions of the discussants.

The group discussion at Amansuri comprised nine discussants and was done on the 15th of February, 2019 at 10 am at the Benyin Primary School. The discussants were;

- 2 Market women (from Nglekazo and Ekabaku)

- 2 Youth group members (male and female)

- A resident male teacher from Benyin

- A tourist (female) from Takoradi.

- A resident Nurse at Nzulezo new town

- A unit committee member (male) and fisherman

- A farmer (male) – secretary to PTA (Nzulezo) and member of the men's association.

The group discussions were key in the study as they helped to capture general relevant issues, confirm responses from the interviews and clarify issues raised by other respondents on TEK processes, products and implementation of governance principles. In all three study areas refreshments were provided by

the researcher and at Amansuri money was given to discussants to cater for their transportation.

Observation

Karma (1999) defined observation as a purposeful, systematic and selective way of watching and listening to an interaction or phenomenon as it takes place without asking the respondent. This is relevant in situations where accurate information cannot be elicited by questioning or as a means of confirming data already collected from respondents or secondary data. This approach was used together with others to obtain information on the geo-physical setting and location of traditional protected sites/areas. Observation as a data collection technique was used to obtain practical information on knowledge sharing platforms and TEK based practices and activities such as traditional rituals that are relevant to the ecology and natural resource governance.

Observation sessions were scheduled as part of the data collection plan for each study area. At Boabeng – Fiema, there were two observation sessions done on 31st July, 2018 and 1st August, 2018 both after 2 o'clock pm. The first observation session was carried out with the assistance of a tour guide through the town to see how the people interacted with the monkeys in the community. Additionally, we observed the process of receiving tourists and tour guiding process. The second observation session was carried out in the forest to see the state of the sanctuary, the cemetery for the monkeys and management routines of the tourist reception center. I also had an opportunity to observe a meeting between the management of the tourists' center with the tour guides and the

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Wildlife Division representative. The meeting was part of a monthly meeting to share ideas on maintaining law and order within the sanctuary.

At Tafi – Atome, two observation session were carried out on 7th November, 2018 at 8 O'clock am and 2 O'clock pm on the 9th of November, 2018. .Major aspects of the data which were collected by observation in Tafi – Atome were; the reception of tourists, the collection of revenues and the issuance of receipts, the customer service protocols and tour guiding procedures. Other areas that were also covered by observation were traditional rituals and activities that are carried out as part of their ecological management such as the burial of animals, feeding of wildlife and pre – harvest rituals in the forest.

At Amansuri observations was done at 2 O'clock pm on the 12th and 13th of February, 2019. The researcher observed the implementation and enforcement of ecological laws and taboos by the community elders and tour guides as well as the culture of the people regarding their relationship with wild animals, tourists and their general environment. Another area of interest during the observation at Amansuri was the waste management procedures at Nzulezo.

Data Validation

To ensure the validity of results, credibility checks such as checking results with the original informants and using multiple qualitative analysis procedures. Furthermore, key informants were drawn from all relevant units of the selected communities (Bless & Higson-Smith, 2000). Response validity were ensured by reviewing transcribed responses with the respondents through validation workshops. Deep saturation was also ensured by talking to more and more respondents to seek consistency across large numbers with respect to data

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gathered. Finally, Triangulation techniques such as having several interviews, group discussions and observations in each community was done.

Two validation workshops were at carried out at each of the three study areas the first sessions were meant for some of the discussants and the second sessions were for the Key informants who were interviewed. At Boabeng – Fiema the both workshops were done on Sunday 5th August, 2018 at 12 pm and 4 pm. That of Tafi – Atome was done on Saturday the 10[th of] November, 2018 and on Sunday the 11th of November, 2018. On Saturday the 16th of February, 2019 two validation workshops was carried out at Benyin at 2pm for the Discussants and 4pm for the key informants. During these workshops I presented to them my write up on the TEK, Governance structures and sketches of the cosmovision. They had the opportunity to make corrections on some sections of the reports and in some cases, certain aspects of the reports were taken out upon their request.

Data Processing and Analysis

Data Processing was conducted using techniques such as mind mapping to reduce the data and organize data into themes based on the objectives and the conceptual frame work. Data organisation and editing was done by the transcription of interviews and discussions under the themes mainly TEK and NRG systems and their integration. Data reduction was done by coding narrations through the following; open, axial and selective options (Yin, 2004). Responses that were linked to the themes were grouped and highlighted; placed under the appropriate objective using inductive categorization (Mouton, 2001). To construct the Cosmovision for the three study areas, mind mapping techniques were used to identify relationships and associations between

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responses. The relationships and linkages were documented using diagrams, text, matrices, charts and tables (Brynard & Hanekom, 1997).

To answer the research question on TEK, responses obtained from the interviews and group discussions on TEK sources, transmission and interpretation procedures that are employed within the traditional ecological knowledge systems of the communities were explored using discourse analysis. Discourse analysis was used to analyze approaches to environmental issues and associated contexts over meaning (Dryzek, 2005). Dyzek's authoritative analysis defines a discourse as a "shared way of apprehending the world" and he uses this approach to reveal and consider how environmental matters are understood and discussed differently. Another analytical approach that was used is interpretative phenomenological analysis (IPA). IPA according to Palmer (1969) is more appropriate if a study needs to explore in detail how participants make sense of their personal and social world, and the meanings those particular experiences and events held for participants.

IPA techniques were adopted in analyzing responses from interviewees and discussants on Natural Resource Governance principles and what they think could be done to improve the governance system. IPA was used since the study involved detailed examination of the respondent's world while exploring their personal experiences, perceptions or account of an object or event (Palmer, 1969). IPA also emphasizes dynamic process where the researcher plays an active role in trying to get close to the participant's personal world. The observation data were analysed based on their relevance to the study objectives. The observation checklist was designed to answer the research questions on TEK, NRG and the integration between the two. IPA analytic techniques were

however used to deduce the significance of the issues observed in confirming or disputing a response already documented from the interviews or group discussions. Where the observations were contrary to the responses, the interviewees were called and given the opportunity to explain the contrast. To take, in Conrad's (1987) words, using the IPA analytical technique gave the researcher an 'insider's perspective'. The differences and similarities among the three study areas were identified using cross site analysis.

Ethical Issues

The major ethical issues that the study encountered were on the subject of confidentiality, anonymity and prior consent of participants for photographs and recordings. To address these issues, participants were briefed well on the depth of information required from them and their consent were sought on the extent to which they prefer to be anonymous. Also, the confidentiality of the information they provided in terms of references back to them were assured. Where participants preferred to be completely anonymous or requested that certain information be exempted in the final work, their requests were granted. As part of observations, pictures taken were done with the full consent of the participants or individuals that were being observed. This was done to ensure that their rights to privacy were not infringed upon.

Participants in the group discussions requested for total anonymity and therefore pictures were not taken during the discussion. According to most of the respondents, it is against their culture to speak ill of the chieftaincy or criticize the chieftaincy in public. Since the Chieftaincy institution was deeply involved in the NRG of their communities, they were not comfortable expressing their displeasure about the governance processes if their anonymity

was not assured. I therefore promised them that their names would not be stated in the research report and also pictures were not taken during the discussion.
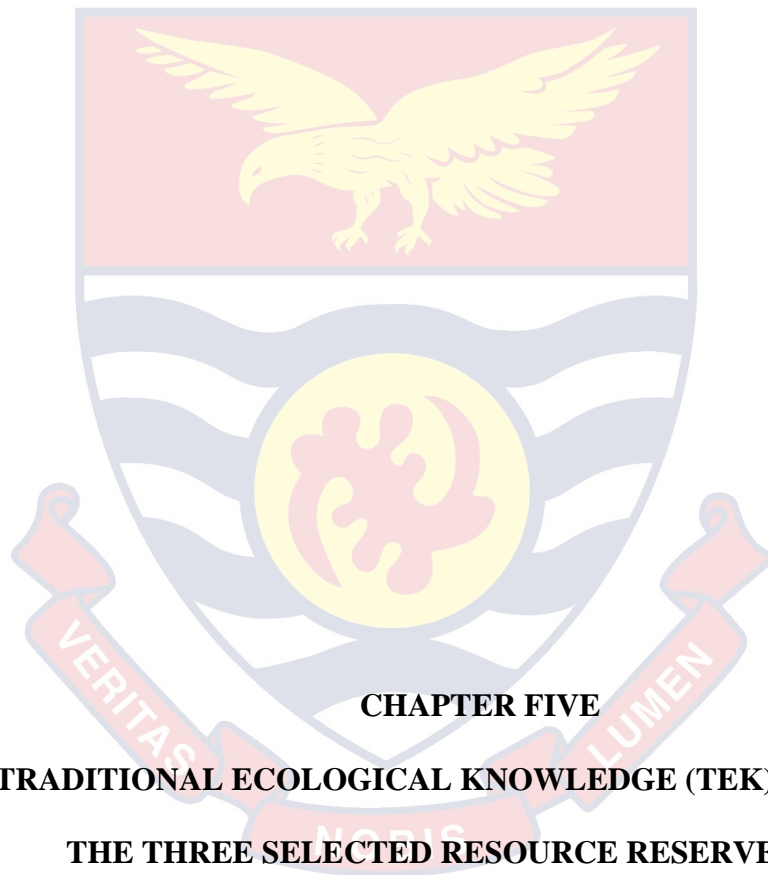
CHAPTER FIVE

TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK) SYSTEM AT THE THREE SELECTED RESOURCE RESERVE AREAS

Introduction

This chapter explores the traditional ecological knowledge at the three study areas. Theoretically this chapter examines the components of TEK and how they influence endogenous development in the three study areas. The chapter also assesses how resilient the TEK of the communities are by examining the mechanisms for adapting to changes in the community. It also

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examines the findings to see evidence of assurance problem. The first research question is answered in this chapter which explores the components of TEK: foundation, processes, institution and products of TEK in the three study sites. The chapter also discusses comparatively, the components of TEK in the three study sites and highlights their similarities and differences. A major aspect of the TEK foundation that is; the cosmovision of the three study sites are described with charts. The chapter ends with an assessment of how TEK may or may not influence NRG as depicted in the conceptual framework as a dynamic system that can influence effective resource governance (Hens, 2006).

The Foundation of TEK

The World Commission on Environment and Development (WCED, 1987) and IUCN (2010) both acknowledge the foundations of TEK as highly important in maintaining the traditional resource governance strategies in traditional communities. In the Brundtland report (WCED, 1987), the committee proposed that it is essential to institute humane policy for traditional communities which practice traditional governance systems as a way of recognising and protecting traditional rights to land and the other resources that sustain their way of life (WCED 1987). Major aspects of TEK foundation explored in the study included the cosmovision and history of TEK.

History of Nzulezo and Cosmovision of Amansuri Traditional Communities

From the interviews with the Chief's representative, the Fetish Priest and a clan elder, it was revealed that the TEK of the Amansuri traditional area is founded on the traditional religious beliefs of the chiefs and people of the Western Nzema Traditional Area specifically on the worship and dictates of the

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Amansuri god. The Amansuri god is the fetish god of the river Amansuri which also transforms to form the Amansuri Lake and wetlands. The river also harbours the Amansuri mangroves and forests. The Amansuri god, according to the Fetish Priest, is revered as a very vital god which supports the life of mankind and all other organisms that live in the river, fresh water lagoon, swamp forests, mangrove and grassland. It is also respected and considered as the source of life for all the organisms that thrive in its catchment area. The power and authority of the Amansuri god dates back 600 years before colonial era according to the history of the people of Nzulezo.

From the interviews with the clan elder and the Fetish Priest, it was revealed that the people of Nzulezo had migrated from the Ancient Mali Empire. Upon reaching Ghana, they first settled at Wenchi near Takyiman and then proceeded to Esipon near Shama. After some years, the people of Nzulezo further migrated to Esiama from where they were directed by their god (Batanka) to move further up the river Amansuri for protection and obscurity. The reason for their need for obscurity, according to the elders of the town, was to avoid being identified by assailants from the ancient Mali Empire that had been looking for them to retrieve a golden stool they had taken from the royal treasury of the Mali Empire.

The clan elder explained that the golden stool rightfully belonged to their clan and also served as the embodiment of their clan god. The current location of the original Nzulezo Township was prescribed by the god to serve as a refuge from their enemies. The god, Batanka also guided them on the architecture of the town which is built with wooden pillars and floors with raffia walls and thatch roof. The Fetish Priest confirmed in the interview with him

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that, the people were instructed by Batanka to remain on the Amansuri River until it instructs them to leave. After 15 years the assailants from the ancient Mali Empire located and prepared an attack on the Nzulezo settlement. The planned attack took place approximately on a Thursday in April 1418 AD. This was during the reign of Chief Teklika I. The Chief in consultation with the Fetish Priest resolved to cast the Golden Stool into the River Amansuri and pleaded with their god, Batanka to save them and preserve his deity.

The records of the Nzulezo people as narrated by the clan elder reveals that, on this day, the Batanka god liaised with the river god of Amansuri to wage war against their enemies. In the narration of the principal elder, from the Amansuri river rose in a huge wave which pulled the assailers and their rafts into the river. This was the end of their troubles with the old Malian Empire. After this divinely orchestrated victory, the people of Nzulezo finally resolved to forever live on the river and adopted the worship of the Amansuri river god. They also learnt the language of the people of West Nzema and with time their original Ensutire language was forgotten.

The Cosmovision of the people of west Nzema traditional area is a as deduced from the interview with the Chief's representative, the clan elder and the Fetish priest is a hybrid cosmovision which has adopted some foreign concepts as a result of their exposure and relationship with the Europeans, Ivoirians and other close neighbours. Their cosmovision has three overlapping worlds; the spirit world, the natural physical world, and the artificial physical world. There is however a linkage between the three worlds with the spirit world being the domineering world. The spiritual world is the largest world according

to the narrators and it can control all activities in the natural physical world and the artificial physical world.

The spiritual world as shown in Figure 8, comprises the supreme God who is omnipotent, omniscient and omnipresent with limitless power and knowledge. The supreme God, according to the people of West Nzema Area, communicates to mankind through the gods and ancestors and provides mankind with the wisdom to create things, farm and invent things.
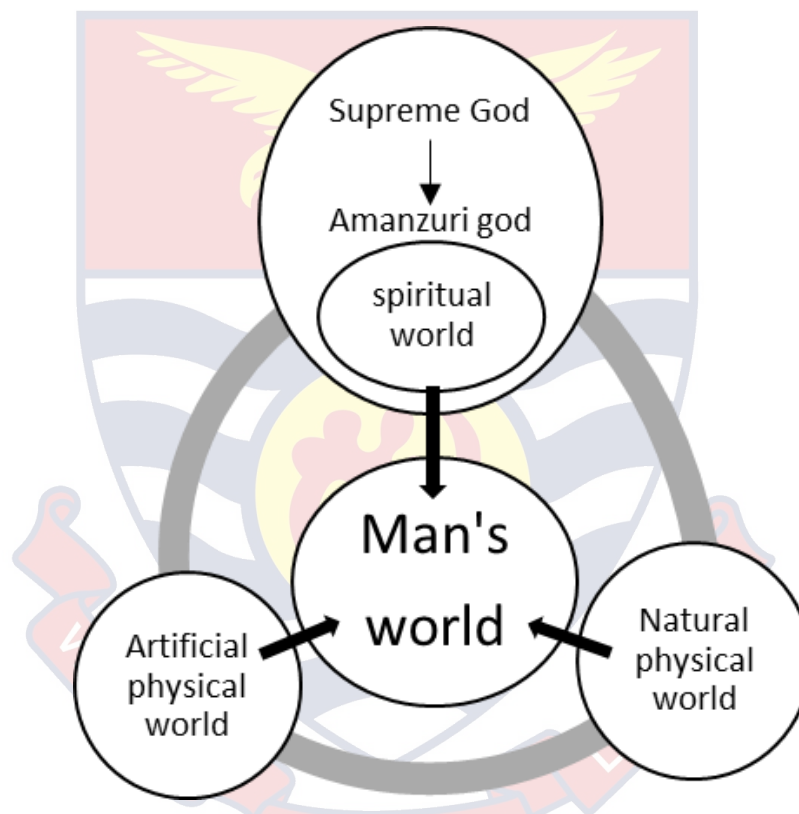
Figure 8: **The Cosmovision of the Amansuri Resource Area.**
Source: Field Data (2019)

The Fetish Priest confirmed in the interview that, the spiritual world is also habited by the Amansuri god who is deemed as the mediating divinity between the supreme God and mankind. The Amansuri god is a river god with domineering authority over the Amansuri River, Lake, Lagoon, surrounding villages, wild animals and the estuaries. According to the Fetish Priest, their belief in the Supreme God is paramount. Thus, the people believe that the

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Supreme God has blessed the West Nzema Area with the Amansuri god to guide, guard and protect them. They also believe the god also has the ultimate plan for the development of their community.

The History and Cosmovision of Boabeng – Fiema

The major foundation for the TEK at Boabeng-Fiema is Spiritual. This was revealed in the interview with the Fetish Priest and the chief's representative. According to them, it is based on the history of the people and their discovery of a fetish in the forest. The priests narrated that, fetish was a brass pan (yawa) covered in White Kaliko (ntoma fufuo). The fetish was discovered by a hunter by name Nana Ampong, a member of the Bretuo family (1st settlers), who went out at night to look for water for this family. The fetish was surrounded by two Mona monkeys (Kwokuo) and two black and white Colobos monkeys (Ofuo). The monkeys fled the scene upon seeing the hunter with the gun. He went to the Dawora River three times after the first discovery and each time he saw four monkeys (two Mona monkeys and two black and white colobos) surrounding the fetish. He then told the Nkoranza Chief about his discovery and later consulted an oracle for guidance.

In the narration of the fetish priest, which was restated by the chief's representative, the oracle told Nana Ampong that the fetish was the god of the Dawora River which still serve as a source of water for the Boabeng people. The monkeys were the children of the Dawora River and for as long as the people were willing to live on the land, they were to respect the monkeys and treat them as they would treat their fellow human beings. They were also to protect the habitat of the monkeys and not do anything to make their living

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among them difficult. They were also given a promise that if they did that, they would be prosperous as a people.

The Bretuo family (the first settlers) according to the chief's representative, migrated from the Kumasi Amakom and were given the Boabeng and Fiema area by the Nkoranza Chief who currently serves as the paramount ruler for the area. The Dawora river (feminine) is married to the Abujuo river fetish who is also linked to the Akora River at Kintampo North. The Abujuo fetish is the main fetish of the Fiema community and is considered the husband to the Dawora River Fetish of the Boabeng people. The two monkey species are considered as the children of the couple.

The Fetish priest stated in his interview that, the Fiema community comprises later settlers from Kokofo. According to him, the first settlers were related to the Nkoranza and Kokofo chieftaincy and were directly related to the Ashanti King (Asante Hene). According to traditional historical narrations, the Abujuo fetish revealed to his people that they would be visited by the Black and white Colobos monkeys and they were not supposed to harm or kill them in any way. He however added that, the god said "if they lived peacefully with these monkeys, the presence of the monkeys would draw visitors from all over the world especially white tourists from Europe and North America". Currently, the Boabeng- Fiema Monkey sanctuary has extended to seven allied communities who are equally protecting these monkeys and for that reason, they are given percentage shares in the proceeds of the Sanctuary.

According to the Chief's representative, the customary laws that govern the people with regard to their environment and their natural resources come from the Dawora and Abujuo fetish who communicate to the people through the

two fetish priests of Boabeng and Fiema communities. This was restated by the fetish priest during the interview with him. They both confirmed that, major annual rituals are performed by the fetish priest for the Dawora River Fetish (feminine) two weeks ahead of the Rituals (Festival) for the Abujuo River Fetish (masculine). Aside the annual rituals on Fridays, the fetish priests perform rituals to ask for blessings for the land, ask for pardon for anyone who has done any wrong and enquire if the gods and ancestors have anything for the people. During these rituals any member of the community can be present to observe and worship.

The Boabeng – Fiema Monkey Sanctuary is a community-based Ecotourism Sanctuary that thrives on the good will of the members of the community, the resilience of their Traditional Ecological Knowledge system and an adaptive Natural Resource Governance system. From the responses of the manager of the tourists centre and the assembly man during their interview, the relative success of the Sanctuary has been strongly linked to the adherence to age old traditional beliefs and taboos that places the Forest and its inhabitants under strict protection from exploitation.

From records in the file of the manager of the tourists centre, the forest earned a sanctuary status in 1974 and has since 1996 been a huge source of revenue for the development of the Boabeng- Fiema communities. The manager stated during the interview that, members of the twin communities and other allied communities continue to face several challenges with regard to living with the Black and White Colobos Monkeys and the Lowe's Monkeys (Kwekuo and Efuo Yaa). According to the women group representative and the youth leader, the monkeys often invade their kitchen and consume food stuffs that have been

reserved for the family. During the observation sessions, it was also observed that, the monkeys played with and destroyed electrical fittings, bulbs and even satellite dishes of the inhabitants.

The cosmovision of Boabeng- Fiema people based on the narrations of the Fetish Priest and the Chief's representative, places the survival of the human world on its linkage with the spiritual world. The physical world is sustained by special messages and revelations from the spiritual world. According to the Fetish priest, the Boabeng and Fiema cosmovision is based on the belief that, messages from the spirit world are transmitted through these sacred animals, natural structures like rivers and trees, sacred individuals like virgins and any living organism that avails itself to the Dawora (Boabeng) or the Abujuo (Fiema) gods. According to the Fetish priest, the people also believe in the Supreme God (Ɔbɔ Adeɛ) the creator who they believe created the Dawora and Abujuo gods. They also believe that for these sacred animals and natural structures to perform their functions as intermediaries, a conducive habitat is required, which implies the need for ecological diversity, environmental sanity and cleanliness.
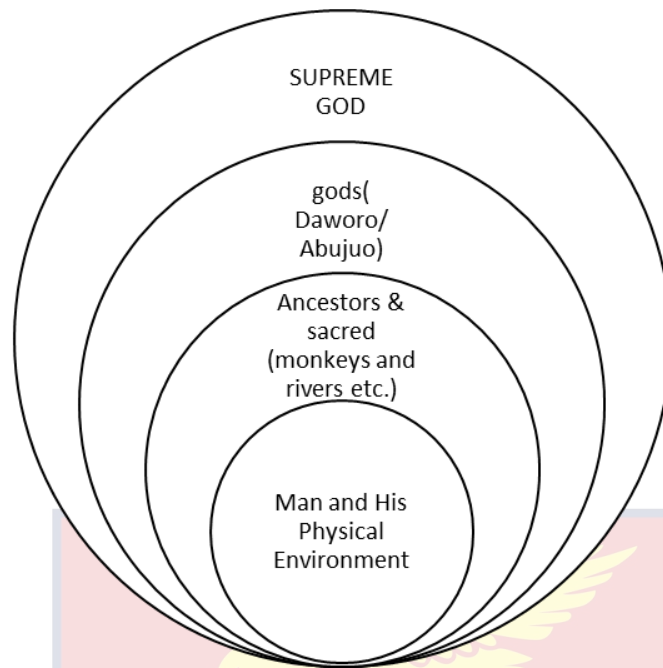
Figure 9: The Cosmovision of the Boabeng - Fiema People.

Source: Field data (2018)

The Boabeng – Fiema Cosmovision also affirms that, if nature is degraded, these sacred animals will migrate to other places, and will no longer bring messages to the humans nor transfer blessings to the land. This was confirmed in the interviews with the fetish priest and the chief's representative. The fetish priests added that, the Boabeng and Fiema communities also hold sacred the Daworo and Abujuo Rivers and forbids the pollution of those rivers. In an interview with a representative of the women group and the youth leader, they confirmed that it is a taboo (Akyiwade3), for a woman in her menses to visit the river. They added that, indigenes are also forbidden from visiting the river with any black attire. According to history as narrated by the fetish priest of the twin towns, the bearers of the Daworo and Abujuo fetish at two different times independently prophesied to the people of Boabeng and Fiema respectively that the Monkeys will bring blessings to the land and will draw men from all over the world to visit them. To fulfil this prophesy, the people were to

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desist from killing or harming them. The people were also charged by the gods to protect the habitat of the monkeys (the forest) and the rivers in order to preserve their own survival.

The Chief of Fiema in an interview stated that, it took hundreds of years before the people saw the first white man visiting the townships ; but today Calgary University, Canada has made the Boabeng-Fiema Monkey Sanctuary a research site bringing students annually to conduct research in Anthropology, Conservation and Bio-diversity. It was also observed and noted from the guest records books that several international tourists and local tourists visit the sanctuary on daily basis all in fulfilment of the promises of the two fetishes. According to the narrations of the chief's representative and the fetish priest, the cosmovision of the Boabeng – Fiema as shown in Figure 9, is founded on the knowledge that, humankind is a constituent of his environment which is a continuum of the physical and spiritual realms. In addition, the human is not lord of his environment but a steward who has responsibilities to ensure the harmonious co-existence of all other living organisms. Humans are however only permitted to kill and destroy other organisms if permitted by the supreme God through his mediators. Man lives in a physical environment which hosts all the natural resources available to man.

The physical world, according to the cosmovision of Boabeng – Fiema is a subsection of the world of the ancestors and sacred mediators. Beyond the world of the ancestors is the world of the gods (Daworo and Abujuo) who are the direct mediators and representatives of the Supreme God. According to the Fetish priest, it is the belief of the people of Boabeng – Fiema that, the supreme God speaks to mankind through the gods who decide on the medium through

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which to communicate directly to mankind. It can therefore be said that the ancestors and the sacred beings such as animals, trees, rivers and dwarfs are all messengers through which the gods relate to mankind. Furthermore, the fetish priest is the direct representative of mankind that has the direct capacity to communicate to gods, ancestors and the sacred beings through approved rituals and incantations.

History and Cosmovision of the TEK of Tafi – Atome

Interviews with the chief's representative and the assistant to the fetish priest on the history of the Tafi – Atome people and the TEK revealed that approximately 200 years ago, the ancestors of the residents of the Tafi Atome area migrated from Assin in central Ghana through a long meandering route to their current location in the Volta Region. According to them, the journey was dangerous and required spiritual protection so they brought with them an idol or fetish from Assin which was responsible for helping the people cross other states and rivers without suffering any harm. Upon arrival at their current location, the Fetish Priest advised the chief and people to keep their allegiance to the idol and preserve it in the sacred forest in Tafi Atome in order to keep it safe.

The fetish priest's representative further stated during the interview that, upon arrival, the fetish family resided near the forest of Tafi - Atome, and constantly performs rituals to maintain their connection with the idol and the ancestors. Following this settlement by the fetish clan, the forest was considered sacred and therefore protected. He added that, a short time after their arrival in the area, the village indigenes noticed monkeys that they believed they had seen in their original location of Assin, and therefore believed that the monkeys had

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followed them to Tafi. According to the assistant to the Fetish Priest, the Priesthood at the time felt some strong supernatural connection between the idol and the monkeys. The monkeys were hence considered as 'representatives of the gods' and therefore protected as sacred.

In the interview with the Chief's representative, he stated that, the fetish priest of Tafi - Atome is the intermediary between the village residents and the idol. Because the monkeys are associated with the idol, it is a taboo to kill them, harm them or destroy their habitat in any way. It is also a taboo to rear or keep as pet animals such as dogs in the community since they are considered enemies to the monkeys. A Monkey Festival which is meant to celebrate the monkeys takes place every February. A major aspect of the festival is carried out by the fetish priest who kills a goat and pours libations at the forest shrine. This ritual is meant to thank the Idol for its continuous protection for the people and also to seek the blessing of the idol and the ancestors for the ensuing year.

From the mind mapping on the narrations of the chief's representative, the fetish priest's assistant and the land owners' representative, the cosmovision of the Tafi- Atome places the universe into three main dimensions; the world of divinity, the spirit world and the physical world (environment). According to their cosmovision, all-natural resources dwell within the physical world (environment) which is under the domain of mankind. The world of divinity is under the domain of the supreme God who also has supremacy and influence over the two other worlds. The spirit world is under the domain of the gods and ancestors. The Fetish priest's assistant revealed in the interview with him that, two spirit entities intervene in the affairs of the physical world by

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communicating directly or indirectly to mankind through Plants and Animals that serve as messengers to the gods and ancestors.
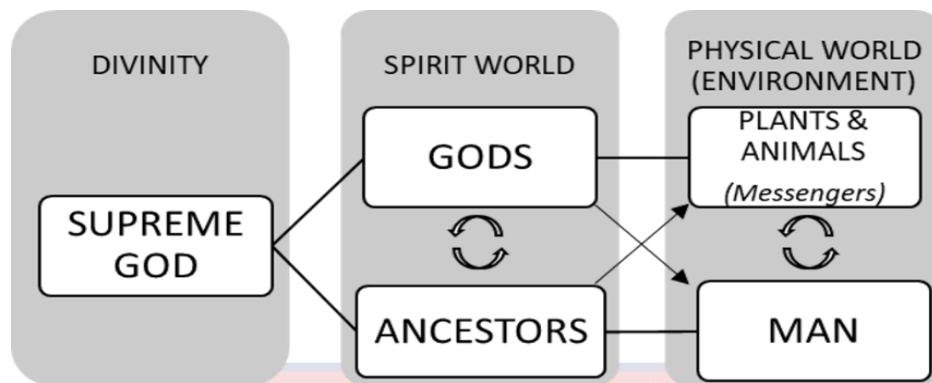
Figure 10: **The Cosmovision of the Tafi – Atome.**

Source: Field data (2018)

From the group discussions and the interview with the Chief's representative, it was evident that the people of Tafi - Atome see humankind as the domineering entity in the physical world but does not make him the master of the world of man this is because man's supremacy in the physical world is subject to the dictates of the spirit world and divinity. This assertion was supported by the assistant to the fetish priest. Based on this cosmovision, the people of Tafi–Atome, from the discourse analysis of the group discussion, do approve the use of plants and animals for food by mankind, however, the privileges given to mankind within the sanctuary are restricted. It is therefore a taboo for the people to harvest or hunt any animal in the sanctuary except mushrooms and herbs for domestic medicinal purposes. The collection of firewood within the sanctuary is also not allowed since the people believe that dead wood goes back to the soil to improve the fertility as well as serve as food and habitat for other organisms. These restrictions were revealed by the Chief's representative during the interview.

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The assistant to the fetish priest also stated that, animals that are being hunted outside the sanctuary (sacred forest) are spared and not pursued anymore once they enter the sanctuary. The sacred forests therefore provides a safe haven for endangered species and threatened animals within the Tafi- Atome community. The cosmovision of the three resource reserve areas was found to be similar to the Karanga cosmovision, and other cosmovision of African communities. In all the three cosmovision, the relationships between the social world, the natural world, and the spiritual world are key to the survival of mankind (van't Hooft, 2008). The expressions of the people and their appreciation of the three distinctive worlds (social, spiritual and physical) that make up the world of mankind could be described as the foundation of their Traditional Ecological Knowledge and resource governance practices. The linkage between the cosmovision of the communities and their TEK is strongly supported by the writings of Bertus (2003) which emphasise the dependence of TEK on cosmovision.

Moreover, the cosmovision of the three communities did not show any degree of restrictions on the basis of gender. Women and men had no special privileges in the hierarchy of their cosmovision unlike is seen in the northern part of Ghana where females are not permitted to perform spiritual rituals such as sacrifices (Apusigah and Opare, 2007).The cosmovision of the Amansuri study area, showed a clear appreciation of the artificial world and on the world of mankind. Such adaptation is similar to the Ugandan cosmovision which is described as a hybrid of indigenous beliefs and western scientific knowledge (Barneveld, 2006). The cosmovision of Boabeng – Fiema also exhibited a uniqueness in the marriage of two gods belonging to two different towns and

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culture. The marriage of the Abujuo and Dawora gods according to the narration of the Fetish priest of Boabeng- Fiema has united the two towns and merged their beliefs and understanding of nature.

The unity of the spiritual entities has resolved any potential conflicts between the two towns despite their historical and ancestral differences. This confirms the writings of (Emeagwali, 2003) that supports the principle that a group of people can be united when they have a common worldview and share similar ecological reservations when it comes to the use and conservation of their natural resources. Theoretically, it can be deduced from the cosmovision and the history of the three communities that their use and management of their resources for development is strongly tied to their history and cosmovision. In both Boabeng – Fiema and Tafi- Atome, the interviews with their fetish priests and fetish assistant respectively revealed that the gods frowns on any form of extraction from the sacred forest, hence, the only way of using the forest and its wildlife to promote development is through eco-tourism. This is a clear evidence that supports the writings of Ohmagari and Berkes (1997) that endogenous development is deeply rooted in the history and cosmovision of a group of people and the success of natural resource governance can also be tied to the history and cosmovision of the people concerned (Laudari,2010).

The conceptual framework highlights history and commotion as the foundation of TEK based on the empirical studies such as Laudari (2010) and Atanga (2015). This assertion has been confirmed by the nature of the cosmovision and history at Boabeng- Fiema, Amansuri and Tafi- Atome. From the findings, it can be deduced that some of the taboos and ecological restriction on the use of the forests can only be changed if the history of the people and

their cosmovision is altered a position that is also supported by Aniah, Asoglenang, and Bonye (2014), based on their study in the Upper East region of Ghana.

TEK Institution at Amansuri Study Area

Based on the discourse analysis of the interviews with the Fetish priest, the chief's representative and the clan elder at Amansuri study area, it was deduced that, the TEK of the Amansuri study area rests on the traditional and cultural beliefs of the people and their history. The interviews also revealed that the TEK is founded on three traditional institutional structures; the chieftaincy, the fetish priesthood and the clans and family systems. The Chieftaincy Council, according to the Chief's representative, and restated by the Fetish priest, is the head of the Traditional Council with oversight responsibility over all the other traditional agencies that exist in the community. The Chief, the head of the chieftaincy council, works in strict consultation with the Fetish Priesthood which is a consortium of traditional spiritual leaders and priests. The traditional priests, from the interview with the clan elder and the priest, are perceived as men with a "third eye" capable of knowing and foretelling the future. The priests are also accorded the status of the final authority when it comes to consulting the gods and ancestors for knowledge and directions concerning the environment and social well-being. This was revealed in an interview with the clan elder and fetish priest at Nzulezo. Based on this, though all traditional knowledge about the ecology is vested in the authority of the paramount chief, the single most powerful institution that is accorded the audacity to alter knowledge, beliefs and traditional worldview is the institution of the Fetish

Priesthood. This unique role and responsibility of the Fetish priest is similar to the role of traditional priests in most African traditions (Zulu, 2006).

The clan and family institution is the third hand in the TEK system at the West Nzema Area. According to the clan head, it is mainly assigned the responsibility of dissemination of TEK and socialisation. The clan heads are represented at the chiefs' council meetings where the fetish priest is fairly represented. The clan heads are obligated to contribute to the refining and institutionalisation of TEK at the Chiefs Council, which is the highest decision making body. The clan heads further disseminate the information gathered to the families under their jurisdiction. The family heads preside over an extended family unit which is mainly matrilineal.

Figure 11, shows the organisational structure of TEK at The West Nzema Traditional Council. Based on field interviews and group discussion at Amansuri, it was revealed that the paramount chief serves as the president of the Management Board of the Amansuri Conservation and Integrated Development (ACID) project. The manager of the tourists centre in an interview stated that, the bylaws of the project are based on traditional laws which are sourced from fetish beliefs, traditional taboos and folklores.

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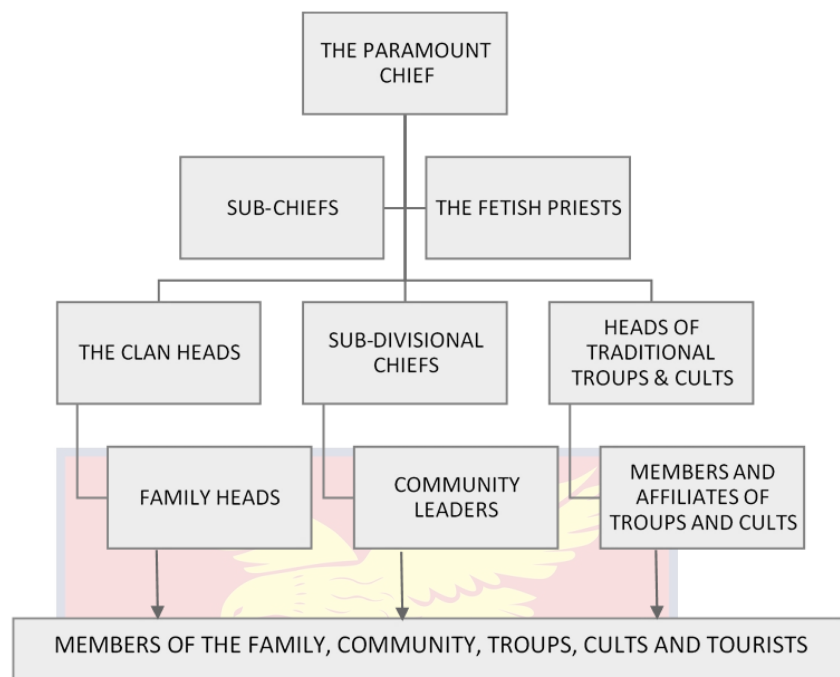
Figure 11: **The Organisational Structure of TEK at Amansuri.**
Source: Field data (2019)

The Nzulezo fetish priest is the chief custodian of all TEK concerning the use of all-natural resources around and within the Nzulezo community. From the field interviews and group discussions, it was noted that TEK processes within the Amansuri study area is mainly based on divination, consensus building and communal experience. This was confirmed by the responses of the fetish priest during the key informant interview. The beliefs of the people with regard to farming, fishing and hunting are greatly entrenched in the fetish beliefs and experiences over time.

These beliefs and practices are based on several years of experiences in the field. Most common TEK reviews have to do with herbal medicine, use of natural resources and taboos on human behaviour which extends beyond indigenes to tourists. A typical example is the taboo which prevent women who are having their menstrual flow from crossing the river to some parts of the

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lagoon. According to the chief's representative, this taboo does not extend to tourists and researchers. When asked why the exemption was made for tourists, the Fetish Priest responded that, tourists could be pardoned for lack of knowledge of the taboo. Though most of the taboos and traditional restrictions on the use of resources and human activities have remained the same for hundreds of years, there have been several modifications to these taboos since the ACID projects began in 1999 and tourism became a major revenue source for the area.

According to the clan elder interviewed during the field data collection, all acquired knowledge by ordinary citizens regardless of the source is supposed to be validated before being approved for dissemination. Where an individual's discovery or experiential knowledge is brought to the knowledge of his clan or family head, the Fetish Priest is consulted for verification and validation. According to the Fetish Priest, he confirms, verifies and validates new knowledge through divination and other practical rituals. For example, a new discovery in agriculture such as plants behaviour in a particular season can be validated by practical rituals such as close observation by the Fetish in a controlled environment. The controlled environment used in a practical ritual was explained by the priest to mean that, the fetish priest will spiritually secure the site and ban members of the community from visiting the observatory sites until the observations have been recorded and verified.

This process is similar to a laboratory or a scientific field study where a researcher controls environmental factors in order to establish a scientific fact with given variables. The process of knowledge verification by the fetish priest involves both spiritual and physical activities; spiritual activities are necessary

to seek the favour of the gods to ensure that there is no spiritual pollution from evil spirits and the physical precautions are to ensure that natural phenomena are well managed and accurately observed. This similarity in knowledge verification in traditional and western scientific knowledge supports Cajete's description of TEK as a native science which focuses on the study of natural laws of interdependence (Cajete, 2000).

The verification process is finalised by a process where the fetish priest and his assistants present their findings to the chief's council for approval for public dissemination. Where the knowledge discovered is found to be harmful for public consumption due to the possibility of being abused, the knowledge is concealed under oath. In such a situation, all persons who are privileged to have the knowledge are made to swear to gods that they would never share that knowledge with anyone else. This practice, according to the priest, is important for protecting the community from harmful knowledge. Examples of such destructive knowledge according to him are the knowledge of evil rituals, summoning spirits and invoking curses using natural entities like plants, rivers and animals. Where the knowledge discovered is necessary for mass public consumption, the council will sanction it for further dissemination to the entire community by the clan and family communication system.

Modification or review of traditional ecological knowledge is done when new experiences inform the need to revise old beliefs and assumptions. This was revealed by the clan elder and the Chief's representative during the interviews. According to them, whenever a new discovery challenges sacred beliefs, they are presented to the Fetish priest who inquires of the gods and the ancestors their position on the new-found knowledge before making an official

statement on the matter. It was observed that the TEK of the West Nzema Traditional area is a hybrid knowledge system with several modifications influenced by western scientific knowledge usually from their exposure to scientific knowledge through formal education and the activities of organisations such as the Ghana Wildlife Society, The Ghana Health Services, Ghana Forestry Commission- Wildlife Division and the Friends of the Earth (an NGO).

The influence of western scientific knowledge was greatly seen in their traditional knowledge on the causes of diseases. It was gathered from the group discussion that, the people had knowledge on disease causing agents such as microbial germs and worms which lived with them in the environment. The interview with the fetish priest revealed that before the introduction of western scientific knowledge on the existence of microscopic disease-causing organisms, the people attributed diseases to spiritual causes such as evil spirits and punishment for flouting taboos that dealt with sanitation and hygienic environmental behaviour. It can therefore be deduced from this assertion that, prior to western science, the people of Amansuri study area attributed diseases not only to spiritual causes but also poor hygiene and sanitary conditions.

From the group discussions, and interviews with the Tourists Centre Manager, it was deduced that, communication of TEK was done mainly through the family and clan communication channels such as monthly family meetings and biannual clan meetings. The traditional socialisation structure begins from the home with the parents being the key facilitators and supervisors. The duty assigned to parents as socialisation agent according to the clan elder interviewed

is a duty assigned to them by God. It is the responsibility of the chief and the gods to ensure that all parents perform their God given assignment.

The clan elder said in an interview that; the success of parenthood (Awovolɔ) is symbolised by or measured according to how well the children are groomed in the traditions of the land. According to the clan elder, an ill-mannered child is an insult to his clan and the entire community. The community therefore places much value on effective socialisation at home. During the group discussion, it was revealed that men see the role of socialisation, to be mostly centred on women. This was explained to be based on the fact that, women spend more time with the children at home and are therefore expected to be the ones to teach and socialise the children on tradition, culture and taboos. The assembly man in an interview cited a situation where a father would ask a mother why his child does not know something the child is expected to know. Two market women who were part of the group discussion, however expressed dissatisfaction with the current structure of their society, where the fathers who mostly sit on committees' reserve and keep lots of information to themselves. The women therefore requested for more involvement of women in the governance system in order to make their work as key socialisation agents easier. The women also added that, although the fathers expect them to teach the children most of the traditional knowledge on nature, the fathers played a key role in training children on traditional farming and fishing techniques as well as bringing the children to order when they err.

Enforcement of the laws and traditions at Amansuri wetlands communities was done by both traditional and statutory procedures. According to the assemblyman, the paramount chief presided over major disciplinary

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issues that had to do with the conservation area. For the enforcement of traditional laws and traditions in the various towns surrounding the Amansuri conservation area, sub-chiefs of the various towns and their fetish priests preside over law enforcement and disciplinary issues. The Assembly Man and the Tourists Centre Manager both stated that, the sub-chiefs of the various towns have traditional councils which comprise the clan leaders, fetish priests, youth leaders and women leaders. Where a community member flouts a law or a taboo, he is reported to the fetish priest who prescribes remedial measures sometimes in consultation with the Chief and the council. According to the Fetish Priest, flouting environmental taboos of the land require spiritual cleansing and forgiveness from the gods who are the custodians of the land and all-natural resources.

From the interviews conducted, the major products of the Amansuri TEK are the beautifully crafted stories and folklores that describe the people's past and relationship with the gods. It also includes stories on the resources that the gods have blessed the people with. Other major products of the TEK are several practical knowledge on farming, fishing and hunting within the Amansuri River, lagoon, wetlands and Forest. It was revealed during the group discussion that the people of the Amansuri study area, based on experience, divination and consensus building have a large collection of traditional knowledge on the most effective ways of farming along the lagoon, fishing in the river and along the mangroves as well as hunting in the forests without facing the wrath of the gods (destroying the environment).

According to the Fetish Priest of Nzulezo, any activity that destroys any part of the environment is considered an act against the gods and attracts curses

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from the gods and ancestors. The traditional ecological knowledge of the West Nzema Traditional Area is also presented in products such as the songs and traditional rhymes recited by children in the villages. The songs are used to teach children the history and best practices in the community concerning their environment and resources. The value the people attach to some of their natural resources such as the forest (ehoayele), crocodiles (elenwene), monkeys (ahomu) and the raffia palms are clearly evident in the traditional totems and symbols that are used to represent clans and families in the communities. The clan elder in the interview mentioned some clans and their totems as follows;

	CLAN	TOTEM	MEANING
1.	Nvavile	Parrot	Communication, hope and promise
2.	Madwuri	Vulture	Sanitizer , purification and transformation
3.	Akisi	Buffalo	Abundance, strength and intelligence
4.	Ezohile	Crow	Persistent and go getters, knowledgeable
5.	Azawua	Leopard	Strong intuitive abilities and sensitivity
5.	Asamangama	Bat	Easily adopts to change in Circumstances
6.	Awongoba	Falcon	Faithful and reliable messenger
7.	Ahwea	Dog	Loyal guardians and perseverance

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These totems as narrated by the Chief's representative describe the uniqueness of members of those clans and establishes human's relationship with nature. According to the Fetish Priest, totems also justify the need to conserve these resources. He added that, members of the various clans are traditionally forbidden from capturing, hunting, eating or even harming animals that serve as their totems. This practice serves a huge conservation purpose.

TEK Institution of Boabeng- Fiema

The Traditional Ecological knowledge of the Boabeng – Fiema communities are enshrined in the powers of the chiefs and traditional fetish priests. This was revealed by the Fetish priest of Boabeng. He added that, the chiefs consult the fetish priests in all matters concerning TEK. However, the chief and the fetish priest do no act alone but take decisions with a council of elders comprising the queen mother, the head of the royal family (abusuapanyin), heads of the clans and leaders of traditional organisations such as the youth and women organisations. The traditional council of the Boabeng - Fiema comprises the following; Chiefs and elders of the two towns, The Community Chief Priest and other divisional chiefs such as Abarasehene and Sesedom (from the Edwa River).

The Chief's representative in an interview mentioned some important social functional groups that played a role in communicating TEK. They included;

- Endamenkomeso (traditional music and cultural troupe)

- Unique Traditional Group (Social development group) –

- Nyamebekyere Group (Social Welfare Group)

- Fiema Youth Group (Community Vigilante and General development group)

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              │ Traditional Fetish  │
              │     Priests         │
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              │  │ Daworo and     │ │
              │  │ Abujuo Priests │ │
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Royal Family Elders	Clan Heads	Organisational Leaders
Queen Mother , Family Head and Sub- Chiefs	Clan heads (Abusuampanyimfo)	Assemblyman, Youth Leader, Women Leader , BFMS Manager
	Family memebers	Organisational members
	Nuclear and external	Members across the 6 communities of amansuri

Figure 12: **Organisational Structure of Boabeng - Fiema TEK.**

Source: Field data (2018)

From the interviews with the Fetish Priest of Boabeng, The TEK processes in Boabeng – Fiema begin with knowledge discovery or creation, which is done through the accumulation of experiences of the people. These experiences are refined through practice, divination and intuition. The final authority when it comes to refining and verification of traditional knowledge rests on the Fetish Priest. The concept of knowledge according to the people of Boabeng –Fiema is the realisation of truth about an aspect of life and the world. The people of Boabeng - Fiema according to the Fetish Priest, accept all sources of truth as credible as long as it was physically or spiritually verified by practical means or divination through their gods. Knowledge about plants and their medicinal usefulness according to the Fetish Priest who is also the chief

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herbalist has been gathered over centuries and such knowledge has mainly been passed on orally. He further explained that the community also shares knowledge with other communities and therefore such knowledge is dynamic and keeps getting better since new discoveries from other communities, research groups and herbal clinics are adopted and practised. He also stated that in situations where a strange disease affects any member of the community, the Fetish Priest would consult the gods and he/she would be guided to identify specific herb(s) that can serve as cure to the disease. Due to this, medicinal plants within the sanctuary are considered sacred and members of the community need permission to collect them unless in emergency situations.

The communication of TEK is done through the TEK structure both in an upward and downward direction. However, all validated knowledge must come from the top (Chief and Fetish Priest) and communicated to the citizens through the clan heads. Within the nuclear family, communication is mainly carried out by the parents who are responsible for teaching the child the traditional beliefs, norms, taboos and practices especially with regard to their interaction with nature and fellow human beings. One mother revealed in the group discussion that, for most mothers in the Boabeng – Fiema community, teaching their children about the taboos of the land was of key essence at home. According to her, until your child can appreciate, understand and practice the taboos of the land you do not consider it safe to send or allow your child to go out alone.

When asked how children are taught the ecological laws and practices, the mothers, during in the group discussion responded that, they mostly used folk songs and storytelling to make the children understand the importance of

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observing the laws governing the use of their environment especially with regard to the conservation of the monkeys in the community. In one mothers words, "Maame biaa a woankyerɛkyerɛ ne mma saa amamerɛ no diɛ, na ekyere sɛ ɔnndɔ ne ba" meaning "any mother who does not teach her child these traditions does not love her child". According to them, it is these traditions that makes them live in harmony with the gods, nature and their fellow men and so without these traditions one cannot live happily in the town.

In the interview with the representative of the Chief of Boabeng, He stated that the enforcement of the laws and traditions of Boabeng-Fiema dwells traditionally with the chief priest and the chief's council. He added that, the chief and the fetish priest had assigned some of their powers to the assembly member and the unit committee. The unit committee as at the time of the study was responsible for ensuring that the traditional and statutory laws as established by law were followed by all members of the community. The committee was also responsible for ensuring that any member who is found flouting any of those laws was apprehended and sent to the chiefs or the Fetish Priest for correction. The Assembly member explained in the interview that, where a member of the community flouts any of the national laws concerning the sanctuary and forest reserves, he was sent to the police for correctional measures.

According to the Fetish Priest, flouting the taboos of the land requires cleansing and forgiveness from the gods who mediate between man and the supreme God. He therefore revealed that it was not enough for the police to arrest someone for killing a monkey. He further explained that, no matter how long a person spends in prison for killing a monkey, one would not be spared of

the curse one brings upon him/herself for committing that crime. According to the Fetish Priest, sacrifices would have to be performed to cleanse the culprit's soul (Okra) to save him and his family from the wrath of the gods. He added that if a person kills a monkey intentionally, the person may be fined and be made to go through a ritual of cleansing. However, if he or she refuses to go through the rituals he/ she may be banished entirely from his clan and the town.

From the interviews and group discussions, it was revealed that the customary laws in Boabeng - Fiema places a ban on farming, harvesting and hunting in the forest habitats of the Colobus and Lowe monkeys (children of the gods). This ban is strategic to protect the home, sources of food and the young ones of these two monkey species. This restriction on hunting and harvesting is based on the traditional knowledge that, the monkeys cannot survive alone in the forest unless their ecological partners (flora and fauna) are also well protected. This is supported by the scientific principle of food webs, food chain and other mutualistic biological relationships in western science. The people are however free to pick mushrooms from the sanctuary.

The ban further extends to the rivers and air space of the forest area. Excessive noisemaking in the forest as well as open defecation in the forest is also banned. Rituals governing the burying of monkeys is highly upheld by the two communities leading to the creation of a unique cemetery for the monkeys. This practice helps to prevent pollution of the forest with carcass of monkeys. It was revealed in the interview with the women group leader that, the culture, history and traditions of Boabeng – Fiema are carved into beautiful memorable stories that have been told over three hundred years. The creation of stories is an ongoing process with some stories being as recent as a week old. For the

people of Boabeng – Fiema, their story can best be told by themselves hence, the need to constantly tell their children and neighbours about their culture and history so they are not forgotten. From observation and listening to some of the stories, it was realised that as a way of entrenching the virtues and morals of the TEK, many of the stories centre around the discovery of their fetish, the relationship between the fetish and the monkeys, the promises and benefits of living in harmony with the monkeys, the dangers associated with harming the monkeys and the sad fate of people who have gone against the customary laws and taboos in the past.

TEK Institutions of Tafi Atome

TEK institutions are the functional units responsible for facilitating the discovery, verification, communication and enforcement of Traditional ecological knowledge in the community (Hanna, 1998). Form the interview with the assistant to the Fetish Priest of Tafi – Atome, it was revealed that the chief is the highest authority in the land but when it comes to traditional ecological knowledge, he does not hold the ultimate power but always consults the Fetish Priest who is considered to be the linkage between the spirit world and the physical world.
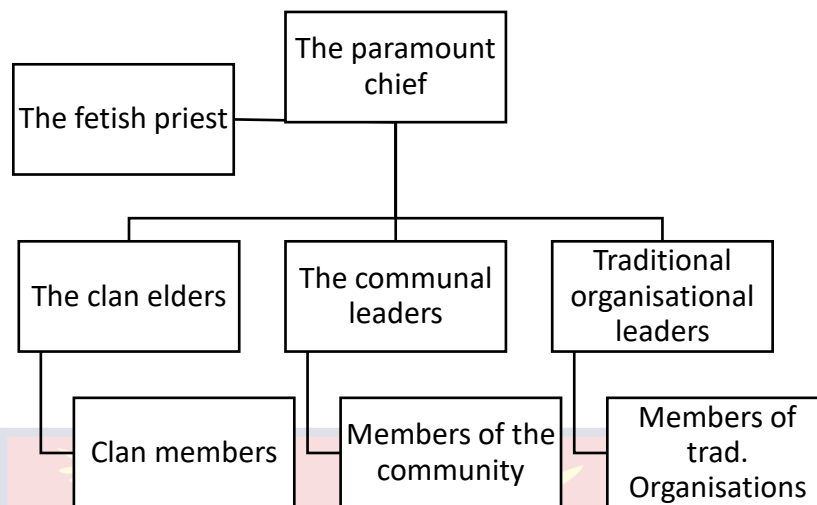
Figure 13: **TEK Functional Units at Tafi – Atome.**

Source: Field data (2018).

It can therefore be deduced that the first and ultimate institution is the Chieftaincy Institution which works closely with the fetish priest to ensure efficient knowledge management. The authority of the fetish priest according to the Chief's representative, extends from the Paramount Chief. The priest does not undertake any decisions without pre-informing or consulting the chief. The organisational structure of the functional units of TEK is as shown in Figure 13. The structure was constructed from the responses of the Chief's representative, the assistant to the Fetish Priest and the representative of the Landowners. It can be inferred from Figure 13 that the clan leaders, the communal leaders and the traditional organisational leaders serve as the middle belt in the TEK structure and serve as the mediators between the people and the chief. The people obtain much of their information from their clan, community and organisational leaders and when necessary, they communicate to the chief through their leaders.

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An interview with the chief's representative revealed that, the Tafi - Atome society thrives on knowledge of its environment and nature thus, all information about nature must be general knowledge. Based on this, it was considered inappropriate for people to conceal knowledge of herbal medicines and traditional farming technologies. The discovery of Traditional Ecological Knowledge is therefore a communal assignment. According to the landowners' representative interviewed, it is a common practice for members of the community to constantly inquire about how their environment changes and function through experimentations and observation. He revealed that, arguing and debating about observations in the environment and on the farms is one common way by which raw knowledge is refined. From the group discussion, some discussants who are farmers revealed that, the knowledge of farming seasons and best farming practices has been passed on from generations but present-day farmers constantly experiment new methods to identify alternatives to achieving higher yield.

Verification of Traditional Knowledge is very important to the people of Tafi- Atome especially when it comes to the protection of animals, the forest and water bodies. According to the Priest's Assistant, the people of Tafi - Atome believe that these natural bodies are entities through which the gods communicate to human kind and thus need to be revered and protected as we protect human life. He further explained that, no member of the community can communicate a spiritually sourced knowledge about the environment to another person in the community without consulting the Fetish Priest for verification. Furthermore, he revealed that, best farming practices, ecological laws, use of natural resources, songs as well as stories told to promote, establish and sustain

natural resource protection and development must be refined and validated by the Fetish Priest before they are disseminated.

The modification of traditional knowledge according to interviews with the representative of the Fetish Priest and the chief's representative, is key to the survival of their culture and society. They believe that knowledge is not static and therefore time refines knowledge. They however stated that the only aspect of knowledge which does not change is their history and identity as a people such as names, clans and basics of their language. The Fetish Priest's assistant stated that, there are no laid down processes of modifying traditional knowledge, however, when something which is common knowledge is later found to be false or incomplete knowledge either as a result of new discoveries or revelation through divination by the fetish priest, the new knowledge is circulated through the traditional mouth piece of the chief to give it official backing. According to him, it is illegal to circulate information about nature which is contrary to traditionally accepted knowledge. It is therefore paramount that all new discoveries that are likely to change already existing TEK, be made known to the Fetish Priest and the chief's council for verification and possible dissemination if found to be true.

Communication of TEK in Tafi - Atome is facilitated by family, friends and social organisations that one belongs to or associate with. The major agent of traditional knowledge communication according responses from the group discussion is the family (both nuclear and extended). The source of TEK to the family are social agents such as the schools, churches, traditional organisations and association. These are traditionally accepted as channels of communication for the chieftaincy and the fetish family. Apart from the family, friends were

also named as a major source of Traditional Ecological Knowledge. It is believed that a person's circle of friends determines how knowledgeable he/ she can be about nature. In the interview with the Manger of the tourists' centre, he revealed that parents saw the task of teaching their children about nature a primary responsibility because children who failed to comply with social norms were not punished alone but their parents were also summoned to answer for them.

Tafi – Atome thrives more on traditional enforcement approaches more than statutory options like using the police or the courts of law. This was revealed by the Manager of the tourists centre in an interview. He added that, the traditional processes of law enforcement involve practices such as ritual atonement, banishment and ritual baths to ward of spiritual curses and public mortification. These practices according to the managers and chief's representative, are much more revered than the police and the laws of the state. In the group discussions, some discussants attributed their interests in traditional methods of enforcement to the fact that, the state's legal system is capital intensive and time consuming. Based on their experience over the years, people found the traditional methods to be more effective because it purged the culprit of both physical and spiritual repercussions of their crime. The formal and statutory methods were not capable of purging culprits from the spiritual effects of their crimes.

TEK products according to the Priests assistant, are highly important to the people of Tafi - Atome. He added that, TEK products are considered as the factors and artefacts that establishes the Traditional Ecological Knowledge in the minds of the people. Key TEK products in Tafi - Atome are songs about the

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environment, stories on plants and animals, folklores, traditional herbs for treating and curing diseases, traditional farming and animal husbandry technologies etc. The assistant to the fetish priest described the knowledge and the art of mimicking the cry and sounds of animals as TEK products. Farmers in Tafi - Atome had traditional herbal products that were effective pesticides in the control of pests on their farms. This knowledge was developed based on their observation of those plants in the wild. A common example was the neem - tree. The farmers used the leaves of the neem – tree and other bitter leaves for controlling pests on the farm. The manager of the tourists centre in an interview stated that some artefacts which are also TEK products are unique to Tafi – Atome and persons who exhibit those products and show of such artefacts are easily identified as citizens or persons who have lived in the Tafi - Atome Community. An example of such artefacts according to him are special beads and kente patterns which are native to Tafi – Atome. A unique ecological product that I observed was a special attire worn by hunters made with leaves and twigs of trees which enabled hunters to easily blend with their environment. The leaves were hyssop, which the people believed are capable of protecting the hunter from harm.

TEK processes were examined in the three communities guided by the model of TEK systems as proposed by Wenzel (1999) and Berkes (2000). The model as shown in Figure 14 , presents the processes that facilitates the sustenance of TEK in four major activities; Discovery, Verification, Communication and Socialisation and Enforcement.

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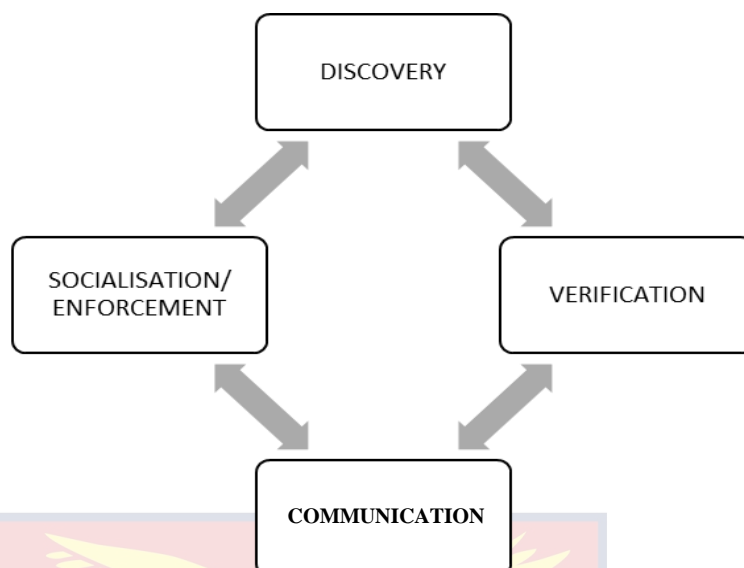
Figure 14: **TEK Processes.**

Source: Author's construct based on Wenzel (1999) and Berkes (2000)

TEK processes as described by Wenzel and Berkes in figure 15 above were found to be prevalent in all three study areas but were conducted in different ways. Furthermore, the facilitators of each stage of the process were different based on the culture and nature of their TEK. The distinctions in the processes among the three communities lied in the intermediary source of knowledge (divination) which is the gods of the land (Peek, 1991). In Boabeng – Fiema the intermediary source of knowledge was the Abujuo and Dawora gods which are river gods. In the case of Tafi – Atome, The god of the land (whose name is withheld) is a terrestrial fetish who offers protection to the people. The Amansuri god of the river Amansuri however is the source of divine knowledge for the people of Amansuri.

According to Peek (1991), the difference in intermediary source of divine knowledge leads to differences in the priority of TEK and developmental goals. This difference is clearly seen in the three study areas with regard to the key objects of protection. In Boabeng- Fiema the key objects of protection are the Black and White Colobus monkeys, the Mona Monkeys the Dawora River

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and the Abujuo River. At Amansuri the key resource of interest and protection is the Amansuri River and all other wildlife within the sacred forests surrounded by the Amansuri river. The Tafi – Atome resource of interest from the interviews and group discussions is the Mona Monkey and its sacred forest habitat.

The TEK processes in the three resource areas shared a lot of similarities with the generalised model as discussed in the literature review in the writings of Berkes (2000). The processes as found in the three study areas can be expressed in a new model as shown in Figure 16.
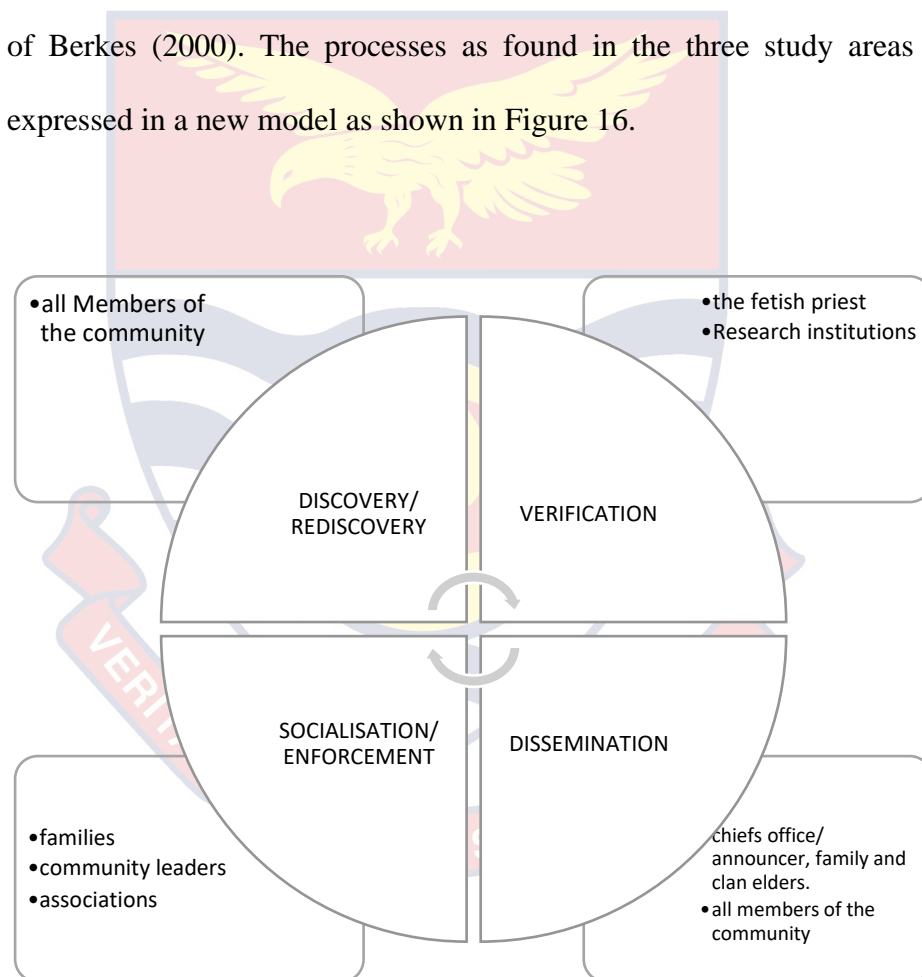
Figure 15: **TEK Processes at the Three Resource Areas.**
Source: Field data (2019)

Discussions on the TEK Organisational Structure of the three
Study Areas

The structure of the TEK institutions as found in the three resource areas works in both directions when it comes to the flow of information and knowledge sharing. The institutions found in the three resource areas could best fit into Olson (1965) definition of institutions as the collectively agreed upon social arrangements that govern the interactions among members of a given group of people. The institutions function as mediating agencies just as described by Berger and Neuhaus (1984). Each member of the community can communicate to the chief and his elders using the right communication channel. Members of the families can communicate to their family heads who are ably represented at the traditional council. Where the matters are institutional oriented, the leaders of such traditional institutions would forward such matters to the council for deliberations.

Where a member of the community comes across a knowledge of ecological importance, he or she will have to forward his discovery to the chief's council through the family head and he or she will be asked to present his evidence or basis of his knowledge. Where the basis of his knowledge may not be physical, the Fetish Priest shall be asked to consult the Fetish for confirmation. A confirmed TEK is accepted by the chief's council and communicated to all members of the community through their family heads, institutional leaders and the town announcer through the Community Public Address System.

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Knowledge and Practical Skills from all three Study Areas

The people of Boabeng – Fiema, Tafi Atome and Amansuri had in-depth knowledge of basic herbal medicine such as the use and importance of popular herbs like nyankyerene and kokowa leaves for stopping bleeding, Cassia, Cocoa, Nantwibene and teak leaves for the treatment of fever. Other potent herbs included the kokomisuo leaves for fever, mahogany bark for treating and managing body pains and sexual weakness.

The people also had experiential knowledge of the local farming seasons and climate. With this knowledge they were able to predict best sowing times and harvest times for their various staple crops and cash crops such as banana, cocoa, maize and citrus plants. The farmers are also knowledgeable about pests and parasites of their crops and livestock. They could therefore be said to have basic scientific knowledge on biological relationships such as parasitism, mutualism and other symbiotic relationships among living organisms. Based on this knowledge, most farmers were aware of some natural herbal pesticides such as the leaves of the neem tree and extracts from the bitter leaf which could naturally repel most pests.

It was also observed that the people had in-depth knowledge of animal behaviour and animal reproductive patterns most of which were similar with western scientific knowledge regarding animal behaviour, anatomy and physiology. With this traditional knowledge acquired through years of observation and experiments the people could predict mating times of animals, arrange for breeding sessions, identify weak and sick animals as well as identify highly potent males. The farmers who were into animal production and wildlife management were seen to extend their knowledge on farm animals to their

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wildlife management practices. In all three study areas tourists were restricted from breeding sites during the mating season. They could also deduce the mood of the animals from their behaviour and sounds and predict if a wild animal would be friendly or aggressive towards tourists. Most tour guides could explain the cries and sounds of the animals especially the monkeys, birds and crocodiles (at Amansuri). They used the sounds to tell if any animal was in distress, in labour or on heat and needed a mate.

Finally, the TEK of the three study areas had reliable knowledge on climatology. The people were well knowledgeable about their rainfall patterns, temperature and humidity patterns. They could also explain the relationship between months of the year and the changes in the weather conditions. They were also able to use this knowledge of their climate to plan their farming activities and other sanctuary management practices. In all three study areas, the seasons were marked by special traditional rituals and performances which were considered scared and highly important for their survival and social wellbeing. In Boabeng – Fiema and Tafi- Atome, the Chief Fetish Priest performed the first rain rituals in March or April to usher in the rains in May. In Amansuri such rituals were performed in May to welcome the rains.

Resilience of TEK and Governance System

According to Walker and Salt (2006), resilience is the ability of an ecological system to or a society absorb disturbances or external influences and still retain its basic function and structure. The three study areas were found to be structured basically on their ancient beliefs, culture and ecological knowledge. It was also observed that although Christian religion had had a toll on their traditional religious worship and practices, it had not changed their

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Cosmovision and their traditional perspectives on the management and governance of their natural resources. The resilience theory explains the principle that for a traditional knowledge system to remain relevant in natural resource governance, it needs to be able to survive social change without losing its ecological significance (Carpenter, Walker, Anderies & Abel, 2001). This principle was found to be very significant in the fact that the chiefs and people of these communities had warmly embraced other organisations such as the Forestry Commission, the Wildlife Society and the NCRC as partners in refining their ecological knowledge without changing their traditional rules, beliefs and practices.
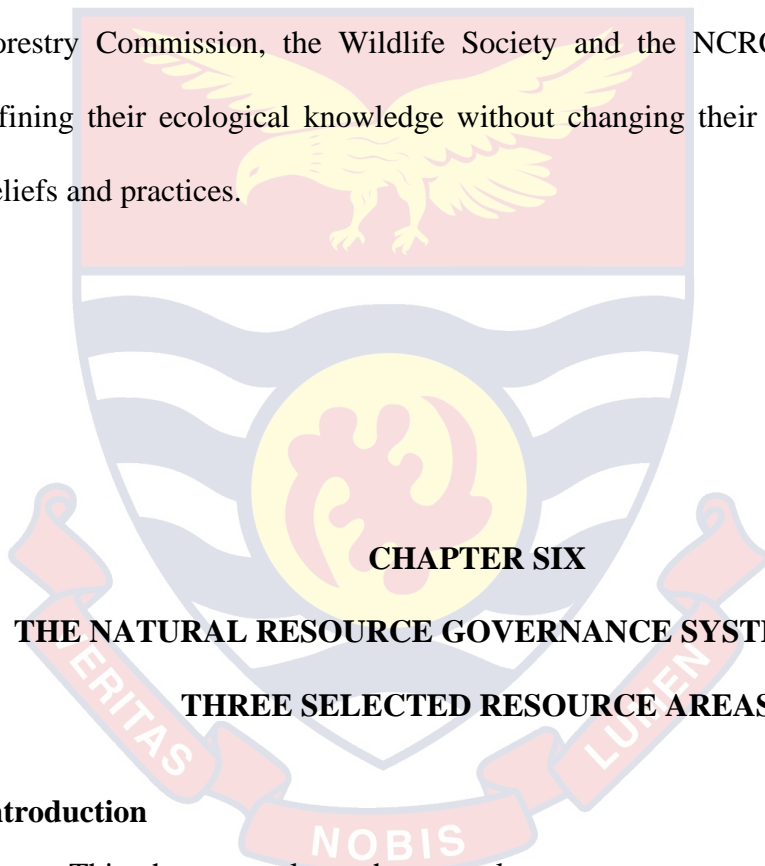
CHAPTER SIX

THE NATURAL RESOURCE GOVERNANCE SYSTEM AT THE THREE SELECTED RESOURCE AREAS

Introduction

This chapter explores the natural resource governance systems at the three study areas. The second research question is answered in this chapter by examining the pillars of NRG: laws, processes and institution in the three resource areas. The chapter further discusses four principles of NRG: transparency, rule of law, accountability and participation, as it pertains in the three communities and highlights their similarities and differences. The sixth chapter also highlights the sharing and use of revenues obtained from the

governance process. The principles of NRG are discussed as necessary requirements for endogenous development based on traditional laws, institutions and processes. Furthermore, the significance of these principles are emphasized by the assumption in the Assurance Problem Theory, which ties successful governance of natural resources to the effective processes aimed at ensuring transparency, accountability and participation. The chapter also examines how the governance system adopts to change as prescribed by the resilience theory and depicted in the conceptual framework. The findings stated and discussed in this chapter were arrived at from extensive discourse analysis of the responses of interviewees and group discussants. Additionally, thematic mind mapping procedures were used to establish the governance institutional networks and procedural linkages.

Natural Resource Governance at Amansuri

In an interview of with the Tourists Centre Manager, it was revealed that, at Amansuri, the laws on natural resource governance area are a combination of statutory and traditional laws on the use of their natural resources. The statutory laws defined the Amansuri wetland area and its wildlife resources as a Nature Conservation Area under the Amansuri Conservation and Integrated Development (ACID) Project. The manager further explained that, the ACID project was designed and implemented by the Ghana Wildlife Society (GWS) in partnership with the Western Nzema Traditional Council (WNTC) in 2000. The ACID project according to the Assemblymember for the area is run on bylaws which have incorporated statutory laws and traditional laws. The Assemblymember further explained that, the bylaw assigns both scientific environmental reasons as well as traditional beliefs and religious justifications

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to the laws and regulations on the use of the natural resources. The bylaws prescribe appropriate use of the resources as well as provide deterrent measures and punishment for persons who flout the regulations. A review of a portion of the bylaw revealed that, the key resources regulated by the bylaws are; the Amansuri lagoon, lake, wetlands and mangroves. Other protected resources are the beaches and the wildlife including the fishes, turtles and birds.

From the interviews with the Centre Manager, Assemblymember and the Chief's representative it was confirmed that, the laws on resource usage and protection accepted both statutory punishments and traditional deterring measures for people who flout the laws. The statutory penalties for flouting the bylaws include fines, imprisonment or both if found guilty by the court. Traditional penalties and deterrent measures include; fines, ritual cleansing and sacrifices, banishment and exemptions from some social privileges if found guilty by the traditional disciplinary committee. According to the Chief's representative, the traditional disciplinary committee is headed by the priest and the community mother (elderly woman who is also the community counsellor). This shows an integration of TEK institutions into the Natural Resource Governance. He added that, the laws permit the harvesting of fishes and fruits and even occasional hunting of some animals such as grasscutter and snails. The manager of the tourist centre revealed that, the law permits the harvesting of raffia palm branches for buildings and their fruits for wine making. However, it bans strictly, the harvesting of threatened and endangered species within the conservation area. Traditionally, there are buffer seasons and fallow areas as well as refuge sites (sacred zones) where hunting is strongly forbidden.

From the interviews with the Centre Manager, Assemblymember and the Chief's representative, it was revealed that the governance of the natural resources in the Amansuri Conservation Area includes four major activities; ecotourism management, resource protection and conservation activities, traditional ecological rituals and practices and community durbars and reporting activities, The tourism management team according to the Manager, supervises visitations, research, legal extractions and revenue collections at all the major tourists sites around and within the Amansuri River, lake and wetlands and forests. According to the Head of the Tour guides, a major activity involved in the management of ecotourism was the reception of tourists at the tourist reception centres at Benyin and Nzulezo. From observation, all tourists are given a brief history and introduction to all the attractions within the Amansuri enclave which are the Nzulezo Village on Stilts, Ebonloa forest and wetlands, the Meandah Trail, the Bakanta Trail and bird watching sites.

The manager and the head of the tour guides said in their interviews that, the management team ensures strict adherence to the traditional and statutory restrictions in bylaws. Stated examples were that, visitors who are in their menses are advised not to swim in the water since it is detested by the goddess Amansuri. Also, the Meandah Lake is closed to visitors on Wednesdays; a day recognized as taboo by the community to visit the lake. The management team also allows economic activities within the protected area but these activities are strictly controlled using bylaws agreed upon by the traditional council which is a combination of traditional and statutory laws on the protection of natural resources. In addition, local taboos that limit the time of fishing, the type of fishing gear and the establishment of sacred no fishing zones have significantly

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contributed to the control of overexploitation of the fish resources in the wetlands.

According to the manager and the head of tour guides, the management team sees to the collection of approved fees from all tourists and guide them through their areas of interests. The management team guides the tourists to ensure that they do not miss their way to the sites, engage in any activity which is contrary to approved bylaws and traditions or harm any animal or plant species which is protected by the law. The team also ensures that visitors do not engage in unlawful research practices or tourism practices.

Some other routine management practices include coordinating and facilitating;

1. Routine maintenance of touring logistics and equipment such as boats, life jackets, telescopes etc.

2. Cleaning and weeding of tour trails and walkways

3. Information circulation and management to town folks and tourist

4. Financial and operational reporting meetings and durbars

5. Assessment of tourist's satisfaction and challenges.

In an interviews with the chief's representative and the manager, it was revealed that natural resource governance at the Amansuri conservation area is coordinated by two major bodies, the West Nzema Traditional Council headed by the paramount Chief and the Ghana Wildlife Society. Other supporting organisations and agencies include the traditional councils of the partnering communities, youth development groups, fishermen associations, women groups and the district assembly. According to the Manager who is a member of the governing board, the objectives of the ACID project also required the assistance of Microsphere, a small scale business funding institution to provide

loans to support alternative sources of livelihood for people who before the inception of the ACID project, made a living by over exploiting the environment in ventures such as turtle trading and charcoal burning.

The representative of the Chief, who is a member of the governing board revealed that, the ACID project governing board is chaired by the paramount Chief. Other members include; the manager of the Tourism Centre who is the representative of the Ghana wildlife Society, the Chiefs of Benyin, Nzulezo, Ebonloa, Nglekazo and Ekebaku. Other members of the Board according to him are the Chief Fetish Priest and a representative of the District Assembly. The Board reports on behalf of the Management Committee at the Traditional Council and the Traditional Council is mandated to approve projects that are to be carried out from the revenues of the ACID project, before they can be carried out.

The Manager of the tourism centre added that, the management team liaises strongly with the Western Nzema Traditional Council, the clan and community elders, and the Ghana Wildlife Society. According to the Manager, the decisions of the Traditional Council and the Governing Board are communicated to the people through the representatives of the community, the clan leaders, and the leaders of the various social associations such as the youth, women and famers groups and associations. From the group discussions, it was revealed that the views and opinions of the people are also forwarded to the Governing Board and Traditional Council through their family and organisational leaders. The discussants agreed and confirmed that, a member of the community has three channels to forward his or her concerns up the ladder to be considered. These according to them are; through his family leadership,

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his gender group leadership, and through the leadership of any recognised local organisation he or she belongs to. Apart from these channels, members of the community can also express their views and concerns at community durbars

The organogram as depicted in Figure 8 was constructed based on the interviews and group discussion. The structure is favourable to the social structure of the people of Nzema. It makes it possible for every member of the community to receive information and channel their views to the top.

According to the structure described by the key informants such as the chief's representative and manager, participation and involvement of all members of the community can easily be achieved once a person has the interest to participate using any of the three ground channels (i.e. Community representative, clan leader or leaders of social associations). In the views of the Assemblyman and the manager, the organogram also depicts a wide network of organisations and agencies that ensure transparency and openness in the governance process. According to them, the downward flow of information has three possible ways of getting to ordinary persons in the community. A person therefore has three possible ways of getting information related to natural resource use, revenues generated and the use of revenues as agreed by the board of governors. During the group discussion, the people expressed dissatisfaction about the flow of information from the top, rendering the governance process less transparent.
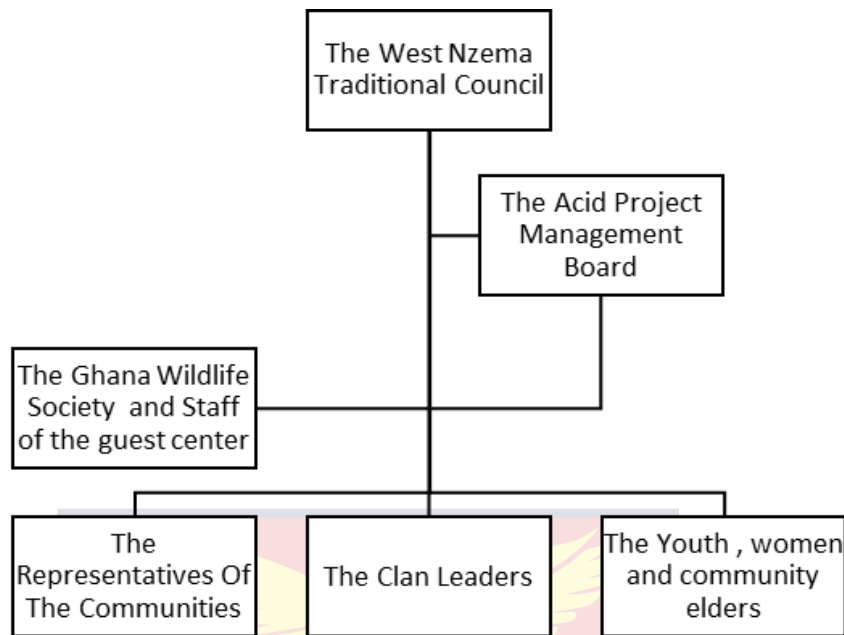
Figure 16: **Organogram of the ACID Project Management and
             Governance**

Source: Field data (2019).

The manager of the centre explained in the interview that, financial reports are given by management to the Board every month. He added that revenue generated by the tourism management committee from tourists and other donors are communicated to the Board which takes decisions on the disbursement, and approves all expenditure. The Board also facilitates auditing of the accounts and communicates earnings by the management to the communities through their representatives. The shares of the communities are as represented in Figure 17.

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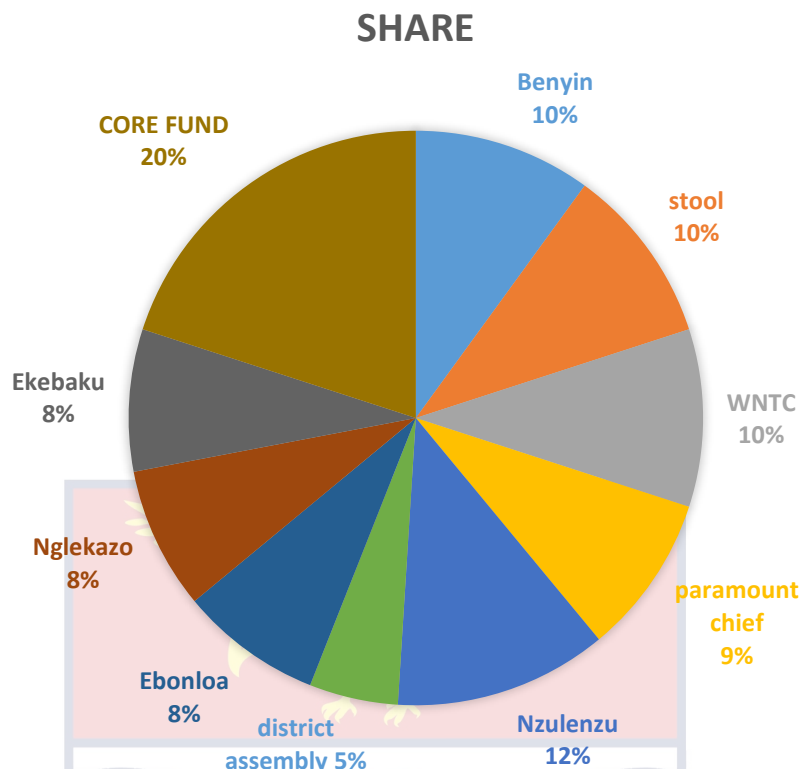
SHARE

Figure 17: **Pie-Chart Showing Revenue Percentage Shares of Stakeholders at the Amansuri Resource Reserve Area.**
Source: Field data (2019)

Figure 17 shows the percentage shares of the towns and stakeholders as follows; Benyin (10%), Stool Lands (10%), WNTC (10%), Paramount Chief (9 %), Nzulezo (12%), District assembly (5%), Ebonloa (8%), Nglekazo (8%) and Ekebaku (8%). The Chief's representative explained that, Nzulezo receives the highest among the five communities because it attracted the most tourist and also had more developmental challenges due to its location on the Amansuri Lake. Aside these percentages allocated to the communities, the management board sometimes undertakes projects in the communities based on their urgency. The manager and the Assemblyman both confirmed in their interviews that, unless there is an urgent need by a member of the community, the proceeds from the ecotourism activities are shared strictly by the approved percentages.

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When asked about transparency, the manager explained that, transparency is ensured by making sure that the traditional custodians of the land and leadership of the people are part of all operational decision-making processes in the governance of the natural resource. These persons according to him, are also tasked by the system of governance to communicate to the people under their jurisdiction, on all major developments and information that concerns them, environment, as well as the use, exploitation and conservation of their natural resources. The Fetish Priest and the clan elder in their interviews explained that, the governance structures in Amansuri makes every citizen accountable to the supreme God for his/her actions. It is therefore the responsibility of the paramount chief who heads the chieftaincy council to ensure that everyone assigned a responsibility by nature, society or the state performs his or her duty. From the field interviews and group discussions, it was revealed that, the major motivations for the natural resource governance at the Amansuri conservation project are to satisfy the spiritual need of pleasing the Supreme God and the gods and secondly, to generate revenue from their natural resources using sustainable extraction processes and conservation to promote ecotourism. The revenue generated from the ecotourism is used to pursue social and infrastructural development. Based on this motivation, the entire society has resolved to comply with the traditional and statutory laws on the use of their natural resources so that tourists would be attracted to come and patronise their ecotourism facilities.

From the interviews and group discussions, it became evident that, much of the laws on accountability focused on the collection of revenue and the appropriate use and disbursement of revenue. There are also clear guidelines on

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the processes of obtaining permit to extract resources. All persons employed are engaged to play a part in the governance process from the tour guards, community receptionist, cleaners and managers. From the responses of the Chief's representative, the manager is assigned the responsibility of ensuring that all persons employed under him temporary or permanently, work according to the bylaws. The manager revealed in the interview with him that, key aspects of his responsibilities were in the areas of environmental protection, revenue collection and tourist management. The bylaws hold the manager accountable for the supervision of all tour guides both temporary and permanent, boat operators, and receptionists at the community centres and cleaners at the tourist sites.

The Chief's representative stated and was reiterated by the manager that, the board takes monthly report from the manager and his team concerning all their operations and the board is also held accountable by the people for all activities concerning the ACID project. They added that, the Board supervises the operations of the Management Committee, the chiefs of the communities and partnering agencies such as (wildlife society and microsphere).Where any of these fail to perform their responsibilities assigned to them in the bylaws, the board reserved the right and the responsibility to punish any offender using approved measures in the bylaws of the ACID project. The manager further revealed that, to ensure financial accountability, the accounts of the management committee are audited by an audit team selected by the board. This was reiterated by the Chief's representative and the assemblymember for the area. They added that, the report of the audit team as well as the financial report are made known to all stakeholders.

The Manager, who is an appointee of Ghana Wildlife Society (GWS), revealed that, GWS annually assesses the environment and ecosystem of the wildlife to establish the degree of exploitation, conservation and maintenance. According to him, the report from these assessments are communicated to the Board and all stakeholders. Where a particular chief's jurisdiction is found to be deficient in ensuring efficient management of the resources, he is advised to be efficient and he is assisted by the wildlife society to correct the deficiency. The assembly member also added that as part of ensuring accountability, before projects are awarded by the Board, the procurement procedures are followed. A project committee is then set-up and oversight responsibilities are assigned to it. The chairman for the project committee reports to the board on the progress of the project and ensures that all funds invested into the project are put to the right use. This was recapped by the chief's representative and the manager.

From the interviews, group discussion and observation, it was revealed that, the Amansuri Conservation and Integrated Development (ACID) project has led to some social developmental projects within the catchment communities. Notable among the developmental outcomes of their governance system are;

1. Provision of seed capital to registered traders and craftsmen from the communities

2. Funding of the training programmes in crafts and arts, animal production, fish processing etc.

3. Construction of a community centre for the Nzulezo community

4. Construction of a health post for the Nzulezo Community

5. Maintenance of the walk ways and school infrastructure for the Nzulezo community

6. Construction of a tourism reception complex at Ebonloa

7. Funding the payment of the allowances for voluntary teachers for the Nzulezo community school.

8. Creation of jobs for the youth and adults from the catchment communities.

The communities have also benefited from foreign exchange and local influx of capital through the activities of hundreds of local and international tourists. Aside these major projects carried out by the management and Board of the ACID programme, communities that benefit from the proceeds and revenue generated from the ACID projects have undertaken other developmental projects to enhance the social status of their communities. Developmental challenges differed from one community to another. Common developmental challenges were the poor roads linking the various towns that surrounded the Amansuri Lake, lack of health posts in the villages, poor educational infrastructure and the lack of adequate health and educational personnel. These challenges were stated during the group discussion and were also highlighted by the assembly member and the Chief's representative in the interviews.

Natural Resource Governance at Boabeng – Fiema

The Boabeng Chief's representative who is a member of the traditional Council of Boabeng and the Chief of Fiema in separate interviews revealed that, the laws that regulate the governance process at Boabeng - Fiema are a combination of Traditional laws and state laws on forests and wildlife conservation. According to them, the marriage between the traditional laws and

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the statutory laws has been formalised by a legalised bylaw on the Boabeng - Fiema Monkey Sanctuary which was put together jointly by the traditional council, the Wildlife Division of the Forestry Commission, the Nkoranza District Assembly and the National Tourism Authority.

According to the Fetish Priest of Boabeng, customary laws in Boabeng - Fiema place a ban on farming, harvesting and hunting in the Forest habitats of the Black and White Colobus and Lowe monkeys (children of the gods). This ban is strategic to protect the habitat of the monkeys and sustain their growth and survival.

The Fetish Priest further explained that, the embargo on hunting of all other organisms in the sanctuary is also based on the traditional knowledge that the monkeys cannot survive alone in the forest unless their ecological partners (flora and fauna) are also well protected. This is supported by the scientific principle of food webs, food chain and other mutualistic biological relationships in western science. He added that, the people are however free to pick mushrooms from the forest but restrictions on resource extraction extends to the rivers and air space of the forest area. According to the Chief of Fiema, excessive noise making in the forest as well as open defecation in the forest is also banned. The Boabeng Chief' representative stated that, rituals governing the burying of monkeys is highly upheld by the two communities leading to a unique situation where a special cemetery is created for the monkeys. This helps to prevent pollution of the forest with carcass of monkeys and controlling of diseases.

According to the District Assembly Representative interviewed, the Management and staff of the Boabeng – Fiema Monkey Sanctuary ensure the regular enforcement of these bylaws by facilitating the following activities;

1. Organising educational talk and awareness sessions in schools and public places.

2. Placing of notices at vantage places to remind citizens and visitors of some regulatory laws and prohibitions.

3. Undertaking patrols and visits to boundaries of the sanctuary and buffer zones to check on encroachment and illegal harvesting and hunting activities.

4. Reporting offenders to the right authorities with evidence for punishments to be meted out to them.

5. Recommending persons who promote healthy conservation practices to be rewarded or awarded by the Governing Board.

The occurrence of these activities were confirmed by the discussants during the group discussion. From the interview with the Manager of The Tourist Reception Centre, it was recorded that, the Boabeng – Fiema community-based ecotourism team mainly comprises volunteers from the two communities. The volunteers are interviewed and trained by NCRC and Ghana Wildlife Division of the Forestry Commission. He added that to ensure equal representation, a quota employment formula of 50 percent to Boabeng and 50 percent to Fiema is implemented. According to the manager, to select the right volunteers, interviews are conducted based on knowledge of customary law, human relation and communication skills. In some cases, employment is based on SHS and Tertiary education status. The head of the tour guides revealed in

an interview that, the tour guides and volunteers are remunerated from the revenue generated from the Sanctuary. He added that, volunteers are motivated by the lack of other job opportunities, love for their community and the role model effect of Mr Akuowua. It was observed from official documents that, The Boabeng - Fiema Monkey Sanctuary field staff included the following; a manager, six tour guides, a labourer, two revenue collectors, a security man and a matron. This was confirmed by the manager and the representative of the District Assembly in separate interviews?.

The Sanctuary Management Board, between 1995 and 2015, was composed of 10 members. According to the Assemblyman, the Governing Board had three representatives each from Boabeng and Fiema. These three representatives were; a representative from the unit committee, a representative from the chiefs, and a representative from the youth organisation. The other four members of the Board were representatives from the Wildlife Division, the Assembly member for the electoral area, a representative from the Nkoranza Traditional Council and a representative from the District Assembly.
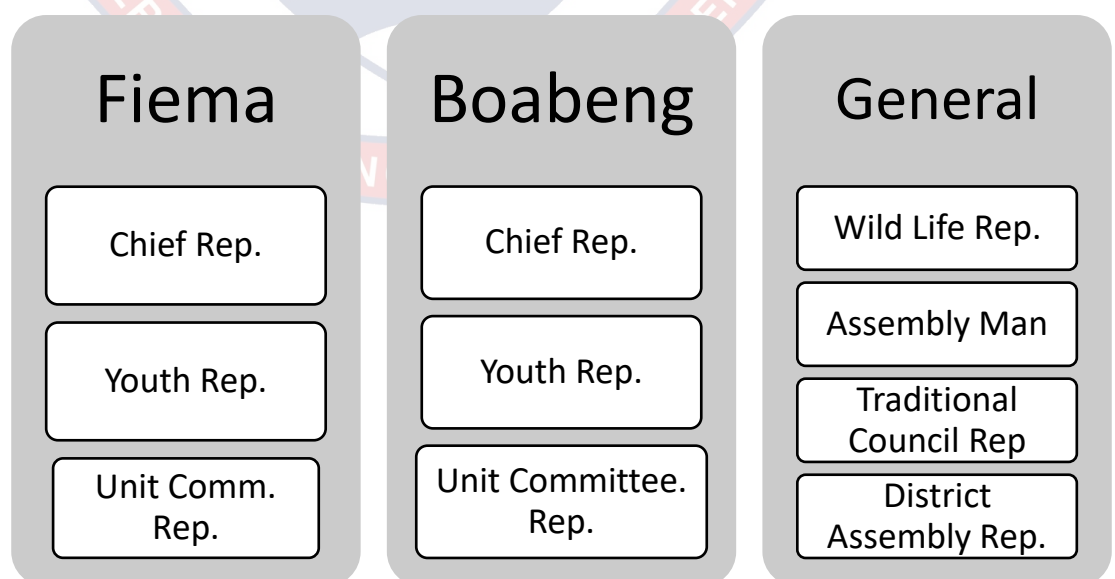
Figure 18: **Structure of Ten Member Management Committee for the BFMS from 1996 to 2015.**

Source: Field data (2018)

The Assemblymember of the Boabeng – Fiema electoral area stated in an interview that, the composition of the governing board was reviewed in 2015 to reflect some changes in the agenda of the community ecotourism project. The review of the board structure, according to the chief's representative, was to improve on accountability and broaden participation. The new board comprises the following;

DISTRICT ASSMBLY REP. - (The District Chief Executive) chairperson

BOABENG TOWN REP. - (The Boabeng Chief)

FIEMA TOWN REP. - (The Fiema Chief)

The Wildlife Division of the Forestry Commision Representative

The Nkoranza Traditional Council Representative.

The District Police Service Representative.

Youth Representative

The District Fire Service Representative.

Figure 19: **Structure of New Governing Board of BFMS from 2015.**

Source: Field data (2018)

According to the Sanctuary Manager and the representative of the District Assembly, the new board structure has the DCE as the chairman of the Governing Board and gives the Boabeng - Fiema Sanctuary a broader stake-holder participation. The involvement of the police service, fire service and the

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forestry division is to make the services of these state institutions readily available to the sanctuary. From the interviews and group discussion it was noted that some members of Boabeng- Fiema community were not pleased with the new management board system mainly due to the fact that most of the people that make up the new board were not from the towns of Boabeng and Fiema but were rather government appointees who had been posted to the district to occupy important statutory offices in the forestry, police and fire service directorates. Additionally, they felt the new board structure did not make the monkey – sanctuary a true community owned project but rather a district assembly owned project – a concept, which according to them, defeats the original intention of the sanctuary. Other persons who were in support of the new board revealed during the group discussion that the new board structure had a higher tendency to reduce corruption and financial misappropriation.

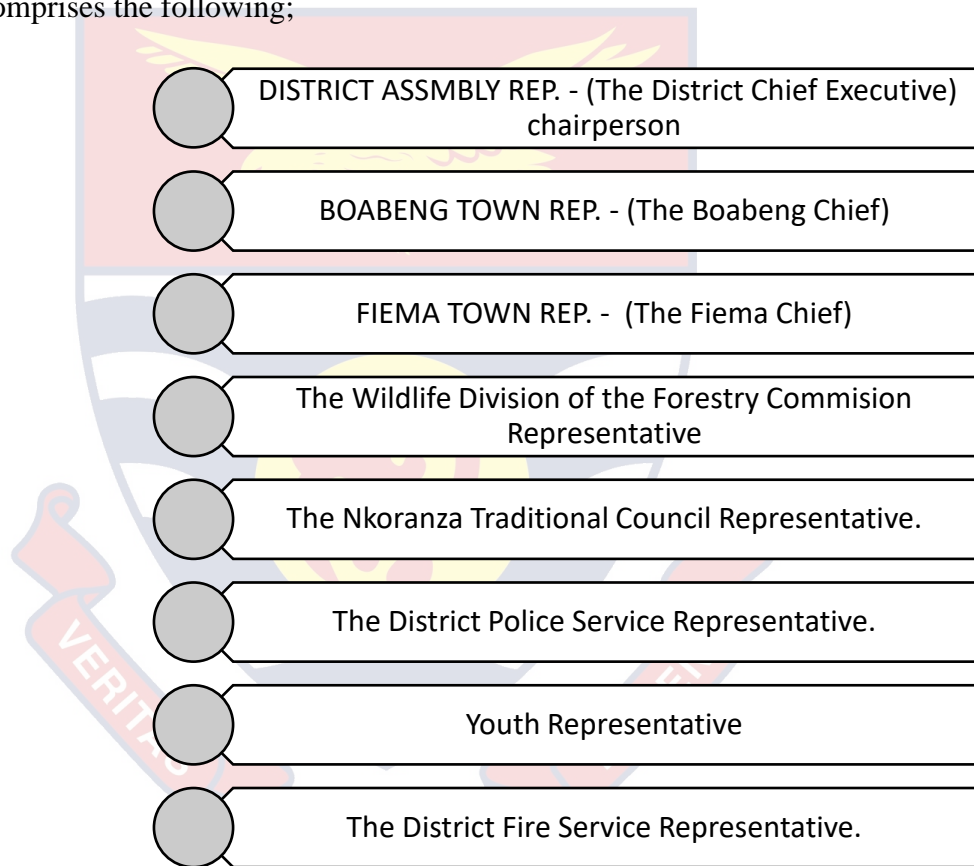When questioned on the processes of transparency in the governance process, the representative of the district assembly, revealed that transparency was ensured in three areas; transparency in human resource mobilisation and recruitment, transparency in revenue generation and usage and transparency in the review of governance bylaws. Under transparency in the mobilisation of human resource and recruitments, it was revealed by the Sanctuary Manager that, by convention, the constitution of the management committee was well communicated and most people in the communities were aware of the criteria for the selection. Furthermore, he disclosed that, representatives of the Governing Board were appointed by the respective institutions they represent based on merit. Appointed members of the Board, had a period of four years to

serve on the Board. Members were not paid any monthly salaries but were given a sitting allowance which was undisclosed.

The District Assembly Representative in an interview also stated the notice of vacancies and recruitment processes for staff of the Sanctuary were made public by using community announcers. The selection is made on quota basis to ensure that, there are as many people from Boabeng as there are from Fiema. Also, the election of staff is not gender based but there is only one-woman tour guide. Tickets (receipts) are issued to all guests at a price of GHC5 for students, GHC 10 for ordinary Ghanaians (non-students), GHC30 for foreigners and GHC 25 for foreign volunteers and Peace Corps. The financial reports of the management staff are read at management board meetings every three months and representatives are expected to send information down to their people. According to the sanctuary manager, some of the revenue collected are used to cover administrative and management cost. Profits made are shared based on generally approved percentages. Profits made from internally generated revenue from the sanctuary are shared quarterly in the following percentages.

Table 5: Revenue Sharing Percentages at Boabeng - Fiema

Institution	Details	Percentage (%)
Boabeng – Fiema	The Boabeng and Fiema Communities	40
Nkoranza Traditional Council	The Nkoranza Paramouncy – land owners	5
Development Fund	Development of sanctuary offices & guest house	10
7 Allied Communities	Surrounding communities (Konkrompe, Bonte, Bomini,	5

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	Busunya, Akrudwa Panyin, Akrudwa Kuma and Senya)	
District Assembly	Nkoranza North District Assembly	20
Ghana Wildlife	Ghana Wildlife Division	20
Total		100

Source: Field data (2018)

From the by-laws of the sanctuary, revenue for Boabeng - Fiema that are shared quarterly go into a common pool for the development of the two communities. To access funds from the common pool, the unit committees present a need to the chief and his elders. The chief and his elders discuss, if they are satisfied with the presentation, they give approval for the use of the funds. In situations where there is an urgent need for any community prior to the quarterly release of funds, the unit committee would be given some funds to be used. The amount given is then deducted from the share of that unit committee in the next quarter. From the interviews with the chief's representative and the sanctuary manager, funds obtained from the revenue have gone into fixing community streets lights, maintenance of community water system and providing scholarships to some Senior High School children form the two communities etc.

The youth leader and the women group leader in their interviews attested to the fact that, in Boabeng – Fiema, financial accountability is mainly supervised by the District Assembly. This was reiterated by manager and the assembly representative. According to them, the District Assembly audits, the accounts of the management committee every month. According to the Sanctuary Manager, The District Assembly also takes reports from all stakeholders and institutions with regard to their responsibilities. Based on these reports, the Board takes decisions and evaluates the performance of all relevant

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stakeholders. The District Assembly also supervises all projects which are undertaken in the Boabeng – Fiema community. The project committee is formed with members coming from both communities. The Chiefs who chair the board are mainly responsible for ensuring that members of the communities observe all the traditional laws and regulations that govern the sanctuary. The chiefs, however task the clan elders and the family heads to ensure that no member of their family is found to flout the governance bylaws.

The governance of the natural resources in Boabeng - Fiema has led to some social developmental projects which has helped to improve the social standards of the Boabeng - Fiema community. These examples of locally funded developmental projects were gathered mainly form the group discussions and the review of some archival documents at the sanctuary available at the manager's office. Some notable projects are;

1. The construction of the tourist complex which houses offices and guest rooms

2. The purchasing of poles for electrification of Boabeng - Fiema

3. Construction of boreholes and water storage tanks to improve water supply in Boabeng - Fiema

4. Provision of scholarships to brilliant but needy students in Senior High Schools and Tertiary Institutions across the country.

5. Provision of jobs to some youth and other members of the community mainly as account clerks, tour guides, research assistants and maintenance officers.

According to the Chief's representative and the assemblymember for the area, Boabeng - Fiema community is also saddled with many social constraints

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and infrastructural deficits. Key among these is the poor roads which have been under construction for over 15 years. According to the assemblyman, the poor roads make it very difficult for tourists to visit the town especially in the rainy season. Other developmental challenges expressed during the group discussion by the discussants at Boabeng - Fiema were;

1. Lack of adequate toilet facilities (only three KVIPs) for the entire community.

2. Lack of a standard health facility for the two communities. A clinic facility had been under construction for the past 24 years.

3. Poor telecommunication and ICT facilities.

4. Lack of job opportunities for the youth as a result of the restrictions on land use and the invasion of the monkeys on farm lands.

During the group discussion, the discussants shared the major challenges they faced with sharing their homes and community with the monkeys. Most discussants expressed a great worry about the growing population of the two breeds of monkeys. Some of the grievances shared are; Stealing of foodstuffs and stored grains from homes ,stealing of eggs from domestic birds, pulling out of electric cables , destruction of electric meters, pulling out of roofing nails and sheets, destruction of farm produce – pre and post-harvest and early harvesting of grains, banana and vegetables.

Natural Resource Governance system at Tafi - Atome

From the interviews, group discussions and observations, the resource governance system at Tafi – Atome was examined. Form the interview with the

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Tafi – Atome Monkey Sanctuary Manager, it was revealed that, in 1993, a bylaw was prepared jointly by the traditional council and partnering agencies for final discussion and adoption by all stakeholders, including the Hohoe District Assembly. The drafted bylaw law sought to forbid the following within sacred forests of the monkey sanctuary; farming, collection of fuel wood, collection of plants and parts of plants such as medicinal plants, roots, bark, leaves, flowers, fruits and seeds, hunting and livestock grazing.

According to the Assistant to the Fetish Priest, the bylaws also protect the Ahavor River against pollution. The assembly member for the area revealed in an interview that, aside the traditional laws, the following national laws and regulations are applicable to the Tafi – Atome traditional area:

a) Forest laws and regulations of Ghana, especially the sections on chainsaw operations.

b) The Wildlife laws and regulations, especially the sections on the completely protected species as well as those on hunting in general and

c) The Control and Prevention of Bushfires Law, 1990 (PNDCL229).

The Sanctuary Manager described the composition of the Governing Board of the Tafi - Atome Monkey Sanctuary as shown in Figure 20. According to him, the Governing Board comprises14 persons. Eight of the fourteen are representatives of the eight clans that make up the Tafi - Atome community. The following groups also nominate a representative each to the board; the land owners association, the chieftaincy council, the fetish priests' council and the sanctuary management team. The Board also comprises two ecotourism experts who may not be indigenes but share in the interest of the community. Currently

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the two co-opted members of the Board are coming from the United States Peace Corps (Ecotourism Unit) and the Regional Tourism Authority.
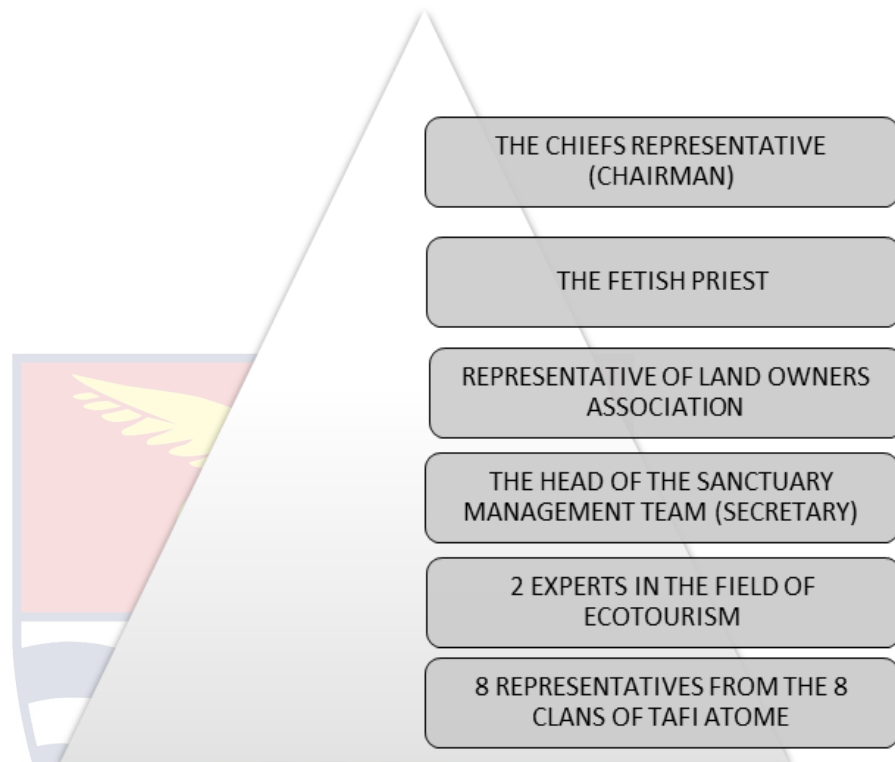
Figure 20: **The Tafi - Atome Monkey Sanctuary Management Board.**
Source: Field data (2018)

According to the Chief's representative, the clan representatives serve as the link between the people and the board by soliciting the views of citizens on the development of the sanctuary to the Board. The representatives also communicate major decisions and projects decided on by the Board to the people during clan meetings and sub-family meetings. The sanctuary forest zone lies on some family lands and the owners of this 387-acre square land area have an association that meets to discuss and take decisions on the use of their land. A representative of this association sits on the Governing Board to serve as a liaison between the Board and the Land Owners. The representative also

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ensures that, the percentage of total revenue due the association is duly paid to the families.

The seat of the Fetish Priest according to the Chief's representative and the Priest's assistant is justified by the fact that, he is the key custodian of the traditional ecological knowledge as well as the enforcer of traditional laws on resource governance. His seat on the Board according to the two interviewees, is to ensure that all the activities of the Board concerning the sanctuary and the sacred groove are in accordance with the dictates of the gods and ancestors who are the true owners of the land, forest and all animals within the environment especially the sacred groove. The manager of the sanctuary, who is the representative of the sanctuary management team to the Governing Board, serves as the board secretary and a liaison between the Governing Board and the sanctuary management team. The manager is the general supervisor and public relations officer of the Sanctuary and also serves as the administrator of the Guest Centre.

The head of the tour guides and the manager of the sanctuary when asked in separate interviews about the functions of the management team revealed that, the sanctuary management team manages the tourist reception centre. According to them, the team comprises nine full time staff; the manager, a secretary and seven tour guards. They added that, the management team are present at work throughout the week from Monday to Saturday and the job even gets more tedious on holidays. The staff of the centre are recruited from the Tafi- Atome community after they have applied officially to fill publicised vacancies. Applicants are shortlisted by the Board and invited to attend interviews organised by the Sanctuary Management Team and the Regional

Tourism Authority. Applicants who pass the interviews are placed on a short training programme to equip them with the basic skills in the following areas; Ecotourism, Client Relations and Tourism. The sanctuary management team also serve as the first point of call for all tourists, craftsmen who wish to sell their crafts to tourists, NGOs, researchers and government agencies that share a common interest with the sanctuary.
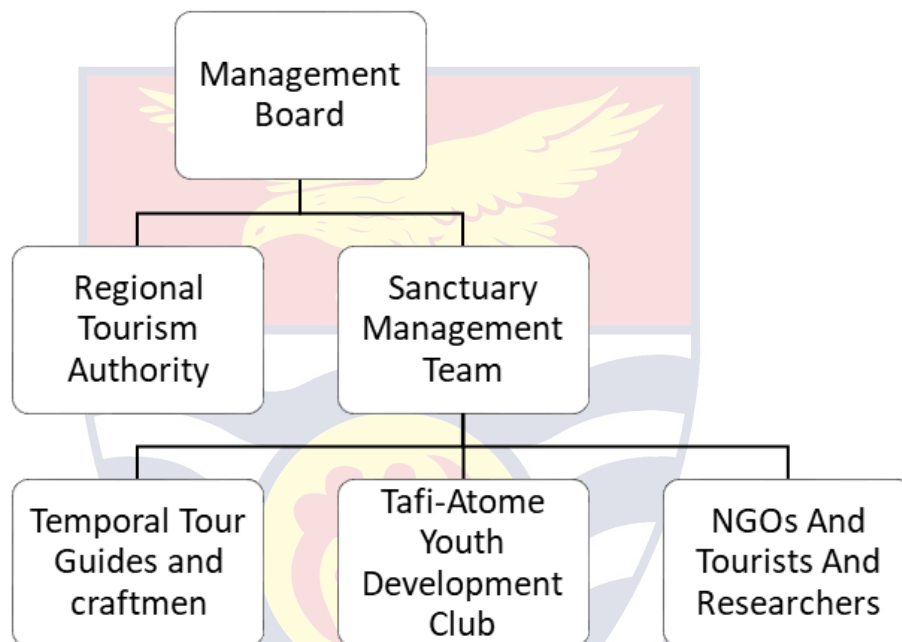
Figure 21: Tafi - Atome Monkey Sanctuary Governance Organisations and Functional Units.

Source: Field data (2018)

Figure 21 was constructed based on the responses of the Head of the Tour Guides, the sanctuary manager, the Assemblyman and the Chief's representative. Figure 21 depicts the organisational structure of the Tafi –Atome Monkey Sanctuary which is made up of the Governing Board, Regional Tourism Authority and Sanctuary Management Team. The structure also recognised the important role played by the tour guides, youth and tourism development clubs, NGOs, tourists and researchers. The uniqueness of this

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structure is that it is based on the levels of relationship rather than hierarchical power and authority. The structure therefore highlights the cordial relationship that exist among the tourists, tour guides and the youth as the basic or foundational management relationship. The next level of relationship is the relationship between the Management Team and the Regional Tourism Authority. The Board sits at the top of the structure as the supervisory body and the key custodian of the natural resource. The structure also depicts the direction of flow of information to the Board and from the Board to all relevant stake holders.

According to the Youth Leader, the rule of law at Tafi - Atome Monkey Sanctuary is fully entrusted in the hands of traditional authority. Members of the community are constantly educated on the traditional laws and moral expectations of the elders of the community. They are also constantly reminded of their TEK - which is built on their cosmovision which places man within the ecology as co- vital elements and not masters over other animals. According to the assistant to the Fetish Priest, members of the community who fail to comply with the dictates of their cosmovision and flout the rules and taboos are made to go through traditional corrective processes such as traditional cleansing rituals, open and public apology, restriction from public gatherings and social occasions and the payment of a fine if necessary and the culprit is capable of paying. The adoption of traditional procedures according to the representative of the Land Owners and the sanctuary manager is motivated by the fact that the elders prefer to treat every culprit as a family member who has erred rather than a criminal. They also believe that the chief should only refer erring subjects to state institutions when they flout statutory laws. The laws on the sanctuary and

resource governance are traditional laws based on traditional beliefs and culture. According to the Assistant to the Fetish Priest, it is therefore more prudent to use traditional means of enforcement.

Furthermore, members of the community who flout traditional rules in the sanctuary are expected to report themselves to the right authority in order to avoid incurring curses from the gods. Where the culprit fails to report himself, members of the culprit's family are expected to report their erring family members if they get to know of the wrongdoing. This according to the Priest's assistant is meant to save the family from inheriting any curse from the member's action. It is also an obligation for any member of the community to report wrong doings based on evidence gathered. Where culprits of reported crimes deny any wrong doing, they are made to swear their innocence at the Fetish and left to go. It was however reported that no member of the community had ever lied before the Fetish due to the serious consequences.

To ensure transparency, the Manager of the Sanctuary revealed that, annually, the Management Board reads its reports to the entire community at a community durbar. The report covers achievements, challenges and details of revenue generated within the period. The Board also uses this platform to take the views of the community on proposed developmental projects for the community. It was also observed that, the tourist centre only issues out receipts that are produced and sanctioned by the board. It was therefore possible for auditors to monitor the revenue gained and the number of tourists received within the period. Procedurally, transparency with regard to donations, revenue, sharing percentages, project funding and recruitment of staff is ensured by processing all activities through the Board where each clan is fully represented.

It was expected that, the clan representatives brief members of their clans on every activity and decisions being taken so that no member of the community will be kept in the dark. The percentages for the sharing of revenue generated from the tourists are made public. The percentages as applicable at the time of the study are as shown in Figure 22.
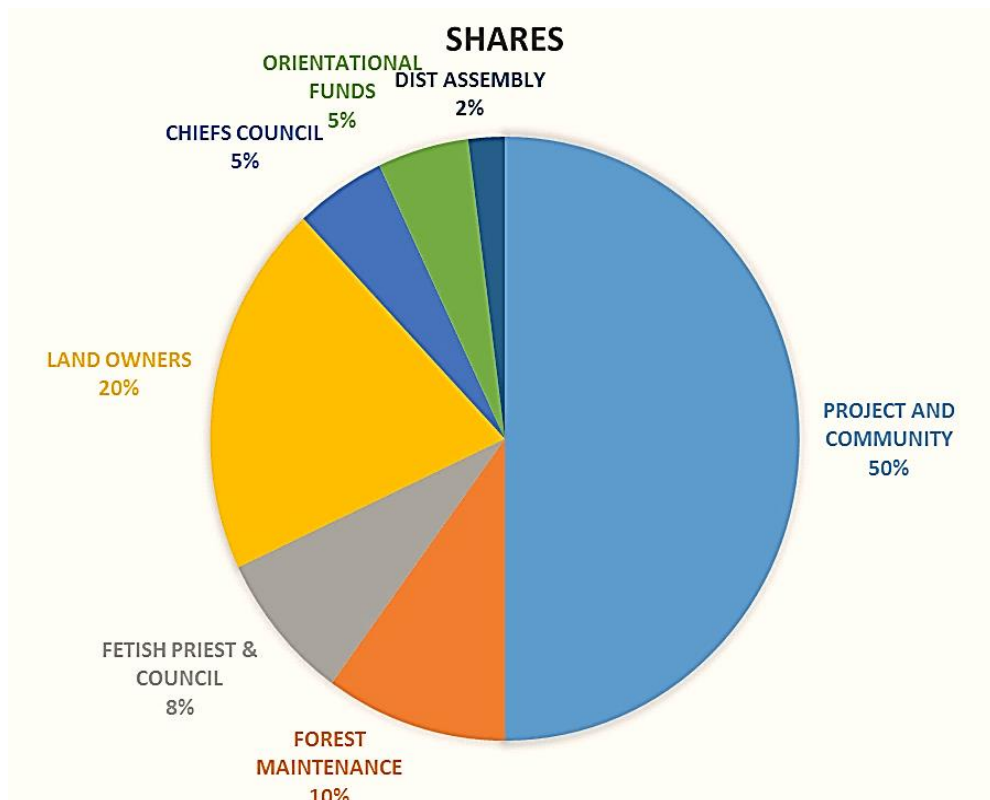
SHARES

Figure 22: **Pie-Chart Showing Revenue Percentage Shares of Stakeholders at Tafi-Atome.**

Source: Field data (2018)

Figure 22 shows the percentage shares of key stakeholders in the revenue generated from the Tafi – Atome Monkey Sanctuary. The key stakeholders and priority areas are; Project and Community (50%), Forest Maintenance (10%), Fetish Priest & Council (8%), Land Owners (20%), Chiefs Council (5%), Orientation Funds (5 %) and District Assembly (2 %). During the group discussion, discussants were asked if they were satisfied with the level

of transparency and accountability in the management of the sanctuary and the governance of their natural resources. The group discussants, indicated that they were fully aware of the annual readings of the revenue accounts by the management of the Board to the entire community. Most people confirmed that although they had no accounting background, they trusted their representatives on the Board to be well informed of all incomes and expenditure made by management of the Sanctuary and the Board.

Another factor that strongly impacted on the perception of corruption was the fact that projects that have been projected to be funded by Sanctuary proceeds in the past have been successfully carried out to the satisfaction of community members. Out of 8 persons who participated in the group discussion, only one person felt that the mechanisms put in place to stop corruption within the management and the Board were not enough to curtail corrupt practices. His reasons were that, some tourists who come to the sanctuary are not given commensurate receipts after making payments especially when they come in groups. He further added that, some tour guides are tipped by tourists to take them round without making the official payments to the tourists' centre.

Based on the contributions of the sanctuary revenue to the development of the Tafi-Atome Community, the discussants believed that the revenue gained from the sanctuary were put into projects that sought to contribute towards the general welfare of the society. From observation, the town of Tafi - Atome is endowed with a huge forest reserve with large farm lands that provide a source of livelihood for most of the people. Majority of the people are farmers and traders. According to the Chief's representative and the Assembly member, the

Tafi – Atome Community thrives mainly on the income generated from the sale of their farm produce and processing of some of the food stuffs. Through the revenue generated from tourism, the community solves most of the community's social infrastructural challenges. The community through the revenue generated from ecotourism, have built a mechanised bore-hole infrastructure that currently supplies water to people in the community. The community has also put up a 4-room standard capacity CHIP-COMPOUND structure which provides the healthcare services to the people. To improve education in the community, the Governing Board has put up some teachers' bungalow, Library and ICT centre for the community. This has helped to provide additional learning resource for the pupils and students in the community.

From the field observation, group discussion and the interviews conducted, it came out that the community felt that the District Assembly was burdened with several needs of other communities in the district and therefore could not be relied on to provide the unique developmental needs of Tafi - Atome. The Tafi- Atome community through the eco-tourism project has embarked on several self - help projects to resolve some of the major social challenges. The monkey sanctuary had also marketed the community to several international organisations such as DANIDA and the US Peace Corps. These organisations had sent development volunteers to the town to help in the areas of classroom teaching, health education and free medical care services, tourism training and stakeholder management. According to the Assembly member, some social challenges that remained to be solved included the lack of a processing plant and food storage silos for the farm produce of the people of

Tafi - Atome and its surrounding villages. Also, he revealed that the community lacked good farm roads which would facilitate the transportation of farm produce. These three major infrastructural deficits had led to large post-harvest losses and low incomes for farmers who make up about 80 percent of the total population.

Discussion on Natural Resources Governance Processes

The study examined the Natural Resource Governance system at the three study areas by first exploring the laws, processes and institutions of governance based on the prescript of IUCN (2010) discussed in chapter two. In all the three study areas, the bylaws upon which resource governance operates were a combination of traditional and customary laws and Community Based Forest and Wildlife Conservation guidelines from the Ghana Forestry Commission. The customary laws governing the use of the natural resources (River, Lagoon, wetlands and swamp forests) are products of the TEK of the communities which are a combination of Taboos, folklores and superstitious restrictions linked to their gods and other deities. A major difference in the laws was that, in Amansuri, the laws extended beyond the forest and wildlife to include laws governing wetlands, mangroves and even the shorelines of Benyin to protect green turtles. It was realised from the interviews and group discussions that, although the bylaws are documented they were not readily available to members of the community in all the three study areas. Additionally, the bylaws had not been reviewed for over a decade. During the group discussions, it was evident that the discussants knowledge of the bylaws on NRG were from family socialisation mechanisms and communal conversations. In Boabeng – Fiema and Amansuri there were few posters placed

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at vantage points that communicated some portions of the bylaws. These posters were however only helpful to persons who can read. Assurance problem theory is based on the assumption that endogenous development is possible if the community has well documented and communicated laws on governance (Folke et al. (2010). It is therefore important for the communities to make the bylaws available to all persons who can read. Carlsson & Sandström (2008) also strongly supports the principle that lack of information on governance laws can greatly affect compliance with laws, participation, accountability and transparency.

The laws on NRG is strongly tied to the rule of law in resource governance. Rule of law from the field interviews and discussions could be summarised in their view as extent to which the governance processes ensure equal treatment in both protection and punishment under the law. The rule of law in the context of natural resource governance means that laws governing natural resources are applied to all stakeholders in the same way, all the time (IUCN, 2010). According to Moore et al., (2010), when there is rule of law, everyone should have the security of knowing how a law will be applied to them and also be assured that, the law will protect them. In ensuring the rule of law, Tafi - Atome applies a traditional mechanism which ensures that, persons who fault in their responsibilities are mainly given traditionally prescribed punishments from the fetish priest. The disciplinary committee is headed by the fetish priest whose job is to ensure the adherence to the traditional laws and practices regarding the protection and conservation of the natural resources. Financial misappropriation and other misdemeanour regarding revenue collection and project implementation crimes are handled by the traditional

disciplinary committee with statutory procedures which may require the involvement of the police. Traditional disciplinary procedures often involve payment of remedial fines, public apology and a cleansing process to purge the culprit of any curses that may have come upon them as a result of their actions.

In communities where there is a blend of customary and statutory laws, a conflict between statutory law and customary law often creates a situation in which local people cannot predict how a law or rule will apply to them (Hilhorst, 2008). In the context of natural resource governance, this conflict of laws can result in assurance problems leading to chaos and non-compliance (Bodnár, 2013). From the findings one could conclude that, there was no conflict in blending customary laws with statutory laws. The bylaws of the three study areas showed operational harmony with the integration of traditional taboos and cultural restrictions into national policies and laws on forests and wildlife conservation.

The objective four of the 2012 Ghana Forest and Wildlife Policy aims at promoting and developing mechanisms for transparent governance, equity sharing and peoples' participation in forest and natural resource management (MLNR, 2012). The 2012 policy recommends approaches which involves consultation, needs assessment, investigation, synthesis and consensus building aimed at ensuring equity and the fair distribution of benefits and efficiency in the execution of forest management prescriptions. For the three study areas, the governance processes embodied processes that ensured some degree of fairness in the sharing of revenue, consensus building and general participation as recommended by the 2012 Policy on Wildlife and Governance. There was however enough evidence from the interviews and group discussions to support

the fact that, there were few challenges with the flow of information and the degree of participation. This could be due to the fact that according to the group discussants, most people do not attend family meetings and clan meetings where information from Board meetings could be shared. Additionally people's interest and attendance to traditional organisational meetings had also dwindled with time.

The governance processes in the three study areas also shared some common structures with regard to the nature of their management team. In all three study areas, the day to day running of the sanctuaries and reserve areas were done by management teams. These management teams reported to governing boards that met quarterly or Bi- annually to audit and evaluate the work of the management. There were however major differences in the composition and structure of the management committees as well as the roles assigned to them. At Boabeng Fiema, the management team comprised two officers from the Ghana Wildlife Division who assisted with supervision and monitoring of activities within the sanctuary. At Amansuri however the management team was headed by a representative from the Ghana Wildlife Society. Tafi – Atome Monkey Sanctuary was however managed by a team that comprised local persons who have been trained by the Ghana Wildlife Society and other agencies to fully manage the sanctuary. The absence of representatives from any external organisation makes Tafi – Atome Monkey Sanctuary a true example of a community managed wildlife sanctuary.

Transparency in natural resource governance refers to the free flow of information on participation, access, rights and responsibility. It also incorporates the provision of information on income generation and

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distribution, Communication channels and grievance expression models (IUCN, 2010). A transparent governance routine also provides all stakeholders with ready and true reports on resource valuation and evaluation. Accountability in resource governance according to IUCN (2010), is the obligation on leaders and governance players to accept responsibility and answer for their actions and inactions regarding the governance of natural resources. The study examined how formal and informal institutions as well as individuals may be held accountable (Patlis, 2004). According to Turner and Hulme (1997), it is ideal for statutory laws to provide clear rules and procedures for determining accountability of public institutions and officials.

According to Turner and Hulme (1997), where the laws of governance fail to provide clear rules and procedures for determining accountability, it will be difficult for other stakeholders to hold governance institutions and officials accountable. They however, proposed that, where that was the case, stakeholders could explore the possibilities of amending the rules and procedures to ensure that there is support for civil society to be able to hold NRG decision makers and implementers accountable. The processes regarding the supervision of projects undertaken with revenue from the tourism in Boabeng - Fiema and Amansuri are similar to the processes at Tafi - Atome. However with regard to the management of the sanctuary, major differences exist. In Tafi - Atome, the daily management of the sanctuary is carried out wholly by the Tourism Management Team but in Amansuri the team works with the Ghana Wildlife Society. At Boabeng - Fiema however, the team works with the Wildlife Division of the Forestry Commission. Secondly the Tafi - Atome sanctuary is under the jurisdiction of only one chief i.e. the Chief of Tafi -

Atome who presides over the board meetings and ensures that all institutions and stakeholders play their roles effectively. In Boabeng – Fiema and Amansuri however, the sanctuaries fall under the Authority of Paramount Chiefs with Sub Chiefs who have direct responsibilities for the natural resources within their jurisdiction.

In all three communities there were clear percentage allocations for various stakeholders with some percentages reserved for maintaining and developing the forests and natural resources from which the revenue were generated. This similarity is quite commendable and important for achieving the principles of sustainable development which is key in natural resource governance. Furthermore, all the three study areas had percentages of revenues reserved for meeting the developmental needs of the communities. These percentages were shared for all sub-communities and were subject to the decisions of the chiefs, the clan elders, opinion leaders and sometimes the assembly members and unit committees where applicable.

In all of the communities, there were no guidelines on the exact usage of the revenue reserved for developments and some people felt the absence of clear guidelines on the use of the monies gave room for some form of misappropriation. In Boabeng - Fiema some people felt the use of revenue as scholarships benefited only a few families and the processes of awarding those scholarships were not transparent. During the group discussion, it was clear that the people felt there could be broader discussion held on the use of revenue for developmental projects. From the group discussions it was suggested that, transparency in the governance process could be improved if the views of the people are sought on the use of revenue. Furthermore, whenever leaders make

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final decisions on projects to be carried out, the people should be briefed on why those projects were selected, how long it would take to complete those projects and how much it would take to accomplish the selected projects. Additionally, where several communities come together to govern a common resource as in the case of Boabeng-Fiema and Amansuri, community representatives must be given special training in stakeholder management and communication skills in order to ensure harmony, improve transparency and promote accountability.

In all three study areas, parents were held accountable for actions of their children and where the children are below the age of 18 years, parents are made to bear the consequences of the actions of their children. It was observed that parents saw it as great responsibility not only to teach their children the right way to behave and act in relation to their natural resources and the environment but also parents constantly monitored the activities of the children to ensure that they do not stain the family with any curse or bring unnecessary penalty fines to the family. According to Stone (1989), community participation can be achieved if governance processes are designed such that the intended beneficiaries are encouraged to take matters into their own hands, to be active functionaries in their own development, defining their own needs, and making their own decisions about how to meet those needs.

In the examination of levels participation during the group discussion, the following levels of participation were considered to be important for the people;

a. Participation in the review and documentation of laws and by laws

b. Participation in setting governance objectives and development targets

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c. Participation in the selection and recruitment of persons for management positions

d. Participation and evaluation of the governance process annually or periodically

e. Participation in decision making concerning the use of revenue from the governance process.

f. Participating in the direct management of the natural resources

The first five levels of participation were found to be existing in the bylaws of the three study areas but the implementation of such participatory processes were not efficient according to the group discussants in all three study areas. However in all three study areas, recruitment into the management teams, into positions such as accountants, secretaries, tour guides etc. were openly announced to the entire community through traditional announcers. Citizens from the communities are given priority and when these applicants are shortlisted, they are interviewed in a very transparent manner. At the Amansuri resource reserve area, the process is supervised by the Wildlife Society under the authority of the Governing Board. The minimum qualification accepted is JHS certificate and recruited staff are trained by the Ghana Wildlife Society on basic client relations skills and service delivery routines at the visitor reception centres. The representatives communicate to the people through community durbars on major governance issues and decisions before they are implemented. The representatives are also considered as the channel through which the people's concerns are forwarded to the management board for considerations.

The process of setting laws, reviewing bylaws and setting governance objectives were seen to be restricted to persons who are at the top hierarchy of

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the chief's council, management boards or family heads. Although family representatives are expected to discuss issues with their family and communicate their concerns in these processes, the situation was far from the plan on paper. In the group discussions, in all three study areas, members of the community expressed dissatisfaction with the degree of participation in establishing laws and setting goals. Participation in the decision-making process when it comes to the use of revenue was partially existing in Boabeng - Fiema and Amansuri resource reserve areas.

Tafi - Atome exhibited some degree of community participation in deciding on the use of revenue and choosing developmental projects. Tafi – Atome used public durbars and the Monkey Festival in August to give a wider room for people in the community to make their voices heard. Finally, it was observed that the participation of women in the governance process was minimal. Most of the representatives on the governance boards were men and in all three study areas, the queen mothers were not represented on the boards. Women also expressed dissatisfaction with the dissemination of information from the decision makers to the women in the society who are usually expected to be the agents responsible for educating the children about governance programmes and decisions.

The study explored the extent to which the governance of their natural resources is bringing about development in the communities that are owners of the resources. The aim of endogenous development, according to COMPAS/UDS (2008), is to empower local communities to take control of their own development process using available resources, knowledge and culture. While revitalising ancestral and local knowledge, endogenous development

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helps local people to select those external resources that best fit the local conditions. Endogenous development leads to increased biological and cultural diversity, reduced environmental degradation, and a self-sustaining local and regional exchange (COMPAS/UDS, 2008). According to Hoppers (2002), endogenous development takes local cultures as a critical starting point and posits those cultures as a central framework for social progress and cross-cultural exchanges. Hoppers further explains that, endogenous development draws from and harnesses local resources to mitigate development.

It builds on and excites local actions for change to occur from within the existing system. By this assertion, endogenous development works towards sustainable, functional and people - centred development which may be inward looking but not in a negative way. Hountondji (2002) states that endogenous development does not close off external influences such as modern science and technology - rather, it works to minimise and even eliminate its tendencies of disorienting, undermining, compromising, and even annihilating indigenous or traditional systems. Based on this, the developmental activities in the three study areas were explored to identify some characteristics of endogenous development.

The chapter reveals a well-structured governance system with existing institutions, processes and laws to facilitate their implementation. In all three communities there were boards that supervised the operations of the management team. Major concerns on the governance system centred on the achievement of the governance principles. Although there were clear guidelines on how to make the governance system transparent very few people were preview to governance decision making processes especially at Boabeng -

Fiema and Amansuri. Also, mechanism to promote accountability, participation of the general public and the rule of law were not fully implemented.

Theoretical Lessons from the Findings

The concept of endogenous development as explained by Farmer (1999), is 'development from within, based mainly, though not exclusively, on locally available resources, values, institutions and knowledge. The study reveals that in all three study areas, the people are using traditional ecological knowledge, adapted knowledge from western science and technology to enhance their social conditions. The developmental goals of the people are met based on their traditional ecological knowledge, cultural and religious beliefs and the combination of western developmental strategies such as ecotourism and the use of relevant western technologies. All three study areas are using the internet to publicise their communities to attract visitors and investors but are strict on the observance of their traditional taboos and rules by all visitors and investors. In Nzulezo, the architecture employed by the local people and the type of building materials used are environmentally friendly and pose less harm to the aquatic habitat and the aquatic organism that share the ecology with the humans.

It is therefore observed that despite the development seem in the town and the use of modern technology the people have stuck to the old building technology while adopting ways of improving it without harming the environment. From the group discussion and observations, it was noted that some new structures at Nzulezo had employed the use aluminium roofing sheets instead of the bamboo and raffia roofs because they believed the aluminium roofs will have less or no negative effect on the environment. They are however

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conservative on the use of timber and raffia branches alone in the construction of the houses instead of using Portland cement due to its long-term negative effect on the aquatic habitat.

North (1990) states that endogenous development (ED) is based on local peoples' own criteria of development and takes into account the material, social and spiritual well-being of peoples. The findings of the study from Amansuri, Boabeng Fiema and Tafi- Atome shows that the people of the communities had complete control in deciding on what they found to be relevant for their development. The people, based on the dictates of the spiritual deities and the support of their traditional leaders have placed more priority on preserving their forest and natural ecosystem than using their fertile lands for crop or animal production. Additionally, the type of developmental projects they embarked on from the proceeds of the revenue generated from ecotourism were decided on by the people with little or no influence from external agencies.

The findings also revealed that the major driving factor for the development of the three study areas was ecotourism. According to Farmer (1999), endogenous development is a development approach that is mainly based on local strategies, values, institutions and resources. This however can be said to be the situation in the three study areas. From the deductive analysis of the interviews and group discussion responses, it was revealed that, in Amansuri, Boabeng – Fiema and Tafi – Atome the strategies, institutions and agents of development were not purely traditional. In all the three study areas, the people had adopted some contemporary strategies as well as some western developmental agencies such as the partnership with organisations such as the Ghana Wildlife Society (Amansuri), The Forestry Commission (Boabeng –

Fiema) and the American Peace Corps (Tafi- Atome). Despite the adoption of foreign strategies and partnership with external organisations, one cannot say that the three study areas are not practicing some form of endogenous development because according to COMPAS/UDS (2008), the aim of endogenous development is to provide local communities with the needed support and opportunities to take control of their own developmental processes.

The findings of this study shows that the involvement of external agencies and the adoption of foreign strategies do not prevent the traditional institutions from facilitating and carrying out their developmental responsibilities. On the contrary, most of the external organisations were found to be helping to improve the efficiency of the local or traditional institutions in fulfilling their developmental responsibilities. Hountondji (2002) further justifies the adoption of external strategies by stating that endogenous development in principle, is inward looking but not in a negative way. Hountondji further explains that communities that practice endogenous development do not close off external influences such as modern science and technology but rather embrace contemporary strategies that improve on already existing traditional developmental strategies.

This principle that endogenous development can be dynamic in nature and adaptive in practice (Hountondji, 2002) is highly supported by the Resilience Theory. The findings of the study highlighted the fact that in all three study areas, there have been some changes in the laws, practices and functional units of development over the years. According to Holling (1973), a resilient governance system has the ability to absorb disturbances and still retain its basic function and structure. Several studies also confirms that the fact that a

governance system keeps changing does not mean it is not resilient (Berkes et al., 2003; Smit & Wandel, 2006). The resilience of the governance system in the three study areas could be said to be resilient since they had undergone several changes over the years but still remain relatively effective in preserving and conserving their natural resources. There is however the need to view the processes of governance in the three study areas in a regional rather than a local context and accommodate future events in whatever unexpected form they may take (Holling, 1973).

According to Folke et al. (2010), the assessment of the resilience of the governance system and the TEK system should be done on the basis of persistence, adaptability, and transformability. It is therefore important to encourage the communities to be flexible in embracing changes that promote their traditional approaches to knowledge management and resource governance. The governance systems in place at the three study areas and the fact that these traditions   backing their resource management have been used for several decades and have managed to keep their resources in sustainable use proves that the "Tragedy of the Commons" theory (Hardin, 1968) is not entirely true. Hardin's argument that resource users cannot be left to decide alone on how to use their resources and that their use has to be curtailed to prevent over exploitation has been proved wrong using the findings form Boabeng - Fiema, Tafi - Atome and Amansuri Resource Areas. On the contrary, the Assurance Problem theory as proposed by Runge (1996) has been found to be practical. From the finding, the governance system at the three study areas were based on the assumption that local or traditional resource governance institutions have

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the ability to regulate people's behaviour based on the assurance of mutual or general compliance.

This assumption is a key principle proposed by Runge. The study revealed that in situations where people had doubts about the transparency and accountability of the management committee, they illegally engaged in tour guiding practices and collected revenue for themselves. Some also harvested some resources to enrich themselves. In Boabeng-Fiema and Benyin, the youth leaders revealed in their interviews that some youth sometimes attended to tourists secretly and collected revenue illegally. Their excuse was that, such youth felt they were not benefiting from the general revenue collected by the officials.
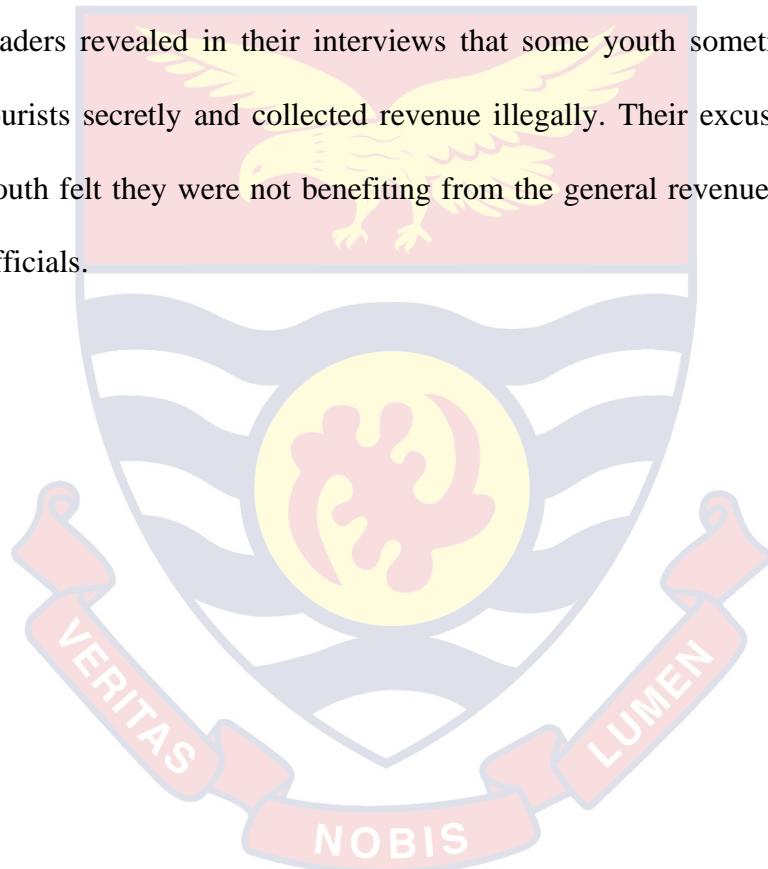
Pictures taken during observation data collection from the three study areas

Figure 23: **BFMS Guest Reception Centre 2, Partially Damaged During a Youth Demonstration over Poor Accountability.**

Source: Field data (2018)

Figure 24: **BFMS Guest House and General Offices.**

Source: Field data (2018).

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Figure 25: **BFMS Monkey Cemetery.**

Source: Field data (2018)

*Figure 26: Ta*fi – Atome Monkey Sanctuary – Observation of Monkey's
          Relationship with Tourists.

Source: Field data (2018)

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Figure 27: **Tafi – Atome Monkey Sanctuary – Tourist Reception Centre and General Office.**

Source: Field data (2018)

Figure 28: Nzulezo Community and Health Care Centre – Constructed with Revenues from the ACID Project.

Source: Field data (2019)

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Figure 29: **Nzulezo Community School – Maintained with Revenues from the ACID Project.**

Source: Field data (2019)

Figure 30: **Nzulezo Main Street – Maintained with Revenues from the ACID Project.**

Source: Field data (2019)

CHAPTER SEVEN

LESSONS LEARNT FROM THE INTEGRATION OF TRADITIONAL ECOLOGICAL KNOWLEDGE INTO NATURAL RESOURCE GOVERNANCE

Introduction

The lessons learnt from the integration of TEK into NRG from the three communities are analyzed based on the pillars of TEK (Foundation, institution, processes and products) and their influence on the laws, processes and institutions of Natural Resource Governance. The lessons were equally drawn from the role of TEK in achieving the four key principles of natural resource governance which are; transparency, rule of law, accountability and participation (IUCN, 2010). Finally, the lessons were discussed to examine their relevance to the theories discussed in the literature review; endogenous development theory, resilience theory and the assurance problem theory.

The use of traditional ecological laws as the foundation for natural resource governance laws is paramount to a successful community owned resource governance system. Based on the interviews and group discussions conducted in the three towns, traditional ecological laws had the following three advantages over statutory laws. The interviews with the Fetish Priest of Boabeng and the Priests' assistants at Tafi – Atome and Amansuri revealed that Traditional laws have what could be described as 'cultural relevance'. The traditional laws on the use of natural resources unlike state laws were crafted to suit the philosophy and dictates of the culture of the people. It imbibed the taboos, spirituality and the historical conventions and practices of the people making it easier for the people to appreciate the importance of abiding by them.

In the group discussions the people described statutory laws as foreign and lacking cultural relevance. In Boabeng - Fiema the people recounted how the laws of the state permitted people to mishandle a monkey if it is found beyond the sanctuary and outside the buffer zone. Contrary to this, their traditional laws protected the monkeys based on their habitat and not their location at a point in time. This gave them protection beyond the Sanctuary.

Furthermore, the traditional laws could be amended easily if need be by taking into considerations the views and opinions of the people within the community. At Tafi - Atome, the discussants recounted the various changes that had been done to their traditional ecological laws based on suggestions by community members during community durbars and clan meetings. The fact that each member of the community has a say in the formulation and review of the traditional ecological laws promoted compliance. According to the Assembly member of Boabeng – Fiema, it is difficult for even him as an assemblymember to influence statutory laws on nature and conservation. Hence, adopting only statutory laws for the management of the sanctuary would alienate the people from decision making concerning the institution and review of ecological laws.

The resilient theory postulates that, the ability of a system to adapt easily to changes without losing its functional relevance is essential for sustaining development and positive social change (Holling, 1973). Based on this I would conclude that when it comes to adaption to changes, the traditional laws were resilient and have the potential to be efficient in maintaining law and order. Moreover, the traditional ecological laws prescribed better punishments for people who flouted those laws than statutory laws. At Tafi – Atome and

Amansuri, the people believed that, the traditional punishment of banishment from the community was a more deterring punishment for killing a sacred animal than a fine of GHC 200 which is mostly prescribed by the laws of the state.

The major lesson from these advantages for policy makers is that, laws on resource governance become easy to implement when the laws are culture specific and locally generated. Additionally, when people are involved in the process of law making, review and enforcement, they become governance players and conflict is reduced (Colchester et al., 2006). According to Bormann & Keller (1991), the establishment and persistence of the rule of law depends on; clear communication of laws, non-discriminatory application of laws, effective enforcement. Moore et al., (2010) also states that when people perceive laws governing the use of their resources to be fair, just and legitimate, they are willing to follow them and support the course of development.

Furthermore, when a policy on resource governance mandates traditional leaders to facilitate the adoption of local and traditional laws, the policy ought to provide guidelines on the frequency and processes for the review of the laws to meet changing social conditions. This will ensure adaptive resource governance and sustainable development even within a rapid socially dynamic society. The processes of governance as practised in all three study areas were deeply rooted in traditional governance processes such as the use of family and clan structures for disseminating information and building consensus. The use of spiritually inspired taboos, buffer zones, sacred zones and restricted harvesting days are all traditional strategies that have been adapted by the governance system to help reduce over exploitation.

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The major lesson learnt from this traditionally rooted governance system is that, the spirituality attached to the traditional laws and processes makes the people feel blessed if they abide by the laws and processes of governance. The danger however is that, people who have different spiritual orientations are often reluctant to submit to the laws and processes unless a non-spiritual motivation is provided. It is therefore important for NRG practitioners to educate people more non – spiritual social benefits of nature conservation and protection rather than the spiritual justifications. From the group discussions at the three study areas, it was concluded that, people are motivated by the physical benefits of ecotourism than the spiritual benefits of abiding by age old taboos.

Furthermore, when resource governance processes are traditionally crafted, it is easy for all members of the community to understand, appreciate and evaluate the process so as to promote accountability, monitoring and evaluation. From the focus group discussions, it was noted that the people found statutory governance processes enshrined in the nation's constitution and the Forestry Commission Act to be too complicated and reserved for the highly educated. It could however be concluded that, where governance processes are based on the people's traditional beliefs and culture, they are easy to monitor and evaluate to ensure efficiency and accountability of the governance system.

The institutions of governance, according to (Dore, 2001), should promote 'light touch' facilitation, where government and civil society organisations regard local communities as partners and work directly with them; providing training and capacity, and monitoring the internal dynamics of power shift within communit*ies*. From the study, the interplay between traditional institutions and social organisations, either governmental or non-governmental,

was indispensable in the governance of the natural resources. The institutions were not ranked in any hierarchical order, however, the chieftaincy institutions remained the single most important institution and this was premised on the cultural relevance of that institution. Other important institutions included the traditional religious institution (the fetish priest and his council), the family and clan institutions, the non-traditional institutions such as The National Tourism Authority and The Forestry Commission.

The Ghana Wildlife Society and the Nature Reserve and Conservation Centre (NCRC) had equally found a relevant space in the governance system. Thus, there was a need to harmonise their role and function in the entire process. A key lesson learnt from this finding is that where the functions of the institutions are not harmonised there could be duplication of functions and conflict of interest. From the experiences of Boabeng –Fiema and Tafi –Atome, the involvement of statutory institutions as key partners in the governance of natural resources should be done with well-defined responsibilities based on the community's expectations, objectives and their philosophy for NRG. Another lesson drawn from the findings is that, where a community engages the services of external NGOs to assist with resource governance, a mutual agreement on the terms regarding their culture, duration of their engagement, financial allocations and mechanisms of accountability, transparency, monitoring and evaluation are key to ensuring that both parties meet their goals of engagement.

This is premised on the fact that At Boabeng-Fiema, the youth leader revealed that, in his opinion, the involvement of the Forestry Commission and the District Assembly had defeated the establishment of the Sanctuary as a community-based governance system. According to him and from the group

discussions, there is general perception that, it is difficult for the ordinary person to demand accountability from state institutions. The lesson from this general perception is that, state institutions that partner with communities in their natural resource governance are expected to make the rules of their engagement so clear to the public that they would not misinterpret their functions. Additionally, the agencies, according to Dore (2001), must play the roles of facilitators and capacity builders rather than supervisors or managers.

Transparency in natural resource governance based on the findings of the study goes beyond the publication of a document on governance protocols and publishing of annual accounts. From group discussions it was revealed that, it was the expectation of discussants in the three study areas that their leaders would hold regular meetings with the community members and update them on the state of their community with regard to their environment, resource conservation, revenue generation and development agenda. They also considered the opportunity to have their questions and grievances answered, as a key evidence of transparency. From the group discussions it was noted that discussants had grievances on the poor access to information especially with regard to revenue generation and the sources of funding of developmental projects in the community. The lesson learnt from these positions and grievances is that, for transparency to be achieved in the governance of natural resources, there is the need for regular face to face meetings and a well-structured mechanism for information to flow upward and downwards (Mkenda, 2010). Furthermore, governance documents, translated into local languages and where possible recorded in audio formats would help improve transparency and participation. Additionally, a key lesson learnt from Tafi –

Atome is that, well-trained governance communicators are important in improving transparency. And these communicators must be persons who can be readily consulted to provide ready answers to the people when they need to clarify issues for themselves regarding governance matters.

The rule of law in natural resource governance from the findings was interpreted as the enforcement and applications of existing laws and the adherence to laws that dictate how resources may be used and managed. Rule of law also included the implementation of the laws that control how revenue is generated and the parameters by which the revenue could be accounted for or used to facilitate the development of all parties. In a focus group discussion at Amansuri, some members of the community were not happy with the modification of the law to allow the use of motored boats on the lagoon. While some felt the review of the law to allow for the use of motored boasts had helped to increase tourist's visits, others felt the use of the boats was affecting wildlife visibility, hence, should be stopped. At Boabeng – Fiema, the leader of the tour guides suggested the review of the laws to prevent the use of motored bicycles in the forest reserve. It can therefore be deduced from these assertions that there should be a broader level of consensus in the review of laws and the protocols of rule of law. The broader consensus building would ensure that the protocols of rule of law are well debated and discussed before they are enshrined in the bylaws.

The selection of enforcement agencies was seen to be key in ensuring sanity in the communities. It was found that where the people had lost trust in the enforcement agency it would be difficult to ensure rule of law. At the time of the data collection, Fiema had sanctioned their Fetish Priest and there was a

search for a new priest due to mistrust and miscommunication. At Tafi – Atome, the fetish priest was more trusted to ensure the enforcement of the law and give punishment than the police. Despite the differences in culture, one could conclude that the agency selected to oversee law compliance must be monitored and evaluated on regular basis so as to ensure that they maintain public trust and smooth governance. In the assignment of punishments to crimes related to the natural resource governance it could be deduced from experiences gathered from the three communities that the people found spiritual curses, seclusion from society and the staining of family names to be more deterring than the payment of fines. The lesson from this is that, people's perception of punishment and rule of law are culture centred and dependent on the cosmovision of the people. It is therefore important to design rule of law strategies in resource governance based on peoples culture and understanding of their world.

Another lesson from this finding is that, flexible but firm laws are more applicable in community-based governance system than strict rules. This was gathered from the fact that the culture of communities studied made room for people to be spared of the sanctions of their crime if they expressed repentance and guilt. Additionally, women and children also had special privileges and considerations with regard to the implementation of these punitive sanctions. These considerations, from the interviews with the fetish priests of the three communities, made people more comfortable in community discussions. Such cultural flexibilities are expected to be imbibed in governance laws to ensure harmony and peace.

Accountability as explained by IUCN (2010) is the requirement to accept responsibility and answer for the actions and inactions of leaders, governance institutions and practitioners. Formal and informal institutions as well as individuals who are placed in charge of natural resources are expected to be held accountable for their role as leaders (Patlis, 2004). According to the TEK of the three communities; man is first accountable to the supreme God and the ancestors when it comes to its natural resources. The objective of ensuring accountability therefore is not mainly an issue of financial and logistical assessment and audit but a spiritual exercise through which one may incur blessings or curses not only for him/herself but his/her generations and family.

The processes of accountability based on the findings of the study are first targeted towards spiritual satisfaction. According to the views of the people involved in the group discussions at Tafi - Atome, "one cannot lie to the gods nor hide the truth from the supreme Gods". According to the Boabeng Chief, People "who are assigned other duties with regard to the environment have been given higher responsibilities by God and are therefore accorded higher respect and privileges with regard to social benefits". A key lesson from this assertion is that, for a traditional community, persons who have no affiliations with the gods are less likely to submit to the spiritually oriented principle of self-accountability to divinity. It is therefore important to establish strict measures that will compel people to be accountable aside the spiritual modalities. The philosophy behind TEK and spiritual accountability is founded on the principle of a clear conscience. This relationship between accountability and spirituality, according to the interviews with the chiefs and their representatives, is the main philosophy and principle for anti-corruption in their governance system.

According to the fetish priests of the communities interviewed, when people know that they are first accountable to God and the gods of the land, they are more careful with their decisions and actions. They therefore proposed that swearing in of governance agencies and individuals should be done according to the traditional processes so as to instil the principle of spiritual accountability. Accountability in community based natural resource governance system is also structured according to the traditional hierarchy of social control. The management team are accountable to the chiefs and answer to the chiefs. The chiefs are however accountable to the people but the people have very little power to demand accountability from the chiefs if they fail to submit themselves to the traditional institutions of accountability.

As a result of this, it was proposed in the group discussions at Boabeng-Fiema and Amansuri that, the chiefs are placed in the supervisory hierarchy of the governance structure rather than as members of the Governing Board. This reason for this proposal was that, if chiefs are placed outside the Governing Board, they could help the local people to demand accountability form people who are directly involved with the management of the natural resources. The Youth leaders at Boabeng- Fiema expressed their desire to have the chiefs removed from the Governing Boards of the Sanctuary because it was too difficult to question their decisions and demand accountability. The lessons for traditional resource governance is that Chiefs hold key social status in traditional communities and their status is revered beyond governance boards.

Participation in Natural Resource Governance is an essential strategy for maintaining a peaceful governance environment. It was observed from the various study areas that where people felt recognised and involved in the

decision making process regarding the use and management of their natural resources, they are more tolerant of the outcomes of those decisions whether it goes in their favour or not. Furthermore, people are less likely to be aggressive about issues if they are given the opportunity to talk about issues with the people that matter the most in governance. In most cases as expressed in the focus group discussions, the people felt more comfortable knowing that their views and opinions had a role in a collective decision taken by the community or a communal matter that affects governance processes and management processes. In situations where decisions had been taken based on public votes or family votes, it was observed that people whose votes did not win the day were still satisfied that at least they still had the opportunity to make their voice heard (Fairhead and Leach, 2004).

This was in contradiction to situations where management completely decided for the people without considering their views. A critical lesson for policy makers in national resource governance was that according to the findings, participation meant different things to different people and could be said to be in levels based on individual expectations. Some key levels of participation revealed in the study were;

a. Decisions concerning nature of laws and regulations

b. Decisions on the mandate of management committees and other partnering agencies

c. Decision on the use and disbursement of revenue

d. Processes regarding the monitoring and evaluation of governance processes.

e. Establishment of governing institutions

f. Resource mobilisation

According to Mkenda (2010), where a group of people felt left out in any of the above listed activities; it fuelled mistrust and disharmony in the governance process.

Historical Records Management

The history of the three resource centres were scattered yet they had some high level of cohesion which could still be used to construct a holistic history. Regardless of these cohesions it was observed that where the history had relationships with the history of other nearby communities, there were slight conflict in the facts.

This was mostly observed in the narration of the history of the Boabeng and Fiema communities. The slight differences in the history as narrated by the Boabeng and Fiema communities raised few concerns on the real timelines and events surrounding the TEK of the two communities. That notwithstanding, the management of the Boabeng-Fiema Sanctuary was seen to have adopted one coherent story which combined aspects of both history and highlighted on their common narrations. In Amansuri, the history mostly told remained the history of Nzulezo with less history told of the other communities. The lesson drawn from this is that the history of communities if not recorded and harmonised may be lost as the older generations passed. Furthermore although the history of the communities had been documented, readily accessible documents on the history of the TEK of the communities were all written in English by organisations such as the Forestry Commission, Ghana Wildlife Society and NCRC. During interviews and focus group discussions some aspect of the history documented by these external organisations were disputed by the people bringing to bear the

importance of the people being engineers in the construction of their own history.

Tafi - Atome, Boabeng - Fiema and Amansuri had diverse but similar world views about their environment and natural resources, the concept of a cosmovision was not new to the communities but the construction of cosmovision as a pictorial diagram was difficult for them to comprehend. In my attempt to construct the Cosmovision of the three communities, much inspiration was drawn from their local appreciation of symbols and totems as well as the traditional spiritual hierarchy and human interactions. The key informants on the cosmovision were chiefs, fetish priests and other community leaders who had in-depth knowledge in the spiritual, cultural and social web of life, existence and nature in human world view. From the contributions of these key community leaders it could be deduced that although each community had its own understanding of the world, the concept of cosmovision had not been inculcated into the socialisation process of the community. Furthermore, the lack of a well-accepted cosmovision by the communities had led to a plurality of world views and multiple philosophical perspectives on some basic parameters of cosmovision such as the place of man in the ecological system. A lesson for governance, from the diverging conceptualisation of worldviews or cosmovision is that if the communities do not adopt and educate their people on common world views, they could lose the foundation of their common TEK.

The management of the environment was an integral part of the natural resource governance system and the principle of environmental sanity was premised on three major driving forces; Spiritual obligation, Promotion of ecotourism and Health and safety . In all three communities, the motivation to

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maintain a clean and serene environment was to ensure spiritual harmony because they believed that, for man to live in peace and harmony, the environment should be clean and hygienic enough for the gods and ancestors to visit the community and live amongst them. According to their beliefs when the community is dirty, the gods and ancestors may abandon the community and bring curses upon the people which may result in diseases and death. Another reason for maintaining a clean and serene environment is to make the communities attractive to tourists and other lovers of wildlife who visit the communities for fun, research and education. The community drives its developmental agenda on the revenue obtained from their ecotourism activities therefore a lot is put into making the environment not only attractive to the gods and ancestors but also to tourists.

Habitat Conservation

The conservation of the habitat of the monkeys and the preservation of the monkey species in the natural environment has created a population explosion for the monkeys in both Boabeng – Fiema and Tafi- Atome. In a biological ecological relationship, the human population would have been a natural control for the monkey population. The traditional laws restricting the hunting and feeding on the monkey populations without an expansion in their habitat is forcing monkeys in Boabeng-Fiema to move into the communities to find food supplement.

It was however observed that traditional habitat and species preservation management systems must go hand in hand with habitat expansion or improvement strategies. Some strategies that could be done to expand the capacity of the habitat without increasing its size is the planting of more fruit

plants within the existing habitat, creating water dams and extending the buffer zone around the protected forest sanctuary.

The traditional ecological knowledge as gathered from the three communities had several religious based beliefs about the ecology that could be supported by western scientific science though they were mainly supported by spiritual reasons at the communities. A typical example of such belief was the traditional belief that; mainly planting a new tree after cutting a matured grown tree was not enough in restoring the balance in nature. According to this traditional ecological belief, the soul "sasa" of a grown matured tree cannot be replaced by that of a newly planted tree and the role performed by a grown matured tree spiritually and physically cannot be played by a newly planted tree. Based on this belief, a person is only permitted to cut down a matured grown tree if he plants a new tree and nurtures it to mature for at least a year. After the first year he can perform a ritual to transfer the soul "sasa" of the matured tree into young tree and only after the gods have approved and accepted the transfer can he cut down the old tree. The major lesson from this practice is that, for a sustainable forest resource management and governance, the replacement of resources must precede their extraction.

This cumbersome process as prescribed by the traditional ecological knowledge ensures that before a tree is cut it is duly replaced. Comparatively this approach is better in sustaining our natural resources than the "cut and plant later" strategy mostly prescribed by western resource management programs. In western biological knowledge, the soul of a tree is non- scientific but scientific facts and discoveries clearly supports the fact that the ecological and biological importance of a huge matured tree are far more than a young tree. A huge tree

supports more living organisms, produces more oxygen for the ecosystem and reduce carbon dioxide concentration than a young tree. It is therefore not enough to think that planting a tree after cutting a matured one is enough.
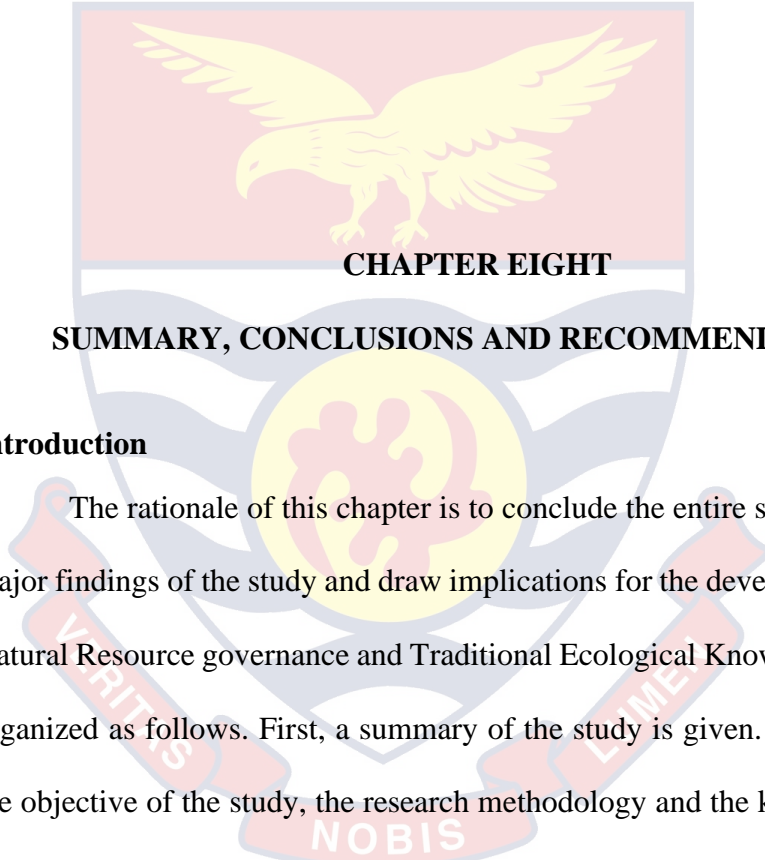
All three communities used fallow days and taboos that could be supported by western scientific knowledge. Though most of the taboos were supported by spiritual reasons and comes from the fetish, the people believed the gods had better reasons than scientific facts to prescribe them. It could however be said that as society develops, it is important for these communities to educate their young ones by providing the young generation with both the traditional and western scientific reasons for their ecological taboos, beliefs and practices.

In conclusion, the Traditional Ecological Knowledge of the three communities have some positive and negative influences on the governance of their natural resources. It was observed that much of the negative TEK founded practices such as the slash and burn methods of land preparation, land rotation methods of farming, voracious hunting of wild animals and the poisoning of wild animals for food had been outlawed by new traditional laws and regulations. In addition, most traditional authorities had imbibed most statutory laws that protected their natural resources. In all three resource areas, the blending of statutory laws and the TEK prescribed laws had improved their management and conservation practices.

Chapter Summary

The third objective of the study which is to draw lessons from the integration of TEK into the NRG processes at the three study areas is addressed in chapter seven. The chapter looks at the success and failures of the governance

system as well as the resilience of the TEK in ensuring an adaptive governance of natural resources at the three study areas.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The rationale of this chapter is to conclude the entire study by discussing the major findings of the study and draw implications for the development of theories on Natural Resource governance and Traditional Ecological Knowledge. This chapter is organized as follows. First, a summary of the study is given. The summary covers the objective of the study, the research methodology and the key findings. Secondly the chapter presents the conclusion and examines the contributions made to the theoretical conceptualization of Natural Resource Governance and Traditional Ecological Knowledge. The chapter further states the recommendations and limitations of the study and ends with highlights on discussion of areas for future research.

Summary

The study set out to assess the role of Traditional Ecological Knowledge (TEK) systems in the Natural Resource Governance of the Boabeng- Fiema, Tafi-Atome and the Amansuri resource areas. The specific objectives for addressing the main objective were to explain the Traditional Ecological Knowledge (TEK) System at the three selected communities, examine the Natural Resource Governance system in the three selected communities and learn lessons from the integration of TEK into NRG for best practices in natural resource governance (NRG). The study explored TEK on four major pillars; the foundation, Institutions, processes and products. The Natural Resource Governance was also examined on three major pillars; the laws, institutions and processes under four principles (Transparency, Rule of law, Accountability and Participation).

The study explored these objectives based on three theories; the theory of Endogenous Development, The Assurance Problem Theory and the Resilience Theory. The population of the study was the people of Boabeng and Fiema, Tafi - Atome and Western Nzema Traditional Area. The study employed a multiple-case study approach using a qualitative study design. Purposive sampling were used to select the key informants for interviewing and other persons for group discussions. Data collection was mainly by interviewing, group discussion and observation. Instruments used for the study were; interview guides, group discussion guides and observation check-lists. Qualitative data analysis involved the use of inductive categorization (Mouton, 2001), mind mapping techniques, discourse analysis and cross site analysis.

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Descriptive statistics such as percentages and pie-charts were used to present data on revenue sharing quotas.

The first objective interrogated the historical foundation and cosmovision behind the traditional ecological knowledge (TEK) of the three selected communities. From the analysis of the interviews and mind mapping illustrations of the cosmovision of the three study area it was realized that;

- Humankind lives in a world which is controlled and influenced by the spiritual dimension. Whatever happened in the physical world had to be approved by the spiritual deities or it would be considered as an error.

- All three Cosmovision considered the supreme God as the Lord of all-natural resources and human beings are not masters over nature but steward of natural resources.

- In all three, mankind is accountable to the supreme God when it comes to the use of all-natural resources and mankind is part of the ecology with equal rights as all sacred animals and tress.

- The motivation for traditional laws on conservation of natural resources are deeply rooted in the history of their migration, resettlement and cosmovision.

- The people's relationship with their immediate ecology was based on their quest to live in harmony with the monkeys in order not to incur the wrath of the gods.

Objective two explored the institutional structure, processes and products of TEK at the three selected communities. From the discourse and deductive analysis of interviews and group discussions it was noted that;

- The TEK of the three study areas were under the custodianship of the Chieftaincy institutions and the fetish priesthood.

- Knowledge acquisition was mainly through divination, observation and experimentation, and anyone could be a source of knowledge.

- The Fetish Priests served as key persons responsible for verification and validation of new knowledge about nature, the environment and natural resources.

- Dissemination of TEK was compulsory and all members were encouraged to share TEK with their family. Parents especially mothers are the key socialization agents. The schools and social organizations and associations also functioned as socialization agents but there were no official TEK and NRG document on to facilitate their function as social educators on resource governance and TEK.

- The products of TEK included agricultural technology, traditional music on nature, artifacts and crafts, herbal medicine and wildlife management practices. These were however not well documented but mainly transmitted by word of mouth.

- The TEK of the three study areas were found to be resilient because they all had mechanisms for adopting to changes in society and new discoveries. They also embraced other sources of knowledge and had imbibed some aspect of western scientific knowledge.

    The third objective of the study was to examine the nature of three pillars of NRG; laws, processes and institutions, involved in natural resource governance at the three selected communities. From the key informant interviews, group discussion and observations, the key findings were that;

- All three study areas had their governance institutions, structures and processes oriented towards observing age old traditions and ecological laws

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and making their communities exceptional eco-tourism centers so that they could generate revenue to develop their societies.

- The laws on resource governance were formulated into bylaws and were a combination of traditional ecological laws and national laws on forest and wildlife conservation.

- The functional institutions of governance at the three study areas were traditional in nature and function. It comprised the Chieftaincy, the fetish priesthood and the family and clan institutions. Others were the state institutions such as the District Assembly and organisations such as the Wildlife Division of the Forestry Commission (Boabeng-Fiema) and the Ghana Wildlife Society (Amansuri)

- Final authority with resource governance was vested in the governing boards but the day to day management of the resources and sanctuaries were done by management teams that are generally responsible for revenue collection and tourism management

- In all three study areas, the percentages for the sharing of revenue were well documented with each area having not less than 20% of revenue dedicated to the protection of their resources, conservation and environmental protection.

- In Boabeng - Fiema the governing board comprised statutory organisations such as the Ghana Wildlife Division of the Forestry Commission, The Fire-Service, The District Assembly and the Police Service. The Amansuri governing Board had inculcated a representative of the Wildlife Society. However, the Tafi - Atome governing board had no statutory or non-

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governmental organisations represented on it but had made room for individuals with expert knowledge from relevant stakeholders.

The fourth objective was to examine the implementation of four principles of NRG; transparency, rule of law, accountability and participation, at the three study areas. Key findings from the interviews, discussions and observation were that;

- Boabeng - Fiema and the Amansuri study areas relied more on both traditional and state organisations (police and forestry guards) to enforce Natural Resource Governance laws. However, in Tafi - Atome much of law enforcement was done using Traditional Authority.

- Members of the community were aware of the laws governing the use of their natural resources as well as the rationale behind those laws.

- Transparency in financial management and the disbursement of revenue in three study areas were not satisfactory at Amansuri and Boabeng – Fiema based on the responses of key informant interviewees and group discussants. At Tafi – Atome however, the annual Monkey Festival was used to brief the community members on the financial status of the sanctuary.

- In all three communities, traditional measures of law enforcement included banishment, fines and public mortification. In addition to the traditional methods, the police service played a major role in bringing law and other in the governance process.

- The board in all three study areas employed the services of external auditors to complement their financial auditing procedures. At Boabeng – Fiema, auditors were sometimes sourced from the District Assembly.

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- The people are also given the opportunity to contribute to the discussion before a decision is taken. However, it was found that Tafi - Atome had an annual session for such public durbars but Amansuri and Boabeng - Fiema schedules were irregular.

The fifth objective sought to identify lessons learnt from the Traditional Ecological Knowledge system and its integration into the Natural Resource governance process. The lessons drawn from the findings of the study are that;

- People's perception of punishment and rule of law are culture centred and dependent on the cosmovision of the people. It is therefore important to situate the rule of law in resource governance based on peoples culture and understanding of their world.

- Traditional laws and institutions are good for natural resource governance because they are easy to change with less bureaucratic procedures, additionally people can easily contribute to the making, reviewing and changing of those laws compared to state laws.

- Depending on the nature of the resources and the ecological demands, natural resource governance can be achieved through partnerships with state institutions and non- governmental institutions. There is however the need to clearly define the roles of all institutions in natural resource governance to avoid conflicts and overlaps.

- The strict preservation approach for the monkeys at Boabeng- Fiema and Tafi – Atome are not sustainable in a long term since the monkeys do not have natural enemies to help control their population. It was observed that the monkey populations in Boabeng – Fiema have increased beyond the carrying capacity of the forest sanctuaries. This situation has forced the

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monkeys to invade the homes of the people to find food to supplement their feeding in the forest.

- The spirituality in TEK should be complemented with strict protocols when it comes to the rule of laws and accountability because persons who have no affiliations with the gods are less likely to submit to the spiritually oriented principle of self-accountability to divinity.

- And participation meant different things to different people , policies on resource governance must be designed to ensure that people at all levels are given the opportunity to participate at the level that they are most comfortable with and have the potential for.

Conclusion

The Traditional Ecological Knowledge in all three resources were deeply rooted in the cosmovision, history and traditional religious beliefs of the communities. The TEK institutions have not changed much in terms of structure but their function keeps changing to accommodate other institutions and new responsibilities. The processes by which TEK is generated, verified, communicated and enforced have adopted to changing times to include the acceptance of western scientific knowledge. Despite this, it has kept its spiritually oriented processes of validation and approval. The laws of TEK have been adopted into formal governance bylaws and have been given statutory powers. The custodians of TEK in all three study areas are still the chieftaincy and fetish priesthood.

The TEK system functions as body of knowledge that function as the guidelines by which natural resources are managed, used and /or conserved.

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They may come from varied sources but have to be verified and validated to be dissemination by the Fetish Priest through the Authority of the Chief. The knowledge includes laws, taboos, practices and traditional technology on nature, farming, traditional medicine and environmental management. The integration of TEK centered laws and regulations into the governance bylaws have made TEK very significant in the natural resource governance of the three study areas.

The governance structure was hierarchical headed by a governing board which was the highest decision making body on resource governance. The board oversees the activities of the management team which comprised a manager and a team of tour guides. The management teams were responsible for revenue collection, receiving and entertaining tourists and researchers and ensuring the compliance of governance laws with their sanctuaries and resource areas. The board audits the accounts of the management team and through the representatives of all stakeholders who sit on the board, take decision on the sharing and use of revenue. Decision making is done through a series of meetings from the family and organizational level to the board through the family, clan, organizational and community representatives.

The natural resource governance system in the three study areas was found to be centered on resource conservation and eco-tourism. The natural resources mainly the flora and fauna in the selected ecology were conserved based on shared mutual principles of governance and traditional laws. The principles of Governance assessed in the study were Transparency, Rule of law, Accountability and Participation. Governance of natural resources in all three study areas upheld these principles but the degree of transparency,

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accountability, rule of law and participation differed from one study area to another. Out of the four principles, transparency and accountability were the least appreciated principles by the key informants interviewed and by the group discussants.

The observance of the rule of law was purely motivated by the mutual understanding and trust that other members of the community will not exploit the communal resources that have been marked for reservation or conservation for spiritual, ecological and economic reasons. This confirms the tenets of the Assurance Problem Theory which proposes that observance of mutually beneficial laws on communal resources is based on the assurance that everyone is observing the laws.

Key lessons drawn from the findings of the study centered on the need for proper documentation of the history, cosmovision and TEK of the communities using Afrocentric and ethnocentric data collection methodologies. Additionally the findings provided some lessons for policy makers in the area of law making, maintaining and sustaining rule of law, transparency and accountability. Policies on TEK integration in NRG must ensure that spirituality aspect of law enforcement and accountability is complemented with other practical but non-spiritual measures. Lastly endogenous development is achievable only when it remains dynamic and adaptive to changing social conditions. This is strongly supported by the Resilience Theory.

Recommendations

Based on the findings and conclusions of the study, three recommendations were made. The integration of TEK into Natural Resource Governance is most effective when the people who are owners of the common

resource are more informed about all aspect of their TEK and the significance of the TEK in driving development (Tippett, 2000). Based on the findings it is recommended that the Chieftaincy Councils of the communities initiate a project to compile and document the TEK of their communities. This document will help traditional and formal organisations such as the schools, youth groups, and wildlife and conservation organisation to educate their members on the true ecological knowledge of their communities. From the study it was realised that, in the absence of an official document on the TEK of the three study areas, the people are more likely to accept distortions of some aspect of the TEK which are mainly shared orally. Additionally, if TEK is not documented certain critical TEK such as knowledge of some herbal medicines, wildlife conservation strategies and traditional agricultural technologies may be lost over time.

Secondly, although the traditional laws have been integrated into the bylaws on resource governance, copies of these bylaws were difficult to come by. The few copies obtained showed that these bylaws had not been reviewed for over 10 years. I therefore recommend that the governing boards of these resource areas should invest in reviewing these bylaws and making copies available to all relevant stakeholders and organisations that are functional units of the resource governance system. This will make it easy for all members to the community to understand the governance process, promote accountability and improve participation among the people. This recommendation is justified by IUCN (2014) framework on resource governance which emphasizes the availability of reference materials on governance laws and guidelines as one significant factor for encouraging public participation and improving accountability and transparency.

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Thirdly, I strongly recommend that the governing boards and the management teams of the three conservation areas studied should design and implement a long term habitat expansion plan to increase the carrying capacity of the sanctuaries. This is important because from the finding of this study and other studies such as Gordon (2000) and Hens (2006) strict preservation and protection of wild animals in sanctuaries lead to an ever increasing population which often leads to over population of the preserved species. The carrying capacity of the sanctuaries can be increased, the sources of planting more fruits crops, improving the source of water by creating dams and establishing corridors to link the sanctuary with other safe habitats within the locality.

Limitations of the Study

One limitation of the study was that, I could not ascertain the factuality of some historic narrations about the foundations of the TEK. The study could not use archeological techniques to help resolve some discrepancies in the historic narrations of the key informants and interviewees.

Additionally, the finding of the study identified some similarities and differences in the TEK and NRG of the three study areas with some evidence of transformation in the processes of governance. However, the time frame for the study could not allow the study to examine the pattern of change in the TEK and NRG systems at the three study areas. Furthermore, the findings on the integration of TEK into the NRG at the three study areas could not be used to establish the extent to which the integration was deepening or lessening over time.

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Contributions to Knowledge

The study sought to establish the foundations of the TEK of the three study areas and examine their significance to the nature of the TEK. To answer the research question on the foundation of the TEK the study has constructed the cosmovision for the three study areas and established the influence of the cosmovision of the communities to their history and TEK. This is important because although there were some documented historic stories about the communities, there was no literature on the cosmovision of the three study areas.

Additionally, the study has established the structure of relevant TEK organisations and institutions and their hierarchical structure with regard to the generation, verification, dissemination and enforcement of TEK and Traditional laws on ecological management. The findings of the study revealed that the chiefs and fetish priests are the main custodians of TEK which is a major similarity in the structure of TEK in the three study areas.

Another contribution to knowledge is the in-depth exploration of the TEK institutions and their relationship with other traditional organisations and non-traditional organisations. The study has revealed that in the three study areas there exists a harmonious working relationship between the chieftaincy institution, the fetish priesthood and governmental and non-governmental organisations in the governance of natural resources. This was evident in Boabeng –Fiema, the relationship with The Wildlife Division of the Forestry Commission, Tafi- Atome's relationship with the Tourism Authority and Amansuri's relationship with the Ghana Wildlife Society.

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Available literature in the natural resource governance in the resource areas had focused on the taboos and traditional rules and the blending of Traditional and statutory laws in achieving natural resource governance. This study has further examined the natural resource governance system at the three resource reserve areas by assessing the nature of the governance laws, processes and institution within the framework of the Traditional Ecological laws, processes and institutions. This assessment revealed that the NRG system had integrated the traditional ecological laws and taboos into the governance bylaws. Additionally, the key custodians of TEK; The Chiefs and Fetish Priests were part of the governance boards and management teams in all the three study areas. The study also established the extent to which TEK influenced transparency, rule of law, accountability and participation in the NRG system in Boabeng - Fiema, Tafi - Atome and Amansuri Resource Reserve Area. This was evidenced by the revelation that some aspect of the rule of law and compliance was done by traditional authorities guided by traditional laws and beliefs.

The study has also contributed to the theoretical discussions on endogenous development, resilience in natural governance and assurance problem in governance common pool resources. The findings of the study revealed that development in the three study areas were not strictly based on indigenous or traditional processes and approaches but included adopted ecotourism driven development strategies from external sources and organisations such as the Ghana Wildlife Society and The Wildlife Division of the Forestry Commission. This goes to support COMPAS/UDS (2008) which

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states that in endogenous development local people can choose external resources that best fit local conditions and developmental goals.

Furthermore, the study supports the discussions on Resilience Theory based on the principle that resilience governance system thrives on resilient governance institutions, processes and laws which are constantly changing to suit changing situations (Walker and Salt, 2006). In the three study areas, the laws and governance processes were found not to be static but evolving. In all three study areas, the communities had moved from a strictly spiritual traditional governance system to a modern system that gave opportunity for the involvement of other developmental stakeholders such as the District Assembly, the police and the tourism authority.

The findings of the study also confirmed the fact that traditional communities are capable governing their natural resources based on mutually accepted rules and guidelines. These assertion is in conformity to the Assurance Problem Theory. The findings from Boabeng- Fiema and Amansuri also supported the tenets that when there is lack of trust in the governance processes owners of common assurance problem may arise leading to chaos and conflicts (Haverkort, van't Hooft and Hiemstra, 2003).

Resilient Endogenous Resource Governance Model
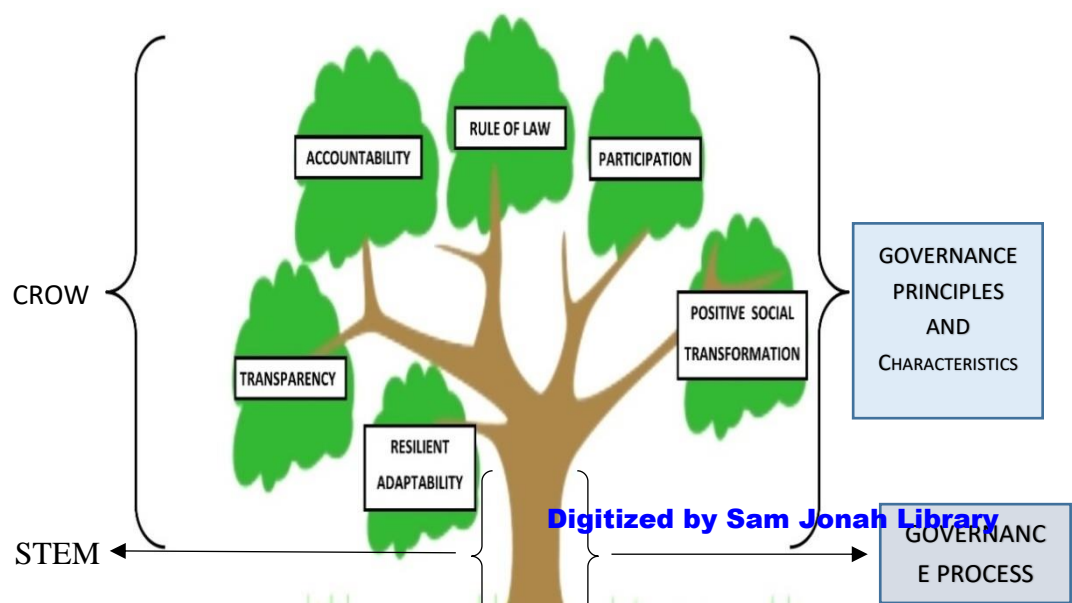
Figure 31: **Resilient Endogenous Resource Governance Model.**

Source: Author's construction (2019)

The Resilient Endogenous Governance Model as shown in Figure 32 is depicted as a tree because it is designed to facilitate growth and development in a society. Additionally, it is proposed to grow and improve if all factors are conducive or die out, if the factors necessary for its survival are absent. Like a living organism, it is supported by environmental factors which are not static but constantly changing. The model therefore prescribes a homeostatic resource governance system which does not oppose change but rather adapts to the changing environment while keeping to its developmental goals and social function.

The model has three sections; the roots, stem and crown. The roots comprise the governance foundation and requirements necessary to achieve the governance goals.

The roots

The root (foundation) according to this model includes;

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i. Natural resources comprising the human beings and their cognitive strengths, flora, fauna, mineral and water resources that are prevalent in the biosphere of the society.

ii. Resilient TEK which is described as a dynamic body of knowledge built by a group of people about the natural environment and resources through generations of living in close contact with nature (adapted from Brockman, Masuzumi, and Augustine, 1997). A resilient TEK system is sensitive to changes in society and constantly upgrades its content, processes and products to meet modern and new relevant discoveries and knowledge.

iii. An endogenous development policy which is drafted by the people, for the people and based on the peoples well-informed criteria for development using mainly but not restricted to local resources, experiences, knowledge and expertise.

iv. Functional social institutions are described as active bodies that facilitate the TEK and governance processes to ensure holistic endogenous development in a most transparent, accountable, humane and participatory manner. These institutions may be independent in their processes but integrated in function to other institutions and the people's needs.

v. Dynamic cosmovision refers to a world view of the people which is the philosophical background to how a group of people understand and appreciate their natural and social being and environment. The cosmovision of a people are often passed on from one generation to another but they must be dynamic in nature to adopt to new knowledge

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which should lead to a better understanding of one's natural and social environment.

The stem

The stem of the model describes the connection between the foundation and the principles and characteristics of the governance system. The stem represents the processes that facilitate the governance and developmental system. It is the real work involved in the implementation of the governance and endogenous developmental policy.

Like a tree, the stem is the connection between the roots and the crown and facilitate the transfer of nourishment from the roots to the crown and vice versa. In this model the governance principles and characteristics are changed by the changes in the roots whiles changes in the crown equally trigger the necessary changes in the TEK, Developmental Policy, Cosmovision and the natural resources (which includes the human beings as the most active constituents).

In the absence of the stem the governance principles cannot be achieved because they will lack operational basis and social commitment from the people. Just like a tree, the crown will die if it loses its connection with the roots and the roots will die if the crown fails to supply it with nourishment. Based on this biological analogy the model proposes that governance systems must be connected to the culture of the people, be sensitive to their social dynamics and be focused on meeting their developmental goals and values. Where this connection breaks the peoples trust in the governance system will be lost leading to chaos.

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The stem is also a critical aspect of this model of governance since it represents the plough back principle of governance which proposes that some of the benefits obtained from the governance system especially revenue and capital resources generated in the implementation of developmental policies must be invested in the foundation of the governance process. In practice it suggests that societies must invest in sustaining their TEK system through the financing of research, documentation of TEK and sponsorship of research into ways of utilising available natural resources, human capital development and biodiversity conservation.

The resilient endogenous resource governance model is based on the endogenous development theory, resilient theory and adaptive natural resource governance – all of which have been discussed in the literature review. The model seeks to present a natural resource governance system that combines the tenets of the two theories and principles of adaptive natural resource governance.

The model has the following tenets;

i. The model promotes a natural resource governance system that is based mainly, though not exclusively, on locally available resources, values, institutions and knowledge.

ii. The developmental goals of the model are based on local peoples' own criteria of development and takes into account the material, social and spiritual well-being of people centred on the culture (Farmer, 1999).

iii. The governance of natural resources must be founded on Transparency, Rule of Law, Accountability and Participation (TRAP) principles proposed by IUCN (2010)

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iv. The governance system must be resilient in its adaptability. Meaning it must be capable of adapting to change in the social-ecology without losing its ability to perform its social functions and achieving the set development goals (adopted from Folke, 2006).

v. The governance system must achieve positive social transformation which is in line with the socially accepted criteria for development. The social transformation must be sustainable and benefit a wider social group and not just a few individuals in the society.

Areas for Further Research

The study concluded that although the study has established that there is integration and relationship between the Traditional Ecological Knowledge system and the Natural Resource Governance system. The study identified the integration mainly in the areas of laws, processes and institutions. There is the need for further studies to examine the degree of integration over a period of time to determine if the integration is deepening or lessening.

The study also identified some similarities and differences in the TEK and NRG at the three study areas but did not assess the pattern of change. The Resilience Theory proposes that changes in governance and TEK could bring different TEK and NEG systems to a "convergent" point where they become increasingly similar or "divergent" where the differences deepen and become extremely distinct. Further studies could be carried out over a longer period of time to examine the pattern of change in the TEK and NRG systems in the three study areas.

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APPENDIX A

INTERVIEW GUIDE

TEK – (FOUNDATION)	
What is the philosophy behind the TEK in your community? What is the history of the TEK? What are the traditional totems that drive and represent the TEK?	
Spiritual * Economic * Cultural * Environmental Deep ecology * Environmental Ethics *Cultural Ecology	
TEK INSTITUTION What are the institutions that facilitate TEK in the community? Which personalities in which capacities serve as custodians What is the mandate of those institutions concerning TEK	
Institutions * Functional units * Governance network	
TEK PROCESSES What are the processes that facilitate traditional knowledge on the ecology? How are those processes communicated? How are those processes reviewed	
Knowledge creation * Knowledge Validation/ adaptation * Knowledge sharing * Knowledge usage enforcement	
TEK PRODUCTS What are the outcomes of the TEK processes? How are the products preserved and presented to the people? What is the role of the products? How relevant are the product presently	

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Taboos * Customary laws * Rituals * Songs and folklores	
TRANSPARENCY in NRG What are the procedures put in place to ensure transparency concerning; Revenue collection and accounting Recruitment of staff and selection of Board members Selection of annual developmental projects Budgeting and allocation of funds Auditing of accounts and audit reports Donations and other funds from NGOS Status of Natural Resources (Resource accounting reports)	
free flow of information on Participation, Access, Rights and Responsibility Income generation and distribution, Communication channels and grievance expression models, resource valuation and evaluation.	
RULE OF LAW IN NRG Which laws run the governance of the Natural resources Where do the laws emanate from and who decides on them? How are the laws reviewed? How are the laws enforced? Which institutions and officers are responsible for the rule of law	
*Clear communication of laws *Non-discriminatory application of laws	

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* Effective enforcement of laws * Predictable and legally enforceable methods for changing the laws	
Accountability in NRG How are leaders in NRG held responsible for their decision How are officers monitored on public incomes and expenditure? How are projects implementation monitored for financial efficiency? Which body oversees auditing and publication of accounts	
Customary and statutory procedures for holding officials and leaders responsible for their * Decisions *actions *expenditure *management activities and *policy impacts	
PARTICIPATION in NRG How NRG facilitates effective representation and involvement of the people in; Decision making Board / community decision making Implementation of community decision Evaluation of project and interventions Ensuring the involvement of gender factors and marginalised group sensitivity	
Effective representation and involvement of people in *Decision making * Implementation *Evaluation and *Gender and marginalised group sensitivity	

SECTION B

WHICH TEK PROCESSES ensures – TRANSPARENCY

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free flow of information on Participation, Access, Rights and Responsibility Income generation and distribution, Communication channels and grievance expression models, resource valuation and evaluation.	
WHICH TEK PROCESSES ensures – Rule of Law	
*Clear communication of laws *Non-discriminatory application of laws * Effective enforcement of laws * Predictable and legally enforceable methods for changing the laws	
WHICH TEK PROCESSES ensures – Accountability	
Customary and statutory procedures for holding officials and leaders responsible for their * Decisions *actions *expenditure *management activities and *policy impacts	
WHICH TEK PROCESSES ensures – PARTICIPATION	
Effective representation and involvement of people in *Decision making * Implementation *Evaluation and *Gender and marginalised group sensitivity	

<u>SECTION C</u>

Which TEK AND NRG INSTITUTIONS ensures – TRANSPARENCY

Free flow of information on Participation, Access, Rights and Responsibility Income generation and distribution, Communication channels and grievance expression models, resource valuation and evaluation	
Which TEK AND NRG INSTITUTIONS ensures – Rule of Law	
*Clear communication of laws *Non-discriminatory application of laws * Effective enforcement of laws * Predictable and legally enforceable methods for changing the laws	
Which TEK AND NRG INSTITUTIONS ensures – Accountability	
Customary and statutory procedures for holding officials and leaders responsible for their * Decisions *actions *expenditure *management activities and *policy impacts	
Which TEK AND NRG INSTITUTIONS ensures – PARTICIPATION	
Effective representation and involvement of people in *Decision making * Implementation *Evaluation and *Gender and marginalised group sensitivity	

SECTION D

Which LAWS ensures – Transparency?

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|	
Free flow of information on Participation, Access, Rights and Responsibility Income generation and distribution, Communication channels and grievance expression models, resource valuation and evaluation.	
Which LAWS ensures – Rule of Law?	
*Clear communication of laws *Non-discriminatory application of laws * Effective enforcement of laws * Predictable and legally enforceable methods for changing the laws	
Which LAWS ensures – Accountability	
Customary and statutory procedures for holding officials and leaders responsible for their * Decisions *actions *expenditure *management activities and *policy impacts	
which laws ensures – participation	
Effective representation and involvement of people in *Decision making * Implementation *Evaluation and *Gender and marginalised group sensitivity	

What is the role and position of TEK on – transparency	
free flow of information on Participation, Access, Rights and Responsibility Income generation and distribution, Communication channels and grievance expression models, resource valuation and evaluation.	

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What is the role and position of TEK on – rule of law	
*Clear communication of laws *Non-discriminatory application of laws * Effective enforcement of laws * Predictable and legally enforceable methods for changing the laws	
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Effective representation and involvement of people in *Decision making * Implementation *Evaluation and *Gender and marginalised group sensitivity	
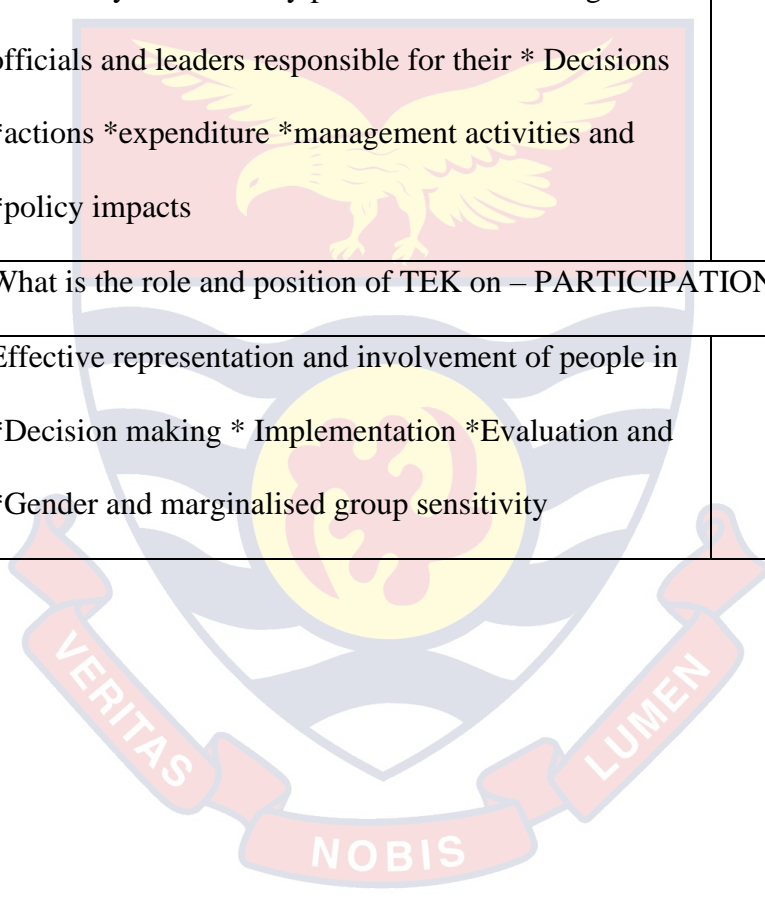
APPENDIX B

OBSERVATION CHECK-LIST

	YES	NO	DETAILS
ENVIRONMENT			

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The community is clean and tidy			
There are directional boards and signage in the community			
Wild animals are free to move about in the community			
The people are receptive to tourists			
Sanitary facilities are available			
There are refuse bins and dustbins available			
RESOURCE AREA ACCESIBILITY AND INFRASTRUCTURE			
Health care facilities are available CHIP Compound 2. Clinic 3. Poly clinic 4. Hospital PHARMACY HERBAL CLINICS			
Educational facilities are available Primary 2. JHS 3. SHS Post SHS Facilities			
Road network within community is good			
There are sources of potable water			
Electricity is available			
Access to transportation by road to and from community is good			
TOURIST MANAGEMENT			

Tourists are addressed in suitable languages			
The tour guides dress decently			
The vision and mission of the sanctuary is well communicated at the reception			
The reception has enough space to receive large numbers of tourists			
TRANSPARENCY AND ACCOUNTABILITY STRUCTURES			
The tourists are given receipt for payments			
Price list for tourist is well displayed at reception.			
Reception has a complaint desk for tourists and members of the community.			
Reception has suggestion box for tourists and community members.			
Accounts for revenues are published and accessible upon request.			
PROJECTS MANAGEMENTS AND PATRONAGE			
Revenue funded projects are well maintained.			
Revenue funded projects are visible in the community.			
Revenue funded projects are well patronised by members of the community.			

Revenue funded projects are labelled to show year and source of funds			

APPENDIX C

GROUP DISCUSSION GUIDE

TEK – (FOUNDATION)
What is the philosophy behind the TEK in your community?
What is the history of the TEK?

What are the traditional totems that drive and represent the TEK?
TEK INSTITUTION What are the institutions that facilitate TEK in the community? Which personalities in which capacities serve as custodians What is the mandate of those institutions concerning TEK
TEK PROCESSES What are the processes that facilitate traditional knowledge on the ecology? How are those processes communicated? How are those processes reviewed
TEK PRODUCTS What are the outcomes of the TEK processes? How are the products preserved and presented to the people? What is the role of the products? How relevant are the product presently
TRANSPARENCY in NRG What are the procedures put in place to ensure transparency concerning; Revenue collection and accounting Recruitment of staff and selection of Board members Selection of annual developmental projects Budgeting and allocation of funds Auditing of accounts and audit reports Donations and other funds from NGOS Status of Natural Resources (Resource accounting reports)
RULE OF LAW IN NRG Which laws run the governance of the Natural resources Where do the laws emanate from and who decides on them? How are the laws reviewed? How are the laws enforced? Which institutions and officers are responsible for the rule of law
Accountability in NRG How are leaders in NRG held responsible for their decision How are officers monitored on public incomes and expenditure?

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How are projects implementation monitored for financial efficiency? Which body oversees auditing and publication of accounts
PARTICIPATION in NRG How NRG facilitates effective representation and involvement of the people in; Decision making Board / community decision making Implementation of community decision Evaluation of project and interventions . Ensuring the involvement of gender factors and marginalised group sensitivity

SECTION B

WHICH TEK PROCESSES ensures – Transparency	
WHICH TEK PROCESSES ensures – Rule of Law	
WHICH TEK PROCESSES ensures – Accountability	
WHICH TEK PROCESSES ensures – Participation	

SECTION C

Which TEK AND NRG INSTITUTIONS ensures – Transparency
Which TEK AND NRG INSTITUTIONS ensures – Rule of Law
Which TEK AND NRG INSTITUTIONS ensures – Accountability
Which TEK AND NRG INSTITUTIONS ensures – Participation

SECTION D

Which LAWS ensures – transparency?

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Which LAWS ensures – rule of Law?	
Which LAWS ensures – accountability	
Which LAWS ensures – participation	
What is the role and position of TEK on – transparency	
What is the role and position of TEK on – rule of Law	
What is the role and position of TEK on – accountability	
What is the role and position of TEK on – participation	

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