THE ROLE OF TRADITIONAL AUTHORITIES IN WATER RESOURCE MANAGEMENT IN BINAABA, BAWKU WEST DISTRICT

BY

TAMARA AMINA SULEMANA (BA. Integrated Development Studies)

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DECLARATION

Student

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

Candidate's Signature:..... Date.11TH OCTOBER, 2013

Name:TAMARA AMINA SULEMANA

SUPERVISOR

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of dissertation/thesis laid down by the University for Development Studies.

Certified by:

Principal Supervisor's Signature:..... Date.24/10/2013

Name: Dr. Kanton I. Osumanu

ABSTRACT

Current water reforms in most African countries focus on decentralizing *water management* to the water users, as a way of improving water governance. The target of these reforms is equity, efficiency and sustainability. Unfortunately, the reforms tend to concentrate on the use of statutory laws, and give little consideration to the already existing traditional practices. This report presents the findings of a case that examined traditional water management practices in Binaaba located in the Bawku West District of the Upper East Region of Ghana. The study examined water-related management activities around the Binaaba Dam, which is a small multipurpose dam. Key informant interviews and structured questionnaires administered at the household level were used to assess traditional water management practices in terms of their existence and their effectiveness in sustaining water supply and rural livelihoods. Their implications for Integrated Water Resources Management, and therefore improved water governance, were also assessed. The study revealed that customary laws govern water resources management. Traditional leaders preside over all water-related issues. The traditional water management practices were also found to be quite effective for sustaining food production, because everyone is allowed to have access to the water. Moreover, water resources are managed as a whole system. Majority of the people are not aware of the IWRM, indicating that the attempts to introduce IWRM in this area have not been effective. The study concludes that it is important to seriously take into consideration traditional water resources management practices, as these are vital for improved water governance. However, it is essential to first assess the sustainability of the traditional water management practices for effective IWRM implementation and therefore improved water governance.

DEDICATION

I dedicate this thesis to my mother, Ms. Mary Takoro, the foundation of my life and the memory of my father Alhaji Sulemana.

To my lovely daughter, Laurentia Pamela Ampim Darko, and my two body guards David and Thomas for their support and inspiration in all my studies.

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ACRONYMS

AREX -Agricultural Research Extension
CBO-Community Basic Organization
CPWF-Challenge Programme for Water and Food
DDF -District Development Fund
FAO -Food and Agriculture Organisation
GNWP-Ghana National Water Policy
GWP -Global Water Partnership
ICWE-International Conference on Water and the Environment
IIKSS -Integration of Indigenous Knowledge Systems and Science
INBO-International Network of Basin Organizations
ISW -International Secretariat for Water
IWRM -Integrated Water Resources Management
NGO-Non Government Organization
SADC -Southern African Development Community
TWM -Traditional Water Management
TWRM- Traditional Water Resource Management
UNCED-United Nation Conference on Environment and Development
UNDP-United Nations Development Programme
USAID-United State Agency for International Development
WRC-Water Resources Commission
WUA-Water Users Association
WWC-World Water Conference

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Water is essential to the existence of man and all living things. Water is a crosscutting element of the Growth and Poverty Reduction Strategy (GPRS II) of the Republic of Ghana and is linked to all Eight of the Millennium Development Goals. Lack of potable water, occurrence of drought or floods expose people, especially women and children, to water-borne and sanitation-related diseases as well as relocation problems including the risk of contracting HIV/AIDs. Water is a basic human need and access to minimum quantities of safe water should be everyone's right. Lack of access to safe drinking water, sanitation, and irrigation is directly related to poverty and poor health. For example, in South Asia 300 million people have no safe drinking water and 920 million people have no adequate sanitation (WWC, 2000).

Water is central to many industrial activities including, hydropower generation, transport services and tourism. Population growth and concentration, rapid urbanization and industrialization resulting in an increase in individual and collective needs have made water increasingly scarce and often of low or reduced quality. In addition to these, current global climatic change processes are expected to affect both the spatial and temporal unpredictability of water availability. The water resource base is, therefore, under threat (GNWP, 2007). The destruction or degradation of ecosystems puts many communities that depend on natural resources at risk. Biodiversity is lost and fisheries decline. Plus, more and more people are becoming exposed to water-related health hazards. Even the most conservative estimates

consider that water-related diseases are currently causing between 2 and 5 million deaths every year and this could increase to 59 and 135 million deaths a year by 2020 (GWP, 2009).

It is also important to recognize both the positive and negative aspects of water. On one hand, water is essential to human, animal and plant life. Water supports productive activities including agriculture, generation of hydropower, industries, fishing, tourism and transport. On the other hand, water can be extremely destructive, carrying diseases and flooding vast areas. Insufficient water or prolonged drought can result in widespread death and economic decline. Water can also cause or escalate conflicts between communities in a local or national basin, or in trans-boundary basins shared by more than one country. Looking at the positives and the negatives of this essential commodity it is important to manage it very well in order to drastically reduce the negatives to the benefit of the positives.

The National Water Policy of Ghana is intended to provide a framework for the sustainable development of Ghana's water resources. It is targeted at all water users, water managers and practitioners, investors, decision- makers and policy makers within the central government and decentralized (district assemblies) structures, non-governmental organizations and international agencies. The policy also recognizes the various cross-sectoral issues related to water-use and the links to other relevant sectoral policies such as those on sanitation, agriculture, transport, energy et cetera (GNWP, 2007).

Integrated Water Resource Management (IWRM) has become a global issue and every nation is making efforts to adopt this style in managing its water resources. These are done by various governments, non-governmental and other civil society groups. The Global Water Partnership (GWP) defines Integrated Water Resources Management (IWRM) as "*a process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems*" (GWP, 2000: 18?)

A definition by the United States Agency for International Development (USAID) also says *"IWRM is a participatory planning and implementation* ***process****, based on sound* ***science****, which brings together* ***stakeholders*** *to determine how to meet society's long-term needs for water and coastal resources while maintaining essential* ***ecological*** *services and* ***economic*** *benefits"(WBI,2006: 4)*

The above definitions suggest that IWRM will help to protect the world's environment, foster economic growth and sustainable agricultural development, promote democratic participation in governance, and improve human health (WBI, 2006).

According to the International Conference on Water and the Environment (ICWE 1992) four principles were recommended as guides for global water management and development. The second of these four principles, which is "institutional" states that "this participatory approach is to raise awareness of water issues among policy-makers and the general public. It emphasizes that *subsidiary* – management decisions should be taken at the lowest appropriate level, with

central government retaining regulatory and support roles. It advocates increased accountability of management institutions and full consultation and involvement of users in the planning and implementation of water projects. The capacity of certain disadvantaged groups may need to be enhanced through training and targeted pro-poor development policies for full participation. IWRM applies this principle through its concepts of decentralization and participation. These clearly indicate that the participation of the traditional institutions is very necessary if water resource management is to be sustainable at all levels.

The integrated water resources management approach helps to manage and develop water resources in a sustainable and balanced way, taking account of social, economic and environmental interests. It recognizes the many different and competing interest groups, the sectors that use and abuse water, and the needs of the environment. The integrated approach co-ordinates water resources management across sectors and interest groups, and at different scales, from local to international. It emphasizes involvement in national policy and law making processes, establishing good governance and creating effective institutional and regulatory arrangements as routes to more equitable and sustainable decisions. A range of tools, such as social and environmental assessments, economic instruments, and information and monitoring systems support this process.

In the last few decades, many countries have made significant efforts to improve institutional and legal frameworks for water management. National water laws and policies adopted recently have generally taken into account good governance values and IWRM principles, such as participation, gender and equity issues, environmental concerns and economic assessments. At

the 2002 World Summit on Sustainable Development, many countries made a commitment to develop national IWRM and water efficiency plans.

Subsequently, several countries in Africa adopted the IWRM approach into formal government structures. For example, Ghana set up the Water Resources Commission with a cross-sectoral mandate. The Ghana Water Act (1998), the South African Water Act (1998) and Mali's 2007 Water Code, among others, all takes an integrated approach. Burkina Faso completed an IWRM Plan in 2003. Kenya, Malawi, Mali, Senegal and Zambia completed plans in 2008, and Benin, Cape Verde, Eritrea, Mozambique and Swaziland are all in the process of developing similar plans (GWP and INBO 2009).

1.2 Problem Statement

Integrated water resource management has become a global issue for decades now. From the 1970s, after the United Nations Conference on Water in Argentina, there have been various World summits, International conferences on sustainable development of the environment with much emphasis on water. In most of these summits and conferences guide lines, suggestions and recommendations are made all geared towards sustainable development and management of water resource. With the mission to support the sustainable development and management of water resources at all levels, the Global Water Partnership (GWP) was formed in 1996 to foster Integrated Water Resources Management (IWRM), to ensure and co-ordinate development and management of water, land and related resources by maximizing economic and social welfare without compromising the sustainability of vital environmental systems.

The **International Network of Basin Organizations** (INBO), established in 1994, is also an international network that supports the implementation of integrated water resources management in river and lake basins. It links basin organizations and other government agencies responsible for basin management in order to promote the exchange of experiences and develop suitable tools for better basin management at trans-boundary, national and local levels.

Ghana in its quest to manage water resources established the Water Resources Commission in 1996 with the mandate to regulate and manage Ghana's water resources and to co-ordinate government policies in relation to them. As the overall body responsible for water resources management in Ghana certain responsibilities were spelt out as follows:

- Propose comprehensive plans for the utilization, conservation, development and improvement of water resources;
- Initiate, control and co-ordinate activities connected with the development and utilization of water resources;
- Grant water rights;
- collect, collate, store and disseminate data or information on water resources in Ghana;
- Require water user agencies to undertake scientific investigations, experiments or research into water resources in Ghana;
- Monitor and evaluate programmes for the operation and maintenance of water resources;
- Advice the Government on any matter likely to have adverse effect on the water resources of Ghana;

- Advise pollution control agencies in Ghana on matters concerning the management and control of pollution of water resources; and
- Perform such other functions as are incidental to the foregoing

The study community is located in the Bawku West District Assembly of Upper East Region. The community is found along the white and red Volta basin. The natives of the community under study are farmers and depend on natural rains and the water from the red and white Volta. It is observed that, during the wet season, people in the communities' farm with the natural rain water however, when it is dry season they move and farm along the Volta basin.
So for them, the Volta River is very important.

In the Bawku West District communities, the traditional institutions are the managers of every resources including the use of the water in the Volta and the dam.

In the view to integrate water resources management, little or nothing is mentioned about the role or the responsibilities of traditional institutions who are seen traditionally as the overseers, owners or spiritual leaders of natural resources, especially water bodies.
Water is the common symbol of humanity, social equity and justice. It is one of our compelling links with the sacred, with nature, and with our cultural heritage (Dooge, 2003).
The research therefore seeks to identify the roles of traditional institutions in water resources management in Binaaba.

1.3 Research Questions

The main question guiding the study is: What is the role of traditional institutions in integrated water resource management?

The sub-questions are:

i. What is the nature of water resource management in Binaaba
ii. What roles do the traditional institutions play in water resource management
iii. At what level of the management are traditional institutions involved?
iv. How effective is the role played by the traditional institutions?
v. How long does it take for laws on water resources to be enforced

1.4 Main and Specific Objectives

The main aim of the study is to examine the role of traditional institutions in integrated water resource management.

The specific objectives are:

i. To examine the nature of water resource management in Binaaba.
ii. To find out the roles traditional institutions play in water resources management
iii. To identify the level at which the traditional institutions are involved in the management
iv. To find out how effective is the role of the traditional institutions
v. To find out how long it takes for laws on water resources to be enforced

1.5 Justification of the Study

Traditional water management practices have been in existence for a long time. They appear to be sustainable in terms of providing food security, and safeguarding the resource. Therefore, for effective water governance, it is essential that an evaluation of the traditional practices is undertaken. It is also important that these traditional practices be appreciated and built upon with the modern water management practices. It can be argued that improving livelihoods is likely not to be attained if people are first stripped of their indigenous water management practices and values, and new ones are imposed on them.

Since the establishment of Water Resources Commission, there has been the setting up of some groups in communities that have water resources like rivers, dams, streams and so on. These groups have added up to the already existing traditional institutions and their roles are most times conflicting. Some Non-Governmental Organizations who are into water projects also set up committees or groups to manage the water projects or water facilities provided in the communities. This has made it difficult to actually see the clear roles of the traditional institutions when it comes to water management.

With Integrated Water Resources Management which is a new paradigm in water management, it appears there is no satisfactory attention given to the traditional institutions. Therefore it is not out of place to identify the roles played by traditional institutions so that it can effectively and efficiently help to successful implement the Integrated Water Resources Management concept.

1.6 Limitations of the study

The following are the possible limitations of the study

- The study is on a community in the Bawku West District of the Upper East Region and as such cannot be generalized for the whole country.
- It took the researcher a day and a half to get to the study community.
- There is no means of transport from the District capital to the study community.
- The researcher is not a native of the study community so could not speak the local language.

1.7 Ways to reduce limitations during research

- The Researcher lived in the study community for the two and a half weeks that she used for the data collection.
- Researcher rented a motor bike from the District capital as means of transport to the study community and used the bike for internal movement since the community is a dispersed one.
- During data collection the researcher used a translator to enable her communicate with respondents.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives the theoretical basis of this study paying particular attention to traditional or indigenous water management practices. In this respect it is important to state that 'traditional' or 'customary' practices are very wide aspect of various societies and have been applied in all sectors of people's lives; the practice ranges from beliefs, world views, superstitions, to natural resource management. This chapter examines the concept of Traditional Water Resources Management practices as it is discussed in literature. It begins by showing the relationship between water and rural livelihoods, explores various examples of TWM internationally, zeroing down to the study area of Binaaba. The chapter then looks at the relationship between the modern water management practices and integrated water resources management (IWRM) in the context of Ghana, and traditional water management (TWM). It ends with a summary of the ideas, concepts, impressions and perceptions explored throughout the chapter.

2.2 Background: Ghana's Water Reforms

National Water legislation was introduced in Ghana in 1906 following the enactment of the Water Ordinance of the British colonial Government in 1903. Although the Water ordinance remained valid until 1996, in practice, various acts were enacted in respect of specific areas on water management. During this period, customary water use laws and norms were accepted and respected throughout the country (Laube, 1997). Early reforms, prior to 1996, in the Ghanaian Water sector targeted the involvement of communities in irrigation management, but focused mainly on the drinking water sector. Various legislations dating from the colonial era vest the

responsibility for the water sector in various ministries, departments and agencies of state. These include mining, agriculture, industry, works and housing and transport and related agencies such as the VRA, the Minerals and Forestry Commissions and the Irrigation Development Authority for the varied and contemporary uses of water including irrigation, power generation, transportation and industrial uses (Sapong, 2005).

From the 1990s Ghana water sector has witnessed significant progress in the re-structuring of the water sector. This was after a long period of state support that was fraught with enormous challenges. Some of the key challenges that necessitated the reforms include insufficient rural and urban water supplies, rising domestic, agricultural and industrial water demand, decreasing water availability, weak institutional framework and economic problems of water providers (Bako-Arifari et. al., 2004). Through the initiative of international donor organizations, mostly the World Bank, three major areas of reforms were pursued namely;

- The separation of rural and urban water supplies (Community Water and Sanitation Act 564, 1998)
- Privatization of Urban Water Supply Management
- Integrated Management of Water Resources (Water Resources Commission Act 522 of 1996)

Under considerable donor pressure, the government of Ghana enacted the Water Resources Commission Act, Act 522 of 1996. This new law laid the foundation for a new institutional framework for the implementation of an integrated Water Resource Management in 1996. The commission has been mandated to regulate and manage Ghana's Water Resources and to co-ordinate government policies in relation to them. The Act stipulates that ownership and control

of all water resources are vested in the President on behalf of the people, and clearly defines the WRC as the overall body responsible for water resources management in Ghana (Water Resources Commission Act, 1996). Prior to this act water resources were not vested in the state (Opoku-Agyemang 2005: 27-33) unlike land.

The results of a study by (Bako-Arifari et. al.(2004) indicate that in spite of these reforms there are considerable challenges facing the effective implementation of the Water resources commission act. These include multiple official laws and regulations, weak legal framework, political patronage, low budgetary allocation, minimal staff levels and lack of capacities.

Although Ghana has institutions, policies and regulations in place to promote proper water management, the country still faces challenges related to, among others:

i) Self-sufficiency in food production, especially during dry seasons;

ii) Proper operation of wastewater treatment plants;

iii) Water scarcity due to population growth;

iv) Levels of access to improved drinking water and sanitation, and;

v) Pollution of water bodies due to unregistered gold mining activities.

Overall, the government in Ghana has made relatively modest water-related investments as a percentage of total government expenditures Government investments have been allocated mainly to agricultural water resources, hydroelectric power plants and basic drinking water supply and sanitation facilities. No government expenditure was allocated to water resources protection or to river development during the period 2003 to 2012.

2.3 Water and Rural Livelihoods

Water is one of the critical natural resources in life. It constitutes an essential element in rural livelihoods because of its contribution to food security and income generation from rain fed and irrigated crop and livestock production. Most rural livelihoods are reliant on natural resource base to a great extent (Chambers and Conway, 1992). And water plays a major role in ensuring food security and sustaining livelihoods, especially in rural communities. Hence, for most rural people, the ability to maintain food security depends on the effective management and conservation of water. As a result, food production and supply in Sub-Saharan Africa countries is closely linked to the utilization and access to water, since water shortage is seriously constraining increased food production (Narendra *et al.*, 1996).

In their study, Narendra *et al.*, (1996), found out that lack of enough water resources greatly reduces the gross domestic production, and thus leads to poverty and decline in quality of livelihoods. The poverty-water association has been said to have three main elements, particularly for the rural people.

Firstly, collection of water from far away is a burden, carried out normally by women and consumes precious time that could be used better elsewhere.

Secondly, debilitating diseases are caused by both inadequate quantities and poor quality of water.

Thirdly, limited water reduces opportunities for irrigation of vegetables and fruits in 'home gardens' and keeping of stall-fed livestock (Critchley and Brommer, 2003).

Water availability is closely linked to human welfare and health. It affects nutrition status and quantity of drinking water especially for the poor. These problems are more keenly felt among the poor households and in the agricultural subsistence economy, which is the case for rural communities in Ghana. Most of Africa's poor people, just as in Ghana, live in the rural areas. In such a situation, rural household's security regarding food, water and energy is a key to strategic element in reducing poverty (Narendra *et al.*, 1996). Ghana is among the African countries said to have been at the risk of water stress by the year 1990, and is projected to be water stressed by the year 2025 (with less than 1000m3/capita/year) (Narendra *et al.*, 1996; SADC 2002). But the problem goes much beyond physical water scarcity.

At the second World Water Forum held in 2002, it was recognized that the water crisis is mainly a crisis of governance (Arriens and Alejandrino, 2004). Delegates at the Second World Water Forum pledged to institute reforms in the water sector to improve governance. There is therefore a case for managing the water resources in Ghana in a sustainable way through improved water governance.

Most African countries, including Ghana recognized that water resources must be used wisely to improve human welfare, achieve economic growth and further reduce poverty. In the Ministerial Declaration of the International Conference on Freshwater held in Bonn, it was recognized that "combating poverty is the main challenge for achieving equitable and sustainable development and water plays a vital role in relating to human health, livelihoods, economic growth as well as sustaining ecosystems". Ndalawha (2002) recognized that water scarcity is an important environmental constraint to development. However, there are claims that these water reforms,

claiming to be objectively focused at improving livelihoods among other things, have failed to address the poverty issue at the grassroots level.

According to van der Hoeck (2001), unless there is new action to recognize the roles water plays in rural livelihoods and people's capacity to manage their water sustainably at the local level and with social justice, water scarcity threatens to change people's options in production, employment and exchange, and the relations among these activities, in ways that will exclude the small producer. For example, in Ghana, new smallholder irrigation systems are being developed and old ones are receiving new support that can improve water supply and livelihoods for more people (van der Hoeck, 2001).

It is also important to realize that when people have water dependent livelihood strategies, they create relationships for cooperation and control in order to acquire and manage water systems. How livelihoods survive under water scarcity is related to how people understand water scarcity, organize social action to remedy it, and act to defend their rights. Improved rural water governance is a powerful tool to diversify livelihoods and reduce vulnerability, especially for small crop producers, who are the communal farmers. Thus designers, planners, and managers can support rural livelihoods when dealing with water governance by appreciating the many institutional roles of water in rural livelihoods and giving rural users scope to negotiate and defend their livelihoods.

However, is there a way out of the poverty trap where water supplies are low? Can prudent and creative use of limited water resources and an integrated approach right from the local level

makes a big difference in water scarce areas? It is well established that investments in water resources management and the delivery of water services are central to poverty reduction. Interventions in the management of water resources or delivery of water services could further entrench inequalities and reduce already regrettable access of the poor to these resources unless they have an explicit poverty objective (Reba, 2003). With water scarcity and increasing competition for water, there has risen the need for more effective and adaptive governance through better stakeholder participation, improved policies and institutional mechanisms for managing river basin and dam water resources.

Effective stakeholder participation in water resources management calls for a strategy that better and deeply involves the water user at the most local level and a system that contributes to poverty reduction through improved and sustainable water resources management. This would involve empowering the local communities and their leaders in natural resources management, and consultation with them on their needs and the appropriate mechanisms they have to address those needs in water issues. One of the strategies proposed by Narendra *et al.*, (1996), as a way of improving water resources in order to lessen the impact of future water scarcity is the consideration of customary law and models of water governance.

These scholars further suggest that since customary practices play a critical role, they are still applicable especially at the local level and blends well with the participatory or integrated approaches required by new thinking in water resources management. It presents a great strength and foundation for improved water governance that has not been explored by the policy makers.

2.4 Traditional Knowledge and Natural Resources Management

The UN Conference on Environment and Development in 1992 catalyzed the interest in the contribution of indigenous knowledge to a better understanding of sustainable development. UNCED highlighted the urgent need for developing mechanisms to protect the earth's biological diversity through local knowledge. Many of the documents signed at UNCED reflected the need to conserve the knowledge of the environment that is being lost in communities.

Similarly, the World Conference on Science (Budapest, 1999) recommended that scientific and traditional knowledge be integrated in interdisciplinary projects dealing with links between culture, environment and development in areas such as the conservation of biological diversity, management of natural resources, understanding of natural hazards and mitigation of their impact. Local communities and other relevant players should be involved in these projects. Development professionals consider indigenous knowledge as an invaluable and under-utilized knowledge reservoir, which presents developing countries with a powerful asset.

Over the years, the World Health Assembly has adopted a number of resolutions drawing attention to the fact that most of the populations in various developing countries around the world depend on traditional medicine for primary health care, that the work force represented by practitioners of traditional medicine is a potentially important resource for the delivery of health care and that medicinal and food plants are of great importance to the health of individuals and communities.

2.4.1 Traditional Water Management

As previously mentioned, a 'tradition' or 'customary practice' is used here to distinguish between what people today consider to be their own established practices and rules governing access to natural resources like water and land, as opposed to outside interventions which propose new rules and regulations to which people are unaccustomed to. Worldwide, traditions are unique to different ethnic groups. For most rural communities, tradition or customary laws are a form of cultural identity, which uphold their worldviews, and therefore give them a sense of identity (Latham and Chikozho, 2004).

Most researchers agree that TWRM practices still exist and are still strong rooted (Dore, 1996; Derham and Hellum, 2002; Shearer, 2003; Chikozho and Lantham, 2004; Juma & Maganga, 2000; Manzungu and Machiridza, 2005). This body of literature reveals that traditional systems of water management prevail among rural communities and are often effective and some have survived many centuries. More importantly they have not been completely destroyed by the colonial or post-colonial state. These customary practices are well understood by the people and are functional because they have resemblance with their worldviews. Most rural livelihoods are reliant on the natural resource base, like water and land to a great extent. The ability to pursue different livelihood strategies depends on the practices that the people have in their possession (Chambers and Conway, 1992). When rural people build their livelihoods around water, they create relationships of cooperation and control in order to acquire and manage water systems. These have existed long before the introduction of any modern methods (van der Hoeck, 2001).

TWRM systems are a feasible option for improving the living conditions of rural people currently facing serious water problems (Shearer, 2003), particularly in dispersed and isolated rural settlements, TWRM can compete with other more modern water options.

This is largely because new statutory provisions do not reach out to all areas of the society while customary water laws will continue to be durable. Unfortunately policy makers tend to continue with these statutory laws, which have poor reach. In Africa, such areas which are not reached by statutory provisions consist mostly of the rural areas, where societies are still depending upon their customary laws. The existence of more than one law governing the society leads to the situation known as '*legal pluralism*', which is the existence of both 'formal state law' and 'local customary law'. The laws may sometimes conflict. Such examples of legal pluralism have been revealed in case studies from Tanzania (Juma and Maganga, 2004), Zimbabwe (Chikozho and Lantham, 2004) and in the Bali island in the Blahpane village (Spiertz, 2000). Some researchers argue that legal pluralism is necessary for the effective management of water resources (Mumma, 2005). This is firstly because customary law existed before the introduction of IWRM, and people are accustomed to it, and secondly because the state law does not usually reach the most rural areas. Underlying this concept or line of thought is the realization that customary or traditional practices and its governing should not be ignored at the expense of the modern management methods.

2.4.2 International Experiences on NRM

Examples of traditional irrigation methods from Latin America include; Qanat irrigation in Mexico (Enge and Whiteford, 1989), irrigation in Cochabamaba, Bolivia (Gutierrez and Gerbrandy, 1998) and in Ecuador (Apollin *et al.*, 1998); tank irrigation in Sri Lanka (Leach, 1961), Subak irrigation in Bali, Indonesia (Leach, 1961) and irrigation in the hills of Nepal (Yoder and Martin, 1998).

Among other TWRM practices was the traditional water harvesting systems that have been practiced all over the world. These tend to be unique to the various societies; studies from Kenya revealed the '*fanya juu'* structures for capturing the runoff in the agricultural fields. In India, water has been harvested since antiquity, with many water-harvesting structures and water conveyance systems specific to the eco-regions. Such examples from India included the *Tankas* (small tank), which were underground tanks, found traditionally in most *Bikaner* houses, the *khadin*, also called a *dhora*. This *dhora,* harvested surface runoff water for agriculture and its main feature was a very long (100-300 m) earthen embankment built across the lower hill slopes lying below gravely uplands. Sluices and spillways allowed excess water to drain off. The *khadin* system was based on the principle of harvesting rainwater on farmland and subsequent use of this water-saturated land for crop production. (www.rainwaterharvesting.org). Other structures like *baories*, *nadis* and small *kutcha* bunds, *kunds*, and *ahars* were all examples of water harvesting systems. These water bodies were adopted depending on the cultural value-system of the regions and were carefully maintained, appropriately located and constructed with simple, yet excellent, engineering techniques.

2.4.3 African Experience on NRM

Africa is endowed with rich and highly diverse biological resources. These resources provide a wide range of natural products such as those derived from bio-prospecting, intermediate products (e.g. natural dyes, colorants, oils, biochemical compounds, medicinal and food extracts, etc) and final products (e.g. timber, handicrafts, nuts, fruits, perfumes, medicines, etc). Many of these

products are collected for subsistence use. Some of them have served as an important source of innovation for the pharmaceutical, biotechnology, cosmetic and agrochemical industries.

The development of traditional knowledge systems, covering all aspects of life, including management of the natural environment, has been a matter of survival to the local communities who generated these systems. The oral and rural nature of traditional knowledge has made it largely invisible to the development community and to modern science. Indigenous knowledge has often been dismissed as unsystematic. As a consequence, it has not been captured and stored in a systematic way, with the implicit danger it may become extinct.

"Traditional medicine" refers to ways of protecting and restoring health that existed before the arrival of modern medicine. As the term implies, these approaches to health belong to the traditions of each country, and have been handed down from generation to generation. Traditional systems in general have had to meet the needs of the local communities for many centuries, e.g. in relation to health needs. Humans throughout the ages have relied on plants as the source of food, clothing construction materials, cosmetics and medicines.

African traditional knowledge is unique to a given African community, culture or society. It is seen to contrast with the knowledge generated within the modern learning system. Traditional knowledge is used at the local level by communities in Africa as the basis for decision-making pertaining to food security, human and animal health, education, natural resource management, and other vital activities.

The world's greatest concentration of biological wealth is found in tropical developing countries including Africa that are beset by acute poverty. In these regions, the loss of biodiversity is

accelerating as poverty is increasing. African tropical forests represent one of the world's great remnant blocks of closed canopy habitat. This forest is under increasing pressure from population growth, unsustainable resource use, hotter and drier climate, poor management, and other problems related to poverty, scarce financial resources and political instability. Other factors of forestry degradation include unsustainable timber exploitation, shifting cultivation, urban expansion, and other human activities, which are posing increasing threats to this globally-significant tropical forest resource.

African countries rich in natural resources and biological diversity are witnessing high deforestation rates and loss of their biodiversity. Search for short-term economic gains and poverty of the populations living in areas rich in biodiversity are at the root of environmentally harmful behaviour. Well known examples are slash-and-burn practices, excessive commercial logging and clearing of natural habitats for agriculture and urban expansion.

Biological diversity comprises countless plants that feed and heal people, many crop varieties and aquatic species with specific nutritional characteristics, livestock species adapted to harsh environments, insects that pollinate fields and micro-organisms that regenerate agricultural soils. Biodiversity, essential for agriculture and food production, is threatened by urbanization, deforestation, pollution and the conversion of wetlands. Biodiversity is very important to food security for the very poor in Africa. A diversity of cultivated species and varieties of crops, trees, livestock and fish help poor farmers to spread risks, especially in marginal environments. In Africa, environmentalists have focused on the conservation of endangered animals, plants and trees taking little account of the needs of the poor people and time and again well-intentioned conservation efforts on protected area systems have been resisted by local people whose

livelihoods have been jeopardized. People can be allies of the conservationists, but for this to come about we have to focus much more on sustainable use, rather than on conservation for its own sake.

CAF development, advocacy and public awareness activities will emphasize the importance of biodiversity for agriculture, food security, nutrition, sanitation and rural livelihoods, and especially for those populations living in marginal and harsh environments.

In addition CAF will:

- promote new and traditional approaches to increasing food production without losing on-farm biodiversity;
- develop capacity and learning process to allow local communities to influence the formulation of national and international plans and policies;
- disseminate best practices and available technologies among CBOs and NGOs and other stakeholders.

The forests play a crucial role in the economies of many African countries, providing timber and industrial material as well as contributing to tourism, recreation and cottage industry. Tropical forests help regulate global climate through the absorption of carbon dioxide. Deforestation and forest degradation continue to occur in the region due to a variety of causes, including demographic pressures, poverty, production and consumption patterns, land tenure patterns and land speculation. Other important factors that contribute to deforestation and forest degradation include, illegal logging, grazing pressures, illegal cultivation, the demand for fuel wood and charcoal, refugee-related problems, oil and mining exploitation, natural climatic events and

forest fires. FAO data indicate that the annual rate of deforestation in Africa was 0.7 per cent between 1990 and 1995, with the highest rates being recorded in the moist western parts of the continent. The data also indicate that the rate of afforestation is far less than that of deforestation.

In Africa there are many ingenious and effective ways through which indigenous and other local communities are rising to these challenges. Unfortunately, their innovations remain largely unknown. Whether for food, medicine, or income generation, these groups are using their biological resources in a sustainable way to improve livelihoods. This programme will empower local communities and non-governmental organizations to promote local initiatives for natural resource management, which involve for example tree planting, nurseries development, and other means of generating income that do not harm wildlife or the environment. Communities sustainable development programmes focus on activities that conserve and protect the local environment and that contribute to alleviate poverty (e.g. activities for ex that increase natural resource base for food security, that generate income through sustainable use of resources, or that can promote healthy status of the poor(e.g. water and nutrition, etc.).

CAF will highlight the key environmental challenges related to natural resources management and sustainable use and conservation through the following:

- What are the key environmental and natural resource management issues confronting Africa?
- Where are people addressing these issues in innovative and effective ways?
- What factors helped people achieve this progress?

- What will it take to achieve broad-based changes in the management of the environment and natural resources, which are required to support environmental conservation in Africa?

Some examples of TWRM in Africa include; irrigation in the Taita Hills, Kenya (Fleuret, 1985), irrigation by the Sonjo, Tanzania (Adams *et al.*, 1994), and rice cultivation in Basse Casamance, Senegal (van der Zaag, 1992). Such cases display the success and resilience of traditional management practices and their great value to the rural people in the respective communities. This section specially focuses on cases of TWRM in Africa.

Research in Pangani and Rufiji Basins in Tanzania reveals that the country operates under a plural legal system; although water reforms in the country focus on the use of statutory legal systems to regulate the use of water resources, diverse customary systems are relied upon in resolving water-related conflicts (Maganga *et al.*, 2003). Similar examples where water related conflicts are settled through the traditional leaders include the tindana, (Huggins, 2000) and in Ethiopia among the *Oromo* people, where this is known as the *Gadaa* system, which is a uniquely democratic political and social institution, which is made up of elders (Chemeda *et al.*, 2005). Another example of traditional water resources management techniques is the indigenous solid and liquid waste treatment found among the *Ngwa* of south-eastern Nigeria (Izugbara and Umoh, 2004). These are practiced by the urban people, and include ingenious and careful waste segregation and sorting, selective burning and burying, composting and conversion, in order to protect their water resources from pollution.

2.4.4 Ghana's Experience

Although Ghana is endowed with significant land and water resources, the country is not self-sufficient in food production, and it has been difficult to ensure food availability year-round. When food abounds during periods of good rains, inadequate storage facilities result in losses of perishable crops. Food insecurity in Ghana is a growing concern due to inadequate agro-processing facilities for agricultural products.

While irrigation technology is not widespread, there is considerable potential to increase irrigation and the informal sector is rapidly expanding and making use of a variety of water resources, including the use of treated wastewater especially in the peri-urban irrigation areas.
An indicative range of benefit cost ratios for new irrigation rice projects is shown above. The analysis indicates that developments are likely to be economically viable under most circumstances, except where capital costs are at the high end of available estimates. In addition, the viability of irrigation developments is highly susceptible to the ability to enhance yields. Overall the analysis indicates a need to access irrigation developments on a case-by-case basis to ensure investments are sustainable.

Ghana faces serious constraints to meet the challenge of providing water and sanitation for rural and urban residents. Access to improved sanitation facilities is particularly serious, as there is still a very big gap to all with only 8 percent of rural residents and 19 percent of urban residents who in 2012 were serviced. As for use of an improved drinking water source, while there has been improvement since 1990, 20 percent of the rural population and 9 percent of the urban population still lacked access in 2012. Currently the urban water utility experiences a dire

financial condition and its performance leaves 75 percent of the capital's residents without 24 hour access to water and 10 percent of people with no access at all.

The sources of water supply in the country are surface water and groundwater. Groundwater is usually abstracted from boreholes for most rural areas. Some borehole supplies are also tapped to supplement urban water supplies. In 2000, 95 percent of the withdrawal for urban supply was from surface water and the remaining 5 percent from groundwater. In peri-urban agriculture, some treated wastewater is also used for irrigation purposes.

Population growth, rapid urbanization and industrialization are resulting in an increase in water demand. In addition, current global climatic change processes are expected to affect both the spatial and temporal unpredictability of water availability, which would lead to reduction in rainfall. Agriculture is the principal water user, accounting for the bulk of water withdrawals.

The interpretation of nature amongst most ethnic groups in Ghana, as elsewhere in West Africa, has influenced most aspects of social, material and spiritual life (Rattray 1923; Frazer 1926; McLeod 1981). In Ghana, traditional natural resources management, as in other parts of Africa, is shaped around local rules and regulations (Ntiamoa-Baidu 1995; Abayie Boateng 1998). These rules and regulations are often enshrined in traditional religious or cultural beliefs and superstitions and enforced by prohibitions. These have no legal backing, but the beliefs have been strong enough in the past to make people obey the regulations (Ntiamoa-Baidu 1995). There is a wide range of prohibitions related to the utilization of natural resources. For example, sexual activity in the bush among the Kusases is considered a sacrilege against the fertility of

land, mother earth. Similarly, several tribes and groups in Ghana consider some days to be sacred to mother earth where farming or going to the bush is forbidden. These days are considered to be the resting days of mother earth (Abayie Boateng 1998). Mother earth was considered to be taking a rest on that day (Abayie Boateng 1998). Non-farming days reduce the considerable pressure on land and other natural resources. In the context of natural resources management, they enhance biodiversity conservation and minimise the continuous use of natural resources (Ntiamoa-Baidu 1995; Abayie Boateng 1998).

Based on the above concepts, traditional natural resources management in Ghana may be classified into the following categories: protection of particular ecosystems or habitats (such as sacred groves and sacred rivers); protection of particular animals or plant species (such as totem and tabooed species); and to regulate the exploitation of particular natural resources (Ntiamoa Baidu 1995; Abayie Boateng 1998). The practices concerned relate to trees, forests, wildlife, marine and coastal systems as well as to farming systems (Abayie Boateng 1998). It is important to emphasise that most of the individual practices are based on religious beliefs which, as mentioned earlier, are enforced by taboos. The environmental wisdom and ethics expressed through these religious beliefs have been very useful tools in natural resource management. For instance, the belief that the earth has a power of its own which is helpful if propitiated and harmful if neglected, is a strong moral sanction against the wanton destruction of the environment (Appiah Opoku and Hyma 1999).

In the northern part of Ghana and especially among the people of Binaaba (Kusases), the Shea tree (*Butrespermum parkii*) and Dawadawa tree (*Parkia clappertoniana)* in the northern savanna

zone are similarly protected for their economic importance. Among other ethnic groups in the north, such as the Dagomba and the Mamprusi, there are chiefs in charge of useful trees to ensure that they are not cut or destroyed in any way (Abayie Boateng 1998).

There are other trees which are not regarded as useful (i.e. in economic and spiritual considerations), but are considered to have other relevance for environmental purposes are the Baobab (*Adansonia digitata*) in the savanna is one of such. Most trees in this category are protected by rules, which forbid cutting or setting fire to them, and each member of the community is responsible for ensuring that others comply with the regulation. In some parts of Ghana such trees are protected by a 'traditional powerful oath', which spiritually binds all members of a community to a god. Anyone who contravenes with the rules and regulations for their protection is sanctioned accordingly. These sanctions could include a sheep, a bottle of alcoholic spirits (schnapps) and cash fines (Kwaku Akowuah *pers. comm.*). Swearing is accepted amongst traditional religious believers as a declaration of the truth and exoneration from false accusations or crimes.

It is important to note that although the social, cultural, economic and ecological importance of sacred groves and sanctuaries have been recognised, their management and survival have only recently become important to the government (NGOs) and civic bodies in Ghana (Dorm Adzorbu *et al.* 1991; Anane 1997; Abayie Boateng 1998). The late recognition of this has been a major contributory factor in the decimation of many sacred groves and the threat to the survival of those remaining (Anane 1997). Many communities recognise that very little has been done to support their effort to protect these traditionally-based practices which are increasingly coming under threat. It has been pointed out that those sacred groves that have survived so far is purely

because of the strong traditional beliefs upheld by the local people and because of spiritual, religious and cultural attachments to the groves (Ntiamoa-Baidu 1995).

Amongst most ethnic groups in Ghana there exist beliefs that regard the majority of water bodies as deities (Rattray 1923; Ntiamoa-Baidu 1991 and 1995; Abayie Boateng 1998; Entsua-Mensah *et al.* 1998). Rivers sometimes assume the role of god of the communities where they are found or located (Rattray 1923; Ohemeng Boakye 1980; McLeod 1981). Such designated rivers are very common amongst the Akans and are protected and worshipped at several spots along their courses. This tradition has been used to protect the headwaters of several river bodies, especially those that served as potable water sources for a community or group of communities. Rattray (1923) mentions the example of River Tano, which rises in the Brong Ahafo region, and Ohemeng Boakye (1980) referred to the River Bosompra that runs through Kwahu in the eastern region of Ghana. Such rivers are also revered and protected because they are regarded as the source of life and fertility; barren women go to bathe in these waters in the hope of being fertilised (Ohemeng Boakye 1980).

Rivers and their immediate surroundings, especially forest, are protected on the basis that the spirit of the river resided in the area. Consequently, there are a variety of rules and regulations which prevent human contact with sacred groves such as taboo days, as noted earlier. Other regulations and controls are available on the exploitation of fisheries and other aquatic resources, and the use of adjacent lands for farming and logging. For example, there exist taboos against the clearing of vegetation for farming right up to the edges of streams and rivers (Abayie Boateng 1998). Farmers are encouraged to leave a strip of land that is "about 30 metres", which should

not be cleared on both sides of the streams and rivers. According to Abayie Boateng (1998), the benefit of this conservation method is quite obvious to any environmentalist, and local people are aware that it checks excessive evaporation and erosion from the rivers and streams. Other taboos, such as the disallowing of menstruating women to collect water from rivers, prevent the defilement of river deities and gods (Sarpong 1974; McLeod 1981). Among the Kusases, menstruating women are not allowed to enter the river or stream if they go to fetch water. They can only stand at a distance and friends or relatives help by fetching for them. The issue of menstrual blood in traditional beliefs has been treated extensively in anthropology as a source of potent force (Douglas 1966). Amongst the Akans it has been emphasised as a source of "impurity" to gods and deities (Mcleod 1981), because a woman during her menstrual period is believed to possess bad powers (Kwaku Akowuah *pers. comm.*). It may be conjectured that women, who were considered to be the most frequent users of water, were prohibited from entering the vicinity of rivers when they were menstruating to prevent degradation and conserve these vital resources. In most communities rivers provided the main source of drinking water (Ntiamoa- Baidu 1995).

Conservation of marine resources is managed similarly on the basis of religious beliefs and superstitions associated with fetishes enforced by taboos. For example, coastal ethnic groups have taboo days during which there is no fishing (Ntiamoa-Baidu 1991; Enstua-Mensah *et al.* 1998). This is said to have the effect of giving both the fishermen and the fished day of rest, and probably, as noted amongst the farming communities above, to assist village cohesion if the rest day is observed (Enstua-Mensah *et al.* 1998). In addition, there is a long period of time during which nobody goes to fish. This resting period coincides with the time when fish lay their eggs

(Abayie Boateng 1998). But, in several fishing communities, the system of the non-fishing day and the long rest period are reported to be breaking down due to disregard for the taboos associated with them. Concern has been expressed about the sustainability of these practices and livelihoods in the communities (Ntiamoa-Baidu 1991; Enstua-Mensah *et al.* 1998).

It is clear from the review and discussions that changes in traditional natural resources management and the sustainability of traditional practices in Ghana are important areas of concern (Fargey 1991; Amanor 1994; Ntiamoa-Baidu 1995; Gyasi 1997; Abayie Boateng 1998). Both biophysical and socioeconomic factors have been cited as responsible for these changes. However, in recent times, it is increasingly being stressed that the rapid change is due to the breakdown of traditional beliefs and its associated taboos. As demonstrated in the examples above, beliefs, rituals and taboos underlie the majority of traditional natural resources management practices. The reason for the central role of these beliefs is that, in Ghana as in other parts of West Africa, the spirituality of local people serves as the basis for all human endeavours and is reflected in their worldview (Millar 1995). Several of the traditional management practices, although they are undergoing changes, have retained some of their intrinsic practices despite production pressures. This has partly been attributed to the fact that many local or traditional people still perceive them to be associated with gods and ancestors who are still revered (Dorm Adzorbu *et al.* 1991; Fargey 1991; Falconer 1992; Ntiamoa-Baidu 1995; Gyasi 1996; Abayie Boateng 1998).

Typical examples of change, coupled with maintenance of sustainability in traditional natural resource management practices, have been demonstrated in sacred groves. Unfortunately, it has

been concluded in several studies (Fargey 1991; Dorm Adorbu *et al.* 1991; Ntiamoa-Baidu 1995; Gyasi 1996; Hagan 1998) that the erosion of traditional beliefs threatens sacred groves and sanctuaries. A number of sacred groves have gradually been encroached upon by surrounding farms and a number have already been lost to development projects, facilitated by the erosion of traditional beliefs (Environmental Protection Council 1976; Ntiamoa-Baidu *et al.* 1992; Gyasi 1996).

The breakdown of beliefs that protect these areas has been attributed to western type education and religion, to the immigration of people who may have no respect for local traditions, and to a lack of modern legislation to back traditional rules (Fargey 1991; Falconer 1992; Ntiamoa-Baidu 1995). Falconer (1992) has observed that, as a result of the uneven impact of these factors, 'sacredness', the prominence and protection of sacred groves varies considerably between and within communities. Many groves have been encroached upon because the fear which used to be associated with them no longer operates (Abayie Boateng 1998). Similarly, Ntiamoa-Baidu (1991) has noted that traditional beliefs and its associated taboos for the conservation of coastal lagoons are no longer respected. For instance, she indicates that fishing activities continue in Sakumo lagoon daily, despite the prohibitions of sacred days and closed seasons; draw-nets of varying mesh sizes are used regularly, which do not conform to the rules stipulated by the traditional authorities. Ntiamoah-Baidu (1995) and Entsua-Mensah et al. (1998) have made similar conclusions in other studies.

An important point that has been stressed regarding these changes is that they have led to overexploitation and degradation of the natural resources base of several communities. This has

eventually undermined the sustainable management of natural resources and the livelihoods of the local people (Ntiamoa Baidu 1995; Anane 1997; Gyasi 1997; Abayie Boateng 1998). An encouraging finding, however, is that some of the natural resources protected by these practices have managed to survive despite increasing pressure on them (Dorm Adzorbu *et al.* 1991; Fargey 1991; Falconer 1992; Ntiamoa-Baidu 1995; Nsiah- Gyabaah *et al.* 1996). Such example in the northern savannas is the Malshegu sacred grove which has been identified by Dorm Adzorbu *et al.* (1991). In the forest zone, Falconer (1992) mentions the Numafoa sacred grove as highly revered; even the most ardent Christians believe in the protective powers of the goddess. The survival of some of these practices has raised the question of variations in attitudes towards different beliefs and practices within and between communities. The need to understand fully these differences in order to promote further research to support the conservation of traditionally-protected areas, and the practices which have maintained them, has been emphasised (Falconer 1992; Anane 1997).

Some discussions have demonstrated that traditional natural resources management in Ghana is enshrined in religious beliefs and practices. The need to investigate these issues for conservation has been emphasised in recent times. Although changes in these practices have been acknowledged, and threats to their sustainability rose, most researchers still agree that their potential influence on environmental and agricultural resources conservation and sustainability of livelihoods is enormous (Amanor 1994; Gyasi 1997). In particular, the important role of these practices in the conservation of biodiversity through sacred groves has been highlighted (Fargey 1991; Falconer 1992).

However, a much clearer understanding of spiritual and mystical beliefs, and the related local institutions associated with traditional natural resources management, is needed (Ntiamoa-Baidu 1991; Falconer 1992; Amanor 1997). Such assessment would provide valuable insights into the changing values of local people in relation to the protection of rivers, streams or dams and other natural resources (Falconer 1992).

Government and non-governmental organisations should fund integrated social and biological research at several locations in the country especially in the northern part of Ghana to promote a better understanding of traditional natural resource management practices. Currently, little or no detailed scientific research on beliefs, taboos and practices associated with traditional natural resources management is being carried out to establish their significance for conservation.

Although these traditional natural resource management practices may be shrouded in complex myths and beliefs and may appear to have no scientific basis, many traditional practices and beliefs have been shown to be based on scientific principles (Ntiamoa-Baidu 1995; Appiah-Opoku and Hyma 1999). Collaborative research involving anthropologists and natural scientists may help explain these complex myths and social value of beliefs related to traditional natural resources management in a particular study area and other parts of Ghana. This may enhance the acceptability of these traditional practices, many of which have conservation potential.

2.5 Summary of Review

The previous sub-sections have presented various examples of TWM practices from all over the world. These TWM practices are mostly observed amongst rural water users, who still rely upon

customary laws to govern their water and other natural resources. This has exposed that TWM still exists, has stood the test of time, and has proved to be effective water governance, and in sustaining rural livelihoods.

Moreover, from research based on three case studies from Tanzania, Egypt and Djibouti, Shearer (2003) argues that TWM systems are a feasible option for improving the living conditions of rural people currently facing serious water problems.

2.6 IWRM in Ghana

Current trends point to the fact that an integrated water resources management approach is needed to ensure that water does not become a constraint to national development.

Previously, water was regarded as a free commodity –considered unlimited in quantity and available as required. However, with continued population growth and urbanisation, and rapidly growing and diversified demands, including water for irrigation, hydropower generation, industrial processes, fisheries and aquatic ecosystem protection, the resource is becoming increasingly scarce and often of inferior quality.

These trends are exacerbated by past practices whereby planning, development and management of the resource for the envisaged uses were approached from a sectoral perspective without recourse to coordination and dialogue among the relevant agencies and institutions. The result of this prevalent situation has often been in the form of non-optimal and unsustainable use of the resource. Additionally, in the past, environmental sustainability – integrating natural resources issues with socio-economic dimension – in water resources management has not featured

prominently among policy makers and planners concerned with the development and utilisation of the resource. Today, however, modern approaches to natural resource management acknowledge that planning Ghana National Water Policy for use and preservation of the natural resource must take the wider sustainable development needs of society into consideration.

IWRM is based on the concept of stakeholder participation in decision-making in water management. In Ghana's NWP it spelt out the strategy that will be used in implementing IWRM as:

(i) Adopt water resources planning as a cross-cutting basic component of national economic planning;

(ii) Ensure preparation of IWRM strategies using the various river basins as the planning units;

(iii) Establish appropriate institutional structures and enhance capacity building;

(iv) Ensure water resources planning to be made with due recognition of "environmental flow" requirements;

(v) Adopt sustainable practices that avoid damage to critical natural capital and irreversible ecological processes;

(vi) Promote partnerships between the public and private sectors for the protection and conservation of water resources through the use of cleaner and efficient technologies, effective waste management and sound land management and agricultural practices; and

(vii) Ensure cost recovery and sustainability of water projects, taking into account the specific needs and preferences of the poor.

First and foremost, IWRM has been seen as a completely foreign concept, that is being imposed on the African by the western culture (Swatuk, 2004), despite the already existence of their own water governance systems. Among the IWRM concepts, there seems to be loopholes;
Firstly, as observed, IWRM is a very centralist concept, where by the role of the state is pronounced; the state dictates the concepts in which the stakeholders participate.

Secondly, the concept of stakeholder participation based on the catchments and sub-catchments seems not to be clearly defined; it does not allow this joint management of water resources to go to the lowest levels possible, the local person especially in the most rural places.

Thirdly, the aspect of introduction of hydrological boundaries, which is completely alien and thus abstract to the people, questions the practicability of IWRM. This raises the issue of the best level at which to organize stakeholder participation.

In addition, the new water concept of IWRM lacks relevance for rural communities, who rely on their indigenous systems for the management of natural resources. (Chikozho and Lantham, 2004). Such indigenous institutions may vary among societies and are in most times informed on ethnicity. The question however, that we need to ask now is: can the global agenda (of IWRM) effectively engage with the local realities in a developing country like Ghana, especially in cases where already existing traditional water governance systems may differ? IWRM emphasizes the

aspect of stakeholder participation. However, 'stakeholder participation' in Ghana's water sector seems to be more of a philosophy than an operational concept (Manzungu, 2002). This is partly because no attention has been paid to how stakeholder participation can be designed and practically effected. Some of these include: the use of English in the meetings, which is barely understood by the locals (Sithole, B., 2001), there was failure to take into account existing local organizations that directly, or indirectly, have previously been involved in the water sector, and also the issue of women not being directly involved in the decision making as observed by their minimal representation or absolute absence during the study (Manzungu, 2002; Latham, 2002). From eleven case studies of IWRM implementation around the world, Visscher *et al.* (1999), highlight how the success of projects at the grassroots level is failing to be built upon at the district/regional/local level, with the result that genuine stakeholder involvement in IWRM remains elusive. This is partly due to the fact that much remains to be done in terms of developing methodologies for its practical implementation. Included in these possible methodologies should be the consideration of the TWM practices at local level. These are usually unique to most rural areas especially Binaaba.

2.7 Conclusion

The above review and discussions have shown that water is an important resource for rural livelihoods; both in terms of food production and income generation, and that water scarcity leads to poverty. The chapter has also presented various TWM practices that various societies from all over the world, especially in Africa, have relied on for water governance and sustaining their livelihoods. However, while rural livelihoods have depended on traditional wisdom to

manage their water resources since time immemorial, the introduction of modern water management practices has neglected the potential of this TWM. This could be one of the reasons why IWRM may fail to address issues at the most local level issues.

Therefore the major question now is; how does IWRM hope to improve rural livelihoods through improved water governance while neglecting TWM? As Manzungu (2002) queries; could it be that what Ghana needs is local actions for local problems? The search should not be for blue prints, the focus should rather be on providing principles for local water management while taking global trends into account. Thus this research has been undertaken to reveal the TWM practices and how their implications will improve water governance.

CHAPTER THREE

THE STUDY AREA AND METHODOLOGY

3.1 Introduction

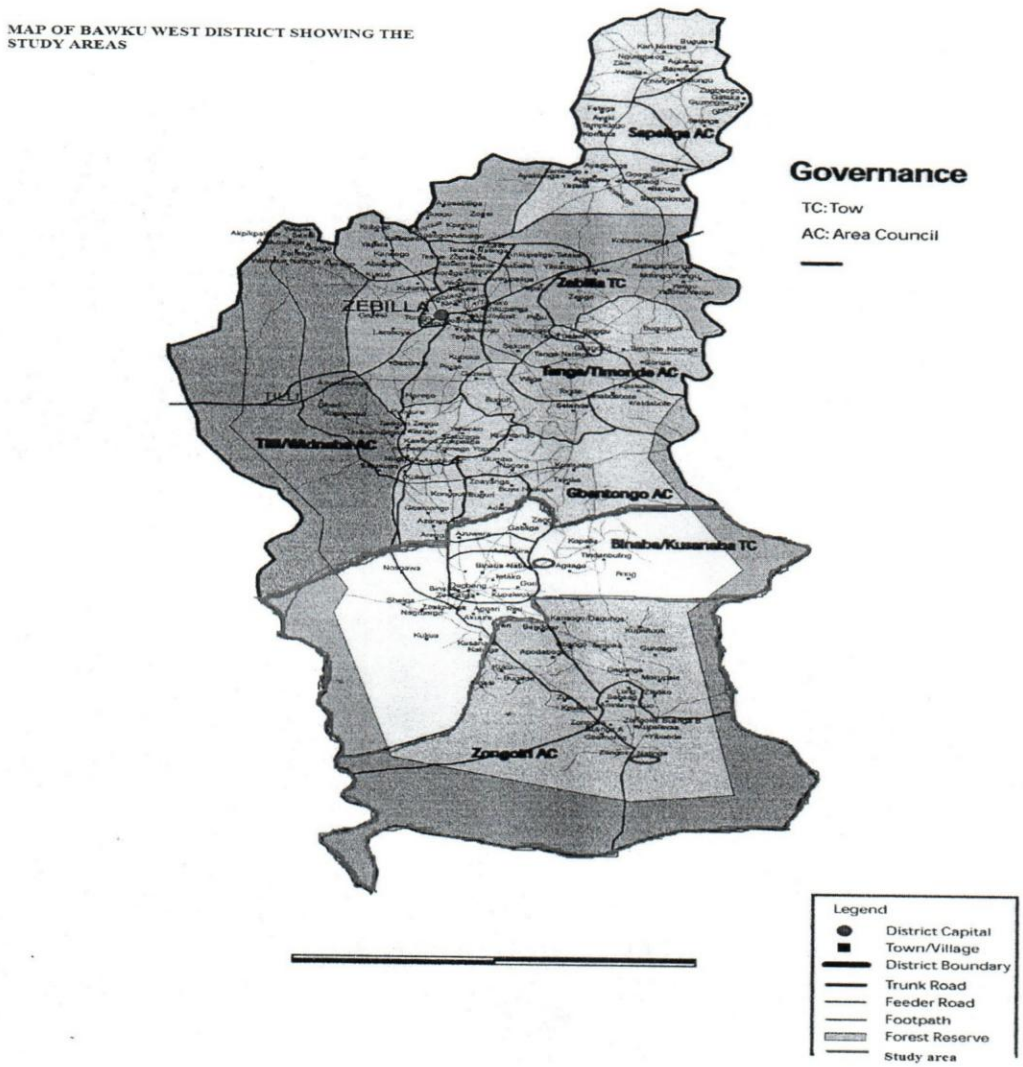
This chapter presents the area where the study was carried out, and the methods used in this study. It begins by describing the study area. It then discusses the design of the research and the research instruments used to collect the data. The chapter further discusses the sample design, the sampling techniques and the criteria for the choice of sample size. It also gives details of the data collection process and the problems encountered during data collection. The rationale behind the selection of the data analysis method used is given. Last to be presented is a discussion of the gaps in the data.

3.2 Profile of the Study Area

3.2.1 Location and Physical Characteristics

The Bawku West District lies within the Upper East Region of Ghana. It was created in 1988 under the new local government system of 1988 by legislative Instrument (LI) 1442. It lies roughly between latitudes 10° 30'N and 11° 10'N, and between longitudes 0° 20'E and 0° 35'E. The District covers an area of approximately 1,070 square kilometers, which constitutes about 12% of the total land area of the Upper East Region. It is the fourth biggest district in the region in terms of land area. The District shares boundaries with Burkina Faso to the north, Bawku Municipality to the east, Talensi-Nabdam District to the west, East Mamprusi District to the south and Garu-Tempane District to the south east.

Figure 3.1:



There is a conspicuous relation between the geology and the relief of the District. Generally, the relief is a gentle undulating plain, broken in some places by hills or ranges formed either by outcrops of resistant Birimian rocks of granite intrusions. These hard rocks make drilling difficult. Formations of Voltaian sandstones types are also present. Although the Voltaian rocks have similar relief characteristics as those over granite and phyllites, they are marked by small

escarpments, examples of which can be seen at Zongoyiri. These rise to 100 – 150ft (33m to 50m) above the White Volta. There are other rocks located in the Tilli – Widnaba area and Teshie – Soogo – Sapelliga area to the North. In the Eastern section of the District are found the Boya-Kpalsako hills. About 75% of the district lies between 183m to 244m above sea level. Parts of the northern fringes of the district are between 244m to 305m with few isolated hills exceeding 305m above sea level.

Mainly the tributaries of the Volta River – namely the Red and White Volta drain the District. The Sahelian zone, which serves as the catchment area feed these two rivers. Floods, sheet and gully erosion are widespread in the area, especially near the banks of the rivers and in the intensively formed areas. The two main rivers are also fed by a number of other smaller streams, which extends across the district (BWDP, 2010)

3.2.2 Hydrology and Water Supply

The water supply conditions in the district are directly related to the underlying rocks. Areas occupied by the Birimian rocks have a high surface runoff so that surface flow of streams generally persists throughout the dry season as observed at some places such as Komaka, Kasongo and Kubongo. The rocks weather into clay and this combines with the relatively impermeable bedrock to give conditions favourable for surface water storage. At Komaka, farmers reported year round flow of water from springs at the foot slopes of the greenstone hills separating Ghana from Burkina Faso. The rich aquifer could be assessed for the development of water supplies and bottling of spring water for income generation.

At present the main sources of domestic water supply in the district are from rivers, springs, wells, boreholes, ponds and dams. Most rivers and springs dry up towards the end of the dry season making water a scarce commodity. At such periods water may be obtained from shallow wells. The yield of boreholes in areas within the White Volta Basin underlain by the Birimian geological formations ranges from 0.0069 to 0.184 $m^3 h^{-1}$ with a mean of 0.014 $m^3 h^{-1}$. The static water level ranges from 0.61 to 12.8m with a mean of 5.57m. The mean depth to aquifer is 15.3m with values ranging from 0.003 to 29.26m (EPA, 2000). In the granitic areas the yield of boreholes ranges between 0.46 and 16.2 $m^3 h^{-1}$ with a mean of 2.26 $m^3 h^{1}$. The range and the mean static water levels are 1.52 to 26.21 m and 5.56 m respectively. The depth to aquifer ranges from 0-31.7m with mean of 15.49 m (BWDP, 2005).

The dependence of the population in the White Volta Basin on its water resources for agriculture, domestic and industrial uses underscores the importance of assessing the impact of climate change on these resources. This, in turn, will facilitate the development of strategies for sustainable water supply. The White Volta Basin within which the district is located covers a total area of 104,752 km^2 of which 45,804 km^2 (44%) is in Ghana with 58,948 km^2 (56%) outside. The area is drained by the White Volta with its major tributaries including the Red Volta and minor tributaries. (BWDP, 2005)

The mean total annual runoff (X 10^6 m^3) from the Basin is 9,565 comprising 6,073 and 3,492 from Ghana and outside respectively (WARM, 1998). The EPA's (2000) assessment of the

response of the catchment to potential climate change using a water balance model, WATBAL (Yates, 1994), showed that runoff is sensitive to changes in precipitation and temperature in the Basin. A 10% decrease in precipitation or 1° C rise in temperature can cause 10-25% and 10-23% reduction in runoff respectively. Predicted reduction in runoff was 16% for the year 2020 and 37% for 2050. As a shared Basin, Ghana and Burkina Faso should jointly develop and implement appropriate catchment area protection protocols to ensure the perennial flow of rivers in the Basin as some of the major water bodies in the basin such as the White and Red Volta are now heavily silted and drying up. Groundwater resources are the main sources of domestic water supply. Recharge of groundwater from the water supply point of view is therefore very important. The mean annual recharge for the White Volta Basin for the period 1961-1990 was 3.78×10^9 m^3 yr^{-1} (0.244 mm). The predicted reduction in recharges by climate change is 22% and 40% for 2020 and 2050 respectively.

3.2.3 Temperature and Rainfall

Average maximum temperatures are highest in March and April and lowest in December and January. Available records indicate that mean monthly temperatures vary from 26 degrees Celsius in August to 32 degree Celsius in March. The height of temperature is greatest during the harmattan period in January and sometimes in December and the lowest in August.

The district experiences a single raining season (from May to October) where the monthly totals increase gradually from April/May until a maximum is reached in August/September. Monthly totals then fall sharply. The mean annual rainfall varies from 900mm to 1,150mm. A significant feature of the rainfall pattern is varied and unreliable. The prolonged dry season, which occurs

from November to April, leads to the drying up of some wells and low yielding capacity of some boreholes. Aquifers are not able to change adequately during this period.

3.2.4 Vegetation

The district falls within the traditional sub-Sahelian area occupied by the Sudan and Guinea Savanna zones. The vegetation consists of short trees and shrubs of varying heights and luxuriance with continuous grass ground cover. Common trees are sheanut, dawadawa, baobab, cashew and mango. It is noticed that parts of the natural tree vegetation is disappearing due mainly to human activities. In most cases the vegetation is highly degraded by land clearing for farming, fuel wood harvesting, overgrazing, bush fire and harvesting of poles for construction. The activities of illegal miners are also contributing to the degradation of the vegetation in some parts of the district as most of these illegal activities take on agricultural lands and exposes the water bodies to excessive evaporation. This therefore has serious implications on soil fertility and crop production. The only areas still supporting natural vegetation are the protected forest reserves along the White and Red Volta Rivers where onchocerciasis prevent human habitation. Recent efforts at tree planting are yielding positive results as some degraded areas are being recovered especially in the Tanga, Kusanaba and Tilli – Widnaba communities.

3.2.5 Soil Characteristics

The soil of the district has less accumulation of organic material in the surface horizons. This is associated with the interior zone of Ghana and is primarily due to high temperatures and the

rapid rate of decomposition. Other human activities such as bush fires, grazing and the slash and burn method of cultivation have also reduced the soil's organic content drastically. About 85% of the total landscape of the district is arable and suitable for the growth of varying crops, such as millet, sorghum, maize, groundnuts, bambara beans, cowpeas and tobacco. The soil needs to be protected against soil erosion by adequate soil conservation practices like crops rotation, contour farming, strip cropping, and provision of enough ground cover/cover cropping. Also, maintaining a high content of soil and organic matter can improve the moisture holding capacity of the soil.

Concerning, the soil fertility of the series there is the need to apply nitrogen, phosphorous and potassium. Crop yields from the soil series can be increased by the application of farmyard manure, compost manure or additional application of super-phosphate fertilizer. The Kolingu soil series also found in the district has low moisture retention. Rainwater filtering is very easy and therefore prone to the effects of drought because the water moves laterally down slopes to valley bottoms.

3.2.6 Current Economy of the District

Agriculture is the major economic activity in terms of employment and income generation. About 80 percent of the working population is engaged in this sector, which constitutes the main source of household income in the district. The major food crops produced in the district are maize, rice, sorghum, millet, groundnut and Soya Beans. The only industrial crops available in the district are Sheanut and dawadawa. The major vegetables grown include carrots, tomatoes,

onions, okro, garden eggs, watermelon and pepper. Modern manufacturing establishments are non-existent in the Bawku West District. As pertains in most developing countries, small scale industrial activities dominate in the lower circuit of the rural economy, characterized by small scale food processing, craft and manufacturing. The major small-scale industrial activities in the district are sheabutter extraction, dawadawa processing, pito brewing, groundnut oil production, blacksmithing, pottery and masonry.

Vehicles/bicycles repairs

Most of these small-scale industries employ less than five persons (usually family labour) and are located in houses. There has always existed a fairly well defined gender division of labour with the women specializing mainly in a broad range of food processing industries. The above mentioned income generating activities or employment involves the use of water resources.

3.3 Study Community

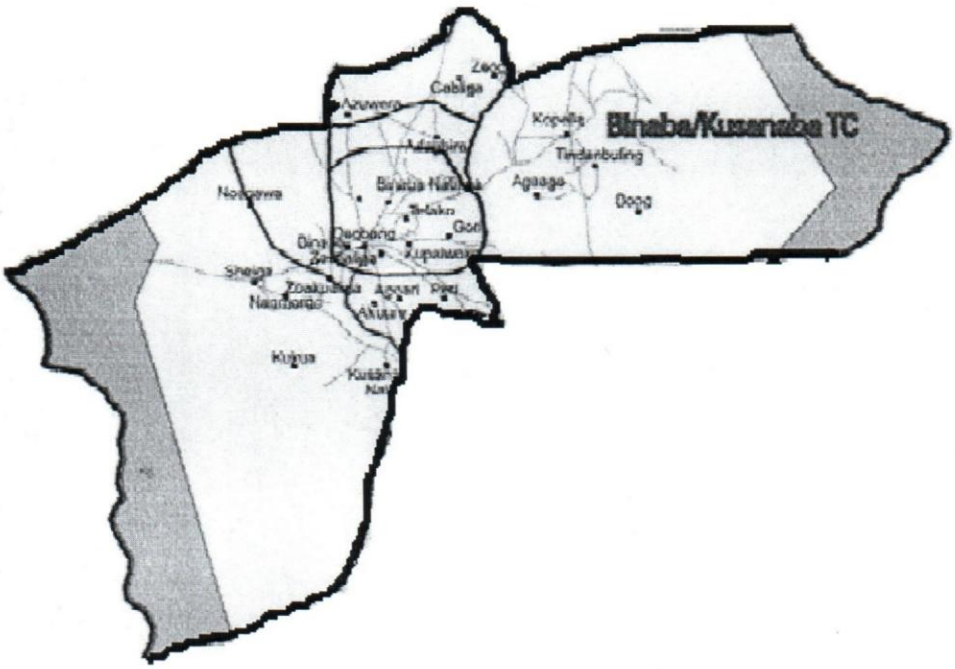
For the purpose of this study, a community was selected in the Bawku West district of the Upper East Region. This is because a brief base line study was done in the area on natural resource management by IWRM on their CPWF and it came out of the findings that the traditional leaders within these areas have a key role to play when it comes to natural resources management.

The researcher therefore in her quest to build on this brief study, wanted to know the specific role that these traditional authorities play when it comes to natural resources management

especially water. Her choice on water was because during the brief study, most of the communities within and around these area suffer for water scarcity during the dry season and as such rely heavily on the White and Red Volta that is by them and there by contributing to its rapid siltation. However, one community which has been able to manage the dam water in such a way that, they have water to farm even during the dry season is Binaaba. It was therefore prudent to draw lessons from this community in order to encourage other communities with such facilities but dry up during the dry season due to miss management.

Profile

Figure 3.2 shows the study area Binaaba.



Binaaba which is the capital of the Binaaba/Kusanaba Town Council is located at the southern part of the Bawku West District. It shares boundaries with Dagbang to the north, Zekpalga to the east and Sheiga to the south west. In the map above Binaaba is seen as a community on its own however, the study covers all the communities within the Binaaba traditional area.

The topography of the area is generally flat with gentle undulating slope. The area is drained by the White and Red Volta and their tributaries. These rivers over flow their banks in the rainy season and sometimes are destructive to the people but as soon as the rainy season ends it dries up with disconnected pools of water in the river bed separated by sand bars and rocks.

Binaaba community experiences a single rainfall regime lasting between 3-6 months and the rest of the year is faced with dry period of 6-8 months. The average annual rainfall, temperature and humidity are 986mm, 29-35oC. This community lies within the desertification zone of Ghana and so water availability is very critical.

3.4 Research Design and Methodology

3.4.1 Research Design

A research design refers to the arrangement or organization for the study, used as a guide for collecting and analyzing the data (Neuman and Wiegand, 2000). In this study, while trying to assess the role of traditional institutions in IWRM, the researcher employed the case study approach. The case study method is very helpful in drawing data through an in-depth study (Tellis, 1997). In this study, guided interviews, unstructured and structured questionnaires were used. The data collected were mostly qualitative and 'qualitative' is data that is non-numerical; it employs different philosophical assumptions, strategies of enquiry and methods of data collection, analysis, and interpretation. Although the processes are similar to quantitative, the qualitative procedures rely on text and image data. It has unique steps in data analysis and draw on diverse strategies of inquiry.

3.4.2 Tools for data Collection

During the research, in order to capture the intended information, the tools used in collecting the data included unstructured questionnaires with informal interviews, structured questionnaires, observation and the respondent's impressions. An unstructured questionnaire is one where by all

or most of the questions are open-ended (A2 Media, 2004), while a structured questionnaire is one whereby all or most of the questions are closed (Lopez-Escamez et al, 2005). The unstructured questionnaires for key informants were combined with informal interviews. These key informants included, traditional leaders, elders in the communities, and specific water users. The other questionnaire used by the researcher was a structured questionnaire.

For both questionnaires, the questions were centered on the people's water management practices, their social organization, the role of traditional leaders, how water is allocated, the level of management of the traditional leaders, the process and procedure involved in passing laws, the level of IWRM in the communities, and how all these are linked with the modern water management practices. The questionnaires were also focused on how the different communities manage water at their community level; how maintenance and discipline around water sources are conducted. The questionnaire for the individual households will combine different water uses; domestic water, livestock watering, small garden watering, irrigation and any other major water user.

3.4.3 Sampling Procedure

The sample is a set of elements obtained from the entire elements available to be studied as a result of the sampling process. This definition by the study is affirmed by both Baker (1994) and Sapsford & Jupp (2006). Baker (1994:148) defines a sample as a "selected set of elements or units drawn from a larger whole of all the elements, the population". By this definition, the researcher underscores the basic point that a sample is always smaller than the population and

logically obtained from it. Sapsford and Jupp (2006) similarly touch on these defining attributes of a sample. They define a sample as "elements selected from a population by studying which we hope to understand the nature of the population as a whole" (*ibid,* pg. 152). However, they expand it by highlighting the aspect that by drawing out a subset from the whole population to study, one is able to get an understanding and insight into the nature or behaviour of the population as a whole. That is to say that the sample becomes a reflection of the population. This assertion has however been subjected to several nuances by different researchers who affirm that the nature of a research study and the objectives it seeks to achieve have a bearing as to the kind of sample to use for a study and which also has implications as to whether the sample would necessarily reflect the population. This study did not seek to delve into this conundrum in research.

Selecting a sample is dependent on a number of factors, and one key factor is the choice of sampling method. Sapsford and Jupp (2006:29) suggests that "balancing accuracy against cost and feasibility" are issues that are brought into question when considering the choice of method. Moreover, where the researcher aims at validity and generalization of findings, it is important that the representativeness of the sample and the fairness in their selection becomes paramount. Having given due consideration to the above issues, a simple purposive sampling method is used to select the sample from the study population.

Purposive sampling can be very useful for situations where one needs to reach a targeted sample quickly. The method used to select the respondents and the key informants was 'purposive sampling' where the researcher samples with a purpose in mind (Trochim, 2001) where there is

one or more specific predefined groups to be used. In the context of this research, the researcher was targeting the traditional leaders; the chief, headmen, village heads, and others like WRC and GIDA. These were thought to be knowledgeable about the general aspects of the management of the water resources in the study area.

The information obtained from these key informants helped the researcher to formulate the questionnaires for the individual household heads. The sampling method used for the respondents to the questionnaires at household level is the 'Accidental sampling' also known as 'Convenience' sampling (Trochim, 2001), which is one of the most commonly used methods of sampling.

The selection of the different areas to administer the household questionnaires was by convenient sampling. Convenient sampling is a non-probability method that saves both time and money, which were both very crucial in this study. It is an inexpensive approximation of the truth (Stat Pac Inc., 2004). Hence the selection of the study sites was according to the water uses of the dams they had and a build up on the study done by IWRM.

3.4.4 Data Analysis

Data analysis is the process involved in making sense out of text and image data. One may also say it is an ongoing process involving continual reflection about the data, asking analytical questions and writing memos throughout the study. (Creswell, 2009).

Before the data was analyzed, it went through a number of processes. That is the raw data from the field was organized and prepared by putting together the field notes, images and transcripts. That is first cleaned and organized this was by ensuring that all the responses were legible, all the important questions answered, all the responses were complete and all relevant contextual information was included (for example; data, time, place, researcher). The unit of analysis in this study is the individuals, that is, the household heads. These individuals constitute the water users, who use water for different purposes; domestic water (drinking, washing and cooking), water for watering small gardens, water for irrigation and water for other purposes. After the organisation, the researcher read through the organised data, the data was then coded using the computer into themes or descriptions. The researcher started to inter-relate the themes into the case study or subject of the study and finally interpreted the meaning of the themes to fit into the case study.

3.5 Challenges Faced During the Study

The first challenge the researcher faced was communication, especially with the key informants who could speak only the local language of the study area. The individual household heads very few of them were conversant with the language of the researcher. The researcher had to therefore use an interpreter, which could have led to the researcher failing to capture certain expressions of the people. The other challenge was ethical; when the respondents were asked a question, most of them kept explaining how their livelihoods are affected by the political influence. This placed the researcher in the dilemma a having to explain all the time that the focus of this study was not the political. This was despite the fact that this has an effect on issues to deal with implementing projects like IWRM. The researcher was therefore caught between whether or not to include

some of the strong assertions by the respondents. Such statements have not been included in the analysis.

3.6 Time of data collection

The researcher collected the data between September and October, 2012. This is because that was the start of the farming season so every key person in these communities was around to supervise his or her farm work.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter presents the results of the study. The chapter presents the general set-up of the water management within and across the study area. It covers the rules surrounding the water resources in the area, the roles and responsibilities of the various relevant authorities and the people's water resources conservation approaches.

4.2 Background Information

This study revolved around a dam, in Binaaba. The Binaaba dam is a small multi-purpose dam constructed in 1963. It gets its supply of water mostly during the rainy season and by base flow supplied even though not scientifically proven. It is the only source of water during the dry season for gardening. Since its construction, the dam has never gone dry completely, meaning it contains water throughout the year. Its overall management is under the Chief of Binaaba, who lives less than 2 kilometres away from it. However, there are some others like the spiritual father called "Tindana" and the water users who play various roles. The Water User Association was set up by the water users in the community. It is made up of approximately five people and its role include discussing issues concerning management of the water resources and to, sometimes, come up with punishments for culprits.

The water in the dam is mainly used for farming/gardening, fishing and livestock watering. The water is reserved for the dry season farming so during the raining season the water is used

minimally for domestic purposes, by the people who live less than 1 kilometre around the river, and fishing.

4.2.1 Water Resources and Management in Binaaba

Resources identified regarding water within the Binaaba community were the dam, wells (5) and boreholes (10). The boreholes are normally for domestic use and sometimes for watering domestic animals. The dam goes beyond domestic uses. To a large extent it is used for dry season farming, and not just for gardening. It is also used for watering livestock. One key informant mentioned that, the White Volta River is only accessed by those doing commercial farming in the district. The reason is that, it is far from the community and the risk of losing crops to the water is high during the raining season or when the Bagri dam is opened and it is only commercial farmers who can take that risk.

Issues' regarding the management, access and use of the resource concerns the whole community. However, the final decisions may be taken by the chief and elders with the aid of the leaders of the Water User Association (WUA). A respondent said "*the dam is being basically managed by the Water Users Association (WUA) on very basic issues. Very important and delicate issues are referred to the chief and his elders and the tindana*".

'Water access' in this context refers to the opportunity or right to experience or make use of the water resources. This concerns the social interactions between the people and their water resource. Access to the use of the dam water by strangers or migrants is obtained from the chairman of the Water Users Association who does that in consultation with the chief and his

elders. Beyond this, WUA give equal access to water to all groups and persons. Decision making involves all stakeholders and persons.

4.2.2 Roles of Traditional Institutions in Water Resource Management

The traditional hierarchy concerning water management comprise of the chief, being at the top. Below him is the headman, then the village head. The spirit medium (tindana) is another traditional leader whose sole responsibility is to communicate with the ancestors, especially for rain-making purposes. The Chief is the head of all the traditional leaders, but in cases where the chief is too far from some villages, a headman is put in position to be the immediate substitute for the chief. However, if the headman fails to handle some issues, he can pass them on to the chief. The village head handles matters at the village level, which entails individual households.

Respondents mentioned the roles of various traditional institutions as given in Table 4.1.

Table 4.1: The roles of traditional institutions

Chief	Village head	Head man	Tindana
Overseeing all issues concerning water -Citing of dams -Ensuring availability of water to everyone, through planning for the water resources -Advising the people not to pollute the	-Ensuring peace in times of conflicts; ensuring that people do not fight at the boreholes' -Ensuring that water is not polluted	-Substitutes for the Chief / Acts as the Chief where chief is far (about	-Predicting rain - Leading the community in all

water -Requesting for more water sources like boreholes, piped water -Managing conflicts and disputes -Informing people about the date for the rainmaking ceremonies -Warning and punishing culprits caught breaking the rules -Ensuring maintenance and protection of the water sources -Setting bi-laws for water resources, enforcing them -Advising on Catchment area protection and conservation approaches -Supervising the headmen village heads, the youth, women groups and spirit media	-Maintaining and protecting the water resources -Setting bi-laws for the water sources, together with the chief, and enforcing them -Taking issues up to the chief or headman -Identifying the areas of the water resources that need to be developed and how they can be developed -Reporting dried-up boreholes, or those with a low yield to the chief	15kilometers away) -Ensuring maintenance and protection of the water resources -Planning for new sites for dams or boreholes	spiritual issues such as fortunes and misfortune.

As to whether these roles are not conflicting, about 10% of the respondents did not know whether there are any conflicts among the roles of the traditional leaders. However, majority

of the respondents, about 85%, were sure that conflicts did not exist among the roles of the traditional leaders. One key informant stated clearly that:

> *"the roles of the traditional leaders are not conflicting due to the nature of the hierarchy and also to the fact that all the leaders knew their roles; the village head focuses on issues at the village level, should he fail to resolve them, he will then pass them on to the higher authority - the headman or chief and when an issue is related to the spiritual realm, it is referred to the spiritual head (tindana)".*

4.2.3 Level of Management and Involvement

The traditional leaders were emotional with their responses to these questions of their involvement in water resources management. It was clearly stated that it is only at the community level that they are involved. At the district, regional and national level no traditional leader is involved. The reasons for the neglect of the traditional leaders were blamed "*on the 'government people' as saying no money to organize such meetings and the language makes it difficult to understand some terminologies*". One headman who mentioned this said "*but if it is the language we have people who will assist us*".

The level of involvement of the traditional leaders is very minimal and is limited to information, which is often an outcome of a decision, passed on to them for consumption. When it comes to making rules or laws regarding natural resources no traditional leader is consulted and as a result, implementation becomes difficult. A key informant said "*if I don't make a law how will I implement it or punish people who break it. I don't even know if the law is broken*".

However, at the traditional/local level, their involvement is very high. When it comes to initiating a project, especially on water, every household is consulted. Decisions about how to manage and conserve the project, for sustainable and effective use involves every household. So at the local or traditional level, people are involved in the planning, implementation, monitoring and evaluation stages of any project since for them, water is the most essential commodity and it is linked to everything.

In the subsequent sub-sections the specific areas where traditional leaders are involved in water resource management are examined.

4.2.3.1 Management of Infrastructure

The day-to-day management of the dam is handled by the community, who work together with the chief and his elders while the day-to-day operation of the dam is the responsibility of the WUA. These responsibilities include ensuring that people do not wash directly in the dam, or to fish with a net in the dam, ensuring that their livestock do not drink at the dam during the raining season, and abstaining from using black pots to fetch water from the dam.

Interviews with key informants revealed that while it was the role of the Village Health Worker (VHW) to ensure that the water quality of the dam is good, it was the responsibility of the community and the traditional leaders to watch out for anyone polluting the water and for people washing their clothes within 50 meters of the water source and any livestock getting within 20 meters of the water sources (dams). People were chosen by the community members to work as volunteers (not paid any salary).

The maintenance of the infrastructure is the principal responsibility of the community. This includes, among others, scooping silt from the silt traps, and removal of vegetation around the dam wall. However, in other cases, like when the dam wall needs to be repaired which the community pays for, it is the responsibility of the traditional leaders to report this to the relevant authorities, which include the Ghana Irrigation Development Authority (GIDA) and other relevant government agencies. Management of conflicts is the responsibility of the traditional leaders who work together with the community.

Similarly, the community has the major responsibility of managing the day-to-day operation of the boreholes, followed by the WUA and then the traditional leaders. It is the duty of the community to clean around the boreholes. Any person(s) caught not heeding to the rules is warned or taken to the village head for questioning. It is the responsibility of the community to maintain the infrastructure of the boreholes. While the traditional leaders report any breakdowns or necessary repairs to the trained personnel at the GIDA. The community has to contribute money to pay for these repairs.

The management of the unprotected wells is exclusively by the individuals or groups of individuals who own them. It is only when disputes or conflicts arise that the village head and, at times, the chief or headman gets involved. Interviews with the key informants also revealed that the WUA only get involved in the management of dams and boreholes when there is any need for external funding.

Traditional leaders and the community are responsible for designating areas for washing, watering of livestock and drawing of drinking water. All community members are to be involved in this process because it is their responsibility to identify the culprits; thus they have to be fully aware of the boundaries of such designated areas.

4.2.3.2 Conservation of Water Resources

The respondents were asked if they carry out any conservation measures as regards their water resources. Some villages have 'no-cutting-trees' campaigns, and tree-planting campaigns. The village head ensures that people do not cut down trees. Other villages, like Binaaba, have silt traps to prevent siltation of the dam. While the government set these up, it is the responsibility of the community to manage them. The community has the responsibility of continuously scooping silt from the silt traps.

When asked about any water conservation methods used in their crop production, the respondents mentioned that they used mulching to conserve the soil moisture, prevent soil erosion through the use of contours and also plant a type of grass (crippling grass) along the gardens to prevent sand from moving into the dam. The respondents said they were also involved in putting stones on points where rivers and streams serve the dam to prevent sand from getting into the dam. The respondents also revealed that the use of fertilizers was not limited, even people were not aware that too much fertilizer might pollute the water for the downstream users.

4.2.3.3 Conflict Management

A conflict in the context of this study is taken to mean a clash between two or more parties over water resource usage. A dispute in this context is taken to refer to a minor misunderstanding between two or more parties, for example, competition for water between different water users. A conflict is at a higher level than a dispute; disputes in this context are taken to be misunderstandings at village level while conflicts may involve parties from different villages, or different wards, or even different districts.

During the Interviews with key informants, it was revealed that struggle over water resources was rare, but in cases where it happens, the traditional leaders together with the community handled these issues. One of the most common disputes cited was when individuals are caught collecting water from other people's wells without permission. The Chief calls a meeting and they discuss how to go about such issues. This process is only between the traditional leaders and the community members, other partners/stakeholders may attend as part of the community, but has no say in the decision making. This was in conformity with the responses from group leaders across the community, in which more than 95% said that both the traditional leaders and the community handle the disputes. However, the irrigation authority may be called upon when there are disputes between the water suppliers and the irrigators at the irrigation scheme. The respondents were asked about the relevant authorities for managing conflicts concerning their water resources according to the various water uses. It was observed that both the traditional leaders and the community were the major authorities involved in the management of conflicts concerning domestic water, water for livestock watering, water for small garden watering and water for building.

The case of water for irrigation is different in that the management of conflicts was mainly by the irrigation committee, and to a certain extent by the traditional leaders. The key informants indicated that conflicts over the water resources were not common, but once there was a conflict, the village head would try to resolve it, but if he failed, he then takes it to the chief or headman. The chief then tried to solve it between him and the village head, with the concerned parties. However, in cases where the conflicts were complex, and involving a big part of the community, then the rest of the community will be called to witness and assist in resolving it.

From some of the respondents' narratives, the researcher gathered that when the chief decides to involve the community in solving a conflict, they gather at the village court, which is a building near the chief's residence. The chief together with the village head chaired the village court. This situation was not a common occurrence, but as one of the respondents revealed, happened averagely once in two or three years. One of such conflicts mentioned was when there is an invasion of people's livestock from other wards during the dry season.

4.2.3.4 Water Allocation

Interviews with key informants revealed that there were no set rules for water allocation. This was confirmed by the majority of household heads (95%) who said that everyone was allowed to access as much water as they needed as long as the water resources were available. However, in times of scarcity, the village head, together with the people ensured that each household got some water (especially from the boreholes).

Since people are free to access as much water as they needed, even for food production, it seems that the water management in this context is not sustainable as regards food production. However, water becomes the limiting factor during the dry season. The respondents were asked how they prioritized water especially in times of scarcity, and the majority of them revealed that they gave the first priority to water for domestic use, which is drinking, washing and cooking, followed by water for livestock watering before water for small gardens. The key informants also revealed that in Binaaba, no one is given priority to water access in times of water scarcity. Responses from the group leaders showed that in times of water scarcity, everyone was given an equal opportunity to get water. In cases of extreme shortage, the village head had to ensure that at least each household got some water.

However, some of the respondents said that in times of scarcity, the first priority was given to community and livestock watering, and people are ordered by the chief and village head to suspend all other activities that were water demanding. It is the duty of the village head to ensure that people comply with the chief's instructions.

The respondents were asked if there were cases when people were denied access to water, and the majority (more than 90%) said no one has ever been denied access to water in Binaaba. The interviews with the key informants exposed that sometimes people are denied access to water when they repeatedly fail to pay fees for repairing the boreholes. They, however, said this was very rare. As they, again, stressed that no one has been denied water for domestic use, saying that water is a basic right and should never be denied anyone.

4.2.3.5 Rain-making Ceremonies

In Binaaba, an average of 81% of the respondents said they had had rain-making ceremonies in the past ten years. Interviews with key informants also revealed that the chief used to organize the rain-making ceremonies, in Binaaba. During the ceremony, the chief calls upon all people in his area of jurisdiction to participate. The spirit medium, popularly known as *'Tindana'*, leads a team of four to six elders to the community shrine, for consultations. This is usually around August or September. On return, they gather all the people; go to the hills for the ceremony, which goes on for the whole day and night. They brew the local beer (pito), the men play drums, and people sing and perform traditional dances. People move around the bush collecting all sorts of rubbish that might be hanging around and bury them, including the carcases. The spirit medium also informs people to stop burning grass and cutting trees.

On scrutiny of such a ceremony, one realizes that it has more connotation than its face value. It is a form of social-organization, which brings the water users together to discuss and do things together, easing decision-making, especially on matters concerning natural resources like water. It might also be a way of preserving the cultural values of the people, and to strengthen their loyalty to the traditional leaders.

4.2.3.6 Punishing Offenders

The respondents were asked what punishment is given to those caught breaking the rules, or to those who fail to contribute towards any matter as required. The punishment for people who are caught polluting the water and those who fail to contribute as required is fining. This fine could be a goat, or some money, which one of the respondents said "*ranges between GHC 50.00 –*

200.00 (fifty – two hundred Ghana cedis)". Sometimes when the offender did not know possibly because he/she is a stranger this fine is negotiable, but the respondents revealed that such cases were not quite common.

The researcher came across a certain gentleman at the Tindana's house, who had been fined for letting his cows drink directly in the dam. This gentleman informed the researcher that he was fined a goat, and although he did not rare any goats in his household, he had to buy it and give it to the chief. While another such an offender revealed that he was asked to bring the money equivalent of a goat that he had been fined. Such goats got from fines are kept and slaughtered during ceremonies like rainmaking or some other rituals, while the money is kept for maintenance purposes.

This shows that the rules governing the water resources are flexible and open to negotiations. Interviews with key informants revealed that once the WUA or the community members identify a culprit, the village head is informed. It is the duty of the village head to warn this culprit and if he/she does not heed, the village head will either fine the individual or take up the issue through the traditional hierarchy.

4.3 Other Relevant Institutions and their Roles

The other relevant authorities mentioned with regards to water resource management during the interviews were the Water Resources Commission (WRC), and the GIDA officials. These people are not involved in the day-to-day management of the water resources. They occasionally may

get involved when there was a new project like a new borehole or new dam being offered by the government or an NGO. Their role as regards water resources management includes reporting issues like any need for development of the water resources to the government. This could be the need for a new dam or borehole or the sitting for a new borehole. Their role may also be to intervene in resolving some extreme conflicts, but this is only at the invitation of the chief which is very rare.

The role of the GIDA officials was focused on the irrigation scheme where their basic role was to help the irrigators in agricultural issues, among which include good soil water conservation practices and the role of WRC is to help maintain and conserve water in the dam. When they were asked about Water Resources Commission they revealed that they were not fully aware of its responsibilities as an authority through which the government manages water as described in the Water Resources Commission 1996 (Act 522)

4.4 Attempts to Introduce Integrated Water Resources Management

In an effort to find out about an attempt to introduce Integrated Water Resources Management (IWRM) in the area, the respondents were asked about their knowledge of the newly introduced IWRM-driven methods of water management. The respondents were not aware of this name or met anyone from the area who knew of this except the chief of Binaaba who mentioned during the interaction with him that he has interacted with officers from International Water Management Institute (IWMI) which organized a workshop in which he was part.

4.5 Laws on Water Resources Management and Enforcement

The rules surrounding the water resources, the authorities responsible for setting up these rules, the authorities responsible for designating particular areas and the punishment of culprits caught breaking these rules are examined here.

The respondents were asked if they were aware of any rules pertaining to their water resources, that is, rules pertaining to access, abstraction and use of their water resources. According to a key informant, the rules pertaining to the water resources were basically set-up by both the traditional leaders and the tindana of the community. This also implies that the traditional leaders, together with the community set-up the rules pertaining to the dam, boreholes and the unprotected wells. The key informants revealed that these rules or laws pertaining to water resources are mainly customary. This means the rules are mostly linked to their ancestors and ends up as a totem or a god in their land so it is well respected and observed as such.

That is to say that these rules were set-up from the rules that have existed since time immemorial, and had been set-up by the ancestral traditional leaders, who had done this together with the community. Thus these rules had existed for long, they are not written, but everyone was aware of them. It is worth noting that some rules pertaining to water for irrigation are also set-up by 'other' authorities, which included the Irrigation Authority and the Water Resources Commission.

It was observed that more than 65% of the respondents were aware of the rules pertaining to the water for domestic use. Such rules includes no one is denied water for domestic use, everyone

must be allowed to access water for domestic use, everyone is supposed to pay fees for repairs in case of any necessary repairs and everyone has to be involved in cleaning around the water source, except the elderly. Of the respondents who used water for livestock watering, almost 65% were aware of the rules pertaining to water for livestock watering. These rules basically centered on the dam, which is the major source of water for livestock watering. These rules include prohibition of washing directly in the dam, no livestock watering allowed at the dam during the raining season. Also, livestock are not allowed to drink directly from the dam; they have to drink at certain designated points.

More than 70% of the respondents who used water for small water gardening were not aware of any rules pertaining to small garden watering. This could mean the respondents were ignorant of these rules because the interviews with key informants exposed that such rules existed and they include not fetching water for small garden watering from the borehole, and no one is allowed to get water from a neighbour's well without permission.

The responses showed that majority of the people who practiced formal irrigation were aware of the rules pertaining to access, abstraction and use of water for irrigation. These rules include farmers should not waste water, otherwise they will be fined, the water supply has to follow the irrigation programme, water should be used only for irrigation and for possible drinking.

Majority of the respondents said they paid fees to access water for the various water uses, although they continuously said they were not sure why and what they were paying for. Interviews with the key informants revealed that people only paid fees in the form of

contributions for the repair of water infrastructure. For instance, such payments helps in the repair of irrigation channels of the dam, boreholes, and also when there is the need to send the spirit medium to go and make consultations about rainmaking. Those people who did not pay these fees accordingly were repeatedly warned and finally punished.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the main issues that emerged from the results presented in the previous chapter. The discussion of these results is in accordance with the specific objectives of the study. The first objective was to identify and examine the Traditional Water Resources Management (TWRM) practices and the second was to examine the nature of integrated water resource management in the study area. The third objective was to identify the roles traditional institutions play in water resources management and the fourth was to identify the level at which the traditional institutions are involved in the management of water resources. The last but not the least objective was to find out how effective the role of the traditional institutions is and lastly, to find out the processes and procedures used in passing by-laws on water resources.

5.2 Traditional Water Management Practices

Having defined traditional practices as those practices that people today consider to be their own established practices and rules, without interference from any outside organizations, it is clear from the findings that the people in the study area practice TWM. As the findings revealed, the management of water resources is informed by customary practices, under the leadership of the traditional leaders. The TWM in this area spans the entire spectrum of issues: overall water use and access, including the rules and regulations; conflict management and handling of offenders; handling of water development issues; and issues pertaining to water resources conservation. Such practices, namely; chieftaincy; jurisdiction over water resources; customary rules governing the distribution of water; and the procedures for initiating development programmes,

are "traditional" or "indigenous", also described as "customary" institutions of governance, and are common practices which have been revealed all over the world (Katerere and van der Zaag, 2004; Maganga *et al*., 2003).

Water management in the study area is similar to other rural African societies. Similar research has been done in rural parts of Africa, including Zimbabwe, to reveal that people still rely on their traditional practices to manage their water resources despite the numerous water reforms (Sithole, 2001; Sithole, 2002; Nompumelelo, 2001). Furthermore, the community represent a typical rural Ghanaian set-up, where the people are still loyal to the chief, upholding him as key to most of their social and natural resource issues. The chief still has jurisdiction over the water resources. It is clear from the findings that IWRM-driven structures are still quite unfamiliar to the people, who, in spite of everything, still depend on customary laws for the management of their water resources. This is in spite of the country's statutory law for water management, that is, the water Act of 1996, which instituted the water sector reform, twelve years ago. Other related cases have been revealed, especially around Africa (Boesen *et al.,* 1999; Meinzen- Dick and Pradhan, 2001).

The rules governing the management of water resources are set-up by the traditional leaders, who are involved in all aspects of water resources management. The traditional leaders, together with the community manage the infrastructure, which includes the boreholes and the dams, despite the fact that these are mostly provided by NGOs and the government. With the various experiences from implementation of IWRM in the water sector reform, it has been discovered

that stakeholder participation and community based resource management are the best approaches to sustainable water governance (Katerere and van der Zaag, 2004).

Among the TWM practices, as revealed by the findings is the management of conflicts. The chief, the headmen and the village heads are responsible for handling any conflicts regarding water resources. This aspect of traditional conflict management is a wide spread practice, especially in rural Africa. This has been identified in numerous communities and has been said to be very effective (Maganga 1998), and is sometimes even the most effective option. For example, it was difficult for Administrative Courts to settle water disputes, because the judges have little or no knowledge about water management (Huggins, 2000). In this respect, diverse traditional practices are more dominant than statutory law are relied upon in developing access to water resources and managing conflicts. The traditional institutions, as revealed by the findings, have been sustainable, besides having been in existence for a long time. There are no clashes and there is no duplication of roles, unlike the case for the newly introduced IWRM institutions, where the catchment managers and the catchment councils and sub-catchment councils have overlapping roles which sometimes leads to clashes. The chief, tindana, the headman, the village head and the WUA are all aware of their roles and this minimizes or eliminates the aspect of clashes in roles. The management of the water resources in this context is based on administrative boundaries. These are based on the area of jurisdiction of the chief. Furthermore, customary law is flexible and open to negotiations (ISW, 2001), such as the punishing of offenders, as revealed by the findings of this study.

These traditional leaders are in charge of the natural resources falling within their boundaries. Such administrative boundaries were socially acceptable to all the members of the community (Mishra, 1998). In such areas, customary law governs the natural resources, including water, presided over by the traditional leaders. However, with the introduction of the new IWRM-driven institutions, it is still not clear how these traditional leaders and administrative boundaries merge with the newly introduced hydrological boundaries.

The revelation that these rural people are still dependent on their customary laws for the management of their water resources is partly evident that the water reform did not reach these rural areas. If IWRM means institutionalising stakeholder participation, as a proxy for water governance (2nd Dublin principle – see Appendix I), how is it practical for the rural people who are not even aware of such legislation? This lack of consultation with the rural stakeholders negates the efforts to achieve effective water governance, because effective water governance requires the consultation and participation of stakeholders from all sectors including government agencies, water users, service providers, and civil society at all levels of the decision-making process (Arriens and Alejandrino, 2004). Globally, the stakeholders are usually different and they have different customary practices, which they have been using to manage their resources. However, critically examining these TWM practices, some of the aspects are found to be lacking; for example, the findings from this study indicate that while women play a big role in the handling of water resources, they do not have any say in the decision-making process. This similar shortcoming is observed in the currently introduced institutions under the water reforms, where studies have indicated that gender representation on WUA or water committees are highly skewed towards men (Gonese, 2002; Sithole, 2001).

Despite the Dublin principles on which the water reforms emphasize that women play a central role in the provision, management and safeguarding of water resources, and thus should be involved at all levels of decision making (3rd Dublin principle-see Appendix I). Other principles recognizing and emphasizing the involvement of women in natural resources management like water resources includes the Agenda 21 and the Beijing declaration (1995).

5.3 Integration of TWM with the New Modern Methods

From the findings, it is observed that the majority of the rural water users was not consulted during the water sector reform, and was thus ignorant of this reform. Those who have heard of WRC are not even aware of its role as the national water authority for regulating and operating water resources. The process of the water reform was supposed to be participatory, involving the lowest possible level. However, the findings expose that this was not the case as regards the rural stakeholders.

Research has revealed that the consultations leading to the water reform focused more on the major water users; the large-scale commercial farmers and the urban water users, neglecting the rural water users (Kujinga, 2002; Dube and Swatuk, 2002; Latham, 2002). While the water reform process and, therefore, the introduction of IWRM were supposed to follow a bottom-up approach, it is tending to be top-down, where the government seems to dictate how the stakeholders must participate, without much consultation with the rural stakeholders. The District Assembly is blamed for attributing this to the lack of enough funds to consult and inform all the water users about the reform, and also that the donors giving the legislator's limited time

for the consultation with the stakeholders. Thus the policy makers did not have time to consult the ordinary stakeholders like the rural water users. The dilemma now remains whether and when these rural water users are ever going to understand the dynamics of the new water management, and what is going to happen to their customary water management practices? Or are they forever going to remain in the dark?

The reliance on customary water management practices for survival in such an arid area suggests that these practices have been efficient in sustaining livelihoods. This is because when people build their livelihoods around water, they create relationships of cooperation and control in order to acquire and manage water systems, and how to survive in times of scarcity. How livelihoods survive under scarcity is related to how people understand water scarcity, organize social action to remedy it, and act to defend their rights (van der Hoeck, 2001). In the case of this study, the chief reserves the Binaaba dam for the dry season. Therefore introduction of new modern methods of water resources management should build on such practices, for effective governance of water resources.

Among the targets of IWRM are empowerment of poor people, reduction of poverty, improving livelihoods, and promoting economic growth (Merrey *et al.*, 2004). But as currently understood and used, IWRM often tends to focus on second generation issues such as cost recovery, reallocation of water to "higher value" uses, and environmental conservation. While IWRM focuses on devolving the water management to stakeholders in the form of committees, it neglects the possibility of existence of different or already existing TWM practices.

Ethnic groups differ in their perception and values of natural resources like water. While IWRM proposes a 'blanket' framework for water management, the people differ in their perception and values of water resources. This, therefore, calls for recognition and consideration of TWM practices by IWRM; the 'modern' legislation should not be imposed on such rural settings that have relied on their customary practices since time immemorial (van Koppen *et al*., 2004). The existing customary law must not be ignored. The challenge facing policy makers in Ghana today is how to modify these deeply ingrained traditional rules and guide them along a path of evolutionary institutional change towards a system of more sustainable natural resource management (Dore, 1996).

There is a growing number of scientists, development workers, and members of indigenous communities themselves, who agree that some solutions to the problems of poverty and environmental deterioration are to be found by merging tradition with modern scientific knowledge (IIKSS, 2002). This is because customary law is flexible and open to re-negotiation, as indicated by the findings of this study. In order to achieve any effective water management and development in rural areas, it is required to involve the rural stakeholders actively in project activities by respecting their traditional knowledge and customary systems. Traditional knowledge has a sound base as it has been tested and practiced over the years (Mishra, 1998). This is because customary practices are appropriate technology in particular climatic conditions and are practical in the living conditions of people.

Moreover, issues emerging from the debate on environmental protection and community empowerment have resulted in a strong need to have a fresh look at these older and time tested

practices and utilize their benefits for meeting the present day needs of rural and urban areas (Rima, 2002).

The recognition of these TWM practices by the modern ones should be considered with caution because it is essential to remember that most of the customary laws and norms are unwritten and flexible, implying a very complex phenomenon (Boesen *et al.,* 1999). Furthermore, while strategic policy reforms take time to develop and must be adapted to the local scale, to be successful, a prudent, measured approach may be necessary with countries prioritizing all-stakeholders involvement, rather than trying to change everything at once. Thus the people will need a phase to transform and adapt to the new methods.

What's more, the implementation of these new reform driven structures does not seem to be favorably carried out; for example the issue of payment for raw water for irrigation. This new principle of payment for water may seriously distort customary institutions (van Koppen *et al.*, 2004) and would hit the most powerless the hardest. Hence there is need for the policy implementers to clearly explain to the new farmers. This way the impact of such structures will be lessened once the people understand the underlying reasons.

5.4 Effects of the Modern Water Management Practices on the Traditional practices

The previous sections have shown that TWM have long been in existence and are vital to the rural people in terms of water governance, food production and sustaining livelihoods. Hence it is important to sustain or preserve such practices. In addition, most modern practices are foreign

to the people. This means that the water users have to adapt as they adopt these new structures, especially in cases where they have to completely embrace the new organization, and forget about their customary one.

Moreover, the implementation of IWRM does not give much recognition to already existing water management practices. This means that once IWRM is in full gear, all the formerly and currently existing customary practices will be a thing of the past. Since traditional practices, traditional knowledge and customary laws are passed down from generation to generation; they will die out completely if they are not practiced continuously, or protected (ISW, 2001).

The role of customary law and practice in the governance of water resources might be eroded by movements that are taking place in society due to globalization processes and trends of modernity that contribute to the overall erosion of traditional values.

5.5 Conclusion

This chapter has discussed the findings according to the specific objectives of the study. It has shown the existence of TWM practices in the Bawku West District. This included the chief's jurisdiction over natural resources, rules governing the access to water resources, conflict management, and issues pertaining to water resources development and conservation. The findings reveal that water resources management is informed on customary practices. It has also shown that this customary law is sustainable as regards sustaining conservation and water management or governance. The chapter has highlighted that customary systems of governance tend to be more widely utilized by the poor, who constituted the greater percentage of water

resource users in the study areas. The chapter also makes a case that there is need for the modern ones like IWRM to recognize and build upon these TWM practices, otherwise they will become extinct. Thus a better understanding of customary law and policy-relevant recommendations on how to strengthen and build upon customary rights is imperative in safeguarding poor people's rights to water.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The focus of this study was TWM. The study was done in one community in the Bawku West District. The case study revolved around the Binaaba dam which is a small multi-purpose dam, using formal interviews with key informants and questionnaires for individual household heads in order to address the study objectives. The findings reveal that although the infrastructure regarding the water resources was donated by other organizations such World Vision and ADRA, the general management of these and the water resources is basically customary.

The previous chapters have described customary practices of managing water resources in Binaaba discussing the implications for IWRM whilst taking a proper account of TWM practices in the Binaaba area as a case study. The study revealed how the current water reforms in Ghana focused on the use of statutory legal systems, neglecting the potential customary practices and the role of the traditional authorities that the people have been relying on. This final chapter presents the conclusions that were made from the assessment of these customary practices and the role the traditional leaders play in water management, and their implications for improved water governance. It also gives the recommendations that are the proposed best course of action. It further gives the aspects that need further research, and discusses the possible implications of this study for policy and practice.

6.2 Conclusion

Almost twelve years after the enactment of the new water laws in Ghana, the majority of the rural stakeholders do not have any knowledge of the reform- driven structures like the Water Act of 1996, the WRC and IWRM, let alone the water reform itself. This shows how ineffective the introduction of IWRM has been. The water management in most rural areas is still predominantly governed by traditional systems, based on customary law under the major leadership of traditional leaders. These customary practices include the rules governing the water resources, the management of infrastructure, the planning regarding the water resources, management of conflicts, and the rain-making ceremonies.

The traditional leadership system is responsible for the planning of the water resources, enforcing the rules, designating specific areas around the water sources for various uses, handling of offenders, and citing of any development projects. The customary practices described in this study have been able to sustain water conservation, food production and livelihoods, which are all water dependent. In addition, the fact that these people have relied on these customary practices for managing their water resources for such a long time implies the sustainability of these practices.

The attempts to introduce IWRM in Ghana have not yet impacted the rural areas, because the people are still ignorant of the newly introduced water management structures, and are thus still relying on the customary ways of water management. The existence of these customary practices despite twelve years of the water reform suggests the intense significance and resilience on these practices. In addition, traditional institutions have the advantage of community presence or

involvement and the chiefs have a crucial role to play in natural resources conservation and management, although modern institutions generally overlook them.

There is the need to support these at the community level by a lower tier management structure. Once such way of recognition for the chiefs and the TWM by the modern ones, that could be the harmonization of the institutions. The WUA and other committees being the lower tiers for water management structures, present an ideal opportunity to consider modern institutions with the already existing traditional ones. These traditional institutions have community legitimacy, and the village heads being social centers present an ideal opportunity for grass-root implementation of programmes.

Therefore, the WRC and IWRM can adopt the traditional leaders as their co-opted leaders, below which the water users committees would become the lowest tier. Some scholars might argue that the aspect of traditional leaders introduces an element of dictatorship in natural resources management, arguing that chiefs are not elected by the people. However, this is not the case in the African context of Chieftaincy, because the chief, though not elected by the people, is still looked at as a 'champion', an individual who still commands loyalty among the people and will front run any decisions aimed at natural resource management, water inclusive. This loyalty is also expressed towards the other traditional leaders; the Headmen, village heads and spirit media. The key point is that 'modern' legislation cannot be imposed hundred percent in such rural settings; the existing customary law must not be ignored. If IWRM attempts to put improved livelihoods of the poor at the centre of its goals, there is need for recognition of these customary practices by the modern ones. However, such an integration or development upon TWM needs to

be carried out gradually, to allow time to the rural stakeholders to adapt to these new structures and concepts.

Furthermore, there is the need to first assess the sustainability of such customary practices before their consideration is embarked on for effective water governance. Such a consideration requires that the groups have a common ground, enabling communication and exchange of ideas and experiences both between and within the traditional and modern systems and structures of water governance or management. This does not mean that traditional practices should be forced into formal science paradigms, as is currently being widely done by policy makers in most African countries in the currently rampant reforms. In fact, communication and collaboration based on the sharing of a common culture, a common vision, which is, in this case, improved livelihoods through improved water governance is essential.

Alternatively, since some countries like Tanzania have existing dichotomy of the legal systems, Ghana might also adopt such a set-up. Therefore, instead of trying to replace a customary legal system with another 'modern' one, it is recommended to develop a uniform all-embracing legal system that accommodates both systems and allows concerted co-existence. This would be effective in reducing rural poverty through empowering the people, and thus improve livelihoods that are dependent on these customary water management practices, and thus improve water governance.

Again, many rural livelihoods have and still do survive on TWM practices for the management of their water resources. If the newly introduced IWRM-driven institutions and practices are

imposed on these rural stakeholders, the customary practices that these people have relied on will become redundant and eventually phase out and die. Thus there is the need to perpetuate TWM practices and their sustainability guaranteed, and this can be done through development of the modern practices on the TWM.

6.3 Recommendations

This study has identified that there is the need to recognize the traditional water resources management and the role of traditional leaders when introducing the modern ones in order to address gaps between the newly introduced IWRM and the water management at the local user level. Thus the following practical and academic suggestions are proposed:

- There is the need to communicate the water reforms to all the stakeholders, through consultations, including the rural stakeholders so that they acquire knowledge about the water Act of 1996 and understand how stakeholder institutions such as WRC and IWRM operate. The consultations preceding the reform process should not neglect the stakeholders in the rural communities.
- There is the need to also inform and explain such proceedings to them so that they understand the reason and significance of the newly introduced structures. This way they will be able to appreciate these new organizations, and they will not feel cheated as was the case concerning the water pricing. This therefore means that when drafting the new national legislation, the government should take time to involve all relevant stakeholders, including the rural water users.

- Moreover, it is not commendable to rush a project, which at the end of the day will not be so successful. Such communication will smoothen the progress of stakeholders in understanding the necessity to participate in water resources management.
- The government should find a way to soften the impacts of some of the modern practices that might conflict with the role of the traditional leaders and the customary law in any specific area. One way the government can do this is by deciding to consider water that is used by the people in such communal areas in irrigation schemes as primary water use, such that this will not be priced.
- Alternatively, the government should subsidize the water for the poor rural people who need to produce enough food to improve their livelihoods, especially those farmers in the communal lands. This can be done through cross subsidies, where the block tariffs are used and the urban or rich commercial users subsidise water for the poor rural communal farmers.

Finally, there is the need for investigation into the effectiveness of the traditional water systems in meeting the diverse requirements of the people in the given locality, before their consideration is affected. This is because not all customary practices are effective in terms of sustaining livelihoods and improving water governance.

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APPENDIX I

Dublin Principles

These Dublin principles were an attempt to concisely state the main issues and thrust of water management. They have been interpreted as a requirement for integrated management of water resources (Miguel & Fernando, 1999). This approach was strongly advocated for in the international conference on water and the environment in Dublin 1992, which bore the Dublin principles. Several countries worldwide have adopted these Dublin principles during the water reforms. The principles then resulted in the fresh water chapter 18 of agenda 21 of the United Nations conference on environment and development and in the influential World Bank policy paper on water resources management (Jaspers, 2003).

These principles are listed below:

- Water is a finite and vulnerable resource, essential to sustain life, development, and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good.

Associated key concepts to the above include the management of water resources in an intersectional manner and representation of all stakeholders. Water is also managed on hydrological boundaries and the catchment is the smallest unit for water management.

APPENDIX II: DATA COLLECTIONS INSTRUMENTS

QUESTIONNAIRE

THE ROLE OF TRADITONAL AUTHORITIES IN WATER RESOURCES MANAGEMENT

TAMARA AMINA SULEMANA

UDS/MDM/0089/10

Name of Community/Electoral Area.....

Name of Household Head .....*Household No*.....

Name of Respondent .....*ID No*.....

(MPHIL DEVELOPMENT MANAGEMENT)

UNIVERSITY FOR DEVELOPMENT STUDIES - GRADUATE SCHOOL

This Questionnaire is administered to solicit your views on the role of traditional authorities in water resources management in Binaaba. A community in the Bawku West District of the Upper East Region in Ghana. It is solely for academic purposes and all information obtained would remain confidential

Thank you for your cooperation.

INTERVIEW GUIDE FOR TRADITIONAL LEADERS

Introduction

Name:

Age:

Sex:

Title:

Years of reign:

Area of jurisdiction:

Educational background:

1. **nature of integrated water resource management in Binaaba**

- What are the types of water resource available in the community?
- How is the water resources managed in the community?
- Who are in charge of the management of water resources in the community?
- Have you ever heard of or met someone from IWRM or WRC? (if yes continue)
- What did you hear about:
  - I. IWRM
  - II. WRC

2. **roles of traditional institutions in integrated water resource management**

- How many traditional institutions in the community are involved in water resources management? Name them?
- How many non-traditional institutions in the community are involved in water resources management? Name them?
- What roles do the traditional institutions play in the water resources management?
- Do you think the traditional way of managing water resources is sustainable for effective water resources management?
- What are the roles played by the non-traditional institutions in water resources management?
- How do the two institutions come together to manage water resources?

3. level of management and involvement

- Do the traditional institutions report to someone about water resources in the community? (if no why, if yes who and at what level)
- Does the District assembly get involved in the management of water resources in the community? (if no why, if yes how)
- Does the district assembly involve the traditional and the non-traditional institutions when planning the management of these water resources? (if no why, if yes continue)
- At what level of the planning does it involve them?

4. effectiveness of roles played by traditional institutions

- Are the roles of the traditional institutions carried out without interference from government?
- What benefit does the community derive from the traditional institution's role in water resources management?
- Has there been any integration between the traditional way managing water resources and the modern way of managing water resources? (if no why if yes continue) the way the questions are framed will help
- How did the integration succeed?
- What role did the following people and institutions play in making sure the traditional and modern ways of WRM worked (integration)?
    a. Chief
    b. Tindana
    c. Clan heads
    d. WRC
    e. NGOs in the community

5. laws on water resources management and enforcement

- Are there laws on water resources?
- Who is responsible for its enforcement?
- In the process of enforcing the law is there any interference from any political party?
- Has there been any law on water resources which originated from the traditional institutions or from the community level? (if no why if yes continue)
- What process did it pass through before it became law?

APENDIX III

WATER USERS INTERVIEW GUIDE

Name:

Age:

Occupation:

Level of education:

1. **Nature of integrated water resource management in Zongoyiri/Binaaba**
   - What type of water resources do you have in the community?
   - Name them
   - What work do you use the water for?
   - How long is the water available within a year for your work?
   - Who manages the water resources in the community?
   - Can you tell how the management is done?

2. **Roles traditional institutions in integrated water resource management**
   - Who are the traditional authorities in charge of water resources in the community
   - What role do the traditional authorities play in the management of water resources
   - Do you see other institutions role aside the traditional institution's role (if yes continue)
   - What are they
   - How does the two different roles move together

3. **Level of the management and involvement**
   - Are there different levels of the water resources management (if yes continue)
   - What are they
   - At what level of the management process are you involved
   - What involvement role do you play in the management

- At what level of the management are you left out and why
- Will you wish to be involved throughout the management process (if yes continue)
- Why

4. Effectiveness of role played by traditional institutions

- How helpful is the roles of the traditional institutions
- Does the role prevent conflict on water resources or breed conflict
- Does the role display equality
- How will you describe the role played by the traditional institutions

5. Bye-laws on water resources management and enforcement

- Are there bye-laws on water resources in the community
- Who makes the bye-laws
- How long does it take the community to accept a bye-law on water resources
- How are the bye-law enforced