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**FACULTY OF RENEWABLE NATURAL RESOURCES**

**DEPARTMENT OF SILVICULTURE AND FOREST MANAGEMENT**

**ASSESSMENT OF COMMUNITY-BASED MANAGEMENT OF PORTABLE  
DRINKING WATER: A CASE STUDY IN KINTAMPO, GHANA**

**BY**

**JUSTICE NANA KWESI AGYEMANG**

**JANUARY, 2021**

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DRINKING WATER; A CASE STUDY IN KINTAMPO, GHANA**

**KNUST**

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**A THESIS SUBMITTED TO THE DEPARTMENT OF SILVICULTURE AND  
FOREST MANAGEMENT IN PARTIAL FULFILMENT OF THE  
REQUIREMENT FOR THE AWARD OF MASTER OF PHILOSOPHY  
(NATURAL RESOURCES AND ENVIRONMENTAL GOVERNANCE)**

**JANUARY, 2021**

## DECLARATION

I hereby declare that this submission is my own work towards the MPhil in Natural Resources and Environmental Governance and that, to the best of my knowledge, it contains no material previously published by another person or material which has been accepted for the award of any other degree of the University, except where duly acknowledged.

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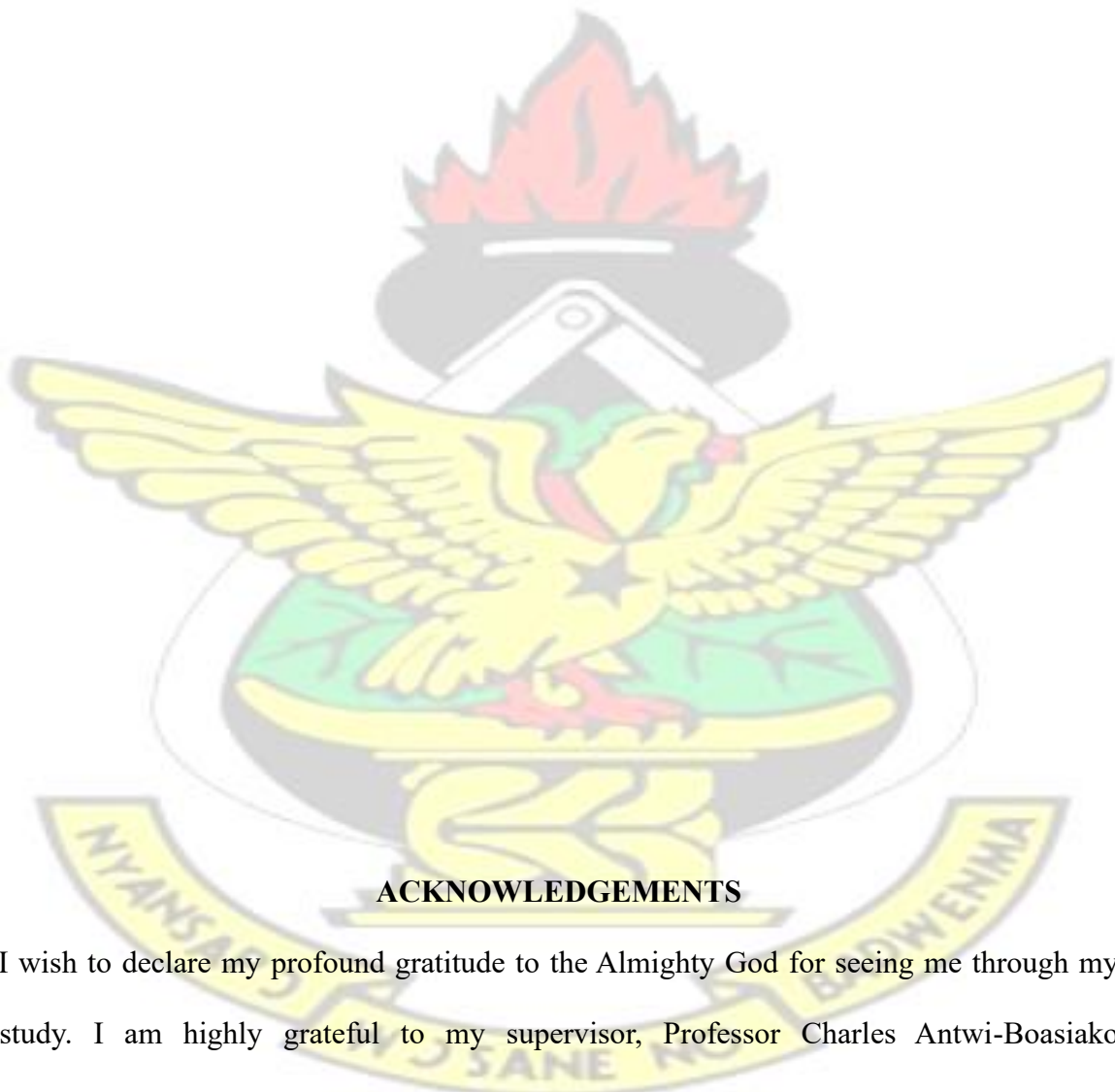
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## DEDICATION

This thesis is dedicated to the God Almighty, my wife Mrs. Bertha Ama Agyemang and my children, Nana Kojo Agyemang, Maame Esi Agyemang and Papa Kwabena

Agyemang.

# KNUST



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## **ABSTRACT**

Although community water management approach has improved access to sustainable water supply in Ghana, community access to potable water supply continues to remain a challenge. This study therefore assessed the impact of community-based management approach on drinking water accessibility in the Kintampo community. The study employed both primary and secondary sources of data. Simple random sampling was used to select six communities (Sunkwa, Sawaba, Moleline, Brigade, K line, and Dwenewoho) out of the eleven suburbs of Kintampo. A sample size of 150 community members (25 respondents in each suburb), eight key informants from Community Water and Sanitation (Kintampo



town), and eight from Water User Association constituted the respondents. Data was analyzed using Statistical Package for Social Sciences (SPSS). The sources of water revealed that majority of the respondents (i.e. 61.3%) rely on pipeborne water, while 38.7% rely on water from borehole. The six studied suburbs have 38 water points (30 are functional) comprising 22 taps and 16 boreholes. The Water Management Committee approaches in water management include supervision of day-to-day operation of the facilities and to ensure that the facilities are sustainable and functional. The benefits of community water management were; time saving (26.9%), health improvement (23.5%), sustainability (19.7%), community empowerment (19.7%), and environmental protection (10.2%). However, lack of funds for maintenance was adjudged the highest constraint (28.4%), and different interest of community was adjudged the least constraint (9.3%). The best way to improve water supply in the study area is community training on operation and maintenance of water system (32%). The community-based drinking water in Kintampo has made water accessibility easier; however, inadequate funds for maintenance and the community members dearth of knowledge on how to repair the water system results in unreliable water supply. The management and operation of Kintampo community-based water must be decentralized to the local people to ensure sense of ownership and effective management. Moreover, the study community members must be trained by appropriate Institutions (e.g. Community Water and Sanitation Agency) on the operation and maintenance of the water facilities.

## TABLE OF CONTENTS

|                            |     |
|----------------------------|-----|
| DECLARATION.....           | iii |
| DEDICATION.....            | iv  |
| ACKNOWLEDGEMENTS.....      | v   |
| ABSTRACT.....              | vi  |
| TABLE OF CONTENTS.....     | vii |
| LIST OF TABLES.....        | x   |
| LIST OF FIGURES.....       | xi  |
| LIST OF ABBREVIATIONS..... | xii |

|   |    |
|---|----|
| CHAPTER ONE.....  | 1  |
| INTRODUCTION.....   | 1  |
| 1.1 Background .....  | 1  |
| 1.2 Problem statement .....                                 | 3  |
| 1.3 Justification .....                                     | 5  |
| 1.4 Research questions .....                                | 7  |
| 1.5 Main objective .....                                    | 7  |
| 1.6 Specific objectives.....                                | 7  |
| 1.8 Organisation of the study .....                         | 10 |
| CHAPTER TWO.....  | 11 |
| LITERATURE REVIEW.....                                      | 11 |
| 2.1 Community water supply .....                            | 11 |
| 2.2 Stakeholder communities in water management .....       | 12 |
| 2.3 The Concept of Community-Based Water Management .....   | 13 |
| 2.4 Impact of Community-Based Water Management (CBWM) ..... | 14 |
| 2.4.1 Potable water security .....                          | 15 |
| 2.4.2 Health improvement .....                              | 16 |
| 2.5 Challenges of Community-based water management .....    | 16 |
| 2.6 Effective Management Practices .....                    | 18 |
| 2.7 Sustainable measures for CBWM .....                     | 20 |
| CHAPTER THREE.....  | 21 |
| METHODOLOGY.....  | 21 |
| 3.1 Introduction .....                                      | 21 |
| 3.2 Study area .....  | 21 |
| 3.3 The Research Design .....                               | 22 |
| 3.4 Sample selection .....                                  | 23 |
| 3.5 Sources of Data .....                                   | 24 |
| 3.6 Data collection.....                                    | 24 |
| 3.7 Data Processing and Analysis .....                      | 25 |
| CHAPTER FOUR.....   | 26 |
| RESULTS.....  | 26 |

|  |    |
|--|----|
| 4.1 Demographic characteristics of respondents .....   | 26 |
| 4.2 The community-based water management approach on water accessibility .....                                 | 28 |
| 4.3 Constraints in the implementation of the community-based management of water supply .....                  | 32 |
| 4.4 Ways to manage the identified constraints .....  | 33 |
| 4.5 Best practices for effective community-based water management .....  | 34 |
| CHAPTER FIVE.....  | 36 |
| DISCUSSION.....  | 36 |
| 5.1 The community-based water management approach on water accessibility .....                                 | 36 |
| 5.1.1 Sources of water in Kintampo .....   | 36 |
| 5.1.2 Duties of the Community Water Management Committee and community members.....                            | 37 |
| 5.1.3 Benefits of community –based water management .....  | 38 |
| 5.2 Constraints in the implementation of the community-based management of water supply in the community ..... | 40 |
| 5.3 Ways to manage the identified constraints .....  | 41 |
| 5.4 Best practices for effective community-based water management .....  | 44 |
| CHAPTER SIX.....   | 47 |
| CONCLUSIONS AND RECOMMENDATIONS.....   | 47 |
| 6.1 Conclusions .....  | 47 |
| 6.2 Recommendations .....  | 48 |
| REFERENCES.....  | 50 |
| APPENDICES.....  | 53 |
| <b>LIST OF TABLES</b>  |    |

|  |             |
|--|-------------|
| <b>Table</b>   | <b>Page</b> |
| <b>4.1:</b> Water points in the Kintampo                               | 29          |
| <b>4.2:</b> Approaches of the CWM in running the Community-Based Water | 30          |



|   |    |
|---|----|
| <b>4.3:</b> Community members’ level of involvement in water management           | 31 |
| <b>4.4:</b> Benefits of community – based water system                            | 32 |
| <b>4.5:</b> Constraints in the implementation of community-based water management | 33 |
| <b>4.6:</b> Ways to deal with the constraints of community-based water management | 34 |
| <b>4.7:</b> Best practices for effective community-based water supply             | 35 |

## **LIST OF FIGURES**

| <b>Figure</b>  | <b>Page</b> |
|--|-------------|
| <b>3.1:</b> Map of the Kintampo Municipal Township showing the study areas | 22          |
| <b>4.1:</b> Gender of respondents in the study area                        | 26          |
| <b>4.2:</b> Age of respondents in the study area                           | 27          |
| <b>4.3:</b> Educational level of respondents in the study area             | 27          |
| <b>4.4:</b> Occupation of respondents in the study area                    | 28          |

## **LIST OF ABBREVIATIONS**

**CBM:** Community –Based Management

**CBWM:** Community-Based Water Management

**CWM:** Community Water Management

**CWSA:** Community Water and Sanitation Agency

**GSS:** Ghana Statistical Service

**GWCL:** Ghana Water Company Limited

**GWSC:** Ghana Water and Sewerage Cooperation

**MDG:** Millennium Development Goals

**SPSS:** Statistical Package for Social Sciences

**UN:** United Nation

**UNICEF:** United Nation International Children Emergency Fund

**US:** United State

**WASH:** Water, Sanitation and Hygiene

**WHO:** world health organisation



# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

The International Conference on Water and Sustainable Development final declaration in 1998 acknowledged that one-fourth of the world's populace do not have accessibility to safe and portable drinking water (Abraham, 1998). Approximately, half of the urban populace in Africa does not have accessibility to ample water and sanitation and this predicament is the Governments' inability to provide and maintain basic infrastructural services for their increasing populations (UN, 2006). Providing safe and affordable drinking water is one of the essential factors that improves human well-being and also secures sustainable livelihoods (Henderson and Wade, 1996).

In Ghana, 10 million people do not have accessibility to drinking water ([www.safewaternetwork.org](http://www.safewaternetwork.org)). Awuah *et al.* (2008) revealed that 70% of the urban populace and 30% of the rural populace had accessibility to reliable drinking water. The external supporting organizations and central Government were in charge of designing, building and preserving community water supplies, with little private sector involvement (Salim, 2002). This approach of provision and management of water was not sustainable and this necessitated the need to include communities in water management and maintenance of water facilities (Fielmua, 2011).

Community-Based Management approach in water provision is the single most significant strategy envisioned by the Policy and Development Actors to provide better availability, sustainability and equity in service provision particularly in the Sub-

Saharan Province (WHO, 2005). Mwakila (2008) explained that, community managed water systems appear to practically perform well and sustainable and although difficult to standardize for all communities, Water and Sanitation Experts agree that they have numerous advantages over other schemes. Lammerink *et al.*

(2001) explained Community Water Management (CWM) as a co-operation between Support Organizations in the Water Industry and communities, which comprises a common search to detect problems with the local water supply system, as well as possible solutions. Lammerink *et al.* (2001) indicated that the basic principles of CWM include: (a) each community develops its own Water Management Schemes (b) communities own the process of change (c) increased management capacities are the foundation for enhanced water systems, and (d) local investigators and facilitators take part in the community's projects.

Fielmua (2011) explained that the Water Sector in Ghana, particularly the rural water, went through streamlining in response to the international agenda on sanitation and water. Fielmua (2011, p. 174) stated that the operation of small town and rural water provisions in 1994 transformed from the then Ghana Water and Sewerage Cooperation (GWSC) to community management under the Community Water and Sanitation Division formed within GWSC and charged with the duty to facilitate the community water provision sector. This was done to privilege the community with the right to take part in running of its water supply since the state management yielded poor results in supplying water to rural and urban zones in the country. Later, the Division was changed to the Community Water and Sanitation Agency (CWSA) by an Act of Parliament, CWSA Act, Act 564 in 1998 with directive to facilitate allied sanitation services and potable water delivery to small towns and rural communities in



Ghana (CWSA, 2007).

## 1.2 Problem statement

Poor water governance is alleged to be the root cause of the water crisis facing some counties around the globe (Keen, 2003; Gupta, 2004; Pahl-Wostl, 2007). The water crisis is in the form of scarceness of freshwater and its degraded quality or flooding when there is failure to control the abundance of water. According to Wester *et al.* (2003), water scarcity is experienced as unequal water accessibility and conflicts between different users and uses. Approximately, one-sixth (1.2 billion) of the world populace do not have access to safe drinking water (World Water Council, 2009). This menace has detrimental effect on human health.

Ghana is also confronted with water problem. Ghana seems to have plentiful water resources, but the sustainability of this water endowment is endangered by natural phenomena such as extreme temporal and spatial variability of climate, mostly rainfall. Human factors comprising pollution and excessive land surface exposure also contribute to the freshwater scarcity. This may lead to conflict between different uses (WRC, 2005; Ghana Integrity Initiative, 2011). It has been projected that by 2025, Ghana will be a water stressed nation unless water crisis are well managed (GWP/WAWP, 2002; WRI-CSIR; 2010). The process of management may require a „good governance“ system such as Community-Based Water Management.

Good governance elements are reckoned to tackle the problem of the water crisis.

These elements comprise inclusiveness, equity, legitimacy, transparency, accountability, effectiveness and efficiency in water resource use, and



service allocation and distribution (Barreira, 2006; UNDP, 2012). Stakeholder participation which is one of the good governance principles is understood to be a determining factor in tackling poor water governance (Medema and Jeffrey, 2005; Allen, 2007; Reed, 2008).

Ghana has gone through some policy reformation in the water delivery industry, particularly in rural areas to improve water supply accessibility. These policy reformations include community participation in management (public private partnership) and community-based management (whereby ownership and responsibility are transferred to the community). One of the main objectives why the community participation approach was introduced is because it provides the platform for the integration of both formal and informal technologies (indigenous knowledge) for managing the water supply sector. Although this water management approach has improved accessibility to sustainable water provision in Ghana, community accessibility to potable water supply continues to remain a challenge, due to less inclusive of the rural communities.

The Kintampo (the District Capital of Kintampo North) urban water delivery sector is governed by the Community Water and Sanitation Agency (CWSA). However, potable water provision to the community is a challenge, due to less involvement of the local community. Anechana *et al.* (2015, p. 9) stated that, “availability and accessibility of portable drinking water is a challenge in the Kintampo-North Municipality, as the residents rely mainly on surface water sources such as shallow dugout wells, streams and dams, which are prone to pollution by grazing animals such as cattle, sheep and

goats”. Although research or literature indicates that community participation ensures efficiency and sustainability in water supply, the situation is somewhat the contrary in the case of Kintampo community. This is partly due to community members lack of sense of ownership, reluctance of community members to participate in water management, as well as some populace continued dependence on other water sources such as well, streams and rivers (Anechana *et al.*, 2015).

Therefore access to potable water in Kintampo is poor in spite of the water management approach in the community. Households in the community continue to resort to unsafe water sources, which are detrimental to their health. This study therefore assessed the community-based management of water in Kintampo, Ghana, to come out with the best possible way to ensure water management and community members’ involvement.

### **1.3 Justification**

Formerly, Ghana water supply was operated by the Central Government. Similar to other nations, Ghana faced shortfalls in maintenance and operation, low revenues, budget constraints, which led to inadequate expansion of the system and failure to satiate rural water needs (Engel *et al.*, 2005). Other vital reasons why the state management of the Water Sector was not sustainable is because the communities were not engaged in the water management for many reasons, particularly due to their lack of technical knowhow and low level of education. Decisions concerning the water management were made without their opinions or views irrespective of the fact that, they are the most affected by these decisions.

Ghana has, thus, transformed its rural water supply structure and transferred responsibilities for water management to both the District Assemblies and community-based organizations that operate outside the Local Government system.

This system necessitates the principle of “treating water as an economic good,” which accepts that water users are willing to pay for water services if proper management methods are employed (Kleemeier 2000).

However, some studies (e.g., Mugumya, 2013; Anechana *et al.*, 2015) have revealed that Community-Based Management (CBM) in some sub-Saharan African countries including Ghana did not yield the expected results, probably due to issues of transparency and funds. Mugumya (2013, p. 1) stated that, “with increasing indication that CBM is disappointing to carry out its expected results on sustainability and equity of rural water provision projects, particularly in sub-Saharan Africa, it becomes vital that further study on the different settings and context-specific issues impacting on it is carried out”.

This study was to make known the best way to incorporate the Kintampo local community in water management to yield effective results in water provision and management. The community members’ views as well as that of the CWSA will be known which amicable recommendation could be made on how the community members could manage the community-based water system. By so doing, the community members may have sense of ownership of the water system and it would make them take good care of the water facility.

#### **1.4 Research questions**

1. What is the community-based management approach on water accessibility in the Kintampo community?
2. What are the constraints in the execution of the community-based management of water provision in the community?
3. How is the management of the constraints of the community-based management of water provision?
4. What are the best practices for effective community-based management of water provision?

#### **1.5 Main objective**

To assess the impact of community-based management approach on water accessibility in Kintampo community

#### **1.6 Specific objectives**

- a) To identify the community-based management approach on water accessibility in the community.
- b) To identify the constraints in the implementation of the community-based management of water supply in the community.
- c) To identify the ways to manage the constraints of the community-based management of water supply
- d) To identify the best practices for effective community-based management of water supply.



## 1.7 Theoretical/conceptual framework

The theoretical framework of this study centres on stakeholder participation and decentralization theory (Figure 1.1). Stakeholder participation implies the involvement of stakeholders in the policy-making and decision-making processes. The overall contention is that stakeholder involvement may contribute inputs into the decision-making or implementation process (Soneryd, 2004; Rowe and Frewer, 2005; Reed, 2008) and; sharing in the cost/benefit outcomes (Blackburn *et al.*, 2002).

Nonetheless, the decentralization process requests that decision-making is handed to the people at the grassroots. Decentralization is of importance to the process of stakeholder participation. Stakeholder participation is expected to lead to democracy and good governance. Effective participation in development processes increases the chances of having democratic outcomes and ensuring equity (Reed, 2008), empowering marginalised groups and raising the legitimacy of policies and outcomes (Dougill *et al.*, 2006). Stakeholder participation and decentralisation are interrelated and their prospective outputs have an effect on the success or otherwise of stakeholder participation.

Stakeholder participation is influenced by theories underlining collective action such as the rational choice theory, which agrees that individuals will calculate the probable costs and benefits of any action before agreeing on what to do. The expected aftermath will influence the decision to participate or not. There are different outcomes that are anticipated from alternative courses of action and individuals will assess and choose that which is best for them (Scott, 2000; Heikkila and Gerlak, 2005). Yet the mutual incentive theory developed by Simmons and Birchall (2005) proposes that incentive



structures in the form of economic and socio-psychological rewards in addition to losses are essential for members to choose sensibly.

Participation can also be informed by the group action theory. This is said to be stimulated by social identity theory (Rowley and Moldoveanu, 2003) and common interest (Olson, 1971). Traditionally, water is taken as a common good and of common interest. This is inspired by the idea that stakeholders have interests, and they are probable to organise to protect or improve those interests if there is a sense of urgency attached to their interests (Rowley and Moldoveanu, 2003). For this study, the stakeholders include community members, Chief and Elders, Water User Association, and Community Water and Sanitation Agency.

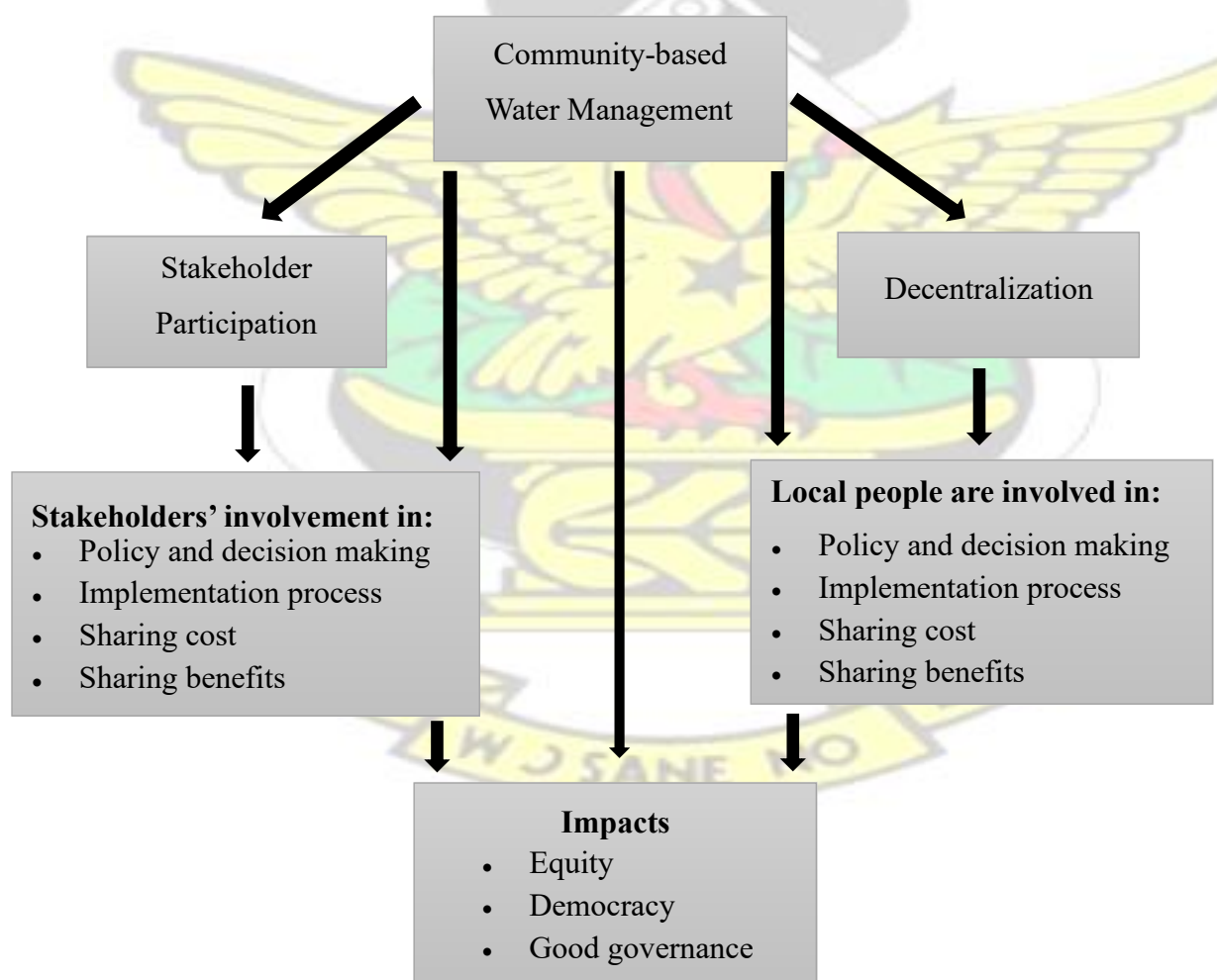
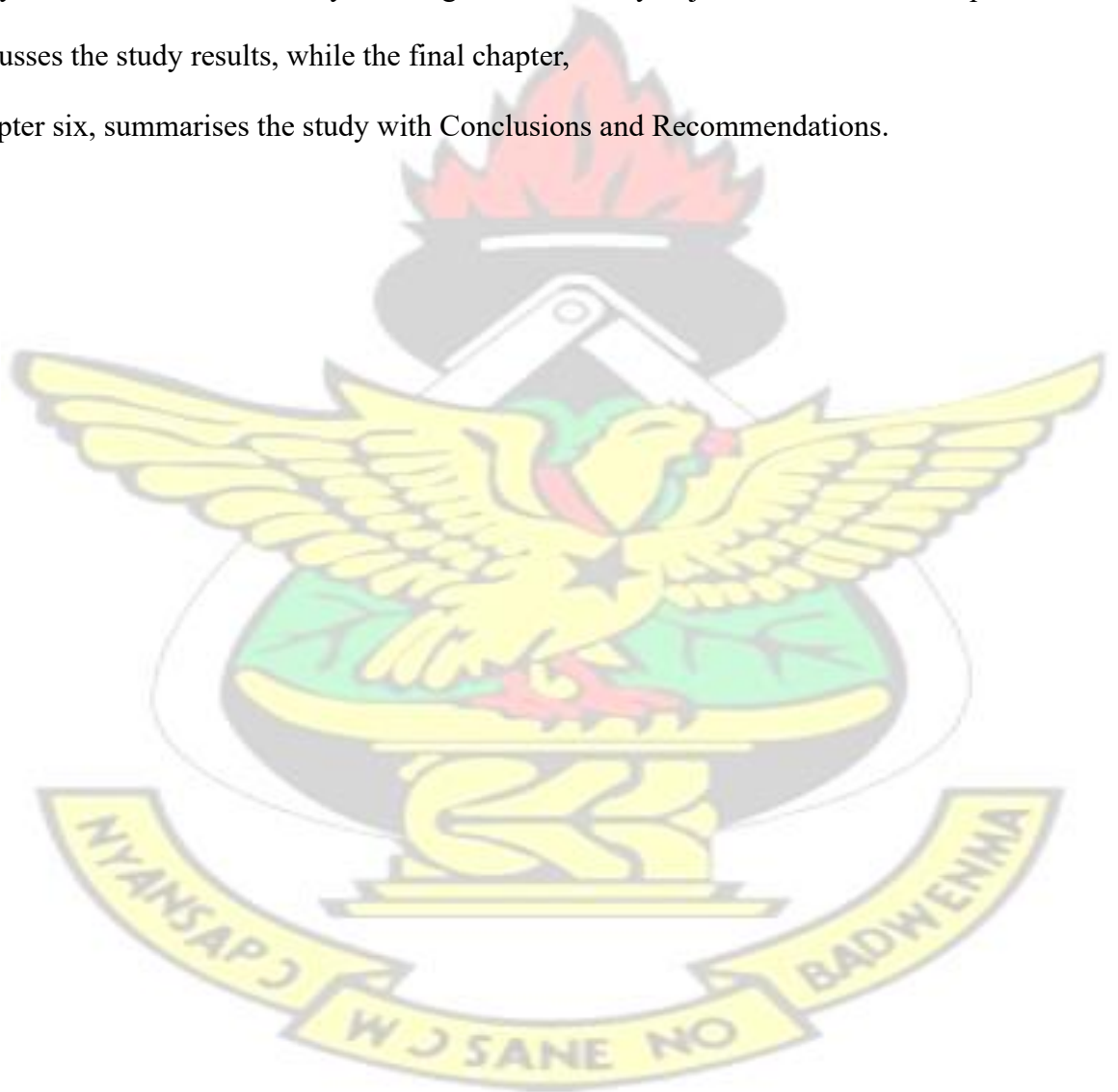


Figure 1.1: Theoretical framework of the study (Source: Author's own construct)

## **1.8 Organisation of the study**

The research is structured into six chapters. Chapter one presents the Introduction; study background, problem statement, justification of the research and the study objectives. Chapter two reviews related study on community-based water management. The Chapter three presents how the research was carried out. It deals with the study area, research design, population, sampling technique and data analysis. The Chapter four analyses the results of the study with regard to the study objectives. The fifth Chapter discusses the study results, while the final chapter, Chapter six, summarises the study with Conclusions and Recommendations.



## **CHAPTER TWO**

## LITERATURE REVIEW

### 2.1 Community water supply

In Ghana, the first public water provision was launched in Accra in 1948, the Department of Rural Water Development was formed to undertake the management and development of rural water delivery through construction of wells and boreholes drilling for rural people (GWCL, 1957). Awuah *et al.* (2009, p. 43) stated that, in 1998, data collected by Ghana Water Company Limited (GWCL) and CWSA, as part of their strategic investment plans, revealed that 70% of the urban populace and 30% of the rural had accessibility to safe and portable drinking water. This data reveals that majority of people from the rural areas in Ghana have no accessibility to adequate safe water, hence, they resort to unsafe sources thereby exposing them to waterborne diseases including diarrhea. Some of the unsafe sources include rivers (most of which are polluted by artisanal mining), wells and lakes.

According to GWCL, in 2008, the urban supply coverage was nearly 60% and from the service supplier, coverage revealed a constant drop from the 1970s to the 1990s and only started to improve again in 2007 (WSP, 2011). CWSA also indicated that rural water coverage has improved at encouraging rates from about 30% (in 1990) to nearly 60% (in 2008), nonetheless, speeding up is still essential to meet the sector MDG+ mark of 76% (WSP, 2011). The government of Ghana decided to restructure the sector since the estimated rural water supply coverage is much lower and this has brought about the formation of various institutions including CWSA (CWSA, 2008).

These institutions were established in a quest to enhance water delivery in rural communities.

## **2.2 Stakeholder communities in water management**

Communities play a vital role towards sustainable water provision management. Involvement of stakeholder communities in water management can occur in two different forms. The first is approach is whereby communities are privileged with the rights to participate in management. This is where, the State officials designated for water management collaborates with representatives of the community to manage the water supply system. Hence authority is shared between the State and the community. Views and opinions of the community are presented by the community representatives during decision making concerning the water. Water decisions and policies are developed through negotiations between the state officials and the community representatives. Therefore, decisions that are made are socially acceptable, sustainable and implementable. Fleming (1991) explained that participation underlines the communities' decision-making role and aids to enhance the design of strategies which signify the conditions and necessities of the community. The second approach of community in water management is whereby ownership of the water provision scheme management is giving to the community. Authority is transferred to the community to manage its water supply. Decisions concerning the water management are made by the community without the influence of the State although the State can offer the community technical advice and help develops their management skills through capacity building. This approach is also known as Community-based water management.

## **2.3 The Concept of Community-Based Water Management**

According to Maganga and Butterworth (2002), water was acknowledged as a public good and the governments embarked on to cover all investment capital costs in many



countries. Therefore, as a result of its economical classification (water as a public good) most of these investments were done by the government and in some occasions, helped by foreign donors. Management of these water systems was also done by public officials from these governments. Most of these investments by governments were not sustainable and many schemes fell into bad condition hence, there was the necessity to include communities in management of these water systems (Fielmua, 2011).

Evidence amassing indicates that well supported communities have the willingness and capacity to oversee their own water schemes (Evans and Appleton, 1993). This is because, they are primary stakeholders hence, and they are most affected by the decisions and management of these water systems. WHO (1996) reported that in community-based water management, water delivery services beneficiaries have control, authority and duty over their services development. This denotes that, communities who are the primary stakeholders of the water supply management are given the chance to own and manage their water delivery schemes. Hence individuals from the community are elected as representatives who manage and control the water supply system on behalf of the community and are also held accountable for the governance of the water system. It denotes a shift of ownership from government to the local people or communities. Fielmua (2011) indicated that responsibility suggests that the people takes possession of the water scheme, with all its associated liabilities/benefits and duties while authority denotes that the people has the legitimate right to make decision regarding the scheme and control denotes that the community people has the supremacy to execute the decisions concerning the scheme.



Lockwood (2004) elaborated that, the basic principles on the concept of Communitybased water management are that, the people that get benefit from an enhanced water provision should have a key responsibility in its progress, own up the water operation service, and have total control for its upkeep and operation. Lockwood (2004) also indicated that, this is done through community water committee creation in charge of regulating and collecting water tariffs, managing the scheme, and repair activities. There are four basic categories of objectives of community-based water management and these are overlapping. They include; strengthening local government, sustainability and effectiveness, enhancing efficiency, building organizational capacity, and empowerment (Slaymaker and Christiansen, 2005). Empowerment is basically the transfer of ownership over the management of the water supply from the State to the communities. Building of organizational capacity is where the State or non-governmental bodies help to develop the management skills of the community. Improving efficiency, effectiveness is community access to a sustainable water supply. Strengthening of local government is where the institutional structures of local authorities who govern these community water supply systems are firmly established.

#### **2.4 Impact of Community-Based Water Management (CBWM)**

Carter and Howsam (1999) indicated that, the desirable objectives of Water and Sanitation Programs (Community-based) in emerging nations involve environmental protection, provision of privacy, health improvement, and time saving. Isham and Kähkönen (1999) explained that, results from community-based water management revealed access to a potable water delivery, that is, regular and dramatic improvements in household health. WaterAid (2003) draws the following conclusions from its research concerning the impact of Community-based approaches to water and sanitation

(Roberts *et al.* 2005): (i) effective management and technical quality and operating water systems; (ii) significant and positive environmental impacts; (iii) benefits for children and women; (iv) education attendance and improved livelihoods and (v) assistance for community people which have improved their capacity to sustain both hygiene behavior changes and supply systems. Pond and Pedley (2001) indicated that improved access to adequate water by community water management can have a significant effect on health, participation and successful completion of formal or informal education, economic productivity, and poverty reduction. Objectively, the impact of community-based water management can be seen in two dimensions, which includes potable water security and health improvement.

#### **2.4.1 Potable water security**

The primary objective of community-based approach of water management is to improve access to water supply. According to Isham and Kähkönen (1999), households in Central Java, Indonesia were very satisfied with water supply through the community management approach. Osumanu (2010) explained that, in a quest to enhanced sanitation and improve accessibility to ample water provision in urban centres of Ghana; communities should be privileged to take part in its water systems management. Fielmua (2011) did a study on community ownership role and management approach towards sustainable accessibility to water delivery in Ghana, Nadowli District. Findings of his work revealed that management approach and community ownership has enhanced accessibility to safe drinking water in Nadowli community. Therefore, this reveals that management of community water can be improved household access to sustainable water provision. Due to the fact that the communities are the most affected

by the management decisions concerning the water supply, the communities will do better in managing of the water provided they have strong institutional framework.

#### **2.4.2 Health improvement**

Most waterborne diseases result in diarrhea, which continues to be a leading cause of illness and mortality worldwide (Deal, 2011). The diarrheal disease is liable for the probable deaths about 5000 children each day (WHO, 2005). According to WHO (2005) data, approximately 10% of the worldwide disease would be removed by the sustainable water supply, management of water resources, sanitation, and hygiene (Pruss- Ustun *et al.*, 2008). Hutton and Haller (2204) explained that even though oral rehydration therapy has resulted in declines in mortality, there is the necessity for affordable hygiene, sanitation and water programs for the one billion people who do not have accessibility to enhanced drinking water. DeWilde *et al.* (2008) indicated that community-based water management are being endorsed as profitable approach that will aid decrease the burden of illness caused by the consumption of unsafe water.

#### **2.5 Challenges of Community-based water management**

Previous studies (Wade, 1987; Ostrom, 1990; Lejano and Fernandez, 2014) have revealed that community-based management process can be elusive and complex. This could be attributed to factors including transparency and accountability, funds for maintenance, building of harmony in the diverse opinions of the community towards making of decision and who is giving power, authority and responsibility to manage and control the water supply system in the community. Carter and Howsam (1999) indicated that, in developing countries, many community-based water and sanitation programs have not remained sustainable over time. Acheampong (2007) also explained

that, there are serious limits to contemporary strategies to community management since community water provision sustainability levels remain low all over developing countries. Kamoto *et al.* (2013) revealed that inadequately developed and executed community-based resource management strategies can cause more destruction in resources management.

Limitations of community-based water resource management may include (1) inequalities in knowledge, power and wealth since communities may not always represent a homogenous group; (2) Watsan practitioners may impose unrealistic targets on communities; and (3) communities might have their traditional hierarchal structures which may contradict the views of best practice by the watsan practitioners and the latter might impose their own external views on communities. A survey conducted by Nyarko (2007) in some communities in Zambia, Uganda, Kenya and Ghana indicated the following as some of the reasons; lack of continuity, mistrust, low income levels of rural communities, absence or inadequate institutional support and the problem of „communal ownership“ of water scheme.

Carter and Howsam (1999) explained that the causes of non-sustainability in the operations of community-based water management include (1) benefits promised at the onset of the implementation of the projects have failed to materialize; (2) community people may not have a sense of ownership of the new project, and Governments may have been lack funds hence, maintenance and repairs may not take place; (3) the monetary costs which community people are likely to raise as a payment to recurrent expenditures may be unaffordable; (4) communities may never have been certain of the desirability of new water sources; (5) trained people may have moved away where full



community involvement has been planned in from the onset or caretakers and community-level committees may have lost interest; (6) behavioural change and community education expected to be accomplished by it, take a long time to yield results, and yet it usually ceases ahead of time. Osumanu (2010) indicated that challenges associated with community-based water and sanitation management include; (1) communities unwillingness to effectively take part in sanitation and water services; (2) generally, community labor is inexpert and will have little experience of installing water and sanitation systems; (3) absence of ready accessibility of community people to institutional finance; (4) formal service providers and public authorities do not have the will or capacity to communicate directly with user communities. According to the report of the workshop by AGUASAN (2008), community-based management of water limitations includes; (1) difficulty in developing a tactical vision for network extension; (2) propensity to lessen expenditures instead of increase revenue from water; (3) inadequate expertise to technically operate complex equipment; (4) if participants get no benefit from their participation, the motivation is lost.

## **2.6 Effective Management Practices**

Effective Management Practices are measures that are adopted for the maintenance and operation of the community water sector. These are also best practices that are deployed to manage constraints or implementation challenges of the communitybased management approach. Wood (1994) indicated the following as the improved approaches in community water management systems including; (1) offering training, maintenance and operation duty to the community; (2) making sure democratically chosen decision-making duty amongst the community for running of the water supply system; (3) Setting of moderate tariff system and maintaining an effective financial




record; (4) clean maintenance of water points; (5) providing communities with access to NGOs. According to Nyarko (2007), a good performing water supply sector should fulfill the following stipulations; equity considerations, effectiveness, efficiency, good governance and sustainability.

Acheampong (2009) explained that best practices concerning effective management model should include the following; (1) research programs should be incorporated into water management models in order to generate innovative approaches to keep abreast with technology; (2) water user committees should be legalized so that laws and regulations can be enforced; (3) an independent regulatory body should be established to control and monitor the actions and events of both private and public sectors; (4) local capacities should be built by using a participatory research appraisal technique in order to ensure internal reliance; (5) observation of equity considerations and measures to protect marginalized groups must be developed in any contracts between government and the private operations; and (6) management contracts branded by performance-based payment with punishments for nonperformance must be adopted.

## **2.7 Sustainable measures for CBWM**

Sustainability in water management is with reference to permanent benefits attained through the continuous enjoyment of water supply services (WaterAid, 2011). Unlike the effective management practices, these are long term maintenance development plans implemented to manage the community water system. The National Water Policy (2002) of Tanzania identifies the following seven fundamentals for sustainable rural water supply (Haysom, 2006); (i) women recognitions as crucial participants; (ii) service and technology level compatibility with the beneficiaries capacity; (iii) water sources protection; (iv) availability of know-how and spare parts (v) community people

attaining full cost recovery for maintenance and operation of the system, in addition to replacements and; (vi) community members owning and running their systems. According to WaterAid (2011), the general requirements needed to ensure sustainability in Water, sanitation and hygiene (WASH) are as follows; (1) there must be tangible call from users which is shown in the consistent usage of enhanced sanitation and water services and the practice of enhanced hygiene activities; (2) there must be sufficient revenue to cover periodic costs, with correct bill structures that considers the most marginalized groups in the community; (3) there must be an operational managing and maintenance scheme; (4) there must be an effective external help to community level institutions; and (5) due attention must be giving to the environmental and natural resource facets of the scheme.

The logo of KNUST (Kenya National University of Science and Technology) is a large, faint watermark in the background. It features a yellow eagle with spread wings, perched on a green shield with a white cross. Above the eagle is a red torch. The entire emblem is set against a white background with a yellow border.

## **CHAPTER THREE**

### **METHODOLOGY**

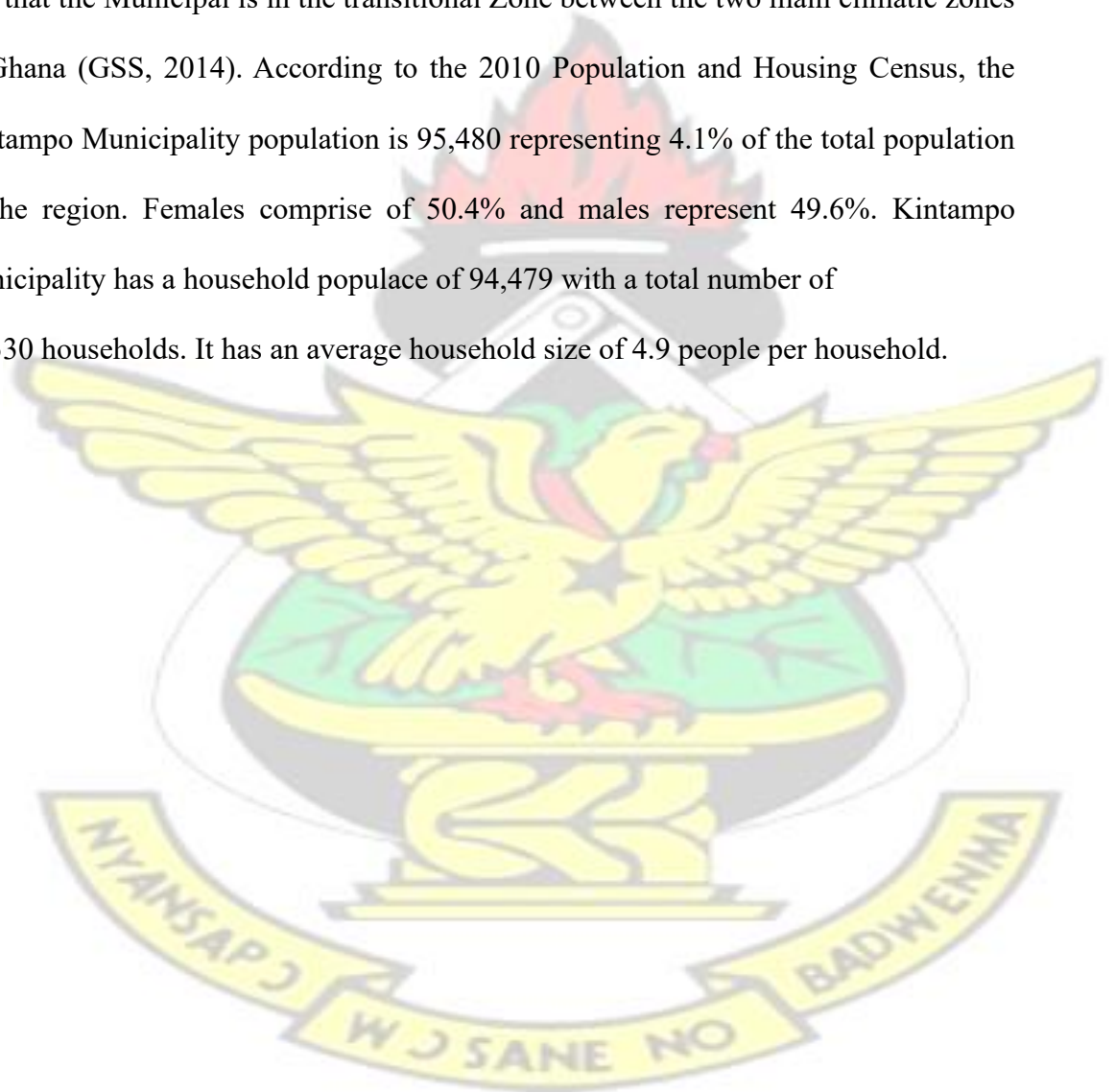
#### **3.1 Introduction**

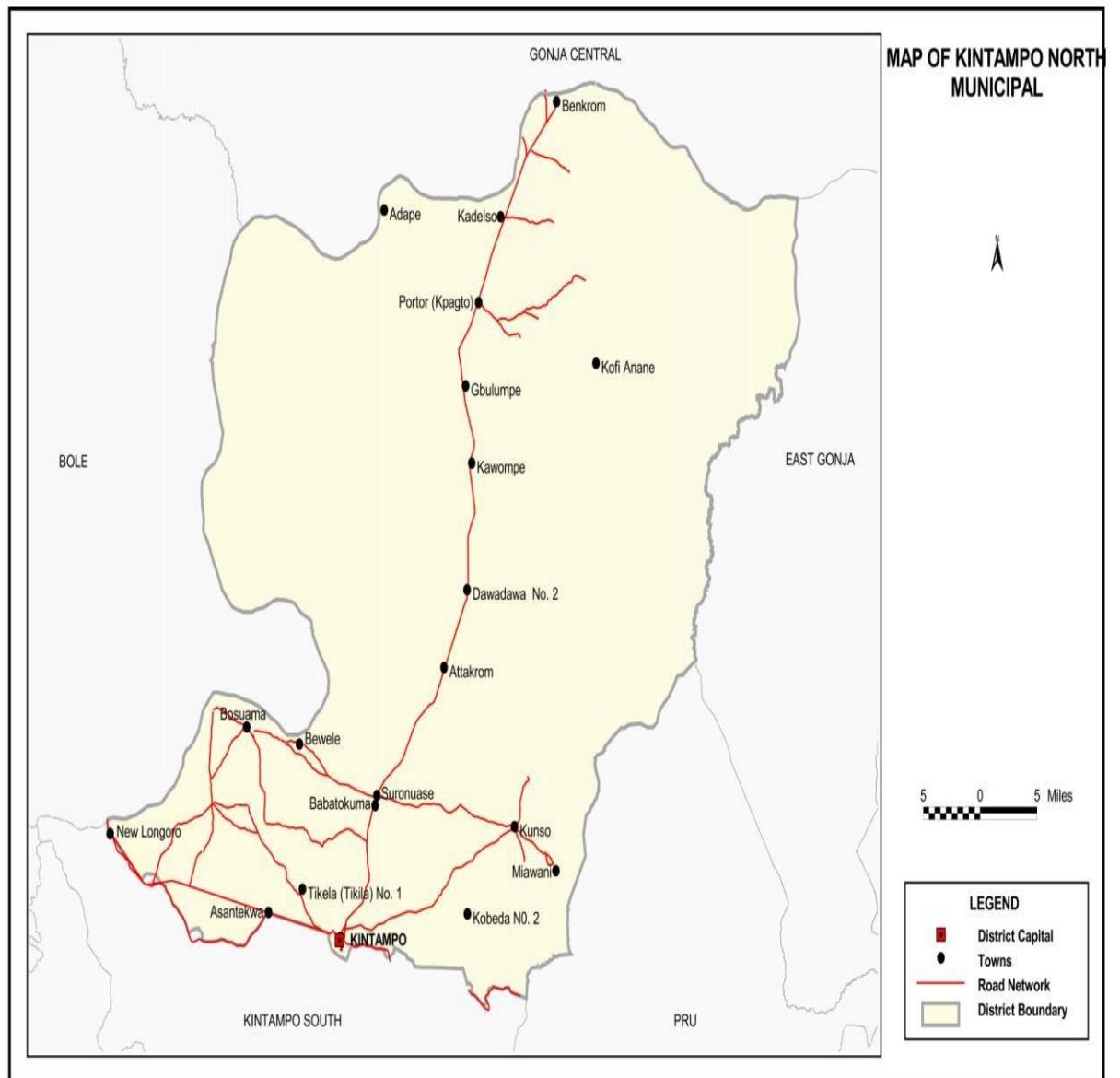
This Chapter outlines the general design of the research. It specifies the study area, the research design, data sources and types and the employed instruments for data collection. It further presents how the data was processed and analyzed.

#### **3.2 Study area**

The research was carried out in Kintampo, the Municipal capital of Kintampo North.

It has a surface area of approximately 5,108km<sup>2</sup> and positioned between Longitudes 1°20'W and 2°1'E and Latitudes 8°45'N and 7°45'N (GSS, 2014). It is strategically situated at the center of Ghana and serves as a transit point between the Southern and Northern Sectors of the nation. The Municipality experiences the Interior Savannah or Tropical Continental kind of climate, which is a modified form of the Wet-Semi Equatorial and the Tropical Continental kind of climate which is largely because of the fact that the Municipality is in the transitional Zone between the two main climatic zones in Ghana (GSS, 2014). According to the 2010 Population and Housing Census, the Kintampo Municipality population is 95,480 representing 4.1% of the total population of the region. Females comprise of 50.4% and males represent 49.6%. Kintampo municipality has a household populace of 94,479 with a total number of 19,330 households. It has an average household size of 4.9 people per household.





**Figure 3.1:** Map of the Kintampo Municipal Township showing the study areas (GSS, 2014)

### 3.3 The Research Design

The research was carried out using a survey (both questionnaires and interviews) with a mixed method approach (both quantitative and qualitative). The mixed method research involves the researcher using the qualitative research paradigm for one phase



of a research and the quantitative research paradigm for another phase of the research (Harwell, 2011). For this study, qualitative data was generated supplemented with quantitative information to allow for statistical analysis. A pre-test was done with 20 respondents to identify whether respondents understood the questions. Questions which were seemingly difficult to understand were reconstructed. Other information obtained during the pre-test was employed to refine the questionnaire. The questionnaire was structured around the objective of the study. Respondents were assured of confidentiality and that their responses were for academic purpose.

### **3.4 Sample selection**

Basically, there are eleven suburbs in the town namely; Sunkwa, Sawaba, Moleline, Kyremakoma, Brigade, Hill top, Kaneawope, Nwaase, Dwenewoho, K line, MPS and Baamrem respectively. Simple random sampling was used to select six communities. Individual household heads were selected by systematic sampling. Yamane (1967) formula was used to generate the sample size (n):

$$n = N / 1 + N(e)^2$$

Where n = sample size required, N =  
number of people in the population e =  
allowable error

A sample size of 166 respondents was used in the data collection. There were 150 community members with twenty-five (25) respondents from each of the six suburbs.

Eight (8) key informants were purposively sampled from the Community Water and Sanitation (Kintampo town) and eight (8) from the Water User Association.

### 3.5 Sources of Data

- Primary source of data was collected from the field through administration of questionnaires, focus group discussions, in-depth interviews and key informant interviews.
- Secondary source of data was obtained from articles, internet and unpublished works related to the study.

### 3.6 Data collection

Different methods were used to complement each other to generate data from both primary and secondary data sources. Both open-ended and close-ended questions were used to solicit responses from study participants. The open-ended question was used to solicit additional information from respondents by giving them the chance to explain themselves. Close-ended questions were also used to get definite answers from respondents. This forced respondent to take a position and encouraged a short or single-word answer. The significance of the study was explained to the respondents in order to gain their trust and also to obtain reliable responses. The interviewer entered the selected house and asked for the household head. The interview was conducted provided the respondent was willing to be interviewed. A situation where the household head was not present, the next individual at the helm was asked to take part in the study and where the person refused to respond to the interview, the interviewer moved to the next house.

### **3.7 Data Processing and Analysis**

Qualitative data was analyzed descriptively. It included manual editing, data cleaning and consistency checking. Quantitative data was analyzed manually. Thus, information obtained from close-ended and open-ended questions were coded to make them appropriate for analyses using Statistical Package for Social Sciences (SPSS) version 21 and presented in Tables. Frequencies, means and percentages were used while the data was presented in Tables and Graphs.

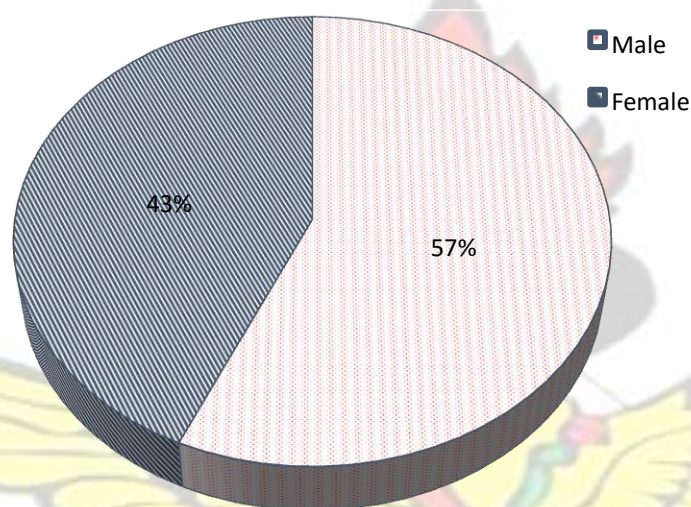


## **CHAPTER FOUR**

## RESULTS

### 4.1 Demographic characteristics of respondents

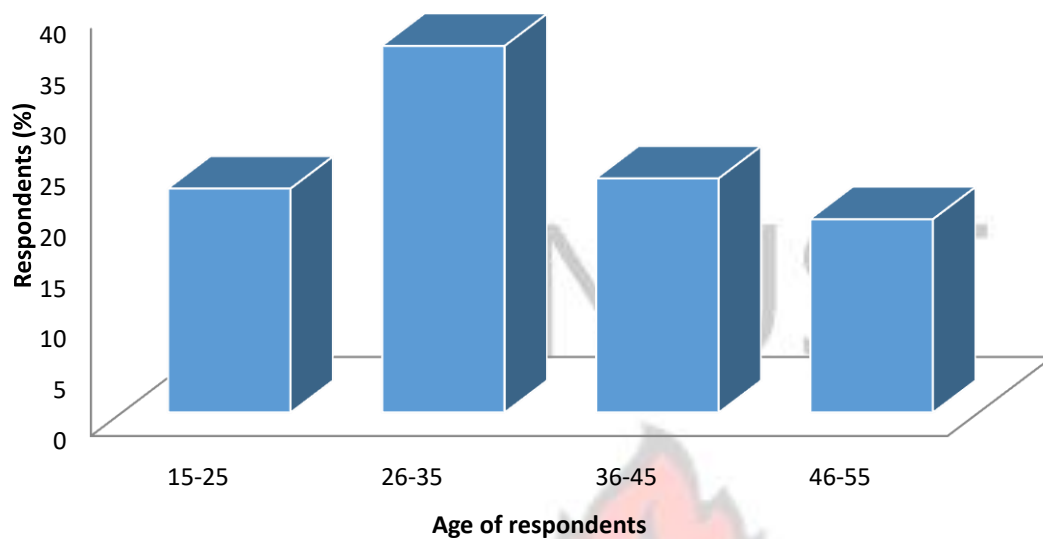
The demographic data collected included sex, age, education and occupation of the respondents. The gender distribution of respondents from the study population was 56.7% males and 43.3% females (Figure 4.1). This gives an indication that majority of the respondents were males.



**Figure 4.1:** Gender of respondents in Kintampo

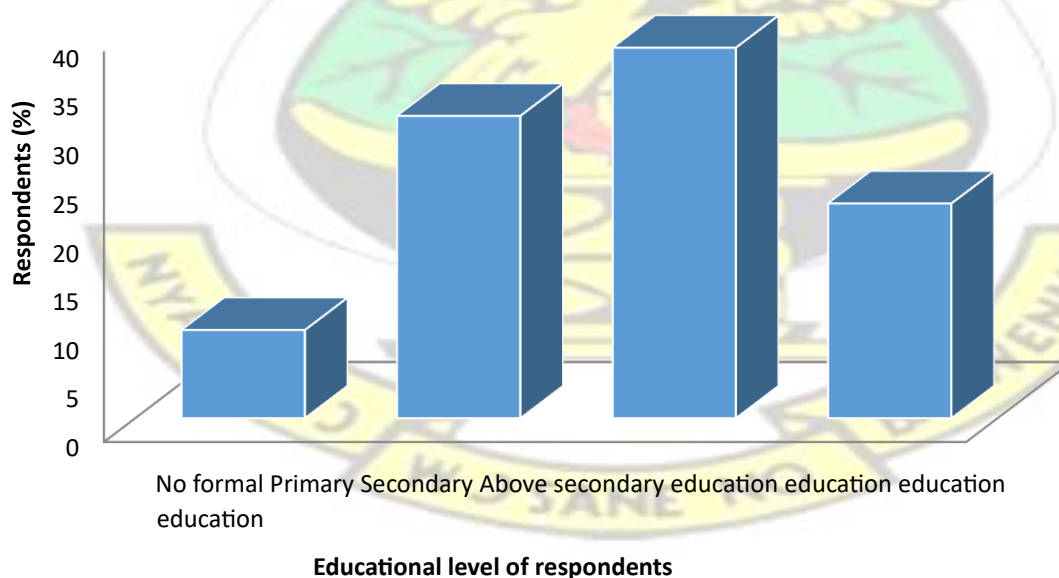
Most of the respondents (i.e., 35.3%) were within the age range of 26 to 35 years. Respondents above 46 years were the least who made up of 19.2% (Figure 4.2).





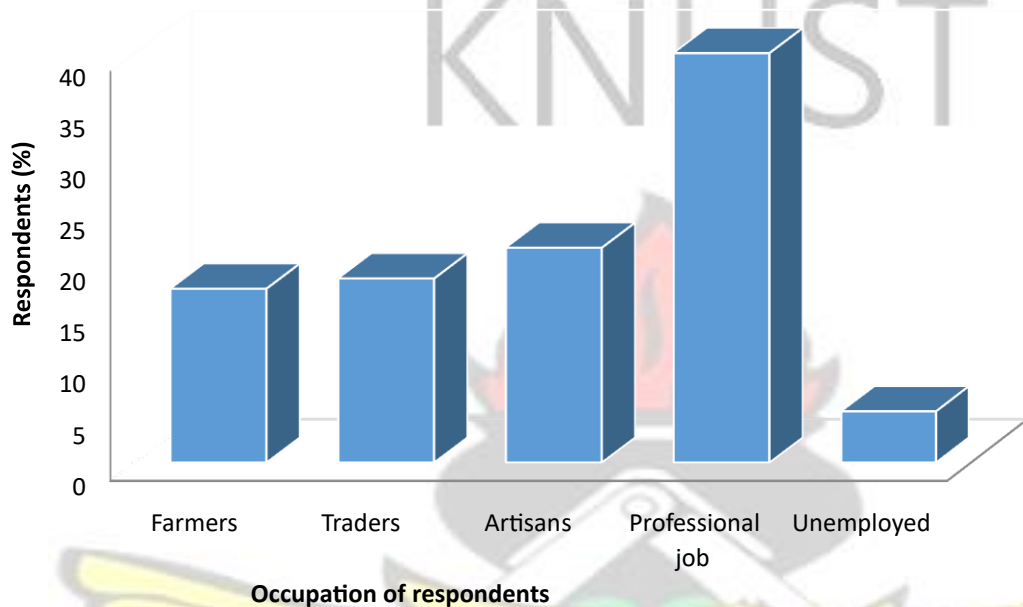
**Figure 4.2:** Age of respondents in Kintampo

In terms of educational level, respondents who had attained Senior High School Education constituted the majority (i.e., 38.3%). Relatively, few respondents (9%) had never been to school (Figure 4.3).



**Figure 4.3:** Educational level of respondents in Kintampo

The sampled respondents showed that 39.8% were professionals or render some professional services. This included nurses, doctors, teachers, Water Managers, and Police Officers. The unemployed were the least (i.e., 5%), among the respondents (Figure 4.4).



**Figure 4.4:** Occupation of respondents in Kintampo

#### **4.2 The community-based water management approach on water accessibility**

The sources of water for the respondents revealed that 92 of them (i.e., 61.3%) rely on pipe-borne water, while 58 respondents (i.e., 38.7%) depend on water from borehole. The study further sought to identify the functionality of water points in the area. There are 38 water points (22 taps and 16 boreholes) in the six suburbs but not all of them are operational. Out of the 22 taps, only 2 of them are non-functional, while 10 out of the 16 boreholes are functional (Table 4.1). The study revealed that most of the operational water points are less than five years.

**Table 4.1: Water points in Kintampo**

| Suburb    | No. of water points | Type of water point | Functional   |      | Non-functional |      |
|-----------|---------------------|---------------------|--------------|------|----------------|------|
|           |                     |                     | Number       | (%)  | Number         | (%)  |
| Sunkwa    | 6                   | 4 Taps              | 4 taps       | 100  | No tap         | 0    |
|           |                     | 2 Borehole          | 1 borehole   | 50   | 1 borehole     | 50   |
| Sawaba    | 8                   | 5 Taps              | 4 taps       | 80   | 1 tap          | 20   |
|           |                     | 3 Borehole          | 1 borehole   | 33.3 | 2 boreholes    | 66.7 |
| Brigade   | 5                   | 3 Taps              | 3 taps       | 100  | No tap         | 0    |
|           |                     | 2 Borehole          | 1 borehole   | 50   | 1 borehole     | 50   |
| Dwenewoho | 3                   | 1 Tap               | 1 tap        | 100  | No tap         | 0    |
|           |                     | 2 Borehole          | 2 boreholes  | 100  | No borehole    | 0    |
| K line    | 9                   | 6 Tap               | 6 taps       | 100  | No tap         | 0    |
|           |                     | 3 Borehole          | 2 boreholes  | 66.7 | 1 borehole     | 33.3 |
| Moleline  | 7                   | 3 Tape              | 2 taps       | 66.7 | 1 tap          | 33.3 |
|           |                     | 4 Borehole          | 3 boreholes  | 75   | 1 borehole     | 25   |
| Total     | 38                  | 22 taps             | 20 taps      | 90.9 | 2 taps         | 9.1  |
|           |                     | 16 boreholes        | 10 boreholes | 62.5 | 6 boreholes    | 37.5 |

Source: Field data, 2018

The study revealed that there is Water Management Committee in charge of community water sanitation. From Table 4.2, the main approaches of the Water

Management Committee are to oversee the day-to-day operation of the facilities (32.2%) and ensure that the facilities are sustainable and functional (32.2%). Few respondents (15.1%) believed that the Water Management Committee prevents any prospects that may lead to total breakdown of the systems. On why there is Water Management Committee but eight out of the 30 water points are not functioning, it was revealed that some of the Committees are not performing well and have collapsed some of the water facilities. As a result, the community members cannot access water throughout the year. They rather rely on water tanks or reservoirs for water supply throughout the year.

**Table 4.2: Approaches of the CWM in running the Community-Based Water**

| <b>Approaches</b>  | <b>Number of respondents</b> | <b>Percent of responses (%)</b> |
|--|------------------------------|---------------------------------|
| Oversee the day-to-day operation of the facilities                     | 150                          | 32.2                            |
| Ensure that the facilities are sustainable and functional              | 150                          | 32.2                            |
| Replace all non-functioning facilities                                 | 95                           | 20.5                            |
| Prevents any prospects that may lead to total breakdown of the systems | 70                           | 15.1                            |
| <b>Total</b>   | <b>465</b>                   | <b>100</b>                      |

Source: Field data, 2018 (Multiple Responses allowed)

The study further revealed that community members are involved in meetings, discussions and contributions as an approach to water management. Most of the respondents (i.e., 38.2%) stressed that they are involved in community meetings



towards water management, availability and accessibility, 30.9% are involved in meetings and discussions (Table 4.3).

**Table 4.3: Community members' approach in community water management**

| Approaches    | Number of responses | Percent of responses (%) |
|---------------|---------------------|--------------------------|
| Meetings      | 130                 | 38.2                     |
| Discussions   | 105                 | 30.9                     |
| Contributions | 105                 | 30.9                     |
| <b>Total</b>  | <b>340</b>          | <b>100</b>               |

Source: Field data, 2018 (Multiple Responses allowed)

Most of respondents interviewed revealed the benefit of community –based water system as time saving (26.9%), while the least number of respondents (10.2%) mentioned environmental protection (Table 4.4). From the study, the community members previously used to fetch water from streams, rivers and wells. This was given them a whole lot of health-related problems. The same wells were the main source of drinking water for animals (mostly cattle). Also, the community-based water system was regarded as time saving and health improvement because on numerous occasions, they would go to streams and wells to fetch water and by the time they got there, the water had been muddied by cattle. When it happened like that, they had no other option than to wait for the water to settle and be clean so that they could fetch some. Moreover, during the dry season, most water bodies dried out and getting access to portable water was really problematic during that period.

**Table 4.4: Benefits of community – based water system**

| Benefits | Number of responses | Percent of responses (%) |
|----------|---------------------|--------------------------|
|----------|---------------------|--------------------------|

|                          |            |            |
|--------------------------|------------|------------|
| Time saving              | 145        | 26.9       |
| Health improvement       | 127        | 23.5       |
| Sustainable water supply | 106        | 19.7       |
| Community empowerment    | 106        | 19.7       |
| Environmental protection | 55         | 10.2       |
| <b>Total</b>             | <b>539</b> | <b>100</b> |

Source: Field data, 2018 (Multiple Responses allowed)

#### **4.3 Constraints in the implementation of the community-based management of water supply**

For successful implementation of any project or program, a number of constraints or obstacles need to be overcome. Thus, constraints in the implementation of the community-based management of water supply were examined. On a multiple response questionnaire, the respondents mentioned that the greatest is funds for maintenance (28.4%), and the least among the obstacles (9.3%) is different interest of community members (Table 4.5).

Communities are most instances required to fund community-based projects. Overreliance on governmental support for operations of the project sometimes leads to project collapse. This is because anytime the Central Government fails to provide funds to the management of the project, the project fails to function effectively. The study revealed that the community members do not have enough funds in running the day to day activities for better water supply, yet whenever anything spoils, they (community) finance it themselves. Running of the project becomes difficult when the community lack the capacity to provide enough funding to carry out operations. The water

management is community based and some community members lack sense of ownership. As a result, their participation and contribution to the facility are at times questionable.

**Table 4.5: Constraints in the implementation of CBWM in Kintampo**

| Constraints  | Number of respondents | Percent of responses (%) |
|--|-----------------------|--------------------------|
| Funds for maintenance                                    | 128                   | 28.4                     |
| Institutional support                                    | 120                   | 26.7                     |
| Reluctance of community to participate in water services | 86                    | 19.1                     |
| Sense of ownership                                       | 74                    | 16.5                     |
| Different interests of community                         | 42                    | 9.3                      |
| <b>Total</b>   | <b>450</b>            | <b>100</b>               |

Source: Field data, 2018 (Multiple Responses allowed)

#### 4.4 Ways to manage the identified constraints

Respondents from the study were asked about ways to deal with the identified constraints. From Table 4.6, the most effective way to manage the identified constraints is community training on operation and maintenance of water system (i.e., 32%), while involvement of women in all aspects of water management (i.e., 9.2%) was adjudged the least way of managing the constraints. These responses above implies that the authorities have to organize workshop or send some of the community members to training centers to learn how to operate, manage and repair the water system facilities. Under this circumstance, whenever there is a system breakage, they would not wait or call for external support but would repair it themselves. This would reduce the financial burden of repairing/replacing the water facilities.

Moreover, the reason why they experience water shortages, more especially during the dry season, is the drying of the water bodies. These water sources must be protected and people must be prevented from working or weeding along water banks. Weeding along water banks exposes the water body to severe heat during the sunny periods, which leads to evaporation and subsequently drying of the water bodies.

**Table 4.6: Ways to deal with the constraints of CBWM**

| Ways to manage identified constraints             | Number of respondents | Percent of responses (%) |
|---|-----------------------|--------------------------|
| Community training on maintenance of water system | 112                   | 32                       |
| Protection of water source                        | 104                   | 29.7                     |
| Total ownership of the water supply facility      | 102                   | 29.1                     |
| Women involvement                                 | 32                    | 9.2                      |
| <b>Total</b>                                      | <b>350</b>            | <b>100</b>               |

Source: Field data, 2018 (Multiple Response allowed)

#### 4.5 Best practices for effective community-based water management

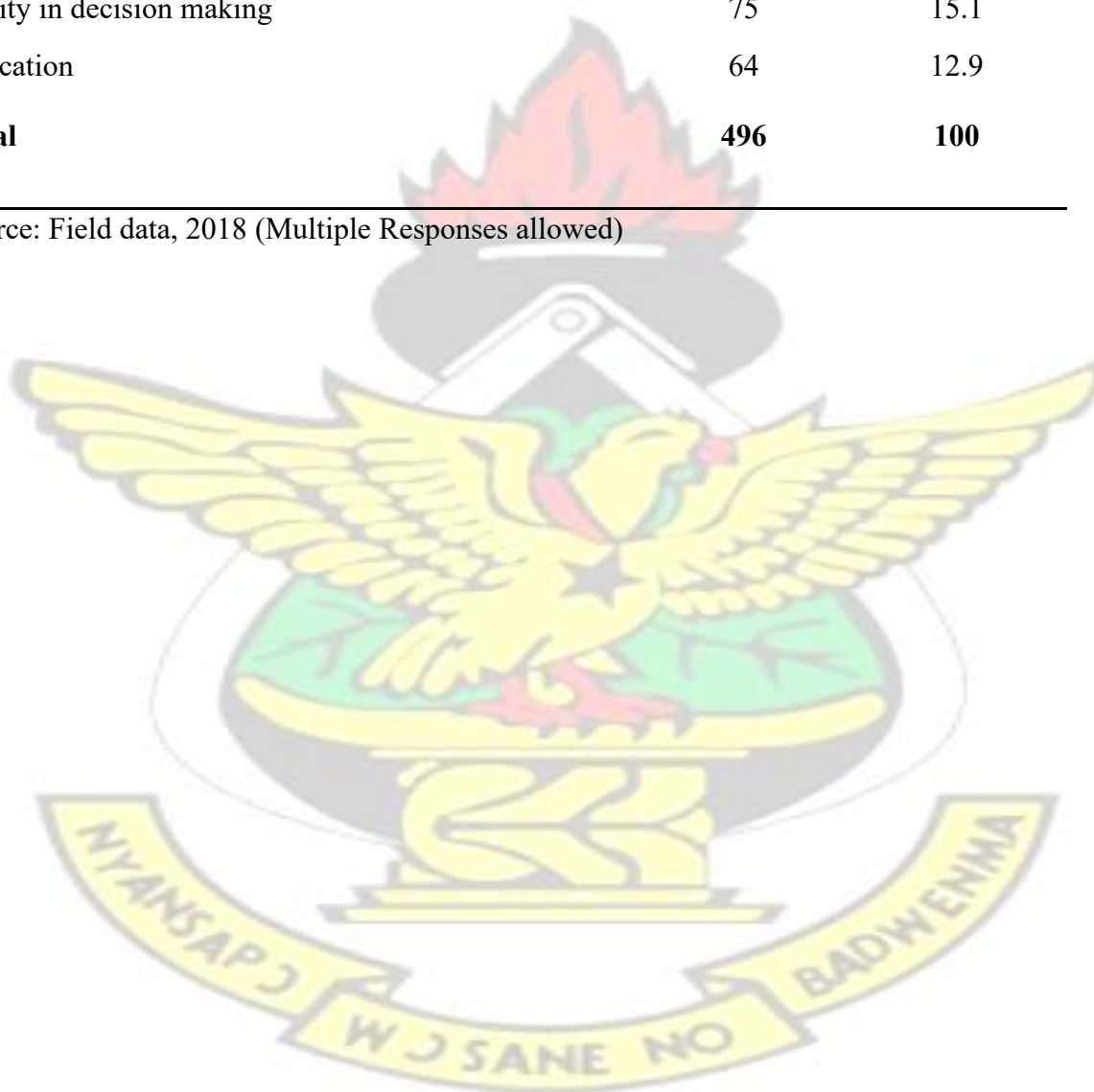
The practices most suitable for management of the community-based water were further revealed. From the study, best practices for effective community-based water management are transparency and accountability of financial records (16.3%), while community education on importance and need to participate in community water management (12.9%) was deemed the least best practice by the community members (Table 4.7).

**Table 4.7: Best practices for effective community-based water supply in Kintampo**



| <b>Best practices for effective community-based water management</b> | <b>Number of respondents</b> | <b>Percent of responses (%)</b> |
|--|------------------------------|---------------------------------|
| Water supply throughout the year                                     | 102                          | 20.6                            |
| Moderate tariffs for maintenance                                     | 98                           | 19.8                            |
| Accountability and transparency of financial records                 | 81                           | 16.3                            |
| Clean maintenance of water system                                    | 76                           | 15.3                            |
| Equity in decision making  | 75                           | 15.1                            |
| Education  | 64                           | 12.9                            |
| <b>Total</b>   | <b>496</b>                   | <b>100</b>                      |

Source: Field data, 2018 (Multiple Responses allowed)



## **CHAPTER FIVE**

### **DISCUSSION**

## **5.1 The community-based water management approach on water accessibility**

### **5.1.1 Sources of water in Kintampo**

The sources of water for the respondents in Kintampo revealed that 92 respondents (i.e., 61.3%) rely on pipe-borne water, while 58 respondents (i.e., 38.7%) rely on water from borehole. In agreement, Sun *et al.* (2010) studied „challenges and opportunities of community - based drinking water supplies in Ghana“, and reported that sources of water in majority of community – based water in their study were pipe borne and borehole. Water is a necessary commodity used domestically for cooking, washing, drinking and bathing. As a result, the source is very important as it can harm or improve lives. In agreement, Pond and Pedley (2001) suggested that improved access to portable water by community water management can have a significant benefit on health. In Ghana, the safest and most common sources of water in urban areas are from borehole and pipe borne. In most places including the study area, streams and rivers are rendered dirty, contaminated, unsafe and unhygienic due to throwing of rubbish and faeces into the water bodies. Likewise, activities of animals (mostly cattle’s) pollute streams and rivers which makes it unhygienic. Hence, it is essential that the study community (Kintampo) uses borehole and pipe-borne water.

### **5.1.2 Duties of the Community Water Management Committee and community members**

The Community Water Management Committee at the study area is capable of managing water accessibility and availability. They oversee day-to-day operation of the facilities (32.2%) and also ensure that the facilities are sustainable and functional (32.2%). They also deal with any prospects that may lead to total breakdown of the systems (15.1%), and to replace all non-functioning facilities (20.5%). Lane (2002)

reported that properly supported communities have the ability and the willingness to manage their own water systems. This is because, they are primary stakeholders, and are most affected by the decisions and management of these water systems. In a related study, Fielmua (2011) worked on „the role of the community ownership and management strategy towards sustainable access to water in Ghana, Nadowli District“. He found out that community ownership and management strategy have improved access to potable water in Nadowli community. This shows that community management of water can improved household access to sustainable water supply. The study community ability to oversee day-to-day operation of the facilities and ensure that the facilities are sustainable and functional implies that when communities are empowered, they can manage their own water system.

The study community is involved in discussions (30.9%), meetings (38.2%) and contributions (30.9%) towards the water supply. This study relates to Isham and Kahkonen (2002) who studied “Institutional determinants of impact of communitybased water services” and reported that communities were involved in management and contributions towards the community-based water deliveries. Community involvement improves access to adequate and portable water supply to households.

Osumanu (2010) explained that, in a quest to improve access to adequate water supply and improved sanitation in urban areas of Ghana, communities should be privileged to participate in the discussions, management and decision making of its water systems. Projects work better if community members contribute to its construction through labour and cash contribution. Community members in Kintampo revealed that their

involvement has improved the water system as community members see the community-based water as their own and responsibility.

### **5.1.3 Benefits of community –based water management**

Moreover, it was revealed from the study that the community-based water management had numerous benefits to the community. From Table 4.4, one of the benefits is time saving (26.9%). The community-based water reduces the distance and time community members will spend to fetch water from streams and rivers. This enables community members to have adequate time to prepare for school and work.

Similarly, Sun *et al.* (2010) indicated that the desirable aims of Water and Sanitation Programs (Community-based) in developing countries involve time saving and provision of privacy which improves people attitudes towards work. Unlike streams and rivers, the community -based water are within the community and this shortens the distance and time community members use to fetch water to their various homes.

In addition, From Table 4.4, it was revealed from the study that the community -based water improves health (23.5%). This is because; the community sources their water from portable pipe borne and borehole. Fetching water from contaminated source has several health implications. The community members no longer fetch water from streams and rivers which are mostly contaminated with rubbish and faeces. With community members’ access to potable water supply, it implies that their health status will be improved. Most waterborne diseases result in diarrhoea, which continues to be a leading cause of illness and mortality worldwide (Deal, 2011). Diarrhoea disease is responsible for the deaths of estimated 4000–6000 children each day (WHO, 2005). According to WHO (2005), approximately 10% of the worldwide disease would be



removed by the sustainable water supply, management of water resources, sanitation, and hygiene (Pruss- Ustun *et al.* 2008). Hutton and Haller (2004) explained that although oral rehydration therapy has led to reductions in mortality, there is the need for affordable water, sanitation and hygiene programs for the 1.1 billion people who lack access to improved drinking water. DeWilde *et al.* (2008) indicated that community-based water management are being endorsed as cost-effective approach that would help reduce the burden of illness caused by the consumption of unsafe water.

Furthermore, the study revealed (Table 4.4) that community-based water results in water sustainability (19.7%). Similarly, Katz and Sara (1997) studying „water system performance in six countries (Uganda, Pakistan, Indonesia, Honduras, Bolivia, and Benin)“ revealed that community-based water substantially increases sustainability. Water sustainability implies that the Kintampo community would likely have continuous water supply. Unlike streams, wells and rivers that dry out during the dry season, most boreholes and pipe borne are able to provide water throughout the year.

From the study (Table 4.4), community empowerment (19.7%) and environmental protection (10.2%) was stated among the benefits of community-based water. Isham and Kähkönen (1999) studied “what determines the effectiveness of community based water projects” and reported that community-based water management empowers community members. In agreement, WaterAid, 2003 draws the following conclusions as the benefits of community-based approaches to water and sanitation (Roberts *et al.*, 2005): (1) improved livelihoods (2) positive and significant environmental protection; and (3) support for communities which have increased their ability to sustain both supply systems and hygiene behavior changes. The community – based water

management in Kintampo empowers the community members through inclusion of the community members in the management of the water system. This enables the community members to participate and contributes to the effectiveness of the water system (Table 4.4). By so doing, it empowers the community.

## **5.2 Constraints in the implementation of the community-based management of water supply in the community**

The constraints encountered in the community-based management of water supply include funds for maintenance (28.4%), sense of ownership (16.5%), institutional support (26.7%) and community members' reluctance to effectively participate in water services (19.1%). These findings relate to previous studies by Osumanu (2010), Fielmua (2011), Lejano and Fernandez (2014), which have shown that community-based management process can be complex and elusive. This could be attributed to factors including transparency and accountability, funds for maintenance, and building of harmony in the diverse opinions of the community towards making of decision. A survey conducted by Nyarko (2007) in some communities in Ghana, Kenya, Uganda and Zambia indicated lack of continuity, mistrust, lack of institutional support, and problem of communal ownership of water system as some of the limitations. Similar findings were found as some of the study respondents funds for maintenance (28.4%), sense of ownership (16.5%), institutional support (26.7%) and community members' reluctance to effectively participate in water services (19.1%). as the main constraints in the water management. In addition, Carter and Howsam (1999) similarly indicated that, in developing countries, many community-based water and sanitation programs have not remained sustainable over time due to lack of sense of ownership, lack of funds for maintenance and lack of institutional support.

These constraints have the prospect to derail the water management system. The constraints encountered in the study area as stated in Table 4.5 (e.g., funds for maintenance, sense of ownership, institutional support, and community members' reluctance to effectively participate in water services) can be attributed to inadequate education on the importance and the need to take care and contribute (financially) to the community – based water (Achemapong *et al.*, 2016). As most of the expenses of the community – based water are funded locally with limited support from the central government, financial demands and budgets for the water system should be moderate to enable the community members to pay. This is crucial as 128 (28.4%) and 120 (26.7%) respondents respectively cited funds for maintenance and lack of institutional support as the main constraints facing the water management system.

### **5.3 Ways to manage the identified constraints**

The study revealed that (Table 4.6) one way to manage the identified constraints include training of community members (32%) in maintenance and operation of the water facilities. This would enable them to repair the water system when the need arose. This relates to Newman *et al.* (2002) who highlighted that training community members on managing user fees, repairing water tubes and cleaning water tanks were crucial for water quality improvement, as community members were able to repair water system on their own whenever there was a system failure. Baur and Woodhouse (2004) mentioned that training community members helps to effectively manage community - based water system. Training community members on the water system means that they will have the requisite skill to operate on the water system when it becomes necessary. As a result, community members will not wait for the central government to come to

their aid when there is a system breakdown. This will reduce the financial burden of repairing/replacing the water facilities. Meanwhile, the respondents stressed that they are not trained to repair their water facilities.

Total control and ownership of the water facilities by the community (29.1%) offers another way to deal with the stated constraints (Table 4.6). As a result of the fact that the communities are the most affected by the management decisions concerning the water supply, the communities will do better in managing the water provided they have strong institutional framework. According to Sun *et al.* (2010), the beneficiaries of water supply services have responsibility, authority and control over the development of their services. Fielmua (2011) indicated that responsibility implies that the community takes ownership of the system, with all its attendant obligations and benefits/liabilities whilst authority indicates that the community has the legitimate right to make decision about the system, and control implies that the community has the power to implement the decisions regarding the system. This implies that the community who is the primary stakeholders of the water supply management is given the opportunity to own and manage their own water supply schemes. The study revealed that the community members also think that full control and ownership will help improve the management of the water system. This denotes a shift of ownership from government to the local people or communities. Similarly, Lockwood (2004) elaborated that, the basic principles on the concept of community-based water management are that the community that benefits from an improved water supply should have a major responsibility in its development, own the water operation facility, and have overall control for its operation and maintenance. This can be done through the formation of a Community Water Committee that is responsible for operating the system, setting and



collecting water tariffs, and managing maintenance and repair activities. At the study area, the community members are involved in meetings, decision making and contributions towards the maintenance of the water facility, but they have not been given total control and ownership of the water facility, as they are deemed incapable of wholly managing the water facility.

Additionally, it was revealed in Table 4.6 that to manage the constraints, water sources must be protected (29.7%). The National Water Policy (2002) of Tanzania identified that the fundamental for sustainable rural water supply includes the protection of water sources. Sustainability in water management is about lasting benefits achieved through the continued enjoyment of water supply services (WaterAid, 2011). Meanwhile, members of the study area (Kintampo) do not enjoy water supply throughout the year. The reason why the community members experience water shortages, more especially, during the dry season may be attributed to the drying of water bodies. These water sources must be protected and people must be prevented from working or weeding along water banks. Weeding along water banks exposes the water body to severe heat during the sunny periods, which leads to evaporation and subsequently drying of the water bodies, and this must be discouraged at the study area, as they experience shortages of water supply during the dry season.

#### **5.4 Best practices for effective community-based water management**

Best practices are measures that are adopted for the operation and maintenance of the community water sector. Best practices are deployed to manage constraints or implementation challenges of the community-based management approach (WaterAid, 2011). From the study as stated in Table 4.7, the best practices for effective community-based management of water include transparency and accountability of financial records (16.3%). Transparency and accountability of financial records are vital for

effective community-based water management. For proper management of the community water, the authorities in charge should keep transparent, well documented and effective financial records. This would enable the community members to track the accounts of the Management Committee and keep them in check. Lack of knowledge of the Community Water Management

Committee's account sometimes leads to hesitation among community members when the need arises for payment. Since the community-based water management and supply lack adequate support from the central government, they (community members) contribute to keep the water system running. With transparency, the community would be willing to contribute when the need arises. This relates to work done by Isham and Kahkonen (2002) who reported that transparency and financial accountability improves community-based water management. The community members involved revealed that they do not know the amount of money they have in their accounts.

Similarly, at times, community members' hesitation to pay for facility maintenance is borne by the fact that they do not get constant and continuous water supply throughout the year (20.6%). From the study, another best practice for community – based water management is provision of water throughout the year (Table 4.7). The purpose of the community-based water management is to provide portable water to the community members. Provision of water throughout the year would inspire the community interest in the water system. In a related study, Wood (1994) reported that provision of clean water throughout the year ensures effective water management, as community members are willing to contribute for the safety of the water management because they are able to access water anytime. At the study area (Kintampo), this is not the case, meanwhile the respondents mentioned it as crucial and are willing to ensure that water supply

throughout the year is ensured by replacing the nonfunctional water points and discouraging the weeding along river banks.

Clean maintenance of water system (15.3%) was also stated in the study as means of ensuring effective water management. In any operating machine, there can be system breakdown, thus, there should be clean maintenance of the water system to prevent system breakdown to ensure sustainable water supply. In addition, the water pumps and pipes should be clean periodically to ensure that the water that is provided is clean. Lack of care and dirty water system may produce unhygienic and contaminated water that may result in various health implications when consumed. In conformity with the work done by Nyarko (2007), he reported that clean maintenance of water points help improve community water management systems and the health of the community members. At the study area (Kintampo), though there are some nonfunctional water points and unreliable water supply throughout the year, clean maintenance of water system is in place.

Moderate tariffs (19.8%) were stated among the best practices to enable effective community – based water management (Table 4.7). Most of the community members that depend on the water system are not well-to-do people and, as a result, water charges must be moderate to enable them to pay. The purpose of the community– based water system is to provide clean and portable water to the community members. Higher charges mean only small number of people can afford and this will not fulfill the purpose of the water system. In a related study, Isham and Kahkonen (2002) explained that moderate tariffs ensure effective management of water system. At the study area, it was revealed that the community members contribute towards water management.

Additionally, the respondents from Kintampo mentioned equity in decision-making (15.1%) as a best practice in community-based water management (Table 4.7). For any system to run effectively, the views and assertions of all members must be taken into consideration when taking decision. Overlooking of marginalized groups in the society will lead to negligence of the water facility and system breakdown as the affected people (marginalized groups) will not take good care of the water facility. Nyarko (2007) reported that equity considerations in decision making and measures to protect marginalized groups ensure effective community-based water system as everyone will be on board to protect the water facility. In the study, it was revealed that the community members are involved in meetings, discussions, decision making and contributions towards the management of the water facility.



## **CHAPTER SIX**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **6.1 Conclusions**

Provision of affordable and safe drinking water is one of the essential factors that improves the well-being of people and also secures sustainable livelihoods for local community people. Community-based Management approach in water delivery is now the most crucial strategy envisaged by the Policy and Development actors to deliver great access, equity and sustainability in service provision mostly in the subSaharan region. The study assessed community - based management of water in Kintampo, Ghana. The following conclusions have been drawn from the study based on the findings:



- Majority of the respondents (i.e., 61.3%) rely on pipe-borne water, while 38.7% rely on water from borehole. However, 30 out of the 38 water points are functional.
- The people of Kintampo partake in meetings, discussions and contributions as an approach to ensure effective operation of the water system.
- Nonetheless, the community-based water in Kintampo encounters a number of challenges which include funds for maintenance, sense of ownership, institutional support, and community members' reluctance to effectively participate in water service. This has the potential to collapse the water management system, as the community members do not see the facility as their own because it is not being managed by them.
- However, the above constraints are being properly managed through total ownership of the water supply facility, community education and training on operation and maintenance of the water system.
- Decentralization and stakeholder participation, which are among the good governance principles, are understood to be a determining factor in tackling poor water governance in the study area (Kintampo). With the involvement of the local people, the water facility will be taken care of and protected as they (local community) will see the water facility as their own.

## 6.2 Recommendations

- In Ghana, since local community-based rules get their implementation from the stake of the Traditional Authorities or people, public policy on water resources management can integrate the traditional governance system with its values and

norms. This is probable to bring about effective participatory governance that will result in sustainable development in water management at the study area.

- Participation is improved when the resource management reflects the collective interest of the people. Hence, participatory management efforts should come first by recognition of the people's collective needs for them to partake actively.
- Where management activities target issues that deal directly with the people's livelihoods, the people's participation is heightened compared to activities targeting issues that do not directly deal with livelihoods. The Community Water and Sanitation Agency should focus on linking management activities with livelihood activities to prompt active participation of various interest groups within the Kintampo community. This method has the prospect of empowering the people economically. It may also inspire community interest, initiative and collective action in the water resource protection.



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## **APPENDICES**

**Kwame Nkrumah University of Science and Technology, Kumasi**

**Department of Silviculture and Forest Management**

### **Questionnaire**

#### **Introduction**

*This research is to solicit for relevant empirical data for the completion of an academic exercise on the subject “assessment of community-based management of water” towards the attainment of Master Degree in Natural Resource and Environmental Governance in KNUST. Your cooperation is very much anticipated since data collected will be treated with complete confidentiality.*

Interviewee code.....

*Please kindly tick and appropriately write response where applicable.*

### Section 1: Personal information

#### 1. Sex

(a) Male [ ]

(b) Female [ ]

2. Age .....

3. Household size .....

4. Education level

(a) No formal education

(b) Primary education

(c) Secondary education

(d) Above secondary education

5. Occupation of the respondent

.....

### Section 2: Socio-economic data

#### COMMUNITY

1. How long have you lived in this community?

(a) Less than 5 years (b) 5-10 years (c) 10-20 years (d) Over 20 years

2. Where do you access water for consumption and use? .....

3. Who is responsible for the management of water in the community?

.....

4. At what stage is the community involved in the management of the water?  
.....
5. Do you understand clearly the law and regulations governing communitybased water management?  
(a) Yes [ ] (b) No [ ]
6. What management approach do you use as a community in accessing water all year round? .....
7. Has the community-based management approach influenced water accessibility to locals?  
(a) Yes [ ] (b) No [ ]
8. If yes, explain? .....
9. Do you know the by-laws that allows for community-based management of water?  
(a) Yes [ ] (b) No [ ]
10. If yes, mention them .....
11. What do you see as the benefits of this water management approach of the community?  
.....  
.....
12. Explain your level of involvement of community-based water related meeting.  
(a) Highly involved  
(b) Involved  
(c) Moderately  
(d) Uninvolved



(e) Completely uninvolved

13. To what extent would you agree that the community participate in the management of water resource?

(a) Strongly disagree

(b) Strongly agree

(c) Agree

(d) Neutral Disagree

(e) Disagree

14. What is/are the adopted sustainable measures for the community-based management of water supply in the community?

.....

.....

15. What are the challenges facing the community in managing their water resource?

.....

.....

16. What do you suggest towards improving community-based management of water?

.....

.....

### COMMUNITY WATER AND SANITATION

1. What are the sources of water in this community?

(a) Ground water (b) River (c) Pond (d) others specify.....

2. Explain how you identify water needy villages or communities.

.....

.....

3. Mention by-laws that allows for community-based management of water?

.....

.....

4. Do you have any committee that see to the management of community water?

(a) Yes [ ] (b) No [ ] (c) Don't know [ ]

5. If yes, what are the roles of the community water committee?

.....

.....

6. What can you say about the management capacity of water services by these committees?

.....

.....

7. The community understands clearly how water is managed.

(a) Strongly disagree

(b) Disagree

(c) Neither disagree or agree

(d) Strongly disagree

8. The community understands clearly the law and regulations governing community-based water management?

(a) Strongly disagree

(b) Disagree

(c) Neither disagree or agree

(d) Agree

(e) Strongly agree

9. What management approaches are used by the community in accessing water all year round? .....
10. Explain how you think the approach can help sustain constant supply of water to community members?  
.....  
.....
11. How are communities empowered to take charge of activities concerning water management and its accessibility?  
.....  
.....
12. What are some of the conflict issues registered in the community concerning the implementation of community-based management action? .....  
.....  
.....
13. In times of such situations who is the mediator for resolution?  
(a) Chief [ ] (b) District assembly [ ] (c) Community-based committee [ ]  
(b) (d) others specify .....
14. What constraints do you face regarding the implementation of communitybased approach to water supply in the community?  
.....  
.....
15. What are some of the sustainable management measures put in place for community-based water supply? .....

16. Are there any challenges buffeting the CBWM approach of water management in the community?

(a) Yes\_\_ b. No\_\_

17. If yes to question 15, list the challenges of the community-based water management approach.

.....  
.....

18. What is/are your recommended plans for management of the identified constraints?

.....  
.....

#### **WATER USER ASSOCIATIONS**

1. When was this association formed?

.....

2. What are the aims and objectives of the association?

.....  
.....

3. Has the community subscribed to it?

(a) Yes [ ] (b) No [ ]

4. If yes, how are they involved in the activities of the association?

.....

5. What community-based action approaches are undertaken by user groups in the management of water lately? .....

.....

6. Explain how you think the approach can help sustain constant supply of water



- to community members? .....
7. How does the association monitor water availability and use in the community?  
.....
8. How is the community empowered to take charge of activities concerning water management and its accessibility? .....
9. What medium is/are used in exchanging information and ideas on sustainable management of community-based water?  
.....
10. What measures are put in place to resolve conflicts related to water use in the community?  
.....
11. In times of resolution which people/group act as mediators?  
(c) Chief [ ] (b) District assembly [ ] (c) Community-based committee [ ]  
(d) (d) others specify .....
12. What challenges are identified in the exercise of your core mandate?  
.....  
.....
13. What is/are your recommended plans for management of the identified constraints?  
.....  
.....