UNIVERSITY FOR DEVELOPMENT STUDIES

THE ROLE OF PUBLIC INSTITUTIONS AND NON-GOVERNMENTAL ORGANISATIONS IN INTEGRATED WATER RESOURCES MANAGEMENT IN THE BAWKU WEST DISTRICT.

BY:

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DATE: NOVEMBER, 2012
DECLARATION

Student

I hereby declare that this dissertation/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: …………………………………………

Name: ………………………………………………………………………………………………

Supervisors’

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

Principal Supervisor’s Signature: ………………………………Date: ……………………………

Name: Dr. Kanton I. Osumanu
ABSTRACT

The capacity for the implementation of the integrated water resources management framework is ignited by strong participation of various stakeholders. Such participation can create the foundation for using water resources efficiently and effectively by engaging social learning, building trust and a forum for understanding possibilities and limits. This study examined the role of public institutions and non-governmental organisations in integrated water resources management in Bawku West District. The study employed qualitative research techniques, mainly interviews and observations in the data collection. The study revealed that the decentralised departments in the district as well as some NGOs play significant roles in the management of natural resources and especially water resources. The decentralised bodies in the district formulate bye-laws regarding water resources management, educate and sensitized the people on water resources management (and all other natural resources). The NGOs engage in disaster preparedness with communities, support farmers to achieve sustainable agriculture production and educate and sensitise the local communities on water resources management. The study concludes that these institutions have the potential of enhancing water resources management at the local level but they are constrained by financial resources and logistics and recommends that they should be strengthened to enable them function effectively.
ACKNOWLEDGEMENT

My heartfelt gratitude goes to my supervisor Dr. Osumanu Kanton, who immensely contributed to the success of the work through his guidance and valuable suggestions. I also wish to express my appreciation to Dr. Jean-Philippe Venot whose contribution towards this work cannot be left out and the Challenge Programme on Water and Food for assisting financially during my data collection.

I wish to extend my profound gratitude to the heads of the decentralized departments in the Bawku West District and that of the NGOs for their time and contribution towards the gathering of data for this study.

I again deem it fit to express my thanks to all my friends who in diverse ways contributed to the success of this work.

My final appreciation goes to the Dean and the Coordinator of Graduate School, Dean of Faculty of Planning and Land Management and all staff of the University for their cherished contributions.
DEDICATION

In loving memory of my brother Mr. Iddrisu Edward and to all my friends.
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<tr>
<td>ADB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>AFD</td>
<td>Agence France de Development</td>
</tr>
<tr>
<td>AVRL</td>
<td>Aqua Vitens Rand Limited</td>
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<tr>
<td>BWMTP</td>
<td>Bawku West Medium Term Plan.</td>
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<tr>
<td>CIDA</td>
<td>Canadian International Development Agency</td>
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<tr>
<td>CODI</td>
<td>Center for Community Development Initiative.</td>
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<tr>
<td>CWSA</td>
<td>Community Water and Sanitation Agency</td>
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<tr>
<td>CWSE</td>
<td>Community Water and Sanitation Agency</td>
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<tr>
<td>DANIDA</td>
<td>Danish International Development Assistance.</td>
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<tr>
<td>DGIS</td>
<td>Directorate General International Co-operation from the Netherlands</td>
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<tr>
<td>EPA</td>
<td>Environmental Protection Agency.</td>
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<td>ESA</td>
<td>External Support Agencies.</td>
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<td>GII</td>
<td>Ghana Integrity Initiative</td>
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<td>GPRS</td>
<td>Growth and Poverty Reduction Strategy</td>
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<td>GWA</td>
<td>Gender and Water Alliance.</td>
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<td>GWPTC</td>
<td>Global Water Partnership Technical Committee.</td>
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<td>GWSC</td>
<td>Ghana Water and Sewerage Co-operation</td>
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<td>GWCL</td>
<td>Ghana Water Company Limited.</td>
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<tr>
<td>GSB</td>
<td>Ghana Standard Board</td>
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<td>GOG</td>
<td>Government of Ghana</td>
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GTZ: Deutsche Gesellschaft Fur Technisches Zusammenarbeit
IDWSSD: International Drinking Water Supply and Sanitation Decay.
IFDA: International Foundation for Development Alternatives
ILO: International Labour Organization
IRC: International Water and Sanitation Center.
LOCP: Lake Ohrid Conservation Project.
MDG: Millennium Development Goal
MF: Ministry of Finance.
MLGRB: Ministry of Local Government and Rural Development
MOFA: Ministry of Food and Agriculture
MMDAs: Metropolitan, Municipal and District Assemblies.
MWRWH: Ministry of Water Resources, Works and Housing.
NADMO: National Disaster Management Organization.
NGO’s: Non-Governmental Organizations
PEGEN: Project for Improvement of Water Governance in the
PHC: Population and Housing Census.
White Volta Basin.
PRA: Participatory Rural Appraisal.
PLA: Participatory Learning Approaches.
PURC: Public Utilities Regulatory Commission
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<tr>
<th>Acronym</th>
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<tr>
<td>TAC:</td>
<td>Technical Advisory Committee.</td>
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<tr>
<td>USAID:</td>
<td>United States Agency for International Development</td>
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<td>UNDP:</td>
<td>United Nations Development Programme</td>
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<td>UNEP:</td>
<td>United Nations Environmental Programme.</td>
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<td>UN:</td>
<td>United Nations.</td>
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<td>USD:</td>
<td>United States Dollar.</td>
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<tr>
<td>UCN:</td>
<td>World Conservation Union.</td>
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<td>UNCHS:</td>
<td>United Nations Center for Human Settlement</td>
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<td>WHO:</td>
<td>World Health Organization.</td>
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<td>Water Resources Commission.</td>
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<td>WRM:</td>
<td>Water Resources Management.</td>
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<td>WSSD:</td>
<td>World Summit on Sustainable Development.</td>
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<td>WCED:</td>
<td>World Commission on Environment and Development</td>
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<td>ZEF:</td>
<td>Center for Development Research.</td>
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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The existence and survival of man and all living things is crucially linked to the availability of water resources. Access to and use of water is basically linked to the existence, health and productivity of human beings (Global Water Partnership Technical Committee, 2003). Water resources, therefore, play a significant role in the development of every country. In an opening statement during the VII session of the World Congress on Water Resources in Morocco 1993, King Hassan II noted, “Water is an important factor for progress and development and represents the basis of the development of authentic civilizations through the ages” (Biswas 1993: 3).

This notwithstanding, UNDP (2001) reports that 20% of the world’s population still lack access to safe drinking water. As human populations and their associated activities increase, there is the driving demand for contemporary water for instance, for industrial uses, drinking, household uses, irrigation and agriculture. With these indivisible functions of water to the wellbeing of mankind lies in the holistic view of the resource and the need to ensure its sustainability for the present and future generations. More so, water security was declared by the Second World Water Forum in The Hague, Netherlands, (2000) as the principal concern for sustainable development in the twenty-first century.

Water is a cross-cutting 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 (Ghana, 2007). Water issues have been at the forefront of political, economic, social and environmental affairs. Managing this resource to sustain it has been a major concern to many governments and
international organisations. Today, as water systems and land uses have become far more complex and interlinked than ever before, water remains a medium for integrating local and national economies and between riparian countries with new challenges (Jean-Michel, 2009).

However, some recent writers speculate that water would be a 21st century source of conflicts. For example in “Resource Wars”, Klare states that “disorder and “disputes may occur over the allocation of a particular source of supply that extends across international boundaries, such as a large river system” (Klare, 2001:21). To buttress this point, in her book, Water Wars, Shiva quotes a 1995 predication from Ismail Serageldin, then Vice President of the World Bank that “If the Wars of this century were fought over oil, the wars of the next century will be fought over water” (Shiva, 2002: ix). She further notes that “we are currently facing a global water crisis” and risk both “paradigm wars” and actual wars between regions, within countries and communities (Shiva, 2002: x).

This argument has raised counter arguments as some scholars questioned the conclusion made by these authors. Two of such scholars Irna Van der Molen and Antoinette Hildering in a Journal on Science and World Affairs concluded that “at the international level, water appears to pose a reason for trans-boundary cooperation rather than for war” (Van der Molen and Hildering, 2005:140). Also, corresponding to Shiva and others in a Water Policy Essay, Wolf et al. (2003) determined that on policy issues of fresh water resources, such as hydropower and water quality, international relationships are fundamentally cooperative.

Also, in the absence of proper management of water, conflicts within countries often arise from competing water uses, and from overlapping and competing jurisdictional mandates of agencies dealing with water issues (Yilma and Donkor, 1997). The question that comes to mind when
these groups of scholars raised their arguments is the issue of scarcity and sustainability of the resource (water) and this leads to the issue of its utilization and management.

As all sectors (including agriculture, environment, health, education, land planning, industry, recreation, transport and energy) are concerned with water, and as water systems and inter-linkages become more and more complex, an integrated approach is needed for the management of each national water sector as a whole. This is as a result of viewing socio-natural processes and dynamics as complex and uncertain - as symptomatic of open systems of overlapping hierarchies which has its root in system theory (von Bertalanfy, 1968), systems ecology (Allen and Starr, 1982) and evolutionary economics (Nelson and Winter, 1982).

In recent times, it is widely accepted that complexity, variation, and uncertainty are inherent properties of linked social and natural processes, and that natural resources management strategies must somehow reflect these properties in pursuit of sustainability (Hodgson, 1993; Giampietro, 1994; Clark et al., 1995; Funtowicz and O’ Connor, 1998). Various models and theories have been developed to provide general and causal explanations of complex socio-natural dynamics. In addition to these theories is management frameworks - prescriptions regarding how knowledge should be produced and used (modes of knowledge production and use) to achieve specified desirable (natural resource management) outcomes. The eventual translation of apprehension into management prescription is a natural final step in scientific knowledge generation which also plays an important empirical ‘feedback’ in theory testing (Pickett et al., 1994), so the emergence of such framework for managing complexity in socio-natural systems is not unexpected. However management frameworks are normally explicitly articulated as theories, they do, at root make available guidance for interventions that yield benefit or satisfaction and therefore, encompass testable statements about the relative
effectiveness of different ways of producing and using knowledge to manage natural resources (Medema et al, 2008).

The management of water in its different contexts has typically been assigned to a variety of institutions (public and private) operating independently from one another (Global Water Partnership Technical Committee, 2003). This system eventually lost its importance as many constraints bedeviled the resource. It is also recognized that water in a given water basin is a continuum, hence its use for one purpose affects its availability or quality for others in the basin (Global Water Partnership Technical Committee, 2003). The resource is facing an increasing competition between different uses and users for various purposes. This sometimes can lead to public unrest and inter-state or international tension. Water resources become more depleted as a result of indiscriminate and uncoordinated usage. These reasons have led to the adoption of an alternative system for managing water resources - integrated water resources management.

Integrated Water Resources Management (IWRM) emerged as a popular concept in the water sector in the 20th century (Saravanan, et al., 2009). Many definitions are associated with the concept of integrated water resources management. The most popular and widely recognized definition is the one given by the Global Water Partnership as “the process that promotes co-ordinated development and management of water, land and related resources, in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital systems” (Global Water Partnership, 2000:22). Inherent in this definition is addressing water governance in a larger context through consensus building, and calls for the inclusion of stakeholders at all levels (Jonch-Clausen, 2004).
Another definition of integrated water resources management is the one offered by USAID in 2007 as “a participatory planning and implementation process, based on sound science that brings stakeholders together to determine to meet society’s long term needs for water and coastal resources while maintaining essential ecological services and economic benefits (Molle, 2008:134). Integrated water resources management in a related development is particularly concerned with pursuing an integrationist agenda: that is the integrated and coordinated management of water and land as a means of balancing resource protection while meeting social and ecological needs and promoting economic development (Odendaal, 2002). In the view point of the World Bank, integrated water resources management is a “comb”, in which the “teeth” are the water–using sectors and the “handle” is the resource itself, defined by its location, quantity and quality (World Bank, 2004).

Various countries in the world have embraced the new concept of water resources management and Ghana is not excluded. Ghana until 2007 did not adopt this system of managing her water resources (Water Resources Commission, 2008). The first attempt to embrace it was an integrated water resources management plan drawn for the Densu river (Water Resources Commission, 2008). The involvement of stakeholders at all levels (Jonch-Clausen, 2004) is much articulated into the country’s practice of Integrated Water Resources Management as various stakeholders are involved in the River Basin Boards. The participation of these stakeholders is very important in reaching well-managed water resources. This is based on the communicative rationality in which actors in a society seek to reach common understanding and coordinate actions by reasoned arguments, consensus, and cooperation rather than strategic action strictly in pursuit of their own goals (Habermas, 1984).
Water resources in the country continue to face challenges and pose health hazards to the citizens. Frequent floods, land and water quality degradation, water shortages in perennial river systems, increase demand for irrigation amongst others in the country takes the centre stage of developmental issues (Water Resources Commission, 2008). This situation has led to seeing water resources in the position that needs conceived efforts from all angles.

1.2 Problem Statement

The high incidence of bush fires in the district which destroys the vegetative cover is a threat to water resources. The vegetation cover around water bodies are usually destroyed by these fires hence resulting in to their drying up. Farming very close to water bodies especially along the White Volta is a major nuisance to sustainable water resources. This happens both in the dry and wet seasons. This is because the silt that is left at the banks of the river is fertile for the cultivation of cereals, vegetables and fruit crops such as water melon. However, as they engage in this cultivation, sometimes lead to the siltation of the river and its concomitant floods and loss of property of all kind. Again the activity of charcoal burning and firewood harvesting in the district is degrading the natural resources base and water resources in particular.

The activities of ‘galamsey’ operators and small scale miners in the district undermine the existence of water resources. They usually wash the gold dust in to water bodies and even the use of mercury devastates the degradation process of water resources and destroys many aquatic lives. Human life is also under a threat as the water bodies are polluted.

The district assembly, decentralized departments as well as communities have formulated by-laws to protect and minimize activities that jeopardize natural resources as well as water resources. Among such by-laws include by-laws on bush burning, farming along river banks,
felling of trees, using chemicals in fishing, illegal mining, etc. Some non-governmental organizations in the district have also involved in championing the management of natural resources as well as water resources. However, with all these interventions, natural resources and particularly water resources continue to experience various forms of degradation. If all these stakeholders are involved in water resources management and yet the water resources depletion is still a social canker, then it raises eye browse of researchers, government and other development partners.

1.3 Research Questions

The main research question that the research seeks to answer is: what is the contribution of public institutions and NGOs to integrated water resources management in the Bawku West District?

The sub research questions are:

i. What is the role of public institutions in integrated water resources management in the Bawku West District?

ii. What is the role of NGOs in integrated water resources management in the Bawku West District?

iii. What are the challenges facing these institutions as stakeholders in integrated water resources management in the District?

iv. What are the ways in which these institutions collaborate with one another?
1.4 Objectives of the Study

The main research objective is to find out the contribution of public institutions and NGOs in integrated water resources management in the Bawku West District.

The specific objectives are:

i. To investigate into the role of public institutions in integrated water resources management in the Bawku West District.

ii. To find out the role of NGOs in integrated water resources management in Bawku West District.

iii. To find out the challenges facing these institutions as stakeholders in integrated water resources management in the District.

iv. To find out the ways in which these institutions collaborate with one another in managing water resources.

1.5 Justification of the Study

Access to and use of water is basically linked to the existence, health and productivity of human beings (Global Water Partnership Technical Committee, 2003). It is common to notice that water resources are depleting every day in and out as water pollution, siltation of water bodies, perennial drying of river bodies, floods among others are rearing their ugly heads in our vicinities. And with these issues, the management of water resources is so crucial to any nation that is seeking to address these situations hence these issues need to be brought to the fore front of development agenda.
This research will provide information to government as well as development partners in water resources management on how to have effective stakeholders’ participation. Other researchers can also rely on this study as a source of literature to continue researching into water resources management in the country.

1.6 Choice of Study Area

The research context is the Bawku West District due to its vast water resources. The White Volta and that of the Red Volta and their tributaries happen to lie within the district. The integrated water resources management has also been modeled for the White Volta and many stakeholders are involved in the management of these water resources.

1.7 Scope of the Study

Integrated Water Resources Management is too a broad topic to research into. In terms of integrating the various stakeholders, the study is focusing on public institutions and NGOs in integrated water resources management.

One of the benefits of integrating stakeholders at all levels is its focus on the blending of viewpoints (Grigg, 1999). The study focuses on the enabling environment, institutional roles and participation and tries to use these parameters to assess the contribution of public institutions and NGOs in integrated water resources management.

Natural resources degradation could be partly attributed to rules, policies, by-laws and regulations governing their management. The success of the Integrated Water Resources
Management depends on the policies, rules, regulations and by-laws governing natural resources management in an area. Who formulate these regulations, policies and rules, how it is done and who are involved will largely determine the effectiveness of the by-laws, rules and policies. The study will further consider these issues and how they affect natural resources management in the Bawku West District.

1.8 Profile of Study Area

The location of the study area is the Bawku West District of the Upper East Region of Ghana. The research was carried out among governmental institutions and NGOs in the district. The district lies roughly between latitudes 10° 30’N and 11° 10’N, and between longitudes 0° 20’E and 0° 35’E (BWMTP, 2010).

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 in the north, Bawku Municipality to the east, Talensi-Nabdam District to the west, East Mamprusi District to the south and Garu-Tempate District to the south east. The District has a total resident population of 83,034 (2000 PHC).

The main sources of domestic water supply in the District includes rivers, springs, wells, boreholes, ponds and dams (BWMTDP). Most rivers and springs dry up towards the end of the dry season making water a scarce commodity. The district is surrounded by vast water resources such as the White Volta, Red Volta and their tributaries.
1.9 Organisation of Thesis

The research work is organized in to five main chapters for sequential and orderly presentation. Chapter one provides an overall introduction to study. This chapter includes the problem statement, the research questions and objectives, justification of the study, scope of the study, profile study area and limitations of the study.

Chapter two entails literature review on the study. This chapter dealt in to scholarly debates on the topic. Concepts related to the topic have been examined as well as the theoretical bases of the study.

Chapter three constitute the research methodology. It outlined clearly the research design, sampling techniques, sampling units and sampling size, sources of secondary data and analysis and presentation of the data.

Chapter four presents findings of the research activity. Data collected are analyzed and organized in this chapter in response to the research questions.

Chapter five summarizes the main findings of the research, discusses and draws conclusions. The research problem, questions and objectives are revisited under this chapter.

1.10 Limitations of the study

The limitations of the study were basically linked to the data collection process. In many cases, it was very difficult getting respondents to interview. There were instances where the researcher would book appointments with some of the heads of the decentralized departments but to be there at the scheduled time and would be told to come another time where he or she cannot even tell when but for you to always resurface to check. For those who were available at a visit do
complain of time and would not hesitate to ask how many minutes will you spend with me. With that, I do convince them that I will not delay and would speed up the process.

Another challenge faced was in connection with the assembly members. Because some of them stay at their electoral areas, it was difficult reaching them since some the places were far from the district. Despite this, some of them do not even stay within the district as they work at different districts. However, in those cases other assembly members were considered. In some cases the researcher had to travel to their homes and interview them.

On the side of the herdsmen, and particularly the Fulani herdsmen the challenge was that they were still afraid to talk to the issues with the view that they are strangers. I have to explain to them and reassure them of the confidentiality of the information given. Their location also poses a challenge in the sense that getting them together as a focus group to interview was not easy. But the researcher had to convince them to sacrifice a little time so as for us to meet.

With respect to the NGOs, the challenge was that many of them do not have offices in the district and whiles others are run by just individuals who were not easily accessible. This reduced the number of NGOs interviewed to four since I could meet such other individuals.
2.1 Introduction

This chapter is a review of the relevant literature on matters that explicitly explains the issues associated to the topic. Theories, concepts and debates on water resources management are also examined here. It also looks at governmental institutions and NGOs involvement in integrated water resources management and how that will yield sustainable water resources management. The chapter, therefore, gives a review of relevant concepts which is intended to aid in the understanding of the research topic and provides clear issues relating to water resources management and integrated water resources management.

2.2 Overview of the Concept of Integrated Water Resource Management (IWRM)

The management of water resources has in recent times attracted the attention of many international bodies. In most countries water is administered by a government department, or as a part of a ministry, or treated as a nationalised industry. It is estimated that nearly 95 per cent of water and wastewater services worldwide are provided by public water enterprises (Wolff and Palaniappan, 2004). However, it can be noted that there are variations in the ways the water sector is organised around the world due to the fact that organising the water sector is largely influenced by a country’s overall standard of governance, its customs, mores, politics and conditions (Rogers and Hall, 2003; UNESCO, 2006).
Furthermore, sustainable water management has become a major issue of concern due to increasing uncertainties caused by climate and global change and by fast changing socio-economic boundary conditions (Pahl-Wostl, et al., 2007). For some writers, it is believed that much of this crisis is attributed to poor governance and therefore water crisis is seen as a crisis of governance (Rogers and Hall, 2003). The adoption of the integrationist agenda in water resources management in the view of many and especially the Global Water Partnership will enable the world to arrest the situation of depletion of water resources and ensure its sustainability for future generations. However, the Integrated Water Resources Management has been criticized by the scientific community despite the praises given to it. This community criticize the IWRM for its ambiguities, given its operational aims, but at the same time recognizes its innovative, even subversive, qualities which often remained untapped (Biswas, 2004; Jeffrey and Gearey, 2006; McCulloch and Ioris, 2007; Mukhtarow, 2007).

The ambiguity of the concept is sometimes used to promote market- based instruments (Molle, 2008). In the beginning of the 21st century, IWRM became a political currency, stressing the ideological orientation of its promoters. According to Molle (2008:134), “Indeed, the use of IWRM as a political currency is apparent in the way it is appropriated by all players or actors without distinction. Yet, each category of player emphasizes one of the tenets of IWRM that most reflects its own inclination, ideology or interest (…). For example, supporters of privatization or those who see the maximization of aggregate welfare as priority objectivity promote the ‘efficiency’ pillar of IWRM and its view of water as an economic resource. Livelihood- oriented NGOs or social activists use the concept as a means to further equity concerns and social agendas”.
IWRM is highly recognised for its focus on the concept of local participation, an approach stressed in the Agenda21 of the UNCED. Kofi Annan, UN Secretary General in supporting local participation emphasised that “without the fullest participation of people at all levels of society the goal of full coverage of Water Supply and sanitation is unlikely to be obtained” (UNEP 2001:2). This study therefore is of the view that, local participation in water resource management comes out of a growing recognition that where local environmental knowledge is made used of and where communities are empowered and have rights to water resources, there is a greater likelihood of a sustainable water management. The inclusion of stakeholders at all levels (Jonch-Clausen, 2004) is one of the major tenets of integrated water resources management.

The existence of power dynamics in social interactions has great influence in the success of integrated water resources management. As different stakeholders interact to reach a well-articulated decision on managing water resources, their power levels either positively or negatively affects the integration process. Integration of the various stakeholders in the management of water resources is seen by others as a political process (Hofwegen and Jaspers, 1999; Allan, 2006). Ideally, there exist inter-subjectivity of actors (Flyvberg, 2000) through communicative rationality, where actors “overcome their subjectively based views in favor of rationally motivated agreement” (Habermas, 1990:315). However, does this exist in the real world situation? The communicative competence of the actors in the integration process is also important. Habermas points out that all sections of society can be easily identified, that they possess equal knowledge and can be included in a communicative action but how this could be done was left untouched.
The notion of Integrated Water Resources Management has a long history (Rahaman and Varis, 2005). This notion was disuse in the 1980s because water was not considered at the international agenda. The notion of IWMR was once more taken up at the beginning of the 1990s at several internally and regional conferences (Ferragina, et al., 2002). At this time, IWMR was associated to basin management which was captured by one of Rio’s chapter’s declaration, Agenda 21: “Integrated water resources management, including the integration of land and water related aspects; should be carried out at the level of the catchment basin or sub- basin” (Olivier, et al., 2009). In the view of the International Water and Sanitation Centre (IRC, 1994), water resource management (WRM) was globally discussed for the first time in the United Nations Water Conference in Mar del Plata in 1977 but it was not until the early nineties that it was really put on the international agenda with the holding of a number of significant meetings such as the 1990 New Delhi meeting, the 1991 Nordic Freshwater Initiative in Copenhagen, the 1992 Dublin meeting, and the 1992 UNCED meeting in Rio de Janeiro (UNDP, 1992) etc.


At the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, the international community took an essential step towards more sustainable patterns of water
management by including, in the WSSD Plan of Implementation, a call for all countries to develop “integrated water resources management and water efficiency plans”

Building on the Dublin Principle, the Global Water Partnership (2000: 15) provides a more comprehensive understanding of IWRM and refers to it as “a process, which 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”. The Dublin-Rio statement departs from the sub-sectoral to cross-sectoral water management and embraces a holistic, comprehensive, multi-disciplinary approach to water resource problems worldwide premised on four guiding principles which includes environmental, social, political and economic concerns. These principles are presented briefly below.

Principle 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. However, this has been contested by some people such as Haggai (2010) saying that fresh water is abundant and cannot be finite as the Dublin principles claimed.

This principle looks at the totality of water recognizing the fact that water is a natural capital asset with a fixed quantity yield per time period and therefore needs to be maintained in order to ensure its requirement for the many different purposes, functions, services and users. Also, the effect of human activity on water is explained by this principle. Human beings can reduce the availability and quality of water by actions, such as mining of groundwater, polluting surface and ground water and through changing land use. As such, upstream users must recognize the legitimate demands of downstream users to share the available water resources and sustain usability. This is the catchment approach.
Principle 2: Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels. This second principle, which is the focus of my thesis, recognizes the fact that water is a subject in which everyone is a stakeholder. According to the GWP (2000:15) “Real participation only takes place when stakeholders are part of the decision-making process. This can occur directly when local communities come together to make supply, management and use choices” or occasionally through market places with the use of appropriate pricing systems. Participation here means more than mere consultation. It should be an instrument that can be used to pursue an appropriate balance between a top-down and a bottom-up approach in IWRM. As we shall demonstrate further, it should be effective participation where all the stakeholders democratically elected or otherwise accountable spokespersons at all levels of social structure and at different levels of water management are represented, and have an impact on the decisions taken. To buttress this, Kofi Annan, UN Secretary General emphasised that “without the fullest participation of people at all levels of society the goal of full coverage of Water Supply and sanitation is unlikely to be obtained” (GWP, 2000).

Effective participation must be able to exploit all the available consultative mechanisms and stakeholders must recognize that the sustainability of water resource is a common problem and that all parties must be willing to sacrifice some desires as a means for achieving long-lasting consensus and common agreement. For this to be possible there should be an enabling environment which includes the creation of mechanisms for stakeholder consultation, awareness raising, confidence building and education, the provision of the economic resources needed to facilitate participation and the establishment of good and transparent sources of information at all
spatial scales; national, basin, catchments; including the marginalized social groups such as the women and youth.

Principle 3: Women play a central part in the provision, management and safeguarding of water.

This piece of work cite with the GWP/TAC in supporting the Dublin principles’ claim that women play a key role in the collection and safeguarding of water for domestic and agricultural uses though they have less influential role than men in management. GWP/TAC continues with the claim that although gender issues have been reflected in many agreements since the Rio conference, the Dublin principle strives to ensure that the water sector is gender aware and that rhetoric is replaced by operational mechanisms and actions to ensure an equitable participation of women in IWRM.

Ironically, the Dublin Principle like many others, by stigmatizing the role of women failed to fully recognize that youth just like women exercise a similar role. By their sheer numbers amounting to about 30% of the world population (UNCED 1992) and through their dynamism, skills and energy and their ability to mobilise resources, youth can play a vitally non-negligible role in IWRM.

Principle 4: Water has an economic value in all its competing uses and should be recognized as an economic good. The Dublin Principle attributes many past failures in water to the fact that water was considered as a free good, or that its full value was not recognized. The principle asserts that water has a value as an economic good. Treating water as an economic good may help balance the supply and demand of water, thereby sustaining the flow of goods and services from this important natural asset. The full cost of providing water includes the full economic cost and the environmental externalities associated with public health and ecosystem maintenance.
The full economic cost consists of: the full supply cost due to resource management, operating and maintenance expenditures and capital charges, the opportunity costs from alternative water uses, and the economic externalities arising from changes in economic activities of indirectly affected sectors. The recovery of full cost should be the goal for all water uses unless there are compelling reasons for not doing so.

However, critics of this principle of water been an economic good raises arguments such as; the improvement of water infrastructure in the developing world will largely depend on subsidies. The principle of full cost recovery sometimes handicaps developing nations that are striving to provide basic needs by subsidizing their basic water infrastructure (Rahaman&Varis, 2003); water will end up being unsustainable. It is believed that water is a basic human need and access to minimum quantities of safe water (20 liters per person per day) should be everyone’s right. Lack of access to safe drinking water, sanitation, and irrigation is directly related to poverty and poor health. The critics went further to look at the issue of equity when it comes to water as an economic good. It has been advanced that in many developing countries, the very poor actually pay a great deal for water relative to their income, but these costs are often hidden. Water is priced by all urban societies, and the poor often have no choice but to pay high prices, spending between 5-10% of their income; however, in contrast in most industrialized countries, the lower-middle class spends 1-3% of their income on potable water and sanitation (Selborne, 2000). For instance, in the developed countries, households spend about 1% of their income on water; on the other hand, in Onitsha, Nigeria, the poor spend as much as 18% of their income on water (Rogers et al., 2002). However, they do not lose sight of the fact that the principle provides a simple tool for the development of water services in a more efficient direction but that water
should not be treated as a market-oriented commodity when it comes to domestic use for very basic needs (Gunatilake and Gopalakrishnan, 2002), particularly for people in extreme poverty.

Also, in a counter argument with the principle, it is noted that water management by the public or government organizations also has many success stories; a point in case is in Finland and other European countries (Shen and Varis, 2000)

The Dublin principles have gained universal support as the guiding principles underpinning IWRM because it calls for effective participation - the focus of this thesis, a hallmark of the concept of sustainable development developed during the 1992 UNCED conference.

2.3 IWRM as an Integral Part of Sustainable Development

The adjective "sustainable" stems from a Latin verb "sustinere" (to uphold). The corresponding English verb, "to sustain", being in use since the late Middle Ages, has meanings such as: to maintain, to keep going, to keep in being, to keep from falling, to carry on, to withstand, to bear, to support life, to provide for life or bodily needs, to furnish with the necessities of life (Little, 1972). Many of these meanings are encapsulated in the term "sustainable development" which is being broadly used nowadays. In fact, "sustainable development" is an old concept that has been used in the management of renewable natural resources to ensure that the rate of harvesting a resource is smaller than the rate of its renewal. As mentioned in the Brundtland Report (WCED, 1987), "humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own
needs”. This aim should be achieved while minimizing the losses (maximizing the gains) to economic, social and environmental systems.

Article 9 of the UN Declaration of Human Rights (1948-66), states that all people ‘should promote sustainable development all over the world to assure dignity, freedom, security and justice for all people’. Sustainable development is defined as development that ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’ (UN Convention on Environment and Development, 1987). This means not simply the use of resources at a rate which could be maintained without diminishing future levels, but development which also takes environmental and social implications into account. Sustainable development entails ‘the integration of economic, social and environmental objectives, to produce development that is socially desirable, economically viable and ecologically sustainable’ (B. Nath, L. Hens, and D. Devuyst, 1996). From the view point of these writers, this may involve the prevention of irreversible environmental change.

According to the Brundtland Commission (1992) sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The commission further stated that sustainable development should be linked to the goals of distributional equity and social justice –within and between countries as well as generations (Brundtland Commission, 1992). In responding to the definition offered by Brundtland, Rao (2000) argues that this definition addresses the issue of both intergenerational and intra-generational resource distribution, with expressed concern for the poor. He stressed that sustainable development must bring in basic political change in line with an alternative development agenda. As the UNCED (1987: 63,65) states “The pursuit of sustainable development requires a political system that secures effective citizen participation in decision-
making … This is best secured by decentralizing the management of resources upon which local communities depend and giving these communities an effective say over the use of these resources. It will also require promoting citizen’s initiatives, empowering people’s organizations, and strengthening local democracy”.

There are problems associated with these definitions: the term ‘future generations’ specifies no time limit, and, although it is conventional to argue that sustainable development includes issues of equity, ‘socially desirable’ is hopelessly vague. In addition, the nature of ‘environmental change’ is often difficult to predict. Advocates of ‘strong sustainability’ argue that stocks of natural capital should be preserved, and not traded for human-made capital, while those who espouse ‘weak sustainability’ would accept such exchanges. Trade-offs can be made between losses in one location and gains in another, or within internationally agreed pollution levels.

Agenda 21 concludes that ‘indicators of sustainable development need to be developed to provide solid bases for decision-making at all levels and to contribute to a self-regulating sustainability of integrated environment and development systems’.

However, it is noted that, the concept Sustainable Development grew out of the sentiments that western patterns of development have not incorporated traditional society-nature relations within the south and inadequately addresses issues of social equity, ecological balance, and overall sustainability.

To buttress this claim, Colchester (1994) as cited in Brohman (1996 :201) argue that many projects such as roads, railways, ports, power lines, dams etc typically initiated in the name of
development and sponsored by national governments with loans from the World Bank and other international financial institutions have only been clearly beneficial to elite groups linked to these transnationals. Such groups have often used lobbying to further their interest within national and international development agencies. Meanwhile, the poor and the disadvantaged have usually been excluded from the decision-making process and have borne the burden of the costs of these projects. This paper raises the argument that future generations (today’s youth) will pay a heavy price for present unsustainable development – the benefits of which are currently being monopolized by an elite minority.

It is on this regard that Brohman (1996: 307) suggests that attention has recently been focused on issues related to the sustainability of development and he provided the pace for environmental issues to move top on the world agenda. An incentive to this was the 1972 report published by the Club of Rome entitled The Limits to Growth, “which warned that life as we know it faces a sudden apocalyptic end if development practices are not dramatically changed to respect the earth’s physical limits to growth” (Meadows and Meadows, 1972). This concept of sustainability was further advanced via the works of theorists like Lester Brown (1981) and others at the World Watch Institute who stressed that no international economic order could be viable if the natural biological systems that underpin the global economy are not preserved. The process gained greater recognition at a number of major international meetings, including the Stockholm conference on Human Environment in 1972, the 1974 Cocoyoc conference in Mexico on ‘Patterns of Resource use, Environment and Development strategies’ and the very significant World Commission on Environment and Sustainable Development report published in 1987 which gave birth to the historic United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 1992.
The world of business cannot be left out in the discussion of sustainable development. The role of business in sustainable development emerged as an important topic of discussion at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil. *Agenda 21*, an action plan that came out of that meeting, stated that “the policies and operations of business and industry, including transnational corporations, can play a major role in reducing impacts on resource use and the environment.” It called for a growing private sector to provide more “employment and livelihood opportunities,” and business leaders were asked to contribute to sustainable development in their strategies and decisions. The 2002 conference also showcased a movement of nongovernmental and community-based organizations, which criticized big business and what they considered “greenwash,” or intentionally misleading public relations campaigns about corporate social responsibility that downplayed or even covered up corporate misdeeds. Such critics maintained that business decision makers are prone to seek short-term profits at the expense of social and environmental externalities, and that instead of partnerships, more state regulation is required to rein in the profit motive: “Today, in a world that is more unequal, with a small number of transnational corporations dominating each sector and exerting tremendous influence on governments, this concept of ‘partnership and stakeholders’ perpetuates the myth that there is a collective endeavour, and that all players are equal and conflicts of interest can be resolved by roundtables seeking consensus.” Many of these critics called for stronger transnational regulations in order to better control multinational corporations in particular.

Although several scholars, such as Robert Solow (1974, 1986); Redcliff (1991); Keiichiro Fuwa (1995); Vellinga et al., (1995); Harremoes (1996), have attempted fairly useful definitions of sustainable development, this concept similar to the concept of IWRM addressed in this work,
may not be possible to define with great precision as well as consensus, but refinements go on. My analysis in this work favours the definition provided by the `Brundtland Report` of The World Commission on Environment and Sustainable Development (WCED) 1987 because it is more generally accepted as a working definition, addresses intergenerational issues, and echoes a basic political change in line with development agenda that secures effective citizen participation of the community which is the central argument in this thesis.

2.4 Participatory Development: Theories and Concepts

The focus of mainstreaming development strategies since the post-world war has been economic growth and the top- down diffusion of development impulses (Brohman, 1996). With such thinking, it was believed that economic growth would trickle down from the top and benefit the peripheral population through the top- down process controlled mainly by international institutions in cooperation with the local third world elites. To further his argument, Brohman points out that, national and international experts conceived and designed development projects from the outside without associating the people to whom these projects are supposedly directed and sometimes these people exist mainly in the abstract as socio-economic indicators.

Despite the development efforts under taken by many countries since the 1950s, it was noticed that growth was not matching with development objectives. This manifested in the accumulation of growing labour underemployment, especially in agriculture, and rising inequalities in income distribution (Adelman and Morris, 1973); Fishlow (1972); Griffin and Khan (1972). Indeed, by the early 1970s, it was vividly clear that much of the third world growth was accompanied by increased inequality (Griffin, 1989: 165). This means that there was something wrong with the
nature of growth rather than the pace of growth as the crucial factor to development. The expected trickling down was not materializing and the widening gap between the rich and poor was exacerbating. This raises questions as whether the top-down approach and its expected results could produce the desired development.

With the inadequacies of the economic growth and the top-down experiences, during the First and Second United Nations Development Decade (1961:71, 71-81), many theorists and practitioners of development deliberated and argued on the essence of development. Black’s (1991: 20-1) argument that the focus should be on the ´animate` instead of the `inanimate` - on human resources, as measured by quality of life considerations, rather than on material resources. In buttressing the above point, UlHaq as quoted by Brohman (1996:203) further argues that new development approaches should be oriented toward the satisfaction of basic human needs and desires, particularly at the local community level, encouraging local participation and projects should “build development around people rather than people around development”. Such alternative development concept is what Berntein and Campbell (1985) refer to as the birth of ´Populist movements`.

In a related development, Moser (1989) links this to the origins of the concept of ´community development`, which the British used to develop basic education and social welfare during the colonial days. Community participation has been seen by many governments, the United Nations agencies and non-governmental organisations (NGOs), as critical to programme planning and poverty alleviation (World Bank, 1996). Participatory development really came to the light in the international development projects especially with institutions such as the World Bank in the 1970s (Brohman, 1996: 204).
According to Brohman (1996: 204) as cited by Ransom (2001), the World Bank in 1973 marked its commitment to this concept by adopting a new development approach termed `redistribution with growth` which targeted programmes for the poor during the initial stages of development instead of simply relying on trickle-down mechanisms to eventually spread the benefits of growth. Parallel to the World Bank, the International Labour Organisation (ILO) adopted a `basic needs approach` which was later formally adopted as the Declaration of Principles and Program of action for a Basic Needs strategy of Development by the World Employment Conference in 1976 putting focus on the basic needs of the poor. Such needs, according to Ghai (1977), included minimum requirements of private consumption such as food, shelter, clothing; essential services of collective consumption such as electricity, water, sanitation, health care, education, and public transport. He further stressed on the need for participation of people in decisions affecting their lives as satisfactions of basic needs within the broader framework of human rights.

Further participatory development concepts emerged in the later part of the 70s. Development in this period was not about concentrating on the inanimate but rather involving those who are the beneficiaries of that development. The Swedish Dag Hammarskjöld foundation published a document in 1995 entitled What now: another development calling for a humanist approach to development that should be geared towards the satisfaction of basic human needs. Also parallel to this publication was the Third system Project, a bottom-up approach to development advanced by the International foundation for Development Alternatives (IFDA) in 1976 in Nyon, Switzerland. According to the IFDA (1980: 69-70), the third system was dedicated to exploring new methods of raising consciousness and increasing participation by grassroots movements in development decision-making. IFDA makes a distinction between the first system of political
power, which is dominated by the state, the second system of economic power that is dominated by transnational capital and the Third system of people’s power, based on voluntary organization, consciousness raising and local action.

Since the 1960s, public participation has become an increasingly important aspect of natural resource management (Hanchey, 1998a; Chess and Purcell, 1999; Lawrence & Deagen, 2001; Redpath et al., 2002; Chase et al., 2004; Darnall and Jolley, 2004 and Broderick, 2005). This is especially true in relation to issues concerning the management of environmental and health risks (Rowe and Frewer, 2000) and is due to the recognition that sustainable natural resource management cannot be achieved without involving the individuals and communities (Johnson et al., 2004:189).

However, as Delli Priscolli (1998:62) emphasizes “the debate over who has sufficient wisdom to rationally decide for society is far from new and in democratic societies is illustrated by the collective wisdom of a body politic which manifest itself through decisions of legitimately elected officials”.

Nevertheless, expressions of representativeness also have limits and problems. The increased use of public participation methods signals a shift in how the public becomes involved in decision-making processes. This shift, which may be attributed to citizens dissatisfaction with standard models of representation (Melo and Baiocchi, 2006), has resulted in a challenge to develop new forms of involvement in the decision-making process (Edelenbos and Klijn, 2005). Based on experience over the last few decade of the traditional public-meeting format, experts have suggested that participation should move to methods that involve relatively small groups of people (Creighton, 1998b) in intensive and often consensus-based, collaborative processes.
Even the term stakeholder involvement denotes deeper more personalized stake in decision making than the more general and impersonal term public participation (Beierle, 2002:739)

2.5 Stakeholder Participation

While there are many definitions of participation, they generally include in some measure the notion of contributing, influencing, sharing, or redistributing power and of control, resources, benefits, knowledge and skills to be gained through beneficiary involvement in decision making. Two volumes on public involvement published by the US Army Corps of Engineers explain how participation has evolved over time. Starting with mere “public information”, public involvement was formalized in hearing before the decision (Creighton et al., 1992, 1998). At this time it was viewed by technocrat as tolerating nuisance from various interest groups. The concept of public involvement evolved further to consensus seeking (influencing the decision) and finally to dispute resolution with agreement to the decision.

The use of participatory approaches is one of the principles of the Dublin conversion (GWP, 2000a, b). The inability of the top-down development approach to live up to expectation in delivery the desired goods of development led to the search for alternative approach to development. It was realized that it is not about deciding for them but they being part of deciding what they really need. Participation has come to be recognised as an absolute ingredient for development within mainstream strategies. Participation can take different forms; direct, representational, political and informed based. Nevertheless, like many other concepts in development it has remained an elusive concept. Brohman (1996:251) points out that
participation has been given multiple meanings and connected to multiple methods of implementation in the last few decades. He noted that there are still many unanswered questions about who participates, what they participate in and how they participate and for what reasons they participate.

Participation is a complex multidimensional concept involving different stakeholders. Community participation has been a constant theme in development dialogues for the past 50 years. In the 1960s and 1970s, it became central to development projects as a means to seek sustainability and equity, particularly for the poor. It became a central plank for health policy promoted by the World Health Organisation, in its conference in Alma Ata in 1978 (WHO/UNICEF, 1978). In accepting Primary Health Care as government policy, all members of WHO recognised the importance of involving intended beneficiaries of services and programmes, in their design and implementation. In the present political and economic climate, organisations such as the World Bank have modified these reasons to pursue the objectives of both, equity and sustainability. These modifications reflect the experiences of particularly the international development agencies. They also reflect the influence of strong advocacy for participation from people like Robert Chambers and other promoters of PRA/PLA (Participatory Rural/Rapid Appraisal; Participatory Learning Approaches) (Chambers, 1994). Through the 1990s, additional emphasis has been placed on community involvement in planning, decision-making and evaluation (Mitchell 1999; Sharma and Deepak, 2001). Fleming (1991:37) suggests that participation emphasises the decision-making role of the community. That is through participation the people at the community level will help the decision makers to come out with the right needs designed for them. There is no agreement among planners and professionals about the contribution of community participation to improving the lives of people particularly
the poor and disadvantaged. Some completely dismiss its value altogether, while others believe that it is the ‘magic bullet’, that will ensure improvements especially in the context of poverty alleviation. For instance Gupta (2003) argues that the process of managing stakeholder participation leads to an increase in bureaucratization of existing systems and thus increases costs associated with planning processes. This argument is true for formal participation settings like hearings in the post-planning process but not for informal settings such as in the pre-planning process (Uhlendahl, 2009). The more important point of criticism is that the true costs of public participation are still not easy to assess (Andersson et al., 2005). While stakeholder participation offers without doubt, the easiest way of solving conflicts directly (Uhlendahl, 2009), it does not guarantee constructive and sustainable solutions. It is worth noting that the involvement of stake holders does not automatically lead to balanced solutions but the consideration of power play within the actors is important as well.

Additionally, the culture and economic context within which new policies are implemented can lead to uncertain and unintended outcomes. Such unpredictable outcomes could contradict the very objective of a participatory process (Lemon, 2001). Finally, this could result in different local policies, which can cause lack of their harmonization at regional and national levels.

For others, at the community level, participation helps improve the design of policies so that they are in line with the community’s needs and conditions to whom they are directed (Cornia et al. 1987). To the economists community participation is seen as the equitable sharing of the benefits of projects; and social planners definition as community’s contribution to decision-making (Fenster, 1993).
In the view of Paul (1986:2), community participation is “an active process by which beneficiaries influence the direction and execution of a development project with a view to enhancing their well-being in terms of income, personal growth, self-reliance or other values they cherish”. In relation to this definition one may raise questions such as is participation either induced, or spontaneous. Participation in many times is always been promoted in rhetoric but in practice they have generally been either tightly controlled by the state or outside development institutions. There are still fears entertained by most countries that when grassroots organisations will produce popular empowerment beyond state control. These fears are further made explicit when Fowler (1991) stated “the imposition of outside concepts of participation …has often undermined indigenous forms of political organisation and democratic practice, thereby reproducing paternalistic and authoritarian patterns of domination”. Midgley (1986) as cited by Brohman (1996: 208) argues that spontaneous participation “comes closest to the ideal mode of participation as it reflects voluntary and autonomous action on the part of the people to organise and deal with their problems unaided by governments or other external agencies”.

It is worth noting that many development agencies now use the term participation as their objective to win project favour or donor support as few really put effective participation in to practice. For participatory strategies to begin achieving their potential, the poor need to be genuinely empowered through fundamental changes to the status quo and the distribution of power equitable to all actors including the young people.

Madulu (1998) suggested that it is important to involve the local communities in assessing and solving the water problems since they are the ones who interact with their environment and carry out activities that have an impact to the environment. In this regard, they know what is in their best interest and therefore for any project to be accepted and successfully, it has to welcome
them on board. Although many researchers agree on the importance of local community involvement in IWRM, the level of involvement is still too low in most developing countries.

For Green (1994) community participation in water resources management evolved in the 1980s and this was in a response to the international crises of water scarcity and dwindling resources. As can be noted participation has been a key component of IWRM in practice but the approach nevertheless draws more on the concept of instrumental rationality informed by good will and good data (hence the pivotal roles of the state in empowering people and of experts in providing information) than on the politics of resource management (Allan, 2003; Miller and Hirsch, 2003; Biswas, 2004; Merrey et al., 2007; Molle et al., 2007 in Molle, 2008).

Conyers (1985) and Moser (1989) see another distinction between participation as a means to improving projects results and participation as an end in itself. For me participation is about empowering people to effectively contribute towards a decision, or an intervention. And in this respect I cite with Conyers and Moster. As UNCHS (1984:6) argues, more people will benefit and the outcomes will respond better to the needs of the beneficiaries with participation as a means to improve project results than with the later because people contribute their ingenuity, skills and other untapped resources.

The Asian Development Bank (2001) defines participation as a “process through which stakeholders share control of development initiatives and of decisions and resources that affect them and determined participation as being one of the four pillars of good governance, and the other pillars being accountability, transparency and predictability. In a related development, the World Bank (2006) defines participation as a stakeholder’s influence and share of control over “priority setting, policy-making, resource allocation and access to public goods and services”.

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According to these institutions, participation is a voluntary process by which people influence or control the decisions. The essence of participation is exercising voice and choice.

2.6 Local Governance and Water Resources Management

Local government has a great role in the management of water resources in every country that is practicing decentralization. The second principle of the Dublin principles incorporated the role of local government when it emphasized on participatory approach including all stakeholders at all levels especially at the lowest level in the management of water resources. However, it may be argued that the lowest level could be the community level, the local government level etc. Decentralization was again highlighted in the International Conference on Freshwater in Bonn in 2000 as key for effective and better management of water resources. It also noted that decentralization is key to water management and that the local level is where national policy meets community’s needs. The Bonn keys further argue for the use of self-help potentials in local communities to reduce the financial requirement for rural and urban projects for poverty alleviation by supporting NGOs and others to develop micro-finance capabilities. Agenda 21 recognizes the vital role of local governments in addressing the many environmental problems encountered in developing world cities including water-borne pollution, sanitation and vulnerability to water related hazards. However, it is often neglected as a stakeholder in the new IWRM institutions.

Local government here refers to the lowest tier of government with full-time professional staff, such as municipalities or district assemblies. Following policies of decentralisation in many countries, more and more functions and responsibilities are being devolved to these levels. The
main argument driving decentralisation processes is that shifting decision making and finances from central to local government leads to better quality delivery of services, fitting better to local needs, as at that level it is easier to organise social participation (Helmsing, 2002). In further supporting decentralization especially in water control, it is argued that local management can be better adapted to the local context (van Koppen et al., 2005). However, critics of decentralisation argue that local governments are too susceptible to elite capture, and lacking in capacities and resources to provide efficient and effective services (Faguet, 2003).

It may also create more dependency than self-reliance, and it may suppress civil society initiatives. Therefore, decentralisation should not only be about local government but also about sharing of responsibilities with communities and enabling their initiatives (Helmsing, 2002), or even to markets, such as in neo-liberal models. The role of state institutions is in those cases more shifting towards regulation. In my view, decentralization promotes participation at the local level and sustainability of projects despite its short comings.

Local government specific responsibilities may vary from country to country but Mazibuko et.al., 2004 outlined it generally to include services provision (including water and sanitation, storm water management, solid waste management, local roads and market places etc), development planning and promotion (including spatial planning and promotion of local economic development), and environmental management.

Local government plays a role in promoting and planning the development of economic activities at local level. It may stimulate, for example, agricultural development, industries or tourism. However, in planning, water resources are often not sufficiently considered. All sectors have very specific water requirements: agriculture will require irrigation water of a specific
quantity at certain times of the year, while tourism development may imply that water bodies are in a “natural” state, without pollution. Not all water development goals may be achieved at the same time, and trade-offs need to be managed. Difficult choices may have to be made between economic development, ecological concerns and service delivery. Local authorities need to consider water resources as a key factor in development planning and promotion.

Local government as in many places is responsible for creating and maintaining a safe and healthy local environment. In practice, this overlaps to a large extent with service delivery tasks such as solid waste management and sanitation. But, it may also include the management of green and blue areas, such as parks.

### 2.7 Non-Governmental Organizations and Water Resources Management

In ensuring that water resources are managed well, the role of NGO’s in this sector is very important as any other stakeholder in the management of the resource. The Dublin principles which are the underlying principles guiding IWRM did not leave out the NGOs as stakeholders. The principle two which emphasizes the involvement of all stakeholders at all levels in the management of water resource highlighted the contribution of NGOs in the integration process.

Interest group pressure has been identified as a crucially important trigger in the pursuit of integrated water management (OECD, 1989). NGOs especially the environmental ones worldwide have fostered the integrated process in water resources management. In trying to look at the water resources management and its issues, a writer has this to say “Water management, water scarcity, and water pollution, of course, do have hydrological, technical and physical dimensions, but the main and probably most intricate challenges lie in society and on its
members, institutions, and legal system" (Falkenmark et al., 2004:304). From this point of view, it means that water issues are much attributed to the stakeholders in which NGOs are not left out.

In Lake Ohrid which is situated in the Balkan Peninsula, the role of NGOs especially the environmental NGOs is well recognized. NGOs in the region in the past have mostly acted as agents of advocacy and contributors to policy dialogue. For instance, a very large number of small size projects have been implemented in the past throughout the region aiming to generate informed public judgment. This was often done in close cooperation with local and national governments and international donors. For instance, these were the prevailing types of projects that were implemented by the Lake Ohrid Conservation Project (LOCP) involving partnerships between local and state governments on the one hand, and the NGO sector on the other, with financial support from the World Bank.

Dryzek points out, however, that environmental NGOs must balance state relationships with external activist strategies. To promote democratic environmentalism, he asserts that the goals of environmental movement organizations must be aligned with the state goals (e.g., economic growth), and at the same time maintain a civic force that challenges the state on political issues (i.e., oppositional civil society) (Dryzek, 1996). More recently in fact, NGOs are trying to complement state and local governments’ implementation of development activities, and to a lesser extent, provision of services.

The integrated approach of water resources management characterizes some kind of relationships between organisations and across them. As noted there is a relationship between certain kinds of social organization (associations) and the quality of governance (Putnam, 1993). As a water resources governance approach, integrated water management requires certain relationships –
relationships with social capital. Social capital characterizes civic engagement and social ties that make for "better schools, faster economic development, lower crime, and more effective government" (Putnam, 1995:66-67) or better water resources management, as the case may be. Forms of social capital include trust, norms, and networks (Putnam, 1993). The emphasizes here is the network building component of social capital, particularly networks across the NGO sector as well as networks between NGOs and government. Building networks and maintaining trust are critical in their ability to bring important knowledge, experience and opinions about water resources that, when left out, jeopardize the success of any water management initiative (Dungumaro and Madulu, 2003).

2.8 Ghana’s Water Resources

Ghana has considerable water resources and is well above the water scarcity level of 1000m3/capita/year (Ghana Integrity Initiative, 2011). Ghana water potential is divided into surface and groundwater sources. Surface water resources are mainly from three river systems that drain Ghana, namely: the Volta, South Western and Coastal river systems. The Volta system is made up of the Red, Black and White Volta Rivers as well as the Oti River. The south-western river system is made up of the BiaTano, Ankobra and Pra rivers. The Tordzie/Aka, Densu, Ayensu, Ochi-Nakwa and Ochi-Amissah comprise the coastal river systems. These river systems make up 70%, 22% and 8% respectively of Ghana’s total land area of about 240,000 km.

Despite the considerable water resources present, water availability in the country changes significantly from season to season as well as year to year. There is variation in the spatial distribution where the south-western and coastal parts have more water than the northern regions.
The availability of water per capita is decreasing due to rapid population growth. It is noted that the problem of reducing water per capita is compounded by increased environmental degradation, climate change, pollution of water bodies and draining of wetlands (WRC, 2009).

Urban water supplies for both domestic and industrial are tapped almost on surface water, either impounded behind small dams or diverted by weirs in rivers. Surface water quality considerations are becoming increasingly important due to mining activities, urban and industrial pollution problems and agricultural development. The world is increasingly urbanizing. At present about 50% of the world population live in urban centres. By 2025 it is expected that an extra 2 billion people will be added to the urban population and of which about 75% will be in the developing world. The pace of urbanization clearly poses a challenge to those responsible for the provision of basic water and sanitation services so vital for the health, dignity and economic wellbeing of the urban population. However, the percentage of people with access to improved water supply systems stand at 82% of which the urban area represents 90% and the rural area represents 74% as at 2008 (GII, 2011). This means that Ghana is almost achieving the target of the MDG of 78%.

For the rural areas, ground water is an important source of water as more than 28,000 boreholes and hand dug wells mostly mechanized have been developed by different programmes nationwide (GII, 2011). The dependence on unsafe drinking water in the country stands at 30% despite the efforts in achieving water as a human right. With appropriate technology and incentives, rainwater harvesting could provide a reasonable amount of water for household and other institutional water needs thereby reducing demand on the pipe-borne system and therefore the resource (Ghana national water policy, 2007).
2.8.1 Ghana: Water Supply Policies and Reforms

Over the past decade, some initiatives have been undertaken to address some of the problems that constrain the sustainable development and management of the country’s water resources, particularly to streamline the role, functions, and decision-making processes within the water sector. Following a review of the results achieved by Ghana at the end of the International Drinking Water Supply and Sanitation Decade (IDWSSD) in 1990, reforms were introduced in the early 90’s in order to accelerate the coverage of the rural population with good drinking water and sanitation facilities. The Rural Water Department of the Ghana Water and Sewerage Corporation (GWSC) was separated and set up as an autonomous Community Water and Sanitation Agency (CWSA) by an Act of Parliament in 1994. A new policy was introduced that requires that supply of water to rural communities be demand driven, and community managed. The communities are also required to make a contribution of 5% of the capital cost of providing the facility. There are 120 small town water supply systems that have been transferred by GWCL to local government authorities and local communities as part of the decentralization process.

With respect to the urban centers, reforms in the urban water sector included a Water Sector Rehabilitation Project that was begun around 1995. Subsequent to the rehabilitation programme, further reforms have been undertaken, and are intended to create conditions (through legal, business and regulatory interventions) to facilitate a favourable environment for increased private sector participation. Ghana Water and Sewerage Corporation was also transformed into a limited liability company, Ghana Water Company Limited (GWCL) in 1999 as one of the many
steps for introducing the private sector to the management and operation of urban water supply systems.

As part of the reforms, the regulation of urban water and other services have been shifted away from government to an independent body, the Public Utilities Regulatory Commission (PURC) established in 1997. The PURC is mandated to regulate and oversee the provision of utility services, including approving tariff levels and drinking water quality for treated water to consumers. The Commission is to ensure protection of consumer interests, while at the same time maintaining the balance between tariff levels and investment, operation and maintenance costs of the utility services that will encourage private sector participation in provision of these services. In furthering private participation in the water sector, Ghana Water Company Limited was taken over by AcquaVitens Rand Limited (AVRL) in 2006 for a five-year contract. It is a Dutch – South African private joint venture with the aim to enhancing private sector participation in the water sector. It has the specific responsibilities of producing, distributing, billing consumers, collection of revenue and maintains the systems.

2.8.2 The Institutional Framework of the Water Sector

The Parliamentary Committee on Water Resources, Works and Housing and Parliament of Ghana provides legislative oversight of the water sector. The MWRWH is responsible for policy formulation and coordination, for soliciting funding from external support agencies (ESA) through the Ministry of Finance; monitoring activities of water supply in the urban areas and advising cabinet. The coordination is normally done by the Water Directorate of the ministry. Other ministries are responsible for other water sectors such as irrigation, fisheries, hydro- power...
and water transport. This indicates that the management of water resources is sector base and not holistic. The agencies of the MWRWH carrying out the ministry’s water resources management and drinking water programmes are the Water Resources Commission established in 1996, Ghana Water Company Limited (GWCL) established in 1999 and the Community Water and Sanitation Agency established in 1998. The Ghana Standard Board (GSB) is the responsible body for setting national drinking water standards while Public Utilities Regulatory Commission (PURC) examines and approves tariffs for water, electricity and gas utility services. The District Assembly regulates tariffs in the community – managed small town piped systems and rural hand pump water supply systems.

The Ministry of Local Government and Rural Development (MLGRD) is responsible for the formulation of policies and programmes for the administration of local government structures. The ministry is the home of the environmental sanitation directorate and therefore is responsible for implementing the Environmental Sanitation Policy including management and regulation of solid and liquid wastes by local government bodies. The institutional structure is shown in the Figure below.
2.8.3 Water Sector Financing

Financing in the water sector depends mainly on two sources. These are external funding from donors and the payment of tariffs by users. However, the sector also receives some support from the government. These donors include DANIDA, CIDA, World Bank, DGIS, GTZ, AFD, EU and ADB. These donors provide about 90% of the investment in water sector. For instance, in the year 2007 donor support to the water sector for both rural water supply and urban water supply amounted to $60.27 m and $49.22 m respectively representing 52.2% and 42.8% (GII,
2011). This means that water sector financing in the country is donor driven and the implication is that when there is delay or failure on the part of the donors will mean a failure in the sector. However, budgetary allocations to the sector increased by 36% in a year over the period 2001 to 2006 due to increase in donor support. Meanwhile the level of domestic funding decreased on average per year by 7% in real terms (BNWP, 2008). With the increased in funding, it is argued that funding will not be sufficient to meet the MDGs as this requires some USD 250 million per year (Kokutse, 2009 found in GII, 2011).

2.9 Ghana’s Experience with IWRM

Water resources management in the country over the past decades has been on sectorial bases. Different ministries handling water resources separately where policies are formulated based on those lines involving water issues. Following the calling for water as a human right and the recognition that the resource needs to be managed in a sustainable manner, Ghana over the past decade joined the rest of the world in embracing the IWRM. In early 1996 the government initiated a Water Resources Management Study (WARM) which identified key water resources issues and challenges and further recommended that Ghana adopt an integrated cross-sectoral approach to water resources management, using the river basin as a unit of planning and management. The choice of Integrated Water Resources Management (IWRM)) approach is therefore aimed at promoting a change from the unsustainable to sustainable water resource management by widening the analytic framework and by inviting all stakeholders to participate in the management of the resource. As a matter of paving the way for IWRM in the country, an enabling institutional framework has been introduced at the national level by creating the Water
Resources Commission and the Water Directorate under the ministry of Water Resources, Works and Housing, and at local river basin level in the form of River Basin Boards. In 2002 following a series of broad consultations, a draft Ghana Water Policy was prepared by the Water Resources Commission (WRC) under the auspices of the then Ministry of Works and Housing. With the establishment of the Water Directorate, a wider consultative process was initiated in 2004 to update the policy.

As part of the process, policies specific to urban water supply and community water and sanitation services were developed and incorporated. This draft finally became a national water policy in 2007. The policy 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 Governmental and decentralised (district assemblies) structures, non-Governmental organisations and international agencies. The policy further recognises 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 etc.

So far, Ghana’s experience with IWRM has gradually accumulated over the last few years thus may be said to be in the operational phase. The process began with the DANIDA “Support to the Water Resources Commission, Phase 1’ programme, which commenced in 2001 and became an integral part of the DANIDA supported WSSP-I cluster of components winding up by the end of 2003. Other international partners that support IWRM in the country include Global Water Partnership (GWP), United Nations Center for Human Settlements (UNCHS), Center for Development Research (ZEF), University of Bonn, World Bank, Japanese International Co-operation Agency (JICA), United Nations Economic Commission for Africa (UNECA), European Union (EU), Friedrich Ebert Stiftung (FES), DGIRH of Burkina Faso and International
World Conservation Union (UCN). The two river basins (Densu and White Volta) have been selected as pilots to test capacity building, participation and public awareness strategies, regulations and water resources planning within a decentralized administrative framework with the river basin as the unit for planning.

Ghana’s experience with IWRM is still evolving, and is gradually included in policies, plans and programmes (WRC, 2009).

2.10 The Bawku West District and water management

Water management in the district has a long history dating back to the 1950s. As at the time, the district was part of Bawku. Zebila, now the district capital of the Bawku West District had a water supply system in 1958. The water system came into existence through the efforts of Mr. Asumda Ayeebo who was a native and Deputy Minister of Works and Housing during the 1st Republic (Bacho, 2001). The management of the water supply system was under the Bawku District Council from 1958 to 1960. By 1961, the District Council was bankrupt and could not afford to pay the workers which led to the taken over of the management of the water system by the Water Supply Division.

The management of the water system faced a lot of challenges and could not stand the test of time. This clearly indicates weak organizational and institutional structures coupled with a weak financial base which characterized the period 1958 – 1964 (Bacho, 2001).

Since then, the district has taken steps in ensuring that its water resources are managed through the formulation of by-laws and as pertain in the country’s water policies.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter takes a look at all the approaches that were used in the gathering of data in this research process. In the view point of Sarantakos, (2005), methodology is a research strategy that translates ontological and epistemological principles into guide lines that show how research is conducted. Methodology is very important and critical in research because the reliability and validity of the research work greatly depend on the methods employed in the data collection process. Methodology is the central position in the research process (Sarantakos, 2005) and the methodology adopted should help reduce errors. He pointed out that unlike in the physical sciences where findings are based on vigorous laboratory process; the social scientists are challenged with precision in dealing with human beings who are the most variables among variables. It is emphasized that much attention should be given to the choice of methodology in a research such that inconsistencies are easily detected and minimized. The pivotal role of methodology in research is also emphasized by Kreuger and Neuman (2006). They said research methodology is what makes the social science scientific. They however stated that there are alternative approaches to science and that it does not mean that any of these approaches goes and that each approach has its own set of philosophical assumptions and principles and its own stance on how to do research. These approaches prescribe what good social work involves, justify why one should conduct a research, relate values to research and guide ethical behavior. This means that the method or approach that one choses has an influence on the research being regarded as science or not. It is also emphasized that the choice and use of appropriate
approaches in social research helps in collecting valid and reliable data which you can compare favorably with data obtained from the physical or biological research (Twumasi, 2001).

3.2 Research Design

Research design is the conceptual structure within which a research would be conducted. It can also be seen as a general plan of how you will go about answering the research questions, the objectives and specify the sources from which you intend to collect data; indicate the constraints which you will invariably encounter. De vaus (2001) states that, the function of a research design is to ensure that the evidence obtained enables us to answer the initial questions as unambiguously as we can. He went further stressing that obtaining relevant evidence means specifying the type of evidence needed to address the research question, to test a theory, to evaluate a programme or to adequately describe a phenomenon. In relating research design to that of a builder or architect where he or she needs to first of all determine the type of building required, its uses and the needs of its occupants before drawing a work plan, De vaus said in social research the issues of sampling, methods of data collection and design of questions are all subsidiary to the matter of ‘What evidence do I need to collect?’. According to Yin (1989: 29) found in De vaus (2001), a research design deals with a logical problem and not a logistical problem. In the view of Twumasi (2001), research design starts with a conceptual model or hypothesis. He defined his conceptual model as a set of theoretical ideas, hunches or clearly – defined concepts to direct the social researcher in his or her operations.

Research designs are usually equated with qualitative and quantitative research methods. Quantitative research has traditionally provided a measurement orientation in which data can be
gathered from many individuals and trends assessed across large geographic region (Creswell, 2008 cited in Creswell and Garrett, 2008). Qualitative research on the other hand yields detailed information reported in the voices of participants and contextualized in the settings in which they provide experiences and the meanings of their experiences (Creswell, 2008 found in Creswell and Garrett, 2008). Qualitative research emerged during the 20th century. Between 1900 and 1950, according to Denzin and Lincoln (2000) as found in Leech and Onwuegbuzie (2007) was the first historical moment for qualitative research. Denzin and Lincoln (1994) found in Kreuger and Neuman (2006) argued that qualitative research expanded greatly and rapidly displacing outdated quantitative style research. However, shortly during the 1960s a new concept emerged known as a mixed research.

The study employed qualitative research in the collection and analysis of data. Qualitative techniques employed in the data collection were interviews and observations.

### 3.3 Primary Data Collection Tools

Primary data collection tools refer to any tools or techniques that a researcher employs in the field to gather information from respondents. Twumasi (2001) underscored the importance of using more than one tool or technique in a researcher work which helps the researcher to evaluate his data source and to detect inconsistent answers.
3.3.1 Interviews

Interview is a data collection tool employed by social researchers where the researcher interacts with the interviewee (respondents) by posing questions and recording the answers. Twumasi (2001:35) defined interview as a method of field investigation whereby the researcher meets his respondents and through the interaction he asks specific questions to find answers to his research problem. He stressed on the important role of interviews indicating that they help the interviewer to check his data and observe what is going on. Interviews also offer the researcher the opportunity to have more control over who answers the questions as it may not be in the case of questionnaire where it may be passed from one person to another (Healey, 1991 found in Saunders et al., 1997). For Kahn and Cannell (1957) cited in Saunders et al. (1997) an interview is a purposeful discussion between two or more people. Interview involves asking questions, listening, expressing interest and recording what is said. In an interview, the interviewer’s presence and form of involvement – how she or he listens, attends, encourages, interrupts, digresses, initiates topics, and terminates responses – is integral to the respondent’s accounts (Mishler, 1986 cited in Kreuger and Neuman, 2006). During interviews, the interviewer must always watch out for markers (Kreuger and Neuman, 2006). According to Weiss (1994: 77) a marker is “a passing reference made by a respondent to an important event or feeling state”.

Interview may be categorized in to three main types thus structured interviews, semi - structured interviews and unstructured interviews. Semi- structured interviews were used in this study in soliciting responses from interviewees in the district. Under this type of interview, the researcher will have a list of themes and questions to be covered, although these may vary from interview to interview. This means that the researcher may omit some questions in particular interviews given the specific organizational context in relation to the research topic. Here, the order of questions
may also vary or change based on the flow of the conversation. According to Torrington (1991), semi-structured interview allows you at times when a question does not reveal a relevant response to probe the area of interest by using a supplementary question which finds a way rephrasing the original question. Worth noting under this type of interview is the chance provided for the researcher to probe with additional questions to enable him or her get answers to the research questions and objectives. According to Sarantakos (2005) semi-structured interview is a form of interview where the researcher opt for interview structure that is flexible with minimal restrictions which is often in the form of guide and not a rule. Questions asked under semi-structured interviews are mainly open-ended which give respondents the opportunity to express their opinion on the issue at stake.

A semi-structured interview can be conducted among individuals, key informants’, groups and focus groups. In all, twenty three individual interviews were conducted. The study interviewed individual heads of the decentralized departments of the local government system as well as fourteen assembly members and managers of functional NGOs in the district. Focus group interview is a type of semi-structured interview conducted among a group of knowledgeable people with a group size of usually six to ten people (Twumasi, 2001). Adding emphasizes on the richness of focus group interview or discussion, Blumer said if a small number of individuals are brought together for a discussion and as a resource group, it is more valuable many times over than any representative sample. Such a group discussing collectively their sphere of life and probing into it as they meet one another’s disagreements, will do more to lift the veils covering the spheres of life than any other device we know of (Blumer, 1970 as cited in Twumasi, 2001). In the study, focus group interviews were conducted among women associations, illegal miners (‘galamsey’ operators), farmers and Fulani herdsmen in the district. Two focus groups each for
women associations and Fulani herdsmen and a focus group for both illegal miners and farmers were interviewed to solicit their responses. Each focus group constituted eight people.

### 3.3.2 Observation

Observation plays a very important role in gathering data from the field. It is a data collection tool where information is gathered through close vision or watching of a group with a view to examine certain behavior that could otherwise not be examined through other data collection tools. Kreuger and Neuman (2006) noted that observation involves paying attention, watching and listening carefully in the field. They said the researcher uses all the senses, noticing what is seen, heard, smelled, tasted, or touched. This means that he or she becomes an instrument that absorbs all sources of information. During observation, it is important for the researcher to learn the specialized language of the people that he or she is observing. According to Bogdan and Taylor (1975:53) researchers must start with the premise that words and symbols used in their world may have different meaning in the world of their subjects. They must also be attuned to new words and words used in contexts other than those with which they are familiar with.

Observation can be participant or non-participant (structured- where there is a high level of controls and standardizations). Participant observation is the process where the researcher engages himself or herself in the activities of the people he or she is observing and at the same time taking records of what is observed either in the mind or as notes and having the objectives of the study at the back of mind. In participant observation the purpose is to discover those delicate nuances of meanings. Delbridge and Kirkpatrick (1994:37) observed that participant observation implies a research strategy of immersion by the researcher in the research setting,
with the objective of sharing in peoples’ lives whiles trying to learn their symbolic world. The study employed participant observation in the gathering of data. Things observed included the operations of by-laws and activities the people engaged in.

### 3.4 Review of Secondary Data

Secondary data refers to data that has been collected for other purposes. Secondary data provides a useful source from which a researcher can begin to answer his or her research questions. It includes both raw data and summaries published and unpublished. A researcher gets acquainted with his or her research topic by laying hands on secondary data. According to Kervin (1992) secondary data could be raw data where there has been little if any processing, or compiled data which has received some form of selection or summarizing. Saunders et al., (1997) building on the ideas of Bryman (1989); Dale et al., (1988); Hakim (1982); Robson (1993) categorised secondary data into three main, thus documentary data, survey–based data and those compiled from multiply sources. The study relied on journals, books, reports, conference proceedings and theses as secondary data. Other sources of secondary data that the study made use of included; internet and articles both published and unpublished.

### 3.5 Sampling Techniques

The role of sampling in social research is very important as far as time, financial and logistical constraints, reliability, objectivity and generalization of the research conducted is concern. According to Miles and Huberman as quoted by Punch (2004:54) you cannot study everyone
Sampling refers to the process of selecting sample units or elements for a research to be conducted by the social researcher. Throwing more light to the need for sampling, researchers such as Moser and Kalton (1986) and Henry (1990) argue that using sampling enables a higher overall accuracy than does a census.

There are basically two types of sampling. These are probability sampling and non-probability sampling. Each of them can be used in the research process depending on whether the research is quantitative or qualitative in nature. However, both can be applied in a particular study as in the case of a mixed research. Probability sampling is the process whereby each and every unit within the population is given an equal chance of being selected (Twumasi, 2001). Non-probability sampling which is associated with qualitative research is a type of sampling procedure whereby the units in a population are not given equal chance of being selected but based on the decisions of the researcher. Under this type of sampling the researcher focus is on how the sample or small collection of cases, units, or activities clarifies social life. Representativeness of the sample units do not matter here as stated by Flick (1998) but that it is their relevance to the research topic rather than their representativeness which determines the way in which people to be studied are selected. For Saunders et al., 1997, the use of non-probability sampling may be necessitated by limited resources or the inability to specify a sample frame. The study solely employed non-probability sampling in the research process. Non-probability sampling is classified under the following techniques; haphazard or accidental or convenient sampling, purposive sampling, quota sampling, snowball sampling, extreme case sampling, sequential sampling and theoretical sampling (Kreuger and Neuman, 2006:209). Purposive sampling or judgemental sampling helps you to use your judgment to select cases which will best assist you to find answers to your research questions and objectives. According to Neuman (1991) purposive sampling is best used
when the sample is small and in cases that are particularly informative. The study used purposive sampling in selecting the heads of the decentralized departments of the district, managers of the NGOs and the regional EPA director. This was done because when it comes to issues of participation by those organizations and the decision making, they are those who are concerned and for that matter will be in the best position to provide responses that will help me find answers to my research questions and objectives. The focus group interviews were selected purposively due to their relevant knowledge in the topic area. The purposive sampling technique was used to select the regional EPA director. This was done due to the fact that the EPA director has relevant knowledge about water resources in the district and directly involve in the management of the resource (Sarantakos, 2005).

3.5.1 Sampling Units

Sampling unit refers to the element or unit or individual, group or system that a researcher selects to solicit information or responses from. In the view point of Kreuger and Neuman (2006), it is the unit of analysis or a case in a population. This unit can be a person, a group, an organization, a written document or symbolic message or even a social action is being studied. The selection of sampling units is very important in the data collection process since a wrong sampling can affect the quality of the data gathered. The sampling units in the study included the heads of the decentralized departments of the district assembly, the regional EPA director, galamsey operators, farmers, women associations, assemblymen, managers of four NGOs and Fulani herdsmen.
3.5.2 Sample Size

Sampling size refers to the total number of units or elements or individuals, systems, or groups that a researcher intends to consider to solicit responses from them. Baker (1994) defined sample as a selected set of elements or units drawn from the population. Determining the sample size for research work is very important as that could affect the representativeness and generalization that may be drawn from the study. The time available and the financial resource base of the researcher must be critical in selecting the sample size. Ghosh (1992) observed that the sample must be small enough to avoid unnecessary expenditure and large enough to avoid sample error. For Kreuger and Neuman (2006) the choice of one’s sample size may depend on three; the degree of accuracy required, the degree of variability or diversity in the population and the number of different variables examined simultaneously in data analysis. From the view of point of Sarantakos (2005) the determination of one’s sample size depends on the following factors: the paradigm that guides the research, the underlying methodology, the nature of the target population, available time or resources and the purpose of the study. As other researchers pay attention to sample size and recognizing its critical role in the data generated, Patton (1990) says that it rather depends on your research questions and objectives; in particular, what you need to find out, what will be useful, what will have credibility and what can be done within your available resources. Patton further stressed that the validity and understanding that you will gain from your data will be more to do with your data collection and analysis skills than the size of your sample (Patton, 1990).

The interviews were conducted among individual heads of the decentralized departments of the district assembly and assembly members who were selected purposively. Twenty-three
individual interviews were conducted. In addition to the individual interviews, focus group interviews amounted to six groups was interviewed.

3.6 Research Validity and Reliability

Validity concerns with whether the findings are really about what they appear to be about (Saunders et al., 1997). According to Kreuger and Neuman, (2006: 184) validity refers to the bridge between a construct and the data. Reliability means dependability or consistency. From the view point of Easterby-Smith et al., (1991) reliability can be assessed by posing the following two questions; will the measure yield the same results on different occasions? And will similar observations be made by different researchers on different occasions? Reliability and validity are important in producing credibility in the research findings. To ensure that the findings of the study are reliable and valid, the study employed interviews and observations in the collection of primary data as well as using secondary data.

3.7 Techniques of Data Analysis

For any data to be meaningful, the data must be organized and interpreted by the researcher. Data analysis therefore refers to the process of integrating the data together, examining variations and determining the patterns involved. In the words of Twumasi (2001) data analysis means a critical examination of the data collected to understand its parts and its relationship and to discover its trends. Data can be analyzed based on two approaches. These are quantitative approach and qualitative approach. The study employed qualitative approach in analyzing the data collected. For Marshall and Rossman (1989) data analysis should start at the time you are formulating a
proposal to undertake a qualitative research. They further state that the act of analyzing qualitative data is very likely to occur at the same time as you collect these data as well as afterwards. Qualitative data is analysed by organizing the data into categories on the basis of themes, concepts or similar features (Kreuger and Neuman, 2006).

The analysis of the data started with editing the data right after the collection process to check consistency of responses. The data was summarized into categories and themes with cognizance of the research objectives in mind. The data was finally interpreted, discussed and conclusions drawn from the study.
CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter deals with the analysis and presentation of data collected from the field through interviews. The chapter also discusses the results obtained from respondents in order to address the research questions and objectives. The analysis and presentation is done on thematic areas of the role of public institutions, participation, roles of NGOs, enabling environment (by-law), challenges, collaborations and networks.

4.2 Natural Resources in the Bawku West District

There are vast natural resources in the district. The natural resources identified by the study include; rivers, forest, farmlands, trees, wildlife, tourist sites and gold. Common trees include Thorn tree, Triplochiton spp and Anogeissus spp. Dawadawa, Sheanut, Baobab and Kapok are the economic trees identified in the district. The economic trees fruit seasonally and generate income for the people, especially women, and therefore serve as a livelihood activity that supports them to supplement their earnings for living. For example, the sheanut notably create jobs for the women in the district and in Northern Ghana as a whole. The dawadawa equally provide their owners with income and are used as an ingredient for soup preparation. The common trees are used as firewood even though cutting firewood for sale is not allowed in the district. Some of these trees are sparse in their location, especially the dawadawa trees.

The forest reserve along the eastern and southern portions of the Red and White Volta, stretching from Widnaba-Tilli area in the District through Binaba-Kusanaba and Zongoiri to
East Mamprusi, is a favourable abode of a variety of animals including elephants. This forest reserve and the sparsely inhabited Oncho-freed woodland and the forest belt are the home for many animals in the district. The wild animal resources are severely depleted and their habitats continue to be under siege from various economic activities including land clearing for agriculture, indiscriminate bush burning, hunting for bush meat, logging and mining. The farmlands in the district are suitable for the cultivation of maize, early millet, guinea corn, groundnuts, cowpea, soya beans, bambara beans and tomatoes. Most of the inhabitants depend on these farmlands for their living.

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 White Volta with its major tributaries including the Red Volta and minor tributaries are the major rivers draining the district. The population depends on these water resources for agriculture and domestic uses. Dry season farming is common at the banks of these rivers. The district has a total of twenty dams which support domestic uses, livestock production and dry season farming. However, some of these dams are not in good shape and this affects their uses.

The district is blessed with a lot of tourist sites. These include Apodabogo and Widnaba Eco-tourism sites, Teshie and Soogo Hills, the confluence of the Red and White Volta Rivers, the Red and White Volta Rivers along the eastern and western boundaries of the District respectively, the Red Volta forest reserve which consists of game and wildlife such as elephants and a variety of rare tree species. The study revealed that despite these legion tourist sites, their development is left untouched and this has made them inaccessible. This means that benefits of
the tourist sites are not realized by the district which could have contributed significantly to economic development and reduce poverty in the district.

The resource gold is found in some communities in the district. Widnaba and Sapeliga are the areas where illegal mining is common even though the activity occurs in other areas.

4.3 Natural Resources Management Issues in the District

Illegal mining, which is popularly known as “galamsey”, is common among the people in those communities that the resource (gold) is present even though people from other parts of the district and outside the district commute to these places to engage in the “galamsey” operations. These illegal miners conduct their activities with little or no attention to the environment. The deep pits created by the miners are left uncovered after they have extracted the resource. This activity has contributed to flooding situations in some of these areas with its resultant effects of causing soil infertility hence damaging the natural resource (farmland) on which many of the people in the district depends for survival. This flooding situation also causes siltation within the rivers and dams. Worth mentioning is the use of chemicals, such as mercury, in washing the gold dust in water bodies. This phenomenon pollutes the water resources available in the areas and threatens the existence of aquatic inhabitance.

Bush fires in the district pose challenge to natural resources management. The physical environment, especially the vegetative component, suffers perennial burning. The study revealed that the bush is usually burnt with varied reasons including hunting for wild animals and birds, to enable economic trees such as Dawadawa and Shea to fruit well, for fresh grasses to geminate
for livestock grazing and a way of cleaning their environment. It was pointed out that sometimes the bush is either intentionally or unintentionally burnt by tobacco and Indian heroin smokers. However, bush burning destroys trees, wild animals and exposes the land to soil erosion. A lot of tree plantations and forest reserves including the forest belt in the district are burnt every year. The activity which is usually practiced within the Harmattan period continues to pose serious challenges to the management of natural resources in the district. Bush burning also leads to the drying up of some water sources as, in most cases; it destroys the trees around them hence exposing these water bodies to direct sunlight.

The study further revealed that farming close to river banks and the catchment areas of dams is common among the people. These practices usually lead to siltation of the rivers and dams. The clearing of the farms here leaves the rivers at the mercy of direct sunlight hence their drying up. Farms are made along the banks of the White and Red Volta and their tributaries. These river banks support dry season farming. This leads to floods and situations where farmlands are now taken by water due to siltation. This activity poses difficulty in efforts to manage these water resources in the district.

Indiscriminate felling of trees in the district exerts serious challenge to stakeholders who desire to manage the natural resources. Trees and their branches are usually cut down for the purposes of burning charcoal and firewood. The activity of indiscriminate felling of trees depletes the forest belt and the forest reserves in the district. It was revealed that some people are always engage in cutting the tree branches and young trees for sale.
Floods occur in the district but this is not perennial and not common to all parts of the district. The occurrences of floods cause loss of soil fertility and the siltation of rivers and dams. This makes it difficult in ensuring that water resources are sustained. Farmlands are also destroyed by floods in the district.

Again, the use of chemicals in fishing as identified by the study poses a challenge to natural resources management. The water bodies in the district, especially the White and Red Volta and their tributaries, suffer the use of chemicals to enable the fisher get a good catch. The parts of these rivers that are in the forest areas suffer most especially around the Zongoire area. This act pollutes the water and kills all aquatic organisms in the water. This is a natural resource management issue because it destroys the water resources and therefore makes it difficult for the district in ensuring the availability of water resources and their quality in the district.

4.4 Actors that are involved in natural resources management issues in the district

The study revealed that when natural resources management issues emerged, the chief and his elders, opinion leaders and the community members are contacted and informed about the issue. The necessary departmental heads are also informed about the issue. At the community level, these stakeholders are informed and discussed personally by the assembly members. However, at the departmental levels, it is a combination of report writing and personal reporting that is used to inform them. All the 14 assembly members interviewed indicated that they interact with the above actors in order to get their support and help find solutions to the natural resources management issues that are prevailing in the area of their jurisdictions. They said it is only by getting these stakeholders involved that they can address those issues that they are grappling
with. It is revealed by the study that interactions with these stakeholders are not one time action but rather it continues until the issue has been remedied.

The situation is not all different from that of the decentralised departments and the NGOs levels where it is discovered that they equally discussed with the necessary departmental heads concerning the natural resources management issues through report writing. They also indicated that the opinion leaders and the community members are always involved when such issues emerge. The involvement of these stakeholders they said is to seek their support in getting the issues solved. They acknowledged that these issues are beyond one stakeholder and therefore all those who have interest in the issues need to be involved.

With the focus group discussions with the farmer groups, women associations, cattle herders and “gallamsey” operators in the district, the study revealed that natural resources management issues at the community level are discussed and reported to the chief, tindana and assembly members. Their reason for doing so is that the chief, tindana and assembly members are leaders and custodians of the land and the community.

As a matter of addressing any of the main natural resources management issues identified in the district, it was revealed that finding solutions to erosion or land degradation could help bring to halt the other main natural resources management issues identified in the district. The respondents advanced that all the other natural resources management issues are linked with land degradation and for that reason if any intervention that targets solving it will be addressing the main natural resources issues in the district as a whole. All the assembly members interviewed, the focus group discussions (farmers, cattle herders, “gallamsey” operators and women
associations), heads of decentralised departments, NGOs as well as EPA responded that solving land degradation will help solve or minimise the other natural resources management issues.

4.5 Institutions and Natural Resource Management

In the management of natural resources in general, and water resources in particular, the decentralized bodies play various roles. The study revealed that all the decentralized bodies in the district contribute to managing the water resources in particular and natural resources in general. It also came to light that some NGOs are involved in managing water resources. As the second principle of the Dublin principles incorporated the role of local government in the management of water resources, all the decentralized departments of the local government institutions affirmed their role as far as water resources management is concerned in the district. The study revealed that the decentralized departments have contributed to the management of water resources in the district and specifically water resources. Those decentralized departments interviewed indicated their role in maintaining the environment. The study revealed that the Ghana Police Service, Ghana Fire Service, Social Welfare Department and Ghana Education Service are not directly involved in the management of natural resources and particularly water resources but rather provide auxiliary services. The study agreed to the conclusion made by Mazibuko et al. (2004) on local government responsibilities in every country.

Below are the institutions and their roles as far as natural resources (and specifically water resources) management is concerned in the district.
4.5.1 Role of the District Assembly

The role of the district Assembly in the management of natural resources as revealed by the study include; the district Assembly is the highest planning authority and plans for natural resources in the district; the district Assembly participates in the management of Water Boards, formulating bye-laws and regulations to protect and conserve the natural resources, educating and sensitizing communities on sustainable use of water facilities; collaborating with other organisations to manage natural resources. The study reveals that the district Assembly does not only play a role as far as managing these resources are concerned but also adds to the existing natural resources base through the assistance given to EPA to plant trees along river banks.

The district assembly in managing natural resources in the district faces some challenges which came to light during the study. The district planning officer stated:

“the major challenge we face is logistical constraints. We do not have the right tools, equipment and the means of transport to move about to monitor what is going on”.

This confirms the argument raised by critics of decentralization that local governments are too susceptible to elite captured and lacking in capacities and resources to provide efficient and effective services (Faguet, 2003).

The issue of attitudes of the people is a challenge to the assembly in managing the natural resources in the district. One of the interviewee remarked:

“we have educated and sensitized them not to farm close to the river banks but they continue farming along these river banks”.

Bush burning was further identified as one of the challenges the assembly faces in managing natural resources. Bush fires are common in the district especially during the dry season. Forest
reserves, trees and wild animals every year are gutted by bush fires. These bush fires made it very challenging to the assembly to preserve and protect the natural resources available since the bush fires kept sweeping away the natural resources in the district. The bush is usually burnt with many reasons including hunting for wild animals and birds, to enable economic trees such as Dawadawa and Shea to fruit well, for fresh grasses to geminate for livestock grazing and a way of cleaning their environment. It was mentioned that sometimes the bush is either intentionally or unintentionally burnt by tobacco and Indian herm smokers’. Inadequate staff both in quality and quantity included some of the challenges that emerged during the study. The assembly does not have qualified and the required staff to effectively and efficiently discharge their duties. This affects the operations of the assembly since the available staff cannot do all the work as expected. The assembly needs staff that could always go round to monitor and keep records of what is happening to the natural resources in the district. The unavailability of the required staff has contributed to the inability of the assembly to achieve a very successful natural resources management. The activities of “galamsey” operators (illegal mining) were not left out as a challenge in managing natural resources. The district continues to experience many illegal mining activities. In order for them to mine the gold deep pits are dug all over and are left uncovered. These illegal mining activities destroy the environment and usually lead to floods during years of heavy rainfalls. Water bodies are equally polluted and aquatic lives suffer death. Farmlands are also destroyed by these illegal mining activities. These have posed a challenge to the assembly in its mandate of maintaining the environment and the natural resources present.
4.5.2 The Role of Ministry of Food and Agriculture (MoFA)

The study reveals that MoFA contribute to the management of natural resources in the district in the following ways:

i. Farmers are sensitized and educated on bushfires. This is done to equip them with the necessary information regarding the effects of bush fires and what they need to do in order to prevent it from occurring.

ii. Encourage farmers to practice natural regeneration by allowing the different species of plants to be grown on their farms. This is to ensure that there are trees left as the people continue to farm and to help prevent desertification.

iii. Engage in soil and water conservation by looking at the good agricultural practices and educating farmers to adopt practices such as ploughing along contours and across slopes to reduce soil erosion and maintaining soil fertility, earth bonds and stone bonds.

iv. Encourage the people to construct bonds and planting of vertiber grasses and trees to reduce the flow of water into the dams in order to prevent siltation of the dams and drying up.

v. Educating and sensitizing farmers not to farm close to river banks. However, it was revealed that the decentralized heads do not know the buffer zone distance. This is because they had different figures for the zone.

vi. Encourage farmers to form water users associations. The role of this association is to carry out minor maintenance work on the dams to ensure that the dams continue to function properly.
viii. Collaborate with Project for Improvement of Water Governance in the White Volta Basin (PEGEV) to undertake tree planting projects in the district. It was revealed that the project has been successful in some communities’ whiles it failed in other communities. However, there are challenges that hinder the effective performances of MoFA in the management of natural resources in the district. These challenges include; siltation of the dams especially in areas where the vertiber grasses is not planted. The objective of MoFA to have water resources available especially dams in the district due to their essence to agriculture and poverty alleviation is always obstructed by the failure to plant vertiber grasses around these dams. This allows a lot of sand to be carried into these dams which result into their siltation and drying up. Also, molding of bricks by the people at the banks of dams and farming within the catchment area of dams contribute to silt the dams in the district. This makes it difficult to continue putting these dams in good conditions so that they produce the expected benefits to the people in the district.

### 4.5.3 The Role of National Disaster Management Organization (NADMO)

The National Disaster Management Organisation in the district performs among other things the following roles in the management of natural resources:

i. Educate and sensitize the people on bush burning and the need to stop such practices. The organisation gets the people informed of the bad effects of bush burning and measures they need to adopt in order to stop the practice.

ii. Make available fire volunteers at the communities to educate the people and help to bring bushfires under control. These volunteers at the communities monitor the outbreak of bush fires and help put off these fires.
iii. Educate the people not to farm close to river banks to prevent siltation of the rivers and its resultant flooding.

iv. Encourage the people to plant trees along the river banks to help prevent floods and siltation.

v. Educate people on the need to manage dams well so that there will water available at all times for use.

The study also revealed that there are challenges bedeviling NADMO in the management of natural resources and specifically water resources. Among the challenges that emerged are; the volunteers at the community level are not motivated to keep them doing their work and lack of logistics to help the organisation function effectively. The volunteers at the communities are not paid. This has made it unattractive for them to continue doing their work and also to attract other people into the volunteerism. The organisation is not financially sourced to reward the volunteers financially. Due to the inability to pay them some token, they are not willing to offer their services at the communities. As a result of this, NADMO has not been able to fight bush fires effectively in the district. NADMO in the district does not have the necessary logistic to fight bush fires when they occur. Logistics such as fire detectives, Walton boots, and protective clothes are lacking and this does not allow NADMO to live up to expectations. The organisation does not have a reliable means of transport to assist them move freely to respond to any urgent natural resources management issues such as bush fires outbreak and also move to communities to educate and sensitize the people.
4.5.4 The Role of Ghana Health Service

The study revealed that the Ghana Health Service has a role in the management of natural resources among which includes the following:

i. Educating the people on water handling and how to avoid polluting or contaminating it.

ii. Educating the people on how to use the boreholes well.

iii. Educate and sensitize the people not to defecate around water bodies or rivers.

However, it is clear that the Health Directorate’s role is specifically on water resources and their quality. Lack of water facilities and non-compliance of the people to the educational and sensitization programmes were identified as challenges facing Ghana Health Services in the management of water resources in the district.

4.5.5 The Role of Environmental Protection Agency (EPA)

The Environmental Protection Agency plays a role in the management of natural resources in the Bawku West District which include the following:

i. Ensuring that the vegetative cover such as trees is not destroyed. Educational and sensitization programmes are normally organized for the people to help appreciate the importance and the need to protect the environment.

ii. Provide seedlings to schools and people to plant. EPA has engaged in providing seedlings to schools to plant. This is to replenish the environment and prevent desertification.

iii. Encourages the protection of water bodies in the district so that they are not destroyed.

iv. Encourage the planting of trees around the river banks to protect them from drying up.
v. Educate and sensitize the people on the effects of indiscriminate tree felling especially around the water bodies.

vi. Provide alternative livelihood activities to people such as bee keeping and providing seedlings to people who want to enter into tree planting business.

With regards to the role of EPA performs in the management of natural resources, there are challenges that it faces which include: attitudes of the people where they do not want to change from what they have been doing. The attitudes of the people towards change especially leaving the things they have been practicing and adopting the new practices affects the agency in its efforts of managing the natural resources in the district. This is because the people are educated and sensitized over and over but they will not stop burning the bush, felling tree and polluting water bodies. Bush fires which normally burn planted trees and destroys the vegetation continuous to pose a challenge to EPA in managing natural resources in the district. The activities of “gallamsey” operators in the district also undermine the efforts of EPA in protecting the environment and managing the resources available. These illegal mining activities usually pollute water bodies and degrade the land hence limiting the ability of safeguarding availability and quality of water resources and farm lands. Finally, the study revealed that farming close to the river banks has incapacitated the efforts of EPA in managing the rivers to guarantee their sustainability.

4.5.6 The Role of Assembly Members

The study revealed that Assembly Members are involved in developing bye-laws and regulations to protect the natural resources, especially water resources in the district. Assembly members
with the help of their electorates identify issues that adversely affect natural resources management and report them to the assembly for deliberation. During assembly sessions they discuss those issues and take part in forming a committee that looks into the issue and recommends. This means that the assembly members serve as a platform from which bye-laws are made since bye-laws cannot be formulated without the assembly members as they constitute the assembly. All the assembly members interviewed admitted that they contribute significantly to managing the natural resources as well as water resources in their electoral areas and for that matter the district. Assembly members again monitor the natural resources available in their electoral areas. They also educate the people on the importance of natural resources and the need to protect them.

The Assembly members’ further work closely with the traditional leaders and the community members in addressing natural resources management issues in the district. They also report to and educate their people on decisions taken at the assembly level on natural resources management.

4.6 Bye-laws and Regulations on Natural Resource Management

The study revealed that there are several bye-laws and regulations put in place to manage natural resources in the district. These bye-laws and regulations are formulated by the district assembly but some communities have their own bye-laws and regulations put in place to manage the natural resources in those communities. The bye-laws and regulations include; bye-laws on bush burning which says under no circumstances should anybody set the bush ablaze and that who so ever engages in this act will be brought to book. Secondly, there is bye-law on indiscriminate
felling of trees especially economic trees. This bye-law prevents people from felling trees anyway and most especially economic trees. The bye-law requires that people go for permit before embarking on tree felling. Bye-laws on illegal mining which do not allow illegal mining were identified. That is miners who have not acquired their operation permit from the Minerals and Commission and EPA should not engage in the activity. However, farming close to river banks is a regulation. This regulation encourages the people to desist from farming on the river banks. Other bye-laws include bye-laws on chain-saw operations which does not permit people to engage in chain-saw operations. Last but not least, the district has bye-laws on using chemicals for fishing which forbids the use of chemicals in fishing.

The study showed that the community members or people at the community level, resource users and other stakeholders are involved in the formulation of these bye-laws and regulations through their representatives (Assembly Members). It was revealed that these bye-laws and regulations are working effectively in some communities than in other communities. One of the respondents when asked whether these bye-laws and regulations are working or not had this to say”

“………….yes let me say that recently a chain-saw operator was caught operating in the forest and was arrested by the police”.

As it was indicated by some of the respondents that the bye-laws and regulations are working, other respondents said these bye-laws and regulations are not working. The following reasons were advanced as why these bye-laws and regulations are not working:

i. Political party influence, where people who are found violating these bye-laws are allowed to go scot-free due to their political affiliation to a particular party.

ii. The chiefs are sometimes benefiting or “getting something” from the culprits and therefore connive and condone with them to continue perpetuating these activities. A case in point is “galamsey” operators.
iii. The sanctions are not effective and sometimes are not applied.

iv. Low education and sensitization given to the people about these bye-laws.

v. People are not motivated to bring culprits. A respondent had this to say:

“……in my electoral area some people were caught felling mahogany trees for roofing of their houses and the Unit Committee Members reported them to the police. The chief got up and said the Unit Committee Members were lying and called for their arrest. So in a case like this, no one will report any activity somebody is conducting which is detrimental or against the bye-laws to any person with the fear that he/she will be arrested instead of the culprits”.

vi. These by-laws are not gazetted and enforcing them becomes a problem.

vii. The fines and charges for violating these bye-laws are too small. For example, when someone is caught burning the bush he/she is fined GH₵20.00 and that of chain-saw operators ranges from GH₵50.00 to GH₵100.00.

4.6.1 How Bye-laws are Formulated in the District

Generally, when there is a pressing issue or an activity that is going on that affects the people in the district and there is the need for redressing such an issue, bye-laws are formulated to prevent people from going ahead with the issue. The assembly after identifying that issue will deliberate on it during an assembly session. A committee is then set-up to look at the issue and come out with recommendations. Based on the recommendations given by the committee, the assembly will then educate and sensitize the people on that issue and the bye-law before it is adopted as a bye-law in the district.
The study revealed that people at the local level are involved in the formulation of these by-laws through their Assembly members who represent them at the Assembly session. The women associations, farmer groups, “galamsey” operators as well as Fulani Herdsmen are all involved indirectly through their Assembly Members. The bye-laws are normally adopted for the whole district and therefore acceptance of them by the individual communities is not considered so important. One of the respondents when asked whether the people at the community level accept these bye-laws before they are adopted said:

“bye-laws are not for a particular community. We do not need their acceptance before adopting them.
As far as the issue is considered as a social menace and poses challenge to other peoples’ existence, the bye-law has to be adopted.”

4.6.2 By-laws and Livelihood Activities

The study revealed that some of the bye-laws affect the livelihood activities of the people. The law on felling of trees indiscriminately affects farming in the communities. Farming usually demands land preparation which involves felling of trees around the farm plots. However, this bye-law does not allow that, hence affecting farming. To fell trees demands that one goes to the Forestry Commission and EPA for license before cutting down which is difficult to do. The bye-law on illegal mining affects those who are engaged in illegal mining. “Galamsey” operators confirmed that the bye-law affect them because that is the only means through which they earn their living and stopping it means that they have nothing to depend on for survival. They said they are very aware that illegal mining is not allowed but they do not have any alternative livelihoods. This bye-law equally affects farmers in the communities especially where the resource (gold) is present. This is because they resort to “galamsey” as a means of
complementing their farm harvest especially in periods of bad or low harvest and during the dry season.

However, it also came up that some of the bye-laws are very helpful to resource users. For example, the bye-law on bush burning allows grasses to grow which is used to roof their houses and to feed their animals.

4.7 The Role of Non-Governmental Organizations (NGOs) in the Management of Natural Resources

All the NGOs interviewed indicated that they contribute in managing the natural resources in the district. NGOs in the district perform the following roles in managing natural resources:

i. Engaging in disaster preparedness with the communities to help reduce the risk of disaster and also prevent them. The communities are educated and sensitized on how to plant trees and prevent bushfires. To ensure that the people or communities are involved in this, trees are provided sometimes to communities and some schools to plant. For example, World Vision has so far provided 2500 grafted mangoes to communities and schools for planting in two years. With regards to reducing disaster and its consequent effects, the communities are taken through vulnerability analysis.

ii. The NGOs also support farmers towards sustainable agricultural production and practices by encouraging them to adopt proper land cultivation, use of organic manure and provide them with tools and equipment to prepare compost. This will help replenish soil fertility.

iii. The people in the communities are educated and sensitized on how to manage water resources in their communities such that they are available for future use. NGOs in the
district not only play a role in managing these natural resources to ensure their availability but have provided communities with boreholes.

The Center for Community Development Initiatives has drilled 9 boreholes whilst World Vision drilled 86 boreholes. Still on water resources, NGOs provide facilities for water harvesting to be used in the dry season and providing irrigation systems run by tube wells. The NGOs also encourage the formation of water users association (WUAs) in respect to the dams. These associations are responsible for sharing land fairly to members and to ensure proper utilization of the water.

Some challenges were identified by the NGOs as they contribute to managing the natural resources in the district.

Lack of commitment on the part of beneficiaries and executive members was identified. The people at the local level (beneficiaries) do not take proper care of some of the projects and allow them to be destroyed. In cases where there are associations such as water users associations, the executives are not committed to their duties. A respondent said the executive members do not like attending meetings and that it is only when people attend meetings that they can deliberate on important issues and the way forward and therefore this attitude affects the proper functioning of the associations.

Again, inadequate fund to carry out their roles was identified. The NGOs do not have enough funds to help them implement their natural resources management objectives. For instance most donors do not want to support disaster preparedness programmes but only wait for disasters to occur before funds can be released. To them, this does not help because some of these disasters can always be prevented through disaster preparedness programmes.
Another challenge that the study revealed is the perception of the people that everything should be done by NGOs. Due to this perception, whenever community members participate in any activity, they expect to be paid allowances. This perception has also affected the level of communal labour in the communities since they always expect the NGOs to do everything for them.

Besides the above challenges, government institutions that have the mandate to manage these resources are not doing their work. These institutions are not interested in the sustainability of the projects that NGOs provide. These NGOs indicated that those government institutions responsible to take up the maintenance and ensuring the projects continuity do not always live up to expectations. For example, some NGOs constructed dams in some communities but after the completion of providing these dams, currently, most of these dams are not functioning properly and that the institutions are not considering their rehabilitations.

However, with continuous education and sensitization of the people, building the capacities of the people through training and setting up structures such as committees at the community level, NGOs have been able to continue managing natural resources in the district.

### 4.8 Stakeholders Collaboration in Managing Natural Resources (Water Resources) in the District

All the decentralized departments and the NGOs indicated that they collaborate with other institutions/organisations in order to manage the natural resources in the district. This has confirmed the need for consensus building and the involvement of stakeholders at all levels (Jonch-Clausen, 2004; GWP, 2000). This collaboration is among the decentralised departments,
NGOs, traditional leaders and the communities. The collaboration between and among the organisations are mostly in the area of: provision of resources, social mobilization and technical services. The district assembly collaborates in the areas of provision of resources, social mobilization and formulation of policies and preparations of plans. With regards to the NGOs, they collaborate in the area of resources provision whilst Ghana Health services collaborate in the area of technical services provision.

The study revealed that there are challenges facing the organisations as they collaborate. The challenges are; lack of accountability of funds given to collaborators where beneficiary organisations are not willing to render accounts of the money given them, some organisations do not always want to participate in the activities of other organisations and whenever they participate they demand “brown envelopes” from lead organisation; financial constraints making it difficult for lead organisations to fund the programmes and projects, sometimes the provision of boreholes to the communities are politically motivated; changing of persons who participate or attend meetings with other organisations which make such people unable to contribute fully in most of the time; weak linkage among the collaborators. With regards to the weak linkage, one of the interviewees cited a situation where a Forestry Commission Official sent seedlings to the communities without contacting the Extension Officer and the tree seedlings were not planted.

4.8.1 Ways in which Both Public Institutions and NGOs Collaborate

The study indicated that both public institutions and the NGOs involved in the management of natural resources in the district collaborate with each other.
The District Assembly provides funds to Ghana Health Services, NADMO and MoFA whilst the NGOs also provide funds to NADMO, Ghana Health Services, MoFA and the Assembly. Social mobilization is carried out by the district assembly for NGOs, Ghana Health Services, MoFA, Forestry Division and EPA. The assembly formulates policies and prepares plans for MoFA, Ghana Health Services and NADMO. Forestry Division provides seedlings to MoFA whilst Ghana Health Services provide technical services to NADMO, NGOs and the Assembly.

Table 4.1 displays the various organisations and their collaborators.

Table 4.1: Organisations and their Collaborators

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<th>Organisations</th>
<th>Collaborators</th>
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<tbody>
<tr>
<td>District Assembly</td>
<td>Water Resources Commissions, Environmental protection Agency, NGOs, Minerals Commissions, MoFA, Forestry Division, UNDP and communities</td>
</tr>
<tr>
<td>NADMO</td>
<td>Water Resources Commissions, World Vision, MoFA, Forestry Division, Information Services Department, the Police Services and the communities</td>
</tr>
<tr>
<td>MoFA</td>
<td>Water Resources Commissions, PAGEV, District Assembly, EPA, Forestry Division, UNDP and communities</td>
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</table>
### 4.9 Social Networks

There exist some kind of relationships between organizations and institutions. The study revealed that NGOs in the district build networks among themselves and across other organisations. The study also showed that the decentralized bodies acknowledge the importance of social relationships in the form of networks in discharging their duties. Relationship in the form of involving other organisations in their programmes is built by the organisations. This is

<table>
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<tr>
<td>Ghana Health Services</td>
<td>NADMO, District Assembly and World Vision</td>
</tr>
<tr>
<td>NGOs</td>
<td>District Assembly, Irrigation Development Authority, NADMO, MoFA, CODI, Ghana Health Services, Rural Aids, Water Aid, World Vision, communities and Action Aid.</td>
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</table>

Source: Researcher’s field survey, 2012.
done to let the other organisations appreciate what they are doing. In areas of natural resources management, when this relationship is created it will let them see the importance of natural resources management and can embrace it. All the NGOs responded that social relations are important and that they established such relationships by including other organisations whenever they have programmes and projects. The network of NGOs consortium among the NGOs provide them the platform where they discuss on issues of their operations and the way forward and how to continue deliver the goods to the people. During meetings held by the consortium, issues concerning natural resources especially water resources are discussed and how to sustained them. This study confirmed Putnam (1995:66-69) that social relationships bring about better schools, faster economic development, lower crime and more effective government. However, it was revealed that the consortium is not very active. This relationship in the form of network helps the NGOs and the decentralized bodies to continue managing water resources effectively in the district. The findings of the study also fall in line with that of Dungumoro and Madulu (2003) that building networks and maintaining trust is critical in the ability of NGOs to bring important knowledge, experience and opinions about water resources that, when left out, jeopardize the success of any initiative.

4.10 Women and Water Resources Management Decision Making

Women play a very important role in managing natural resources and more specifically water resources in the world and particularly in Africa. The study revealed that women in the Bawku West District play a role in managing natural resources. They participate in the decision making process of bye-laws formulation to govern the natural resources in the district. During the focus
group discussions with the women associations, when asked whether they are involved in the formulation of bye-laws to manage natural resources and issues concerning their management, the respond that came up was:

“yes we are involved because the assembly members represent all the people in the electoral areas and they together with women leaders meet at the assembly sessions where these bye- laws are formulated”.

These findings has agreed with the third principle of the Dublin principles that women play a central part in the provision, management and safeguarding of water. However, the findings are contrary to the observation that gender and the role women play in water management has been neglected (Schiller, 1992; Rosegrant, 1997; Segreldin, 1995). The findings further support the findings made by the International Water and Sanitation Centre of Community water supply and sanitation in 88 communities in 15 countries where projects run with full women participation are more sustainable than those that do not involve women as partners (Wijk- Sijbesma, et al., 2001). This supports Francis (2003) that women’s equal participation in decision making is a requisite for more equitable access to water and sanitation and could lead to services that respond more effectively to men’s and women’s different demands and capacities.

The study again shows that there is no woman among the 34 elected assembly members in the district apart from government appointees. This means that women are less represented at the district level where most decisions on water resources management are taken. The findings confirm the assertion by GWA (2003) that women playing influential roles at all levels over the long term could hasten the achievement of sustainability in the management of scarce water resources but only few make it to the water corridors of power today. The study confirms the role women play in the management of water resources as captured in the International

4.11 Conclusion

The involvement of all interest groups in the management of water resources is key in sustainability of the resource. The findings of the study revealed that all the interest groups or stakeholders in the district are involved in the management of natural resources. All the respondents confirmed their participation in the management of natural resources either directly or indirectly. These stakeholders play their role in managing natural resources and also collaborating with one another in order to have effective management. All the decentralized departments, NGOs, assembly members, women associations, resource users (herdsmen, “galamsey” operators and farmers) are involved in the management of natural resources (water resources in specific). This falls in line with UN former Secretary General Kofi Annan’s emphasis of local participation that “without the fullest participation of people at all levels of society the goal of full coverage of Water Supply and sanitation is unlikely to be obtained” (UNEP 2001:2).

The findings of the study brings to light that organizing meetings for other organisations to participate demands extra cost where participating members expect brown envelopes from lead organisations. This confirms that of Gupta’s (2003) argument that the process of managing
stakeholder participation leads to an increase in bureaucratization of existing systems and thus increases costs associated with the planning processes.

The study revealed that the local communities are not left out in the management of the natural resources in the district. This confirms Madulu’s (1998) suggestion that it is important to involve the local communities in assessing and solving the water problems since they are the ones who interact with their environment and carry out activities that have an impact on the environment.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the concluding part of the research report. It looks at the major findings of the study, conclusion and recommendations.

5.2 Summary of Major Findings

The study discovered that the district is endowed with a lot of natural resources and water resources in particular. Rivers, forest, farmlands, trees, wildlife, tourist sites and gold are the natural resources discovered by the study. The water resources include the White and Red Volta and their tributaries, dams (20 dams), boreholes, dug-out wells and overhead tanks and stand pipes.

The study revealed that in the management of water resources and natural resources in general, stakeholders are involved. These stakeholders include; resource users, women associations, decentralized bodies of the local government, communities and some NGOs. This has confirmed the second principle of the Dublin principles that water development and management should be based on a participatory approach involving users, planners and policy makers at all levels.
The study discovered further that the decentralized bodies of the local government in the district play a role in the management of water resources. All the decentralized bodies in the district responded that as far as water resources management (natural resources in broader terms) are concerned they contribute to achieving sustainable management of them.

Another finding of the research is that some NGOs in the Bawku West District contribute to the management of natural resources, especially water resources. The study revealed that all the four NGOs interviewed indicated their role in the management of water resources in the district. They engage in disaster preparedness with communities to help reduce the risk of disaster and also prevent them. The NGOs also support farmers achieve sustainable agricultural production and practices by encouraging them to adopt proper land cultivation and the use of organic manure. They educate and sensitise the people in the communities on how to manage water resources such that it is available for future use.

The findings of the study established that both the NGOs and the public institutions in the district collaborate as well as build networks. All these organisations responded they collaborate with other organisations in managing water resources in the district and that social network is very important in the functioning of organisations. There exists the network of NGOs consortium which serves as a platform for discussions on natural resources management. All the decentralized departments and NGOs involve other organisations in their programmes as a way of building relationships.

The role of women in decision making on the management of natural resources (water resources in more specific) is not left out in the district. The study saw that women are involved in natural
resources management issues in the district. The focus group discussions with the three women associations indicated that women participate through their representatives in formulating bye-laws and regulations to protect and manage the available natural resources, especially water resources.

5.3 Conclusion

Water resources management in the world has remained very important to governments, development partners, NGOs, and all interested groups. Water resources management in the world has a long history and evolved over time, it continue to attract the attention of every nation. Ensuring that the resource is sustained for the future generations has been the major concern for policy makers, planners and governments. Water resources management in Africa needs to be given much attention if poverty reduction is desired since water is a cross cutting element and remains the most resource that the rural populace depends for their survival.

The study sought to find out the role of public institutions and NGOs in integrated water resources management in the Bawku West District. This takes into account the challenges, building of networks and collaborations with these organisations.

The findings of the study indicated that the district is endowed with vast natural resources especially water resources. The study expose that bush burning, illegal mining, activities of herdsmen, using chemicals in fishing, indiscriminate felling of trees and farming close to water bodies are the main natural resource issues that the district is grappling with.

In the management of water resources, the involvement of stakeholders such as users, planners, development partners and policy makers is very crucial in achieving sustainable water resources
use and management. The findings of the study revealed that the decentralised departments in
the district as well as some NGOs play significant roles in the management of natural resources
and especially water resources. It came to light that as these institutions contribute to the
management of natural resources and water resources in particular in the district, there are
challenges that they encounter.

The district assembly is a major player in the management of natural resources and for that
matter water resource. The bye-laws which protect these resources are formulated by the
assembly during its sessions. However, these bye-laws are not functioning properly due to
politicization, low fines and charges associated to the bye-laws, lack of motivation on the part
of the people to expose culprits, non-gazetting of bye-laws, non-enforcement of the bye-laws,
low education and sensitisation and some chiefs conniving and condoning with perpetuators.

The study further revealed that women are involved in the management of natural resources and
water resources in particular. However, their roles are far from the corridors of water power.

5.4 Recommendations

To achieve sustainable water resources and natural resources management in general for
economic development and water as human right commodity, then stakeholder involvement
right from the user down to policy makers must be given the needed attention. Based on this and
the findings of the study, the researcher recommends the following to help achieve integrated
water resources management as well as sustainable natural resources for the advancement of
both present and the future generations.
• The decentralised departments as well as NGOs needs to be strengthened both in financial resources and logistics to enable them function effectively.

• There should be education and sensitisation for all the stakeholders to put them in the picture of working together to achieving sustainable water resources management.

• The district assembly should in consultation with the necessary opinion leaders refine the charges and fines associated with bye-laws. This will discourage perpetuators from involving in those acts.

• Women should be given more opportunity to participate in water resources management as well as natural resources. They should be positioned at all levels of the decision making processes where policies regarding natural resources and water resources in particular are made. This is because women are carriers of water, main users, family health educators, motivators and agents of change.

• Government should facilitate the process of giving legal backing to bye-laws that protect natural resources especially water resources. This will allow culprits to be dealt with vigorously whenever these bye-laws are violated.

• Last but not least the study recommends that further research should be conducted on institutional policies on water resources management.
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APPENDIX

UNIVERSITY FOR DEVELOPMENT STUDIES
(GRADUATE SCHOOL)

INTERVIEW GUIDE FOR THE DISTRICT COORDINATING DIRECTOR.

THIS INTERVIEW GUIDE IS TO HELP COMPLETE A STUDY ON THE ROLE OF PUBLIC INSTITUTIONS AND NGO’s IN INTEGRATED WATER RESOURCES MANAGEMENT IN THE BAWKU WEST DISTRICT. THE PROVISION `OF HONEST, OBJECTIVE AND ACCURATE ANSWERS WOULD THEREFORE BE MUCH VALUED AND WELL APPRECIATED. THIS IS PURELY AN ACADEMIC EXERCISE, PLEASE NOTE THAT YOUR CONFIDENTIALITY IS HIGHLY ASSURED, THANK YOU.

1. Does your organization have any role in the management of natural resources in the district? Yes  No

If yes, explain.

2. Which type(s) of water resources do you have in the district?

(b) What specifically does the organization do in the management of each water resource?

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3. What challenges does your organization face in the management of natural resources and specifically water resources

4. How do you manage these challenges such that you have effective management of water resources over the years?
5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes No

(a) If yes, who are these organizations?

(b) How is the collaboration done?

(c) Do you face any challenges as you collaborate with the other organizations? Yes No.

(d) If yes, explain.

6. Do your organization build social networks with other organizations? Yes No.

(a) If yes, how is it done?

(b) Who are these organisations?

(c) Are there clear rules and regulations governing this social network?

7. Are there any by-laws, regulations or policies governing natural resources management? Yes No.

(a) If yes, specify.

(b) Who formulate these by-laws?

(c) Do you involve in the formulation of these by-laws?

(d) How is it done? Explain.

(e) Are the local communities involved in coming out with these by-laws, rules and regulations?

(f) Are the by-laws, rules and regulations accepted by the local people before they are put to work?

(g) Are there sanctions against those who violate these by-laws? Yes No.

If yes specify.

(h) Do you think the sanctions are strong enough to deter others from doing same? Yes No.

If no, what do you think is lacking?
8. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

9. Are there rules related to the use or access of natural resources that are enforced in a given community? Yes  No.

(a) If yes, how can these rules/norms translate into by-laws?

(b) Who has to do what?

(c) Whose initiative is it?

(d) Is it difficult?

10. When rules/norms are translated into by-laws, does that mean that they are enforced in the whole district or only in that said community.

11. What do you think are the main natural resources management issues in your area of operation?

12. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

13. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

INTERVIEW GUIDE FOR THE DISTRICT HEALTH DIRECTOR

1. Does your organization have any role in the management of natural resources in the district? Yes  No

If yes, specify.
2. Does your organization have any role in the management of water resources in the district? Yes No
   (a) If yes, specify.
   (b) What specifically does the organization do in the management of each water resource?

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3. What challenges does your organization face in the management of natural resources and specifically water resources?

4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes No
   (a) If yes, what are these organizations?
   (b) How is the collaboration done?
   (c) Do you face any challenges as you collaborate with the other organizations? Yes No.
   (d) If yes, specify.

6. Do your organization build social networks with other organizations? Yes No.
   (a) If yes, how is it done?
   (b) Who are these organisations?
   (c) Are there clear rules and regulations governing these social networks?

7. Do you know of any by-laws, regulations or policies governing water resources management? Yes No.
(a) If yes, mention.

(b) Who formulate these by-laws?

(c) How is it done? Explain.

(d) Are the local communities involved in coming out with these by-laws, rules and regulations?

(e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?

(f) Are there sanctions against those who violate these by-laws? Yes  No. If yes mention them.

(g) Do you think the sanctions are strong enough to deter others from doing same? Yes  No. If no, what do you think is lacking?

8. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

9. What do you think are the main natural resources management issues in your area of operation?

10. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

11. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

INTERVIEW GUIDE FOR MoFA DIRECTOR

1. Does your organization have any role in the management of natural resources in the district? Yes  No
If yes, specify.

2. Does your organization have any role in the management of water resources in the district? Yes No
   (a) If yes, explain.
   (b) What specifically does the organization do in the management of each water resource?

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4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes No
   (a) If yes, what are these organizations?
   (b) How is the collaboration done?
   (c) Do you face any challenges as you collaborate with the other organizations? Yes No.
      (d) If yes, explain.

6. Do your organization build social networks with other organizations? Yes No.
   (a) If yes, how is it done?
   (b) Who are these organisations?
   (c) Are there clear rules and regulations governing this social network?
7. Do you know of any by-laws, regulations or policies governing water resources management? Yes No.

(a) If yes, mention them.

(b) Who formulate these by-laws?

(c) How is it done? Explain.

(d) Are the local communities involved in coming out with these by-laws, rules and regulations?

(e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?

(f) Are there sanctions against those who violate these by-laws? Yes No.

If yes explain.

(g) Do you think the sanctions are strong enough to deter others from doing same? Yes No.

If no, what do you think is lacking?

8. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

9. Do your organization have specific rules, by-laws and regulations governing the management of natural resources? Yes No.

10. What do you think are the main natural resources management issues in your area of operation?

11. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

12. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?
INTERVIEW GUIDE FOR NGO’S OPERATING IN THE DISTRICT.

1. Does your organization have any role in the management of natural resources in the district? Yes No

   If yes, mention them.

2. Does your organization have any role in the management of water resources in the district? Yes No

   (a) If yes, explain.

   (b) What specifically does the organization do in the management of each water resource?

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4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes No

   (a) If yes, what are these organizations?

   (b) How is the collaboration done?

   (c) Do you face any challenges as you collaborate with the other organizations? Yes No.

   (d) If yes, mention them.
6. Do your organization build social networks with other organizations in the management of water resources? Yes No.

   (a) If yes, how is it done?
   
   (b) Who are these organisations?
   
   (c) Are there clear rules and regulations governing this social network?

7. Do you know of any by-laws, regulations or policies governing water resources management? Yes No.

   (a) If yes, mention them.
   
   (b) Who formulate these by-laws?
   
   (c) How is it done? Explain.
   
   (d) Are the local communities involved in coming out with these by-laws, rules and regulations?
   
   (e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?
   
   (f) Are there sanctions against those who violate these by-laws? Yes No.

   If yes explain.
   
   (g) Do you think the sanctions are strong enough to deter others from doing same? Yes No.

   If no, what do you think is lacking?

8. Do your organization have specific rules, by-laws and regulations governing the management of natural resources? Yes No.

   (a) If yes explain.
   
   (b) What about water resources in specific?

9. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

10. What do you think are the main natural resources management issues in your area of operation?
11. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

12. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

INTERVIEW GUIDE FOR EPA DIRECTOR

1. Does your organization have any role in the management of natural resources in the district? Yes  No

If yes, mention them.

2. Does your organization have any role in the management of water resources in the district? Yes No

(a) If yes, explain.

(b) What specifically does the organization do in the management of each water resource?

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4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes  No

(a) If yes, what are these organizations?

(b) How is the collaboration done?

(c) Do you face any challenges as you collaborate with the other organizations? Yes No.

(d) If yes, specify.

6. Do your organization build social networks with other organizations in the management of water resources? Yes No.

(a) If yes, how is it done?

(b) Who are these organisations?

(c) Are there clear rules and regulations governing this social network?

7. Do you know of any by-laws, regulations or policies governing water resources management? Yes  No.

(a) If yes, specify.

(b) Who formulate these by-laws?

(c) Are the local communities involved in coming out with these by-laws, rules and regulations?

(e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?

(f) Are there sanctions against those who violate these by-laws? Yes  No.

If yes specify.

(g) Do you think the sanctions are strong enough to deter others from doing same? Yes  No.

If no, what do you think is lacking?
8. Do your organization have specific rules, by-laws and regulations governing the management of natural resources? Yes  No.

(a) If yes specify.

(b) What about water resources in specific?

9. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

10. What do you think are the main natural resources management issues in your area of operation?

11. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

12. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

INTERVIEW GUIDE FOR NADMO DIRECTOR

1. Does your organization have any role in the management of natural resources in the district? Yes  No

If yes, mention them.

2. Does your organization have any role in the management of water resources in the district? Yes No

(a) If yes, explain.

(b) What specifically does the organization do in the management of each water resource?
3. What challenges does your organization face in the management of natural resources and specifically water resources?

4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes  No
   (a) If yes, what are these organizations?
   (b) How is the collaboration done?
   (c) Do you face any challenges as you collaborate with the other organizations? Yes No.
   (d) If yes, mention them.

6. Do your organization build social networks with other organizations in the management of water resources? Yes No.
   (a) If yes, how is it done?
   (b) Who are these organisations?
   (c) Are there clear rules and regulations governing this social network?

7. Do you know of any by-laws, regulations or policies governing water resources management? Yes  No.
   (a) If yes, mention them.
   (b) Who formulate these by-laws?
(c) How is it done? Explain.

(d) Are the local communities involved in coming out with these by-laws, rules and regulations?

(e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?

(f) Are there sanctions against those who violate these by-laws? Yes  No.
If yes explain.

(g) Do you think the sanctions are strong enough to deter others from doing same? Yes  No.
If no, what do you think is lacking?

8. Do your organization have specific rules, by-laws and regulations governing the management of natural resources? Yes  No.

(a) If yes explain.

(b) What about water resources in specific?

9. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

10. What do you think are the main natural resources management issues in your area of operation?

11. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

12. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?
12. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

(c) For which purpose?

(d) How regular is the interaction?

INTERVIEW GUIDE FOR FARMERS

1. Are there any by-laws governing natural resources management in the district? Yes No

If yes, what are these by-laws?

2. Who formulate these by-laws?

3. Are you involved in the formulation of the by-laws?

4. Are these by-laws working? Yes No

If no, why?

5. Do these by-laws affect your livelihood activities? Yes No

If yes, how?

6. What do you think are the main natural resources management issues in your area of operation?
7. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

8. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;
   (a) Whom do you interact with?
   (b) How is the interaction done?
   (c) For which purpose?
   (d) How regular is the interaction?

**INTERVIEW GUIDE FOR HERDSMEN**

1. Are there any by-laws governing natural resources management in the district? Yes No
   
   If yes, what are these by-laws?

2. Who formulate these by-laws?

3. Are you involved in the formulation of the by-laws?

4. Are these by-laws working? Yes No
   
   If no, why?

5. Do these by-laws affect your livelihood activities? Yes No
   
   If yes, how?

6. What do you think are the main natural resources management issues in your area of operation?

7. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?
8. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

**INTERVIEW GUIDE FOR ‘GALAMSEY’ OPERATORS**

1. Are there any by-laws governing natural resources management in the district? Yes No

   If yes, what are these by-laws?

2. Who formulate these by-laws?

3. Are you are involved in the formulation of the by-laws?

4. Are these by-laws working? Yes No

   If no, why?

5. Do these by-laws affect your livelihood activities? Yes No

   If yes, how?

6. What do you think are the main natural resources management issues in your area of operation?

7. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

8. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

   (a) Whom do you interact with?

   (b) How do you interact?
(c) For which purpose?

(d) How regular is the interaction?

**INTERVIEW GUIDE FOR WOMEN ASSOCIATION**

1. Are there any by-laws governing natural resources management in the district? Yes No

   If yes, what are these by-laws?

2. Who formulate these by-laws?

3. Are you involved in the formulation of the by-laws?

4. Are these by-laws working? Yes No

   If no, why?

5. Do these by-laws affect your livelihood activities? Yes No

   If yes, how?

6. What do you think are the main natural resources management issues in your area of operation?

7. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

8. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

   (a) Whom do you interact with?

   (b) How do you interact?

   (c) For which purpose?

   (d) How regular is the interaction?
INTEVIEW GUIDE FOR THE PLANNING OFFICER

1. Does your organization have any role in the management of natural resources in the district? Yes No

If yes, specify.

2. Does your organization have any role in the management of water resources in the district? Yes No

(a) If yes, specify.

(b) What specifically does the organization do in the management of each water resource?

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<th>Water resource</th>
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3. What challenges does your organization face in the management of natural resources and specifically water resources

4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes No

(a) If yes, what are these organizations?

(b) How is the collaboration done?

(c) Do you face any challenges as you collaborate with the other organizations? Yes No.

(d) If yes, specify.

6. Do your organization build social networks with other organizations? Yes No.
(a) If yes, how is it done?

(b) Who are these organisations?

(c) Are there clear rules and regulations governing these social networks?

7. Do you know of any by-laws, regulations or policies governing water resources management? Yes  No.

(a) If yes, mention.

(b) Who formulate these by-laws?

(c) How is it done? Explain.

(d) Are the local communities involved in coming out with these by-laws, rules and regulations?

(e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?

(f) Are there sanctions against those who violate these by-laws? Yes  No.

If yes mention them.

(g) Do you think the sanctions are strong enough to deter others from doing same? Yes  No.

If no, what do you think is lacking?

8. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

9. Are there rules related to the use or access of natural resources that are enforced in a given community? Yes  No.

(a) If yes, how can these rules/norms translate into by-laws?

(b) Who has to do what?

(c) Whose initiative is it?

(d) Is it difficult?

10. When rules/norms are translated into by-laws, does that mean that they are enforced in the whole district or only in that said community.
11. What do you think are the main natural resources management issues in your area of operation?

12. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?

13. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?

INTERVIEW GUIDE FOR PRESIDING MEMBER

1. Does your organization have any role in the management of natural resources in the district? Yes  No

   If yes, specify.

2. Does your organization have any role in the management of water resources in the district? Yes No

   (a) If yes, specify.

   (b) What specifically does the organization do in the management of each water resource?

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3. What challenges does your organization face in the management of natural resources and specifically water resources?

4. How do you manage these challenges such that you have effective management of water resources over the years?

5. Do you collaborate with other organizations in the management of natural resources and more specifically water resources in the district? Yes  No
   (a) If yes, what are these organizations?
   (b) How is the collaboration done?
   (c) Do you face any challenges as you collaborate with the other organizations? Yes No.
   (d) If yes, specify.

6. Do your organization build social networks with other organizations? Yes No.
   (a) If yes, how is it done?
   (b) Who are these organisations?
   (c) Are there clear rules and regulations governing these social networks?

7. Do you know of any by-laws, regulations or policies governing water resources management? Yes  No.
   (a) If yes, mention.
   (b) Who formulate these by-laws?
   (c) How is it done? Explain.
   (d) Are the local communities involved in coming out with these by-laws, rules and regulations?
   (e) Are the by-laws, rules and regulations accepted by the local people before they are put to work?
   (f) Are there sanctions against those who violate these by-laws? Yes  No.

If yes mention them.

(g) Do you think the sanctions are strong enough to deter others from doing same? Yes  No.
If no, what do you think is lacking?

8. How are by-laws, policies, rules and regulations on water and land implemented at the community level?

9. Are there rules related to the use or access of natural resources that are enforced in a given community? Yes No.

(a) If yes, how can these rules/norms translate into by-laws?

(b) Who has to do what?

(c) Whose initiative is it?

(d) Is it difficult?

10. When rules/norms are translated into by-laws, does that mean that they are enforced in the whole district or only in that said community.

INTERVIEW GUIDE FOR THE ASSEMBLYMEN

1. Are there any by-laws governing natural resources management in the district? Yes No

If yes, what are these by-laws?

2. Who formulate these by-laws?

3. Are you are involved in the formulation of the by-laws?

4. Are these by-laws working? Yes No

If no, why?

5. What do you think are the main natural resources management issues in your area of competence?

6. Do you think addressing land degradation/erosion/flood will solve the main natural resources management issues?
7. When it comes to discussing natural resources management and finding solutions to the problems you are faced with;

(a) Whom do you interact with?

(b) How do you interact?

(c) For which purpose?

(d) How regular is the interaction?