

Chapter 1 Introduction

This thesis deals with an analysis of decentralised water governance in Ghana, Africa. This introductory chapter presents the background of the research problem that this study sought to address. It also briefly highlights the contributions the study is making to developing new knowledge. The chapter also describes the structure of the thesis.

1.1 Background

Since the Dublin conference of 1992 and the 2000 Hague World Water Forum, water governance became an important issue on the international and national development agenda. Water governance, as defined by the Global Water Partnership, is ‘the range of political, social, economic, and administrative systems that are in place to regulate the development and management of water resources and the provision of water services at different levels of society’ (Rogers and Hall, 2003:16). This definition recognised the need to embrace within governance a range of actors and agents beyond the narrow confines of government. In addition the definition suggests a range of outcomes - ‘water resources’ as well as ‘water services’ - which is broader than the management functions of individual water sector authorities. Its reference to different levels of society also implies acceptance of the fact that outcomes may be different for these different levels, and that different social groups, for instance, the very poor and other disadvantaged groups like women, may need special consideration in formulating governance systems (Franks et al., 2011). As noted by Franks et al. (2011), the concept of water governance widens the scope of study beyond the simplified and structured approaches outlined by Integrated Water Resources Management (IWRM), to include a more comprehensive understanding of how people interact with each other and with organisations such as the state in relation to water resources and services.

The need for sustainable water governance became prominent on the global development agenda from the early 1990s, following the Dublin International Conference on Water and the Environment (ICWE) held in January 1992, and the June 1992 Rio Earth Summit. Efforts to reduce poverty and improve food security have been linked to effective water governance institutions at the local, national, regional and global levels (Saleth & Dinar, 2000; World Water Council, 2009; Miranda et al., 2011; Uhlandahl et al., 2011). It is widely argued that the water crisis in many parts of the world is often a governance failure, rather than one of a shortage of water per se, or lack of technology to harness and allocate it (GWP, 2000; Alexander, 2002; Pena & Solanes, 2003; WWC, 2003; Fenemor et al., 2011). Consequently, the 3rd World Water Forum (WWF) in Kyoto in 2003 and the 5th WWF in 2009 in Istanbul identified water governance as a priority (WWC, 2003, 2009).

The 2002 Johannesburg World Summit on Sustainable Development (WSSD) also highlighted the importance of public-private partnerships, and gender-sensitive policies and programmes, in water sector decision-making, management, and implementation processes. The focus of the 3rd WWF in Kyoto in 2003 was specifically on water governance as the key process, presenting a broader, but less technocratic approach that appears to be more consistent with current trends in development thinking. The evolving concept of water governance overshadows earlier ideas such as ‘managing water wisely’ (Franks et al., 2011). The Kyoto WWF stressed the need for mainstreaming pro-poor and gender perspectives into water policies, facilitating stakeholder participation, ensuring good water governance and transparency, building human and institutional capacity, and developing new mechanisms of public-private partnership (WWC, 2003; Rahaman & Varis, 2005). By implication, effective water resources governance requires an environment which promotes a bottom-up approach to

water resource development and encourages participation of communities at the lowest level (Garande & Dagg, 2005).

In pursuing good water governance, numerous scholars and practitioners have highlighted the need for decentralised approaches to designing and implementing institutional arrangements for this governance. The UNDP states that: ‘decentralising governance is the restructuring of authority so that there is a system of co-responsibility between institutions of governance at the central, regional and local levels according to the principle of subsidiarity, thus increasing the overall quality and effectiveness of the system of governance, while increasing the authority and capabilities of sub-national levels’ (UNDP, 1999:2). By this, decentralisation is closely linked to the concept of subsidiarity, which proposes that functions (or tasks) should be decentralised to the lowest level of governance, which has the capacity to carry them out satisfactorily (Marshall, 2008). Thus, UNDP (1999) and Marshall (2008) took a broader perspective, recognising that governance functions can be decentralised beyond governments to other organisations involved in the governance process.

Decentralised governance aims at broadening stakeholder participation to involve local resource users and specific vulnerable groups like women, at all levels in the decision making process (UN, 1992, 2003; Leach, Means & Scoones, 1999; Rahaman & Varis, 2005). It is argued that decentralisation would include local level solutions derived from community initiatives (Leach et al., 1999; Rahaman & Varis 2005). Thus, the WWF came to the conclusion that access to water should be shared responsibly, by creating an environment whereby all stakeholders are involved in the decision-making processes that result in transparent, and accountable water governance (UNDP, 1999; Alexander, 2002; Rahaman & Varis, 2005). Proponents of decentralisation have argued that when

implemented well it will speed up economic development, increase political accountability, and enhance community level participation in governance, increase the financial resources of local governments, and provide the flexibility to respond effectively to local needs and demands. They have also argued that decentralisation can remove the bottlenecks in hierarchical bureaucracies, and assist local officials and the private sector to deal with complex procedures, and get decisions made (UN, 1992; Cheema & Rondinelli, 2007; Faguet, 2011a). On the political front, the value of decentralisation is viewed in terms of its ability to promote 'good governance', and empower the local people as it moves government closer to the people. It makes government more responsive and more accountable to citizens (Moriarty, 2008).

1.2 Research Context

Water plays a central role in sustainable development, including poverty reduction. Water governance and sustainable development are inseparable parts of the environmental system as a whole, and are inextricably linked with the socio-cultural, economic and political institutions of all societies (Hoekstra, 2010). Hence, there has been a long history of water resources governance in Ghana, which began much earlier than European colonisation of Africa. The system of water governance in Ghana was originally enforced by customary institutions (Opoku-Ankomah et al. 2006). Formal laws were introduced during the colonial and post-independence periods to either replace or complement customary water laws in response to dwindling water resources, changing socio-economic and political developments, as well as water sector institutional reforms (Opoku-Ankomah et al. 2006). However, there were still significant weaknesses in the governance of water resources in the country which led to increasing pressures from the World Bank and major donors for major reforms in the water resources sector in the early 1990s.

1.3 Irrigation Water Governance Reforms in Ghana

As observed by Manor (2004), generally decentralisation came as a result of either ‘top-down’ pressure from donors or governments, rather than the ‘bottom-up’ pressure from water users or other stakeholders in water governance. The reforms were concerned with decentralising water governance. The decentralisation was seen as a way of achieving broader stakeholder participation in this governance. In response to the pressure from the World Bank, International Monetary Fund and donors, Ghana began a series of water sector institutional reforms in the early 1990s. The reforms embraced the IWRM system that sought, among others, to ensure improved irrigation water governance through the Participatory Irrigation Management (PIM) approach, as well as strengthening the role of local government authorities (District Assemblies), local communities and traditional authorities in the governance and management of water resources and services (Laube, 2009; GoG/MWRWH, 2007; Hauck & Youkhana, 2008; CWSA, 2005, 2009; GoG/MOFA, 2011; Namara et al., 2011).

The water sector reforms culminated in the establishment of the Ghana Water Resources Commission (WRC) in 1996 by an Act of Parliament (Act 522), to regulate and manage water resource utilisation as well as coordinate sector policies (GoG, 1996). The use of a community-based approach through Water User Associations (WUAs) has become the national strategy for the management of small scale irrigation schemes (Birner et al., 2010; Ministry of Food and Agriculture, 2010). In the Upper East Region of Ghana, the Tono and Veia large-scale schemes (which stretch across eight villages or more) were devolved to a para-statal Irrigation Company of Upper Region (ICOUR) with the aim to widen farmer participation in its operations.

Despite efforts to reform water governance in Ghana beginning in the early 1990s, recent studies have revealed weaknesses in the current governance arrangements that require critical attention. The weaknesses identified include poor management structures for urban and rural water supply delivery, weak intra-sectoral and inter-sectoral coordination for water resource governance, environmental degradation of water resource catchment areas, ineffective irrigation water resource governance and poorly coordinated integrated approach to water resources governance (Laube, 2007; Opoku-Ankomah et al, 2006; GoG/MWRWH, 2007; CWSA, 2005, 2009).

1.4 Significance of the Research

Despite attempts by many researchers to understand water governance problems in Ghana, there are still significant gaps in our understanding of differences in performances between farmer-managed and government-managed institutional arrangements. For example, few studies specifically examined the management of small-scale (farmer-managed) irrigation schemes and that of large and large scale (government-managed) irrigation schemes. The few studies that examined these areas primarily focused on technical and financial issues. Institutional aspects of irrigation water governance were rarely targeted in previous studies and even fewer studies have differentiated between farmer-managed and government-managed irrigation water governance problems. Previous studies on irrigation water resources in the study area and the country as a whole have either focused on farmer-managed or on government-managed irrigation schemes. These studies failed to adopt a comparative approach in assessing these institutional arrangements. As a result little is known regarding differences in performances in governance approaches between farmer-managed and government-managed irrigation schemes in Ghana. It is unclear whether the currently available information on the two institutional arrangements in Ghana presents

researchers, academia, policy makers, and development practitioners an adequate understanding of governance performances in the different institutional arrangements in the farmer-managed and government-managed irrigation schemes in the country.

1.5 Research Objectives

Against this background, this study seeks to evaluate the current governance structures and processes at the regional, district and community levels to assess whether these are supporting a community-based approach to irrigation water governance. A qualitative research approach using four case studies was undertaken of governance in four communities of three districts in Ghana's Upper East Region involving key informant interviews and focus group discussions as well as field observations. The objectives of the present study are:

1. To examine the current governance structures and processes at the regional, district, and community levels in irrigation water governance in the study area.
2. To compare farmer-managed and government-managed irrigation schemes to assess which best furthers the decentralisation process to support irrigation water resources governance at the community level.
3. To examine any difference in the farmer-managed and government-managed irrigation schemes in the study area on the impact at the community level of the current institutional structures on irrigation governance.

1.6 Structure of the Thesis

The thesis is presented in four parts. Part I, contains chapter two and three. Chapter two provides a literature review on resource governance and presents an conceptual framework for analysing irrigation water resources management at the case-study area. Chapter three provides the history of water resources governance in Ghana from the

pre-colonial and post colonial times. The chapter also includes a discussion of the achievements and failures encountered in water reform policies. In addition, the research aim, objectives and questions are developed in this chapter. The chapter helps to identify the knowledge gap this thesis seeks to fill. It also directs the selection of the case studies and research methodology adopted.

Part II of the thesis comprises chapter four and is concerned with the research philosophy, methodologies and methods to be used in the study to achieve the research objectives and answer the research questions. Chapter four informs selection of case studies, data collection, data organisation and analysis.

Part III comprises chapters five, six, seven, eight, and nine, and presents findings from four case materials, each from irrigation water governance at the regional, district, and community levels in Ghana addressing research objectives (1), (2), and (3). Chapter five addresses research questions (1), (2), and (3) under research objective (1). Chapter six addresses research question (4) under objective (2) while chapter seven addresses research question (5) under objective (2). Chapter eight addresses research question (6) under objective (3), and chapter nine addresses research question (7) under objective (3).

Part IV comprises chapters ten and eleven. Chapter ten represents a synthesis and discussions of the key findings from the analysis of data generated from the four case materials from farmer-managed and government-managed irrigation schemes in the Upper East Region of Ghana. It also highlights areas deemed necessary for further research. Chapter eleven details both conclusions and recommendations of the study. Figure 1.1 explains how chapters 5-9 have been structured to address the research objectives and questions. Figure 1.1 also shows the relationship between chapters ten

and eleven and the result chapters (5-9). It also shows the relationships between the research objectives, research questions (RQ) and the chapters.

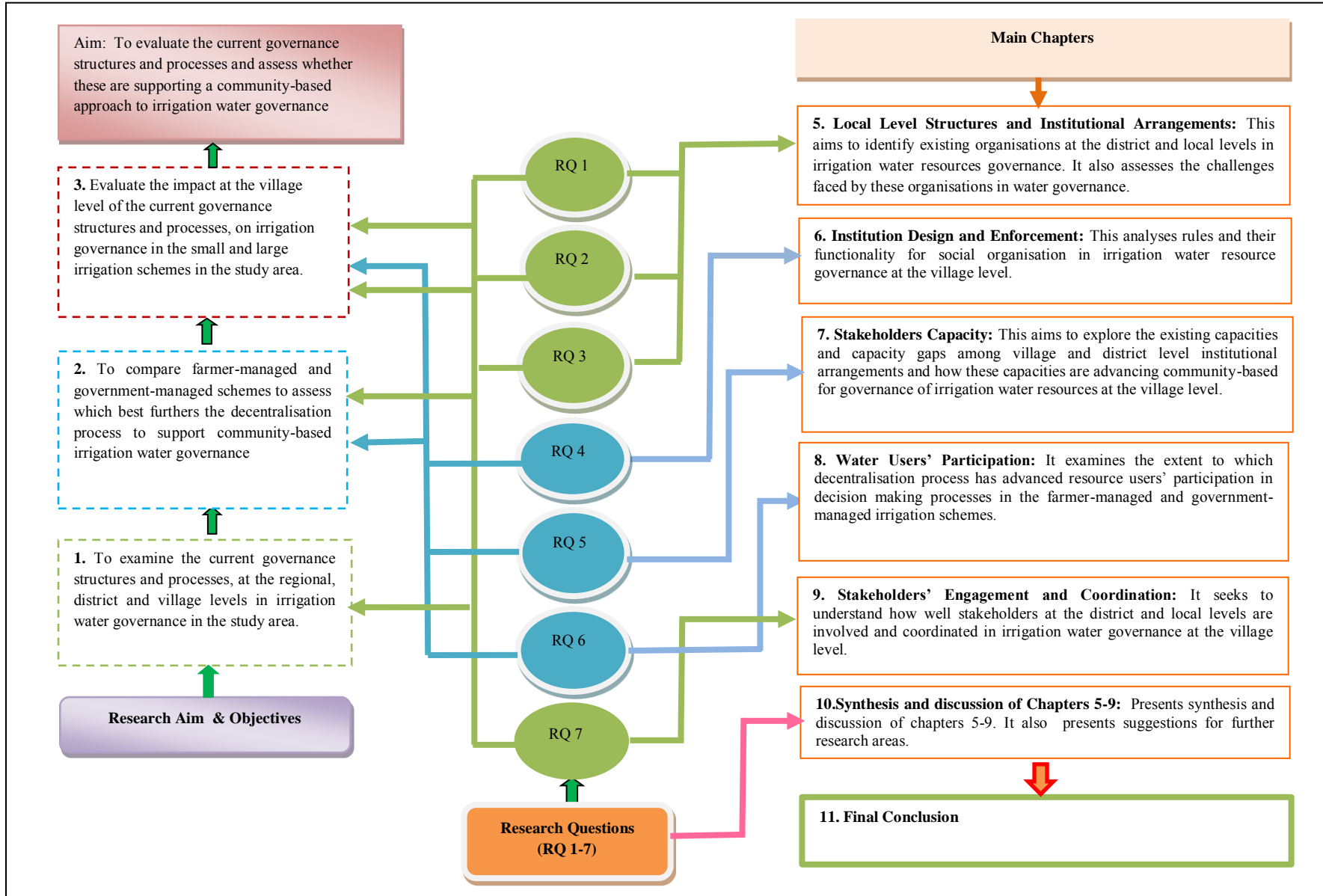


Figure 1-1 Relationships between Research Aim, Objectives, Questions and Result Chapters

PART I

THEORY OF RESOURCE GOVERNANCE AND HISTORY OF WATER RESOURCE GOVERNANCE IN GHANA

Chapter 2 Literature Review and Theoretical Framework

2.1 Introduction

The previous chapter examined the research context and also described the structure of the thesis and how the chapters related to one another. This chapter examines the theoretical foundations of common pool resources (CPRs) governance and common property, the theories of collective action, and the theories and concepts of governance and their relevance to irrigation water resource governance. The purpose of the chapter is to use these theoretical foundations to develop a “governance conceptual framework” for analysing CPR irrigation water resource governance for the purpose of this study.

This chapter is structured as follows. Natural resource property and use rights regimes are discussed in section 2.2, section 2.3 focuses on the theoretical debates on common property governance, section 2.4 examines institutional approaches to common pool resources governance, and section 2.5 discusses Ostrom’s design principles of CPR governance, 2.6 provides an overview of governance and related concepts. The difference between water management and water governance is examined in section 2.7. Natural resource governance principles and their relevance to water governance is critically examined in 2.8 and an overview of decentralisation is provided in section 2.9. Section 2.10 focuses on decentralised water governance and decentralised community-based water resource governance is discussed in sections 2.11. A conceptual framework for community-based irrigation water resource governance is developed in section 2.12.

2.2 Natural Resource Property and Use Right Regimes

Sustainable use of water and other natural resources has been identified as highly dependent on the property rights and governance regimes that are in place (Ostrom, 1990; Rogers & Hall, 2003). Labeling a resource as a ‘property,’ means it is considered as a reservoir or flow of benefits to which rights can be attached (Stein & Edwards, 1999). ‘Property rights’ are social institutions that have evolved as a means of enforcing claims to that benefit stream. A ‘property regime’ refers to the institutional arrangements that define the conditions of access to, allocation of, and control over a range of benefits arising from the resource (Stein and Edwards, 1999). Four broad types of property rights regimes with their associated rights and obligations have been identified (Ostrom et al. 1999; Stein & Edwards, 1999; Rogers & Hall, 2003) as follows:

1. *State property*

This is owned by a national, regional, or local public agency that can forbid or allow use by individuals. Access for the public is held in trust by the state. Individuals have a duty to observe use and access rules determined by the controlling agency of the state (Stein & Edwards, 1999; Rogers & Hall, 2003).

2. *Private property*

Individuals own the resource and have the right to exclude others access to the resource. They can transfer their rights to others. However, they have the responsibility to refrain from socially unacceptable uses. Non-owners are to respect decisions by the owners (Stein & Edwards, 1999; Rogers & Hall, 2003).

3. *Open access*

Open access is a situation in which there are no use rights attached to any defined group potentially resulting in a “free for all.” Benefits from the system are available to anyone. Individuals may act without regard to the interests of others (Stein & Edwards, 1999; Rogers & Hall, 2003). Open access occurs from the absence, or the collapse, of management and authority systems primarily intended to introduce and enforce a set of institutions among resource users with respect to that particular natural resource. Thus, the institutional vacuum of open access ensures that use rates will eventually deplete the asset (Bromley, 1991). Ostrom et al. (1999) noted that resource users under open access circumstances can themselves change the arrangement from open access to common or private property.

4. *Common property*

Common property refers to a resource use arrangement where use rights are attached to a defined user group. The user group has the right to exclude non-members and define the rules regarding its use. Individual members of the user group have both rights and obligations in respect to usage, maintenance and management of the property (Stein & Edwards, 1999; Rogers & Hall, 2003).

For decades, scholars have tried to study how common property is managed, with complexities involved in such an undertaking (Olson, 1965; Demsetz, 1967; Hardin, 1968; Bromley, 1992; Ostrom, 1990, 1992, 2007a; Ostrom & Cox, 2010). As a result, a substantial part of the common property literature has focused on determining the conditions that make it possible for user groups to successfully maintain the collective

action needed to sustain a common property (Adams et al., 2002; Dietz et al., 2002; Ostrom & Cox, 2010). Hence, the focus of the remaining review of the literature is on concepts relating to common property governance.

2.3 Governance of Common Pool Resources: Theoretical Debate

2.3.1 The Tragedy of the Commons

There has been continual debate over sustainable use of natural resources, particularly problems associated with resources that are used in common (Ostrom, 1990, 1992; Stein & Edwards, 1999). In 1968, Garrett Hardin published an influential paper entitled the “Tragedy of the Commons”, in which he posited that humans have the tendency to overuse and deplete a common-pool resource, even though it is not in their best interest to do so. Hardin’s seminal paper has become the rallying point of the CPR governance debate across many disciplines (Ostrom, 1990, 2007a; Bromley, 1992; Stein & Edwards, 1999; Dietz et al., 2002; Gibson et al., Ostrom & Cox, 2010). The characteristics of CPRs create potential dilemmas, which Hardin (1968) described as the *“Tragedy of the Commons.”*

Hardin (1968) observed what could happen when a hypothetical open access pasture is opened for all people, and concluded that self-interested humans will overexploit the resource to maximise their individual benefits to the disadvantage of all other users. Hardin noted that increasing demand for natural resources and related services due to population growth and increased per capita consumption, as well as ineffective social arrangements for extracting environmental resources are the two major human drivers for resource depletion. In Hardin’s view either state control or private ownership provides the solution to CPR degradation. Hardin’s work encouraged policies of state control or private ownership of natural resources for decades (Stein & Edwards, 1999;

Stern et al. 2002). Hardin has been extensively criticised and his earlier assumptions on the tragedy of the 'commons' challenged (Ciriacy-Wantrup & Bishop, 1975; Bromley & Cernea, 1989; Feeny et al., 1990; Dietz et al.; 2003, Ostrom, 1990, 1992).

The critics argued that Hardin's tragedy of the commons is applicable only to open access resources where no property rights are assigned, and not to common property arrangements with assigned roles and responsibilities (Ciriacy-Wantrup & Bishop, 1975; Bromley & Cernea, 1989). Even the common grazing lands in Hardin's classic '*Tragedy of the Commons*' were well managed for centuries, before they declined for reasons unrelated to any inherent flaw in the commons system (Cox, 1985). The critics argued that Hardin's tragedy of the commons often results not from any inherent failure of common property management but from institutional failure to control access to resources, and to make and enforce internal decisions for collective use (Adhikari, 2001).

Gibson, Lehoucq and William (2002) and Gibson et al. (2005) argued that common property control and management at the local level was better than private ownership. In contrast, Acheson (2006) argued that there is no universal solution to problems of natural resource management, whether under private ownership, state or communal control, as any of them can be effective or ineffective, depending on the circumstances. Even under conditions of secure rights and efficient markets, private property can be overexploited due to poverty, competition, and problems associated with slow-growing or non-renewable resources (Acheson, 2006). Similarly, Young (2007) pointed out that private ownership can lead to outcomes that are grossly unfair, and state institutions usually lack the political will and capacity to manage public property well. Young (2007) argued that '*The Tragedy of the Commons*' is not fundamentally a consequence

of over-reliance on common pool resources (CPRs). Rather it occurs when resources are limited in situations where demand exceeds supply, and also in the absence of effective exclusion mechanisms or other restrictions on use. In this context, Hardin (1968) was also criticised for overlooking the ability of many social groups, including the herders on the “commons” that provided the basis for his analysis, to successfully develop and maintain self-governing institutions to overcome resource degradation for long periods (Ostrom, 1990; Gibson et al., 2002; Young, 2007).

2.4 Institutional Approach to Common Property Governance

2.4.1 Institutions: An overview

Institutions generally are taken to include the range of mechanisms society uses to achieve desired collective ends (Cortner, Wallace, Burke & Moote, 1998). The term institution is defined in various ways under different contexts and by different authors. Most definitions refer to the term as structures, mechanisms, and processes, as well as rules and norms that govern human behaviour and social order (Uphoff, 1986; Ostrom, 1986, 1990; Cortner et al., 1998; Moe, 2005; Hodgson, 2006). The structures and mechanisms may also be termed ‘organisations’. While some scholars (Uphoff, 1986, 1992) held the view that the term ‘institution’ and ‘organisation’ can be used interchangeably, others (North 1990; Ostrom, 1990) maintained the need for a clear distinction between the two concepts in order to minimise ambiguities. North (1990:3) referred to institutions as “rules of the game in society” or “the humanly devised constraints that shape human interaction”, and categorised institutions into two broad areas: formal and informal. Informal institutions are systems of rules and decision-making procedures which have evolved from endogenous socio-cultural codes, and give rise to social practices, assign roles to participants, and guide interactions among

common pool resource (CPR) users. Informal institutions encompassed sanctions, taboos, traditions and codes of conduct. Formal institutions on the other hand comprise constitutions, laws, rules and regulations that guide access, control and use of common property rights, and are usually implemented and enforced by the State (Leach et al. 1999, Yami et al. 2009). Formal rules are particularly important when many actors are involved, and the risk of non-compliance with rules is high. This is because clarity around meaning and interpretation of the rules becomes important and makes enforcement and compliance easier (North, 1990).

The purpose of rules is to define the way that the game is played. Organisations are groups of individuals who work towards a common goal or objective and have common interests. Political parties, churches, schools, unions, or government agencies are some examples of organisations. North considered the role of organisations primarily as agents for institutional change. North acknowledged that organisations have internal players and systems of rules, and hence by implication, organisations are a special type of institution (Hodgson, 2006). Ostrom (1992) also made some distinctions between institutions and organisations. Ostrom (1986:5) defined institutions as “potentially linguistic entities . . . that refer to prescriptions commonly known and used by a set of participants to order repetitive, interdependent relationships” where “prescriptions refer to which actions are required, prohibited, or permitted.” Institutions represent the rules used within a community as it attempts to coordinate mutually beneficial behaviour and resolve collective-action problems. From a policy analysis point of view, Cox (2008) pointed out that institutions are distinctively important because they are most directly endogenous to decisions made by resource users, managers, and policymakers. Uphoff (1986) referred to an organisation as a structure of recognised and accepted roles.

The definition of North (1990) is useful for the present study because of its attempt to distinguish between formal and informal institutions, as well as between institutions and organisations, albeit at the macro-level. Customary rules are considered in this study as informal institutions, while modern codified rules developed by resource users' associations and government agencies are considered as formal institutions. North, like Elinor Ostrom, recognised the importance of strong social norms and informal procedures for making rules and enforcing sanctions within communities and among user groups as these enable sustainable management of common pool resources.

2.4.2 Theories of Collective Action and Common Property

'Collective action' is action by more than one person directed towards the achievement of a common goal or the satisfaction of a common interest. It becomes imperative when the common goal or interest cannot be obtained by individuals acting on their own (Wade, 1987a:97). Mancur Olson provided a classical definition of collective action as: 'when a number of individuals have a common or collective interest—when they share a single purpose or objective—[and when] individual, unorganised action [...] will either not be able to advance that common interest at all, or will not be able to advance that interest adequately' (Olson 1965, 1971:7). In this regard, the collective action might be 'formulation of a rule of restrained access to a common-pool resource and observance of that rule', aimed at ensuring sustainable exploitation of that particular resource (Wade, 1987a:97).

Until recently, there was scepticism vis-à-vis the feasibility of collective action through community-based or common property arrangements. This stemmed largely from the pessimistic conclusions reached by many collective action theories and scholars, notably from the Prisoners' Dilemma Game, Hardin's 'tragedy of the commons,' and

Olson's 'logic of collective action,' as well as the theories of Gordon (1954) and Demsetz (1967). Hardin's arguments, already discussed, have been formalised as a 'Prisoners' Dilemma Game' (Runge, 1981), where each individual acting in her or his own individual interest collectively leads to an outcome that makes the group collectively worse off (Hardin, 1971; Wade, 1987a; Baland & Platteau, 1996, Dietz et al., 2003). The archetypical formulation of the Prisoners' Dilemma: two co-conspirators are captured by the police. If neither confesses about the other, they both face light sentences. If both confess, they both face long jail terms. If one confesses and the other does not, the informer receives a very light sentence or is set free while the non-informer receives a very heavy sentence. Faced with this set of payoffs, the narrow self-interest of each will cause both to confess, producing a result less desirable to each than if they both had remained silent.

The worrying conclusion of the Prisoners' Dilemma is that rational people cannot agree on collective outcomes. However, where the situation is an enduring or recurrent one (i.e. in a repeated game), the logic may change (Axelrod, 1981). Free-riding remains a possibility but not, as in a Prisoner's Dilemma, an imperative (Runge, 1984; Sugden, 1984; Snidal, 1985). Empirical evidence shows how a number of situations demonstrate that people can succeed in overcoming the dilemma (Wade, 1987a).

Mancur Olson's 'logic of collective action' is consistent with the conclusion of the Prisoners' Dilemma. His core proposition holds: 'unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interests*' (1971:2). In other words, the logic says that:

1. voluntary collective action will not produce public goods,

2. collective action based on selective (that is, excludable) penalties or rewards may produce public goods.

Existing cases of common interest groups are thus to be explained by selective punishments or inducements (Wade, 1987b). Without selective punishments or inducements, individuals will free ride and the public good will be supplied in sub-optimal amounts (Olson, 1971). These seminal theories of collective action continue to attract large followings, despite being criticised on many fronts.

Several studies have been carried out to understand the factors that affect collective action situations (Olson, 1971; Axelrod, 1981; Wade, 1987a; Ostrom, 1990, 1992; Ostrom, Gardner, & Walker, 1994). Wade's (1987a) study in 31 irrigated villages on collective action for resource management in a district of South India revealed that the main factor explaining the presence or absence of collective organisation was the net collective benefit of that action. His findings contradicted Olson, the Prisoners' Dilemma, and Hardin's tragedy of the commons. Olson's argument would have led to non-cooperation in terms of free riding, and to co-operation in terms of punishments or inducements which overcome free riding. Many other studies have reported that local user groups were able to manage CPRs through collective action of self-governing institutions to regulate resource use (Ostrom, 1990; 1992; Tang, 1992; Koku & Gustafsson, 2003; Stern et al., 2002; Basurto, 2005; Tefera et al., 2005; Nkonya, Pender & Kato, 2008; Yami et al., 2009, 2011). Stein and Edwards (1999) argued that the pursuit of individual interests does not necessarily have to lead to irrational outcomes. They argued that pursuing individual interests can also lead to co-operative efforts.

2.5 Ostrom's Design Principles of CPR Governance

Collective action is easy to recognise when there is a clearly defined group and clearly defined set of rules evolved by the participants over time. Ostrom (1990) proposed eight design principles that characterise robust institutional arrangements for managing common-pool resources such as irrigation schemes, forests or fisheries resources under local common property arrangements. Ostrom (1990:90) defined a design principle as:

“...an essential element or condition that helps to account for the success of these institutions in sustaining the CPRs and gaining the compliance of generations after generations of appropriators to the rules in use”.

Ostrom, however, cautioned that these design principles should not be adopted as a blueprint for analysing CPR management, emphasising that they have been found to be consistent with experiences in many long-enduring local managements of CPRs.

Table 2-1 Institutional Design Principles for Long Enduring CPR Management

Design Principles	Explanation
1. Clearly defined boundaries	Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself
2. Congruence between appropriation and provision rules and local conditions	Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labour, material, and/or money
3. Collective-choice arrangements	Most individuals affected by the operational rules can participate in modifying the operational rules
4. Monitoring	Monitors, who actively audit CPR conditions and appropriator behaviour, are accountable to the appropriators or are the appropriators themselves
5. Graduated sanctions	Appropriators who violate operational rules are likely to be assessed for graduated sanctions by other appropriators, by officials accountable to these appropriators, or by both.

Design Principles	Explanation
6. Conflict resolution mechanisms	Appropriators and their officials have rapid access to low-cost, local arenas to resolve conflicts among appropriators or between appropriators and officials.
7. Minimal recognition of rights to organise	The rights of appropriators to devise their own institutions are not challenged by external government authorities
8. Nested enterprises (for CPRs that are parts of larger systems)	Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organised in multiple layers of nested enterprises.

Source: Adapted from Ostrom (1990).

Ostrom (1990:52) noted the importance of distinguishing three levels of rules that cumulatively affect actions taken, and outcomes obtained, by individuals and groups in CPR use. These three levels of rules are: (1) operational rules, (2) collective-choice rules, and (3) constitutional-choice rules. Ostrom (1990, 1992) and Tang (1992) argued that the long-term sustainability of CPR management systems depends on rules that can accommodate negative behaviours.

Operational rules: Operational rules define who can participate in which situations; what the participants may, must or must not do; and how they will be rewarded or punished. In irrigation systems, four kinds of operational rules are important if water users are to solve their collective action problems. These include boundary rules, allocation rules, input rules and penalty rules (Ostrom, 1990, 1992).

- Boundary rules. Boundary rules prescribe the requirements individuals have to meet before using the water resources.
- Input rules. Input rules relate to contributions that are needed to maintain and repair the resource facilities.

- Penalty rules. Individuals may have little incentive to follow boundary and input rules if rule breakers are not liable to any penalty.

Collective-choice rules: Collective-choice rules stipulate the conditions for adopting, enforcing, and modifying operational rules. Operational rules are neither self-generating nor self-enforcing. They will have to depend on individuals who will coordinate, enforce and monitor their compliance.

Constitutional-choice rules: These rules affect operational activities and outcomes through their effects in deciding who is eligible to use CPR and determining the specific rules to be used in framing the set of collective-choice rules that in turn affect the set of operational rules.

The past two decades witnessed renewed interest in research analysing the effectiveness of institutional settings using Ostrom's eight design principles (Ostrom, 1990, 1992; Sarker & Itoh, 2001; Shivakoti & Bastakoti, 2006; Cox, Arnold & Tomás, 2010). Ostrom's design principles have been tested and found robust in explaining the ability of CPR users to manage their local resources sustainably. For instance, Sarker and Itoh (2001) examined the design principles and found that the principles on 'monitoring' appropriators' behaviour and 'graduated sanctions' were quite implicit in Japan's irrigation management system, explaining why irrigators normally obey the rules. The researchers concluded that Ostrom's eight design principles are basic, well configured, and unique, and when applied together can account for the success of Japan's long-enduring irrigation institutions that irrigators formulated to self-govern their CPRs. However, CPR theories have been criticised on several grounds.

2.5.1 A Critique of CPR Theory

The strength of CPR theory lies in its ability to recognise and conceptualise the role of local actors and institutions in CPR management. Challenging the deterministic notion that individuals always “defect” from the commons, CPR theory suggests that given the right social institutions, individuals will exercise restraint. In so doing, however, the theory raises a number of problematic issues relating to power, autonomy and what constitutes sustainable cooperation (Johnson, 1997).

CPR theory rests on the assumption that individuals can interpret and respond to an objectively defined set of rules (i.e. individuals are rational) (Johnson, 1997). As Toye (1995) argued, it is not entirely reasonable to assume that individuals will interpret, or follow, rules in a uniform fashion. Because individuals in a collective action situation and those who enforce the rules are faced with the problem of bounded rationality, they may not share a common understanding of what constitutes acceptable behaviour (White and Runge, 1995). Factor in assumptions of uncertainty, and the notion that individuals can know and/or predict the effects of their actions becomes highly problematic. Common property regimes appear to work well when the relationship between actions and outcomes is relatively direct. How CPRs work when the resource serves many, potentially conflicting interests (not necessarily ones living in the area), however, is far less certain (Johnson, 1997).

Assumptions of bounded rationality, then, raise the issue of opportunism. As Toye (1995) argued, some parties follow rules better than others. And, more important, some are better able to choose the rules they will follow (North, 1995; Ostrom, Schroeder & Wynne, 1993; Agrawal, 1994; Knight, 1992). Asymmetrical distribution of skills and capabilities and high cost of monitoring and enforcement make the notion that

individuals have the time and resources to govern their own rules becomes problematic, suggesting a strong need for representative enforcement. Only when the activities of the enforcer are absolutely transparent, however, can a CPR work efficiently. When guardians possess specialist information and knowledge about their activities and the activities of resource users, opportunities for defection arise (Bates, 2005).

A second issue relates to the costs of achieving and maintaining internal autonomy. Explanations for the emergence and evolution of CPR arrangements suggest that individuals will negotiate new institutional arrangements when the (perceived) benefits of change exceed the costs of maintaining the status quo (Ostrom, 1990; Ostrom et al, 1993). Central here is the notion that negotiating, implementing, using and re-negotiating rules of conduct entail particular costs which individuals can ascertain in a rational manner. Institutional change is more likely, Ostrom (1990) asserted, when individuals share the understanding that failure to change will affect all individuals equally and negatively (White and Runge, 1995; Libecap, 1995). Unless the costs of inaction are readily apparent, however, individuals tend to discount their personal stake in the equation, making this type of interdependence highly elusive (Ostrom, 1990; Pearce and Warford, 1993).

A third criticism is that the eight design principles of Ostrom do not take sufficient account of external conditions and constraints (Johnson, 1997). Singleton and Taylor (1992) argued that a fundamental feature of the successful CPR systems in Ostrom (1990) is that each involves a “community of mutually vulnerable actors” (Cox et al 2010:49). These communities of mutually vulnerable actors could emerge, and arguably are already emerging at the global scale because of climate change, the vulnerability of water management, other systems, and other global wicked problems

that increase the risk of “catastrophic events” at the global scale. For example, population pressures, poor governance, market integration, globalisation and rapid economic development can lead to: (i) greater heterogeneity and inequality between CPR participants; (ii) greater pressures on and risks of over-utilisation of tangible and intangible resource pools; (iii) reductions in cooperation, trust and reciprocity; (iv) loss of control over resources by local user groups; and (v) reduced dependence of local users on common-pool resources because of alternative income opportunities and greater opportunities for exit – leading to reductions in common understanding, vision and interests, shared vulnerability, trust, reciprocity of trust, and cooperation at local and other tiers and geographic scales (Swift, 1993; Cox et al 2010). A central argument here is that CPR theory under predicts the costs of initiating and sustaining new and enduring institutional arrangements. CPR theories also understate the costs of excluding or neutralising the effects of external agents, particularly ones who migrate into the resource area or use its resources from afar (Johnson, 1997).

As Young (1995) suggested, the principles on which CPRs appear to thrive may be more empirical than the theorists suggest. CPRs, he argued, are initiated and maintained by political processes, which may be highly contextual, and inappropriate for different socio-cultural situations (Young, 1995). Ostrom’s (1990) theory of institutional change, for instance, extrapolates theoretical propositions from a highly sophisticated process, involving district, state and supreme courts, and constitutional rights that guarantee the freedom of speech, association, litigation and access to information. Although it concedes that “rules are nested in another set of rules that define how the first set of rules can be changed,” Ostrom’s analysis (1990) under predicts the costs of changing institutions in less accommodating socio-political conditions. As Fox (1996: 1091)

argued, social capital cannot be assumed to be continuously distributed, especially where freedom of association is not guaranteed.

Indeed, enduring CPRs appear to depend upon powerful moral allies, who are willing and able to assume the costs of maintaining or changing the status quo. One important ally is the state. Assuming that internal and external pressures undermine the autonomy of self-governing CPRs, 'the right to exclude' (Toye, 1995) and the state, which enforces this right, becomes vital (Vivian, 1992). A central issue, then, and one that CPR theories often neglect, is the way in which local institutional arrangements achieve and maintain autonomy (Swift, 1994; Mearns, 1996a). Evidence seems to suggest that CPRs can survive through periods of "contestation," although their survival either depends upon active state intervention or international pressure (which induces state intervention) (Engberg-Pedersen, 1995; Lund, 1993; Vedeld, 1994).

Thriving CPRs also depend upon the existence of non-state moral allies, particularly ones with indirect interests in the CPR, and indirect relationships with its members. As Ostrom (1990) clarified earlier on, her primary focus is on individuals who depend "heavily" on the CPR for livelihood, intentionally exogenising the role of indirect interests. Indirect interests receive little scrutiny in the CPR literature, particularly with respect to the ways in which they reduce or assume the costs of maintaining internal institutional autonomy.

Another criticism relates to the way in which conflict and cooperation are conceptualised in CPR theory. At issue here is the degree to which trust and cooperation can be generalised from selective networks of engagement into broader categories of human interaction (Humphrey and Schmitz, 1996). CPR theories suggest that the benefits derived from mutual monitoring and incremental sanctions will be distributed

evenly. Assuming social asymmetry, however, this proposition raises a number of problematic issues. First, it implies an assumption of abundance (i.e. that there are enough benefits to go around). Second, the unequal power relationship raises a significant principal-agent dilemma. Assuming that those who decide the distribution of a particular good represent the agent, the principals have few means of obtaining the good or obtaining information about the conditions under which the good is distributed (Bates, 1988; 1995). Finally, empirical evidence appears to challenge the notion that when given the chance, influential groups will not maximise rent at the expense of those less fortunate (Bates, 1989; Ostrom, 1990: Chapter 5; Bromley, 1992; Mearns, 1996b). Cooperation, CPR theory implies, simply suggests that everyone follows the rules. Conceptualised in this way, CPR theory under predicts the existence of implicit conflict, and the potential for explicit conflict. In so far as uneven distribution creates losers, it implies the existence of implicit (if not explicit) conflict, a condition under which individuals seek to leave a relationship, but are prevented from doing so. The arrangements that Ostrom calls “successful CPRs” may lack explicit conflict, but this certainly does not suggest they are conflict-free.

A final criticism and risk relevant to extending the Ostrom IAD framework to the global commons is that the eight principles would be viewed by international organisations, governments and stakeholders as something of a magic bullet or institutional panacea and thus be misapplied as a prescription for improving the governance of CPRs in particular settings (Cox et al 2010). These authors conclude that the design principles are well supported by the evidence, but that a probabilistic rather than a deterministic interpretation and application of the principles is warranted.

Nevertheless, the Ostrom design principles and IAD framework have proved useful in understanding a wide variety of institutional arrangements in both developed and developing countries. It emphasises the careful consideration of contextual factors. It draws attention to the full range of transaction costs. It contains no normative biases and does not presume *a priori* that one type of institutional arrangement is preferred to another. It also uses a variety of criteria to assess institutional performance.

2.6 Governance: An Overview

In recent years, the concept of governance has become fashionable in cross-disciplinary discourses, and has been used widely in the discussions and publications of the United Nations (UN) system and other international aid organisations involved in promoting socio-economic development (Van Keersbergen & Van Waarden, 2004; Peters, 2010). Peters (2010:3) observed that the emergence of governance in contemporary societies fits in well with the root of the word ‘governance’ or ‘government’, meaning to “steer a boat”. Increasingly, modern societies face collective choices in pursuit of a range of issues that cannot be addressed adequately by individual action, and some means must be found to make and to steer (implement) those decisions. The need for these collective decisions has become imperative when the global community as well as individual societies are faced with challenges such as water scarcity, increasing poverty disparities, natural resource depletion and climate change that cannot be addressed by individual actions, and indeed are often cases in which individual self-interest is likely to result in collective harm (Ostrom, 1990). Governance in some contexts also implies some conception of accountability, public participation, equity, and transparency, so that the actors involved in setting goals and then in attempting to reach them, whether through public or private action, must be held accountable for their actions (Van Keersbergen & Van Waarden, 2004; Adhikari & Tarkowski, 2013) to society.

Governance is perceived and defined as a concept that involves a wide range of actors within society. Governance is not synonymous to ‘government’ – i.e. dominance of state actors, but also includes the private sector and civil society. Governance in the context of this study is defined as “the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say” (Graham et al., 2003: ii). Decision-making rules, including responsibility and accountability are certainly part of the governance system of decentralised and community-based irrigation schemes being investigated in this study.

2.6.1 The New Governance Paradigm

The current use of the term ‘governance’ signifies a change in how the process of governing occurs (Rhodes, 1996). Governance in this sense includes the formal and informal processes by which authority is exercised and can take many forms, for example, customary, centralised top-down (by government), common property, polycentric, and so on. It also requires policy-making that follows a procedural logic of joint target-setting and peer assessment of national and sub-national performances under broad and clearly agreed upon guidelines (Eberlein & Kerwer, 2004).

Traditional public administration regimes are generally unsuited to the cross-sectoral and multi-scalar challenges of modern times (Lockwood et al., 2009). From this standpoint, a good governance process is one that enables stakeholders, through interaction to collectively design and implement policies and strategies that meet their goals effectively and acceptably (Kooiman, 2000; Lockwood, 2009). The new governance approach is also seen as a complex process that considers multi-level participation beyond the state, where decision making includes not only public

institutions, but also the private sector, civil society and society in general (Tortajada, 2010).

Governance outcomes result from interactions among many actors. No single actor, public or private has all the knowledge, information and capacity required to solve complex problems associated with natural resources (Rittel & Webber, 1973; Kooiman, 1996, 2000). As an activity, 'new' governance seeks to share power in decision making, encourages citizen autonomy and independence, and provides a process for developing the common good through civic engagement (Jun, 2002). Because governance-related issues are not just public or private, but are frequently shared, governance activities at all levels become diffused over various societal actors whose relationships with each other are constantly changing (Tortajada, 2010). Rhodes (1996) argued that the task of governance is to enable socio-political interactions; to facilitate arrangements for dealing with problems, and to distribute services among the several actors.

Head (2009) considered the new governance as a more inclusive and networked approach to collective problem solving. This approach requires the inclusion and commitment of all actors of government and private sector organisations. The essence of governance is that the public sector, civil society and other stakeholders can pool resources (knowledge, ideas, fiscal resources, expertise, etc) to solve seemingly unsolvable and complex problems. The quality of decision-making depends on the extent to which the stakeholders accept their involvement as a shared responsibility (Lovan et al., 2004). Having reviewed the broader concept of governance and new governance forms, the next section examines water governance and distinguishes it from water management.

2.7 Water Management and Water Governance: the Difference

The previous section reviewed the concepts of governance and new governance forms. This section examines water governance and distinguishes it from water management. It is not uncommon to find in the literature that water management is often equated with water governance, especially in the irrigation sub-sector, where irrigation management transfer (IMT) and the related term participatory irrigation management (PIM), have become the dominant approaches for promoting increased involvement of farmers, either through formal management transfer or through other less formal institutional arrangements. Thus, the subsequent sections distinguish between water governance and water management.

2.7.1 Water Management

Management has been defined by several authors from different perspectives. Because of the tendency to equate governance with management, Olsen, Sutinen, Juda, Hennessey and Grigalunas (2006:5) made a distinction between governance and management, by defining management as a “process by which human and material resources are harnessed to achieve a known goal within a known institutional structure”. Robbins et al. (2003:8) referred to management as “the process of coordinating work activities so that they are completed efficiently and effectively with and through other people. The basic functions of management include planning, organising, leading and controlling.” Franks (2006:3) also referred to management as “the collective allocation of resources to achieve specific objectives implying a purposive set of actions involving inputs, costs and benefits distributed amongst a number of actors.” Based on his definition of management, Franks (2006) referred to water management as controlling the supply, distribution, use and disposal of water to achieve specific objectives, and

can thus be seen as distinctly different from governance. Toonen (2011:13) emphasised that water management is about achieving goals, preferably in a functionally and socially responsive and efficient manner, with given means, and largely within given conditions and constraints. In the context of using the available means and technologies to achieve efficiency in water sector goals and objectives, Tollefson et al., (2013:4) on their part consider *water management* as the “functional coordination of the human behavior that is necessary for realising water use”, in contrast to *water governance* which is “the set of allocation, rule-making and public auditing activities” aimed at creating the frameworks and conditionalities for use and management. Franks (2006) argued that there is the need to distinguish water management at a number of levels, which may give us further insights into its differences and links with governance:

- At the local level, water management comprises the practices and processes of manipulating water flows by means of channels, gates, pumps and other natural, physical and mechanical devices.
- At the basin level, water management has a number of functions (Svendsen, 2005), including to: plan, allocate and distribute water, to monitor and enforce water quality, and to protect against water disasters, conserve natural resources, construct and maintain facilities.
- At the resource level, integrated water resources management (IWRM) brings together the management of land, water, other natural and human resources. IWRM is “the systematic process for the sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives” (Franks, 2006:3). The IWRM approach de-emphasises the traditional fragmented and sectoral approach to water and distinguishes between resource management and water service delivery functions (Rogers &

Hall, 2003). Until recently, IWRM was in vogue as the most appropriate approach towards sustainable water management, and was quite often directly equated with water governance, though they are not the same (Franks, 2006). New ideas around adaptive water management (AWM) have overtaken the pre-eminence of IWRM (Lenton & Muller, 2009). AWM acknowledges the complex and dynamic character of physical water systems, and therefore, its focus is on developing management and governance approaches to accommodate changing circumstances. In view of the complexity of water systems making it difficult to determine the consequences of policy actions beforehand, adaptive management provides “a systematic process for improving water management policies and practices by learning from the outcomes of management strategies” in use. In effect it adopts a systems and complexity approach to water management (Pahl-Wostl et al., 2007).

The levels shown above are characterised as the operational, organisational and constitutional levels of water management. Of these three, the third (the highest) level has the closest links to water governance, though input of resources is emphasised to achieve outputs as the objective of management at the constitutional level, whilst water governance is about the systems in place to make these actions possible (Franks, 2006). These three levels are analogous to Ostrom’s (1990:52) three levels of design rules are: (1) operational rules, (2) collective-choice rules, and (3) constitutional-choice (see Section 2.5 for details).

2.7.2 Water Governance

Building on the concepts of governance, Rogers and Hall (2003:7&16) defined water governance as “the range of political, social, economic and administrative systems that

are in place to develop and manage water resources, and the delivery of water services, at different levels of society". Water governance involves the collective design of an acceptable public policy and institutional framework by stakeholders that mobilises social resources to solve problems and exploit available opportunities. It is concerned with the political, social and economic organisations and institutions (and their relationships) that are necessary for water development and management (Rogers & Hall, 2003). Toonen (2011:13) referred to water governance as identifying, choosing or adhering to values and translating these values (water, safety, agriculture, urban space and natural beauty) into goals, standards and institutional structures and processes. Water governance is concerned with how institutions operate and how regulations affect political actions and societal concerns through formal and informal instruments (UNDESA, UNDP & UNECE, 2003). UNDP (2004) considers water governance to include political, economic and social processes and institutions through which governments, the private sector and civil society make decisions about how best to use, allocate, develop and manage water resources. It comprises mechanisms, processes, and institutions through which all involved stakeholders, including citizens and interest groups, articulate their priorities, exercise their legal rights, meet their obligations and mediate their differences concerning water resources.

The water governance process identifies social arrangements on property rights and administrative structures that need to be put in place to enforce laws (Rogers & Hall, 2003). Water governance is about establishing the appropriate means and setting limits and constraints within which operational action in terms of water management can take place. It shifts the focus from government to a network of agencies, organisations, stakeholder groups and individuals concerned with the management of water resources and the delivery of water services (Franks, 2006). Rogers and Hall (2003) argued that

effective water resource governance and water service delivery require the combined effort of governments and various groups in civil society, particularly at local/community levels, as well as the private sector. A participatory and consultative approach is required in water governance. Tortajada (2010) argued that water governance is evidently not an issue that can be approached only from within the water sector, or only from the perspective of one single stakeholder or sector. It is instead a development challenge that requires the cooperation, collaboration and coordination from within and outside the water sector as well as from the multiple interested parties. Tortajada (2010) noted, however, that with the involvement of multiple actors in the arena of water resources planning, development and management, and the introduction of ethical issues such as responsibility, accountability, transparency, equity and fairness, the challenges associated with making good water governance a reality have become more complex.

Rogers and Hall (2003) observed that the river basin often provides opportunities for governance networks. It provides incentives for people to come to an agreement on governance systems with water as the focus. In water governance, knowledge is no longer considered as a unidirectional resource, transferred from the expert to the end-user, but as a resource to be discussed between stakeholders with different perspectives and perceptions. Power is not a commodity to be transacted between elites, but a set of relations for negotiation between different groups through new mechanisms such as alternative dispute resolution. Working through these processes for the complex and intricate relationships of the water sector provides many insights into the issues and challenges of water governance more generally (Franks, 2006).

In water governance, the state has an important role to play in defining water and use rights (see section 2.2 on different property rights regimes) and responsibilities. Also, water governance needs to take into account land use and land ownership as they are often closely linked. As noted by Ostrom (1990, 1992, 1999) water resources are often appropriated by a group to become a common property resource.

Franks (2006:5-7) stated that consensus on what constitutes water governance during the Dublin Water Conference is consistent with Rogers and Hall's (2003) definition of water governance. Franks (2006) summarised the Dublin Water Conference consensus on what constitutes water governance as follows:

1. *Citizens have rights and entitlement to water.* This emerges from rights-based approaches to development.
2. *Participation of stakeholders is an essential component of governance.* This results from the realisation that government alone cannot meet all the needs of its citizens and that other sections of society (the private sector, community groups and citizens) all have an important role to play.
3. *Women are key users and managers-in-practice of water.* It is acknowledged that the role and contribution of women to water governance has been underestimated in the past and that this needs to be addressed in the future.
4. *There is a need for partnerships to deliver water services.* Partnerships have been considered important in the water sector. The emphasis on partnerships arose partly from the ideas of governance beyond government but also from a lack of confidence in the public sector to deliver services and the need to bring private sector finance into water development.

5. *Water is an economic good and has an economic value in all its competing uses.*

Although some argue that water is a free good, most agree that there is a need to cover the costs of water services. There is however a debate on the implications of treating water as an economic good, particularly on the poor and disadvantaged.

6. *Water has become scarce for all uses.* It is realised that water is becoming scarce for all uses but there is often debate over the causes and perceptions of scarcity. It is believed that scarcity is as much a social issue as a physical issue. To address the physical issue, the response is to limit demand relative to supply. Scarcity as a social issue relates to how patterns of power and access stimulate scarcity in particular sections of communities, and the establishment of new and more effective methods for resolving disputes and managing conflicts.

7. *Water should be managed at the basin level.* This proposition arises from the biophysical nature of the hydrological cycle. Conceptually there is the need to address the issues which arise when other resources or practices are undertaken on the basis of quite different boundaries, which have no hydrological basis. Other resources, such as land, are to be managed together with water, leading to integrated water resources management.

8. *Shared knowledge is an essential basis for good water governance.* Under hierarchical systems and processes, knowledge resides in experts, who transfer the knowledge to others who need it to fulfil their roles and responsibilities. In turn, this expert knowledge confers a degree of power on those who possess it. Governance, by contrast, works through networks and partnerships at a multiplicity of levels. Under systems of governance, knowledge resides in different ways in the different partners and it therefore needs to be continuously shared and negotiated between them.

The conceptual definitions and functions of both water management and governance show that they are both processes that integrate activities to achieve a common goal through collective actions for effectiveness and efficiency. Both water governance and water management emphasise collective action. A critical examination of the concepts of water governance and water management show that the two concepts do not necessarily exist independently of each other. Thus, water management is embedded in good water governance processes and can be perceived as a capacity required for good water governance. Capacities for water management can therefore ultimately and indirectly affect water governance capacities.

2.8 Natural Resource Governance Principles and their Relevance to Water Governance

The complexities of the interrelationships between water governance actors have meant that governance discourses require principles (Tortajada, 2010). Rogers and Hall (2003) stated that there is no single model of effective water governance. They argued that to be effective governance systems must fit the social, economic and cultural particularities of each country. Nevertheless they asserted that there are some basic principles that could be considered pivotal to effective water governance. Rogers and Hall (2003) identified transparency, inclusiveness, accountability, integration, and fairness [equity] as important principles to underpin water governance. Ostrom et al (1993) in their work on *institutional incentives and sustainable development*, identified ‘equity,’ [fairness], ‘accountability,’ and ‘adaptability’ as important evaluative criteria [principles] to understand sustainable development, infrastructure maintenance, institutional analysis, and institutional arrangements. Ostrom’s design principle four emphasised ‘accountability’ through ‘monitoring’ whilst design principle seven stressed the need to recognise appropriator’s rights to organise which implies ‘legitimacy.’

Ostrom's design principle eight, nested enterprises (polycentric governance) emphasised that the resource governance processes should encompass [include] all individuals and organisations at different scales. Like Roger and Hall, Ostrom also asserted explicitly and implicitly that there are some basic principles that are critical to effective water resource governance.

Lockwood et al. (2009) identified eight governance principles through a meta-analytic review of various governance principles from many scholars mainly from the developed nations for good natural resource management governance. These governance principles are referred to as transparency, inclusiveness, accountability, integrative, fairness [equity], legitimacy, adaptability, and capability. The first five governance principles of Lockwood and colleagues were also identified by Rogers and Hall (2003) whilst fairness, accountability, adaptability, inclusiveness and legitimacy have also been either explicitly or implicitly recognised in Ostrom's design principles as well as in the IAD framework. All these principles are relevant to irrigation water resources governance in the context of the collective action theories discussed earlier.

Ostrom's (1990) design principles provide guides for small self-organised community-based resource user groups. However, as noted by Berkes (2004), the community is just where resource governance begins. Resource governance cuts across multiple scales and involves multiple groups as noted in Ostrom's nested enterprises or polycentric governance concept. For instance, the case-study on irrigation water resource governance reported later in this thesis involves multi-stakeholders at regional, district and community levels. Guided by Berkes' (2004) observation, and Ostrom's (1990, 1992) nested enterprise, irrigation water resources governance cuts across multiple communities and involves many actors at the regional, district and community levels.

Hence, an extension is required to Lockwood et al. (2009) eight governance principles which synthesised many existing governance principles including Hall and Rogers and Ostrom and colleagues to complement the remaining of Ostrom's (1990) design principles for governing irrigation water resources in the study area. Just as Ostrom's (1990, 1992) design principles could be used to guide local group behaviour regarding CPR use, the governance principles of Lockwood et al. (2009) also could provide guides for the wider spectrum of stakeholder relationships regarding natural resource governance decisions. It also provides criteria to assess irrigation water governance quality involving many stakeholders. The eight governance principles of Lockwood et al. (2009) are described below.

Legitimacy: Legitimacy is a political and social assessment as to the validity of an organisation's authority and power to govern. This can be conferred by democratic statute or through stakeholders' acceptance. The power must be devolved to the lowest level and must be with integrity (Lockwood et al. 2009).

Transparency: Transparency relates to the visibility of decision-making processes, or the clarity and accessibility to relevant information about governance processes. Transparency is required in who has made a decision; the means by which it has been reached; and its justification (Lockwood et al. 2009).

Accountability: Accountability refers to the allocation and acceptance of responsibility for decisions and actions, and the demonstration of whether and how these responsibilities have been met. Accountability also relates to effectiveness and efficiency, and may have political, legal, financial and natural resource management dimensions. Accountability needs to be both upwards to national and state and territory

governments and downward to local and regional communities and laterally to partners (Lockwood et al., 2009).

Inclusiveness: Inclusiveness relates to opportunities for stakeholders to participate in and influence decision-making processes and actions (Lockwood et al. 2009). According to Lockwood et al. (2009) governance is regarded as inclusive when all stakeholders have equal access to participation, knowledge and information from multiple sources.

Fairness: Fairness relates to the respect and attention given to stakeholders' views, and consistency and absence of personal bias in decision making. Fairness also relates to the consideration of the distribution of costs and benefits of decisions (Lockwood et al. 2009).

Integration: Integration refers to the connection between and coordination across different governance levels, and organisations at the same level of governance. Integration also relates to the alignment of priorities, plans and activities across governance organisations. In relation to NRM goals, this involves institutional arrangements which provide for integration between governance scales, different sectors, and different issues (Lockwood et al. 2009).

Capability: Capability encompasses governance capacity in terms of the systems, plans, resources, skills, leadership, knowledge and experiences that enable organisations, and the individuals who direct, manage and work for them, to effectively deliver on their responsibilities (Lockwood et al. 2009, 11). According to Berkes, Coding and Folke (2000) and Olsson and Folke (2001) capacity in terms of knowledge is a key component of developing solutions to complex problems. Solutions to such problems have to be

informed by a broad range of knowledge sources including scientific research, on-ground experience, and traditional ecological knowledge.

Adaptability: Adaptability refers to “(i) the incorporation of new knowledge and learning into decision-making and implementation; (ii) anticipation and management of threats, opportunities and associated risks; and (iii) systematic reflection on individual, organisational and system performance” (Lockwood et al., 2009: 12).

The preceding sections underscored the concept of governance. Good governance as discussed in the earlier sections emphasised inclusion of all actors at different scales: national, regional, district, and community. Good governance as a new development approach that emphasises inclusiveness of all stakeholders in solving complex problems such as irrigation water resource governance is relevant to the current study. Hence, the issues of good governance particularly governance principles will be discussed in depth in section 2.12 and applied throughout the discussion and conclusions of the study. Thus, the next section presents an overview of decentralisation as a governance approach which aims to devolve responsibilities to different actors at different scales in the governance process.

2.9 An Overview of Decentralisation

Decentralisation has been an evolving process in many developing countries since the late 1980s and in Ghana since 1988. This section provides a short review of decentralisation in general and in Ghana as a governance approach. It briefly introduces decentralisation as a concept and practice, followed by a brief discussion of the forms and different drivers for decentralisation, the requirements and challenges for decentralisation and the links between decentralisation and water resource governance.

There are many definitions of decentralisation. Rondinelli, Nellis and Cheema (1983) defined the concept broadly as the transfer of responsibility for planning, management and resource raising and allocation from the central government and its agencies to lower levels of government. Faguet (2004:2) refers to it as 'the devolution by central government of specific functions, with all of the administrative, political and economic attributes that these entail, to local governments that are independent of the centre within a legally delimited geographic and functional domain'. Decentralisation is closely linked to the concept of subsidiarity, which proposes that functions (or tasks) should be decentralised to the lowest level of governance, which has the capacity to carry them out satisfactorily (Marshall, 2008). The UNDP states that: "decentralising governance is the restructuring of authority so that there is a system of co-responsibility between institutions of governance at the central, regional and local levels according to the principle of subsidiarity, thus increasing the overall quality and effectiveness of the system of governance, while increasing the authority and capabilities of sub-national levels" (UNDP, 1999). Thus, Marshall (2008) as well as UNDP (1999) take a broader perspective, recognising that functions can be decentralised beyond governments to other organisations involved in governance. In the next subsection, various forms of decentralisation are discussed.

2.9.1 Forms of Decentralisation

As the concepts of development and governance continue to expand, the rationale, objectives and forms of decentralisation also take on new dimensions. Decentralisation now embodies not only the transfer of power, authority, and responsibility within government, but also the sharing of authority and resources for shaping public policy within society (Cheema & Rondinelli, 2007). In this evolving concept of governance,

Cheema and Rondinelli (2007) have categorised decentralisation practices into at least four main forms:

- *Administrative decentralisation* includes de-concentration of central government structures and bureaucracies, delegation of central government authority and responsibility to semi-autonomous agents of the state, localised government agencies (e.g., regional offices), and decentralised government agencies performing similar functions through “twinning” arrangements across national borders. Deconcentration involves shifting of workloads from Central Government Ministries, Departments, and Agencies to offices outside the Headquarters where decisions are made without transferring the corresponding authority to make decisions (Ahwoi, 2010).
- *Political decentralisation* includes organisations and procedures for increasing citizen participation in selecting political representatives and in making public policy; changes in the structure of the government through devolution of powers and authority to local units of government; power-sharing among organisations within the state through federalism, constitutional federations, or autonomous regions. It also involves institutions and procedures allowing freedom of association and participation of civil society organisations in public decision-making, in providing socially beneficial services, and in mobilising social and financial resources to influence political decision-making. Devolution involves legal conferment of powers and performance of specified functions by formally constituted regional bodies. These bodies exercise those powers and perform those functions without reference to the central authority and take

legal responsibility for the consequences of the exercise of these powers and the performance of those functions (Ahwoi, 2010.)

- *Fiscal decentralisation* includes the means and mechanisms for fiscal cooperation in sharing public revenues among all levels of government; for fiscal delegation in public revenue raising and expenditure allocation; and for fiscal autonomy for state, regional, or local governments.
- *Economic decentralisation* includes market liberalisation, de-regulation, privatisation of state enterprises, and public-private partnerships.

Having identified the forms of that decentralisation takes, the next section examines decentralisation in water resource governance.

2.10 Decentralised Water Resource Governance

In this section, decentralisation as it applies to water resource governance is examined. In recent decades, water resources have become increasingly viewed as economic goods rather than social ones, and decentralisation in accordance with the subsidiarity principle has become a useful means to deliver on this perspective (World-Bank, 2001, UN, 1992; Perry, et al., 1997). Governments and donors are trying to link service delivery and costs, provide incentives that increase the efficiency of water resource allocation, reduce costs, increase sustainability of water resources, and promote integrated and participatory approaches through decentralisation (Gleick, 2000; World Bank, 2001, Larson, 2003; Anderson & Ostrom, 2007).

It is reasoned that local government authorities, non-governmental organisations, and community organisations are closer to the beneficiaries of this governance and thus have better access to the information that enables them to identify citizens' preferences and respond flexibly to local conditions. As local governments act on this information

to improve quality, reliability, and services, this reasoning goes, users are more likely to participate in service delivery and pay for improved services. The increased user charges can, in turn, be used to finance expansion, improvement, and maintenance of the existing infrastructure (Easter & Hearne, 1993; World Bank, 2001, Anderson & Ostrom, 2007; Wade, 1988,). Three main trends in decentralisation of water resource governance have emerged: private sector participation (PSP), delegation, and devolution.

2.10.1 Private Sector Participation

Private Sector Participation (PSP) is the permanent transfer of powers to any non-state entity, including individuals, corporations, NGOs and so on. The private sector participation approach ranges from full privatisation to contracting out services such as irrigation and domestic water supply. This approach is not well suited for publicly financed irrigation schemes meant for rural poverty reduction, because private, profit-seeking companies tend to neglect segments of the population that are harder to reach and less profitable (World-Bank, 2001; Ribot, 2002).

2.10.2 Delegation

Under the delegation approach, governments transfer decision-making powers for water resource governance to water or irrigation companies that may be publicly or semi-privately owned (ICOUR, 1985). These companies are responsible for providing services within a specified geographic location. This approach has been adopted in Ghana where the Tono and Veua medium-scale Irrigation Schemes in the Upper East Region are being managed by the Irrigation Company of Upper Regions (ICOUR Limited), a para-statal organisation. However, delegation may not necessarily lead to an

improvement in service delivery, as public and semi-private companies are frequently faced with the same inefficiencies as government agencies (Laube & Yaukhana, 2006).

2.10.3 Devolution to Sub-National Governments and Users

Management of public irrigation schemes is often devolved to local governments, communities, and water users. However, the responsibilities devolved may vary, depending on the capacity of the local level authority or user group. In some countries, local level actors may be expected to undertake activities ranging from community organisation to technical planning, supervision, construction and operation. Other approaches might focus more on community organising, while relying on staff from central or intermediate government levels for technical support (World-Bank, 2001; Saleth & Dinar, 2004).

Ghana's current irrigation governance policy is geared towards the second approach, where management responsibilities of large and medium scale public irrigation schemes are to be devolved to users with user participation in decision making at all levels (MOFA, 2011:12). In this Ghanaian model, the central government retains the duty to construct and/or rehabilitate large schemes for the District Assemblies (DA) and farmers to co-manage and maintain, while governance of small schemes are devolved to farmers for management through Water Users Associations (WUA), with DAs providing public interest regulatory functions (Ayariga, 2008; MOFA, 2011).

The donor and government-driven participatory governance and management of water resources largely influenced the direction of decentralisation process of small-scale irrigation schemes in Northern Ghana and elsewhere in the developing world towards to user groups (IFAD, 2006, Glaas, 2007). The approach if successfully implemented is claimed to be mutually beneficial for both governments and communities: communities

get what they need and governments are relieved of the long-term operation and maintenance burden (World Bank, 2001, Rosegrant & Perez, 1997, Ostrom, 1992, 1999).

Despite the potential benefits claimed to accrue from decentralisation of water and other natural resources, Anderson and Ostrom (2007) observed that the actual outcomes of decentralised resource governance policies adopted around the world in the 1990s have been mixed. Empirical evidence supports their observation that decentralisation does not uniformly or necessarily lead to better or worse local resource governance (Gibson & Lehoucq, 2002; Larson, 2003; Nygren, 2005; Ostrom, 2001; Smoke, 2003; Cheema & Rondinelli, 2007). Anderson and Ostrom (2007) concluded that since there is no perfect governance system anywhere, scholars and policy makers should consider the extent to which complementary back-up institutions exist at higher or lower levels of governance that can help offset some of the existing governance imperfections, especially at the local level. These alternative governance concepts have led to the promotion of decentralised community-based approaches to resources governance. This is discussed in the next section.

2.11 Decentralised Community-Based Water Resources Governance

Community-Based Natural Resource Management (CBNRM) is a participatory resource governance approach that has gained prominence for three decades in Asia, Africa and industrialised nations (Carson, 1999). It is considered as an alternative approach to centralised forms of governance of resources (Chou, 2010). The CBNRM approach has been broadly defined by Berkes (2004:628) as ‘environmental governance and conservation action that starts from the ground up but deals with cross-scale relations.’ Berkes (2007: 15193) further noted that it is a system of governance that ‘extends

beyond communities to include institutional linkages and multiple levels of organisation that impact and shape institutions at the local level'. Berkes' (2004, 2007) definition emphasised a bottom-up approach and organisational linkages in governance process as key to CBNRM. To understand the CBNRM concepts well, it is important to be clear about what is meant by 'community' in each context. Thus, the definition and characteristics of community is provided in the next section.

2.11.1 Delimiting the Local and Community Level

The concept of CBNRM hinges on a definition of 'community.' There are many different definitions of community, and many different kinds of community have been distinguished. For the purposes of this study, what is meant by community is clarified by identifying some basic characteristics of community. The Rural Development Committee at Cornell was commissioned by the US Agency for International Development to study local institutional development and identified ten levels that may be linked to a community, based on decision making activities that affect development (Uphoff, 1986) as shown in Figure 2.1.

Uphoff (1993) argued that, the basic characteristic of what is "local" from a socio-economic viewpoint is that most people within the locality, village (community) or group levels tend to have face-to-face relationships and are likely to have multi-stranded connections and complementary relationships. People at the local level are closely interwoven and interact extensively with one another in all aspect of their lives. Uphoff (1986, 1993) argued that this provides a better platform for collective action than is normally found above or outside these levels, say at the district or sub-district levels. Households and individual levels are smaller units found at local levels, but are not

regarded as local levels, because they are not faced with the same problem of “collective action” associated with group, village and locality levels.

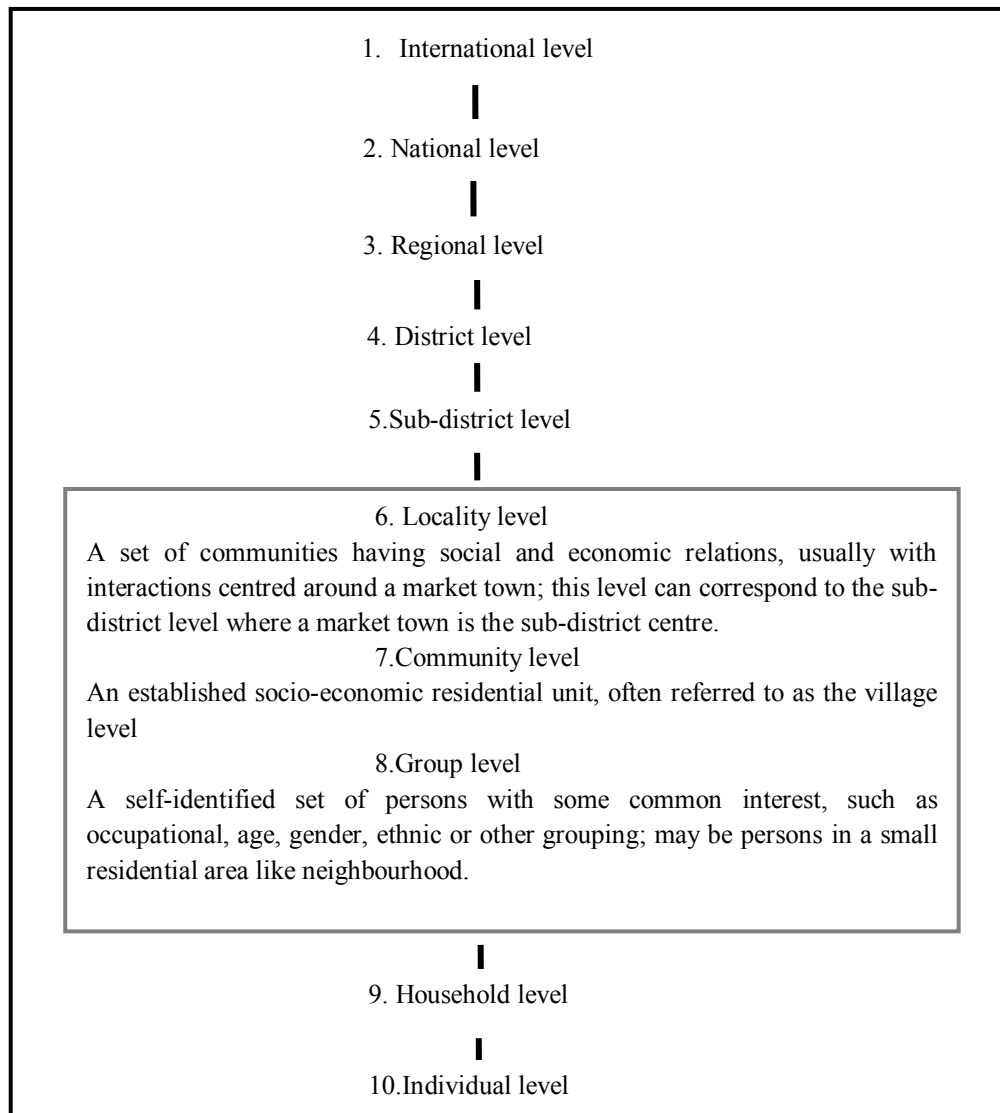


Figure 2-1 Levels for decision making and activity for development

Source: Uphoff (1986:11).

Out of the ten levels, the committee delimited three levels (6, 7, and 8) as local levels.

Organisations at the local level are often associated with ‘bottom-up’ development rather than ‘top-down’ styles of decision making and implementation of the kind taken at higher levels (Uphoff, 1993). Therefore, for the purposes of this study, the researcher refers to the local level as including localities (villages and groups within the villages) within a given geographic area. The characteristics and development approaches, at the

local level as defined above, is the basis for community-based approaches to CPR governance that the study seeks to explore.

There are three main assumptions underlying CBNRM, namely: (i) community participation, (ii) community ownership, and (iii) community control (Chou, 2010). Community participation has been referred to by Tosoriero (2010:145) as an attempt to empower people to be involved in their own development processes by increasing the role of these people in development decision making. Ownership involves and engenders a sense of responsibility, accountability, and the desire to manage a resource which is critical to community participation in CBNRM processes (Leach et al. 1999; Johnson 2004; and Ackerman, 2004). Community ownership is often understood more loosely as describing when a community feels a sense of ownership of a problem even if it does not have complete legal ownership of the resource/s associated with the problem. These scholars were also of the view that local resource users should also have some level of control over the resource stock and its services. They refer to control as the power to make decisions over the resource and capacity to maintain it. The resource users need to be involved in decision making regarding the resource use and management (Agrawal & Gibson 1999; Johnson 2004; Hibbard & Lurie 2006).

As discussed earlier, decentralisation emphasises devolution of power and governance decision making rights to the local, community levels, and identified social groups (resource users). Also, good governance as discussed earlier emphasises inclusiveness of all actors at different scales. The identified ten levels (scale) where decisions are made concerning irrigation water resources that affect the development of those at the lower local levels are relevant for an understanding of the irrigation governance process the study seeks to examine. The three main elements of CBNRM: community

participation, community ownership, and community control occur at the locality, community and group levels. Hence, the practice of community-based irrigation water resources governance can only be at the local level (6, 7, and 8). The ‘bottom-up’ development emphasised in decentralisation, which is also the focus of this study, also occurs at the local levels (6, 7, and 8).

As discussed above, participation is one of the key elements that underpin CBNRM. Participation affects community ownership and community control over resources (Chou, 2010). The next section highlights key theories of citizen participation in the development process which underpin the analysis and conclusions of the study.

2.11.2 Theories of Citizen Participation

This section examines theories of participation as relevant to CBNRM and examined in this study. The concept of community or citizen participation in natural resource governance and management has been variously labeled and defined (Tan et al., 2008; Kessler, 2004; Narayan, 1995). Participation is simply defined here as, “the coming together of the people to define priorities and develop rules and policies in the community, to implement and to enforce rules” (Agrawal and Gibson, 1999:638). This definition highlights the importance of participation in irrigation water resource governance at the local level, where the direct users of the resource are genuinely involved in the decision making and implementation of collective action initiatives. A core principle that underpinned the devolution of irrigation water governance to local people, is that water users are to be involved as key partners in the decentralised governance processes. The literature suggests that participation of local people enhances rule design and compliance because resources users are likely to be more knowledgeable about, committed to, and supportive of regulations if they have a say in

the process (Tan et al., 2008; Kessler, 2004, Narayan, 1995). Thus, genuine local participation is core to community-based irrigation water resource governance and management objectives. But how does one judge or measure the validity of local participation?

Arnstein (1969), in a widely cited article, proposed a 'ladder of citizen participation' that was to create an even platform for more informed dialogue around the contested issue of citizen participation. Arnstein developed a typology of eight levels of citizen participation, with the lowest end of the scale labeled as (1) manipulation of public information, followed by (2) therapy (3), informing (4), consultation (5), placation (6), partnership (7), delegated power (8) and citizen control. For Arnstein, the highest level of citizen participation in the form of 'citizen control' resides at the top of the list, where citizens have full control of decision-making or full managerial powers in the governance processes (Arnstein, 1969:217). But, as noted by Timney (2011) this highest level of citizen participation is rarely attained as public managers are often unwilling to relinquish the control necessary to permit citizens to reach the top of the ladder. Arnstein's 'ladder of citizen participation', though has not been revised to embrace new approaches to citizen participation and the realities in practice, continues to constitute the standard approach to classifying the various modes of public participation in the fields of planning and public administration (Timney, 2011; Tan et al., 2008). Similar typologies have emerged in recent years, most of which present citizen participation on a continuum ranging from non-participation (such as manipulation and therapy) to tokenism (such as information provision, placation and consultation) through to the delegation of decision-making power and direct citizen control (Tan et al., 2008).

The International Association of Public Participation (IAP2) (2009), for instance, developed a participation model that described an increasing level of public power and control in decision-making processes. The IAP2 topology categorised the public participation goal in a five level spectrum, ranging from a lower point of: (1) providing *information* to citizens on the issues; (2) ensuring regular *consultations* with them for feedback on analysis, alternatives and decisions; (3) citizen *involvement* throughout the process where their aspirations and concerns are clarified and considered; (4) *collaboration* with the people through partnerships during all stages of the governance process; and (5) ultimately *empowering* the people to assume major decision-making. The International Association of Public Participation (IAP2, 2006) identified three major outcomes of effective public participation as:

1. acknowledgement of the natural desire for people to participate in the decisions that affect them;
2. facilitating understanding; and
3. bringing all perspectives to the decision-making table, by identifying critical issues early in decision making, and by attempting to achieve a balanced understanding of the issues.

Recent works of Ross et al. (2002), 'laying down the ladder', and the Wondolleck et al. (1996), 'teetering at the top of the ladder' have critiqued Arnstein's 'ladder of citizen participation.' Ross et al. (2002) and Wondolleck et al. (1996) have moderated the hitherto uncritically accepted power hierarchy expressed in the ladder and spectrum.

Ross et al. (2002), argued that such unidimensional classifications can no longer reflect the realities and complexities of role-sharing between governments, communities and other parties in natural resource management. They pointed out that initiatives may

come from nongovernment sources, and other dimensions besides power are relevant in designing participatory processes.

Ross et al. (2002) further argued that ladders do not necessarily take into account the type of participation in natural resource management which prevail in developing countries, a community-based form often combined with community development (Ife 1995). Here the emphasis is on strengthening or restoring collective approaches to natural resource management, or promoting a collective approach that has not previously existed. Ladders of participation probably over-simplify, or fail to take into account, the types of community-based action and government community partnership models which are now common in natural resource management (e.g. Lerner 1993, Carr 2002).

The underlying assumption of typologies of participation based on power-sharing is that participatory processes are going to influence outcomes - and public support for the outcomes - through sharing power. This assumption failed to recognise that empowerment is not about a transfer of power per se, but how to change existing power structures (Kaufman 1997, Martin 1997). Ross et al. (2002) also criticised the assumption that power issues are relevant mainly between groups of 'have' and 'have not', rather than within groups on a gender, cultural or age basis. They argued that the complexity of roles in natural resource management cannot be ordered on a single scale, and decision-making power (or responsibility) is not the main factor on which these roles should be scaled. There may well be other factors relevant to a typology of public participation. As Carr (2002) argued, we are moving beyond a focus on 'top-down' and 'bottom-up' conceptualisations of working relationships in NRM, to form what she describes as a 'middle-ground' where the advantages of each are realised through a

commitment to seeking solutions, openness to new ideas, flexibility, responsiveness and pragmatism, and equity and diversity among horizontal and vertical links (2002:230).

Wondolleck et al. (1996) found that, citizen groups that participated in alternative dispute resolution processes had overcome many of the barriers described in Arnstein's "ladder of citizen participation." They however, observed that scaling the ladder is one matter; hanging on at the top is quite another. They observed that degree of participation at the top of the ladder is not without its own challenges and costs. Reaching the top of Arnstein's ladder is a challenge that then begets new challenges. Most successful efforts are those in which citizens have requisite skills—political savvy, negotiation, and communication skill, energy and resources to devote to the process. Wondolleck et al. noted that well-structured collaborative processes can remedy some of the imbalances and other stumbling blocks inherent in traditional forums, broadening the issues considered as well as the potential solutions.

Having identified the different degrees of citizen participation possible in development interventions, and some of the major outcomes desired from public participation, we can further examine the possibilities of decentralised community-based irrigation water resource governance.

2.11.3 Decentralised Community-Based Irrigation Governance

After identifying theories that encompass citizen (community) participation and different degrees of citizen participation, in this section some approaches used in the irrigation sector to achieve citizen participation are discussed.

In recent decades, the poor performance of central government agency-controlled irrigation schemes (large and small) worldwide has motivated interest in decentralised

irrigation management (Howarth et al. 2007; Vermillion & Muñoz, 2007). Governance arrangements through IMT and PIM were initiated and encouraged (Shivakoti & Ostrom, 2002; Howarth et al., 2007; Garces-Restrepo, Vermillion & Muñoz, 2007). Garces-Restrepo et al. (2007:11) defined IMT as “the transfer of responsibility and authority for governance of irrigation systems from government agencies to private-sector organisations that are meant to represent the interests of water users”. On the other hand, PIM seeks to promote increased involvement of water users and local people in irrigation governance, along with the government (Garces-Restrepo et al., 2007:4). Thus, while the objective of IMT is to gradually replace the role of the government, PIM seeks to strengthen the relationship between water users and government by including farmer participation irrigation governance (Groenfeldt, 2003; Garces-Restrepo et al., 2007).

The IMT and PIM concepts came into being in the context of: (i) central governments’ and donors’ unwillingness or inability to finance operation and maintenance of irrigation systems, (ii) growing competition for water, and (iii) a view that irrigation schemes can be better governed by community-based arrangements or user governed organisations (Ostrom et al., 1999; Agrawal, 2001; Howarth et al., 2007). In addition, the literature shows that resource users and local communities can sometimes, where conditions are supportive, effectively manage common pool resources, including water, within a nested framework supported by government (Bromley & Cernea, 1989; Ostrom, 1990; McKean 1992a, 1992b).

For example in Ghana, in the large and medium-sized public schemes the irrigators are being encouraged to participate in the governance decision making with public irrigation agencies and local government authorities (District Assemblies), while small

scale community systems are transferred to WUAs or cooperatives for collective governance (Ayariga, 2008, GoG/MOFA, 2011).

More recently, community-based natural resource governance models, including those developed for irrigation schemes, have come under strong criticism for their failure to deliver real benefits to communities (Fabricius, 2004; Howarth et al., 2007; Abernethy, 2010). Howarth et al. (2007) summarised the situation by pointing out that community-based WUAs and cooperatives were often hurriedly formed without adequate attention to their support needs. In addition, the processes of establishing WUAs were likely to gloss over the mixed livelihood strategies of water users, community dynamics, and the particular interests and relationships of people recruited as WUA members and leaders. Often insufficient time and effort were invested to develop skills and relationships between multiple water users and with WUA leaders, and perhaps with other stakeholders within a nested governance system. Technical procedures tended to be stereotyped without taking local requirements and objectives into account, and WUAs often lacked the capacity and resources to adapt standard technical procedures.

Decentralisation as a governance approach adopted globally did not occur in a vacuum, but has either been driven externally or internally. The next section highlights key drivers of decentralisation.

2.11.4 Drivers of Decentralisation

This section discusses the key drivers of decentralisation within Africa and the developing world as a whole. The current wave of decentralisation in Africa, and more generally in the developing world has become a driving force for a paradigm shift in understanding governance (Moriarty et al., 2008). Cheema and Rondinelli (2007) pointed out that, as the concepts and forms of decentralisation became more diverse, so

did the objectives of its advocates. Thus, proponents of decentralisation argued variously that decentralisation could help speed up economic development, increase political accountability, and enhance public participation in governance. They argued that when pursued properly decentralisation could also increase the financial resources of local governments and provide the flexibility to respond effectively to local needs and demands (Cheema & Rondinelli, 2007; Faguet, 2011). Conyers (2007) identified three different drivers to decentralisation, namely (i) improved service delivery; (ii) democracy and participation; and (iii) reduction in central government expenditures.

Decentralisation tends to be associated with the trend toward the promotion of ‘good governance’, with emphasis on the empowerment of people for its own sake, and of movement towards government that is closer, more responsive and more accountable to citizens (Moriarty, 2008). Despite differences in views regarding the overt and covert drivers of decentralisation, the concept refers essentially to a political process with multiple actors pursuing diverse agendas. It also includes an administrative process of deciding how particular tasks should be decentralised to the lower level. In this regard, decentralisation is, as Conyers (2007) argued, simply part of the gradual improvement of governance and state-building, which to be effective in water and other natural resource governance, relies on a wide range of factors including type of the natural resource, details of the designs of decentralisation, ways of implementation, capacity of involved stakeholders and agencies, and the wider economic, social and political environment.

More recently, Manor (2004) observed that decentralisation in developing country contexts has often come as a result of either pressure from donors, or as a ‘top-down’ initiative of governments, rather than pressure from the bottom-up. The motives behind

the decision to decentralise may vary from country to country and from context to context. Such motives may include attempts by governments to: (i) further political power at local level, (ii) capture local support, (iii) channel resources or patronage to particular sections of society, (iv) build political alliances, (vi) smooth out regional disparities or uneven development, and (vii) dump responsibilities and costs for the provision of services on local authorities and the people (Moriarty, 2008:9).

Based on the scholarly materials presented in this chapter on resource governance, a conceptual framework will be developed in the next section to help formulate the research questions (further discussed in the next chapter), to guide the study discussions, and conclusions.

2.12 Conceptual Framework for Community-Based Irrigation Water Governance

A conceptual framework is a coherent set of concepts and/or models associated with a methodology that allows a connection to be made between theoretical generalisations and empirical observation (Hufty, 2009). The purpose of this conceptual framework is to provide a systematic way of analysing the quality of decentralised, community-based irrigation water governance in the case studies. This section describes the application of the conceptual framework in understanding irrigation water governance in the Upper East Region of Ghana. The conceptual framework as presented in Table 2.2 was used to diagnose the problems and also analyse the irrigation water governance situations encountered in the case-study areas. The framework served the following purposes.

1. The tool was used to formulate the research questions.
2. The tool helps structure and focus the discussion and conclusion. Because the conceptual framework was developed using concepts of governance,

decentralisation, Ostrom's (1990, 1992) design principles, and the governance principles of Lockwood et al (2009), these concepts underpin the discussion and conclusion.

3. The conceptual framework also helped to develop thematic categories using both pre-determined and emerging codes for analysis and interpretation. A 'code' in qualitative inquiry refers to a word or phrase that symbolically assigns a summative attribute for a data (Saldana, 2009:3). Encoding the information organises the data to identify and develop themes from them (Fereday & Muir-Cochrane, 2006:4). A theme refers to 'a pattern in the information that at minimum describes and organises the possible observations and at maximum interprets aspects of the phenomenon' (Boyatzis, 1998:161). Thus, five main thematic categories guided by the conceptual framework formed the discussion chapters 5 to 9: i) local level structures and institutional arrangements; ii) stakeholders capacity; iii) institution design and enforcement; iv) water users' participation in irrigation water governance; and v) stakeholders' interaction and coordination. Patterns of interactions between the various components of the conceptual framework were sought to explain irrigation water governance problems at the study area. It also provided a consistent question structure and sequence for interviews. The processes involved in developing the conceptual framework and the logic of how its various components interact are discussed in the subsequent sections.

Table 2-2 Conceptual Framework for Irrigation Water Resource Governance

Content	Description
Key Components of Institutional Analysis for Development (IAD) (Ostrom, 1990, 1992)	
Contextual factors	Bio-physical and material conditions of the irrigation system Community attributes: demographic characteristics, relationships and shared values
Institutional arrangements (Rules-in-Use)	Operational rules, collective choice rules, enforcement and compliance
Stakeholders' interaction /Action arena	The action arena provides the space, either physical or virtually, where problems and solutions converge, actors interact, power dynamics display, decisions are made, agreements are concluded and norms are established.
Monitoring & Evaluation	Those who monitor are either the members/users, or report back to the users. Data that is useful to users are collected and they decide what information would be useful.
Governance Principles (Lockwood et al, 2009)	
Legitimacy	<ul style="list-style-type: none"> • Validity of an organisation's authority to govern that may be (a) conferred by democratic statute; or (b) earned through the acceptance by stakeholders of an organisation's authority to govern. • Integrity and commitment with which authority is exercised
Transparency	<ul style="list-style-type: none"> • Visibility of decision-making processes • Clarity with which the reasoning behind decisions is communicated. • Ready availability of relevant information about the governance and performance of an organisation
Accountability	<ul style="list-style-type: none"> • Allocation and acceptance of responsibility for decisions and actions. • Demonstration of how these responsibilities have been met.
Inclusiveness	<ul style="list-style-type: none"> • Opportunities available for stakeholders to participate in and influence decision-making processes
Fairness (Equity)	<ul style="list-style-type: none"> • Respect and attention given to stakeholders' views • Consistency and absence of personal bias in decision making • Consideration given to distribution of costs and benefits of decisions
Integration	<ul style="list-style-type: none"> • Connection between, and coordination across different levels of governance • Connection between and coordination across organisations at the same level of governance • Alignment of visions and strategic directions across governance organisations
Adaptation	<ul style="list-style-type: none"> • Systems, resources, skills, leadership, knowledge and experience that enable organisations, and the individuals who direct, manage and work for them, to deliver on their responsibilities
Capacity	<ul style="list-style-type: none"> • Incorporation of new knowledge and learning into decision making and implementation • Anticipation and management of threats, opportunities and associated risks • Systematic self-reflection on organisational performance

Source: Adapted from Ostrom (1990, 1992) and Lockwood et al (2009)

2.12.1 The Conceptual Framework Development Process

Gross (2008) stated that understanding complex water resource governance problems requires a research methodology that is holistic and transcends disciplinary boundaries, and recognises the linkages between the bio-physical and social systems. Biermann (2007) suggested that research methodologies, where necessary, should be integrative to reflect social reality, and are best based on approaches that are ‘qualitative, case-based, context dependent, and reflexive.’ The primary sources of knowledge used to develop the conceptual framework for the study included concepts of governance, decentralisation, Ostrom’s (1990, 1992) design principles, CPR governance, and the governance principles of Lockwood et al (2009). Other sources include institutional theory, the context of the case-studies, current institutional arrangements and findings from the local community itself, and other important concepts derived from the literature review.

2.12.2 Components of the Conceptual Framework and their Relationships

This section explains the components of the conceptual framework and how they interact with each other to yield outcomes to enable governance. The component parts of the conceptual framework include (i) stakeholders interaction arena, (ii) contextual factors, (iii) institutional arrangements, (iv) governance capacity, (v) governance principles, and (vi) governance performance monitoring and evaluation.

2.12.2.1 Stakeholders Interaction Arena

The core of the Institutional Analysis and Development (IAD) framework (Ostrom, 1990, 1992) is the ‘action situation’, which is the social space where stakeholders “interact, exchange goods and services, ideas, design institutions, solve problems.....within institutional arrangements” (Ostrom 2011:11). The action arena is

the core or heart of the framework, where the attributes of the other components interact to generate irrigation water resource governance outcomes. In irrigation governance, the entire irrigation system represents the action arena (Bastakoti & Shivakoti, 2012). Stakeholders refers to those people and or organisations who have an interest in, or who are affected by, a development, planning process or decision, either as individuals or representatives of a group (Prior, 2010:12-13). Ostrom noted that an action arena is affected by three main clusters of variables: the characteristics of the resource, the rules-in-use, and the attributes of the community of actors [stakeholders]. Governance performance is not only an attribute of the human system of relationships, but also how the human system relates to specific biophysical and social domains (Ostrom, 2007a, 2007b).

In the action arena, choice rules determine the actions that are allowed or not allowed to be undertaken by different stakeholders involved in the governance process (Hufty, 2009). In the interaction arena, the stakeholders share resources, ideas, integrate plans, and coordinate activities to achieve a common goal. The interactions among the stakeholders in the interaction arena are guided by the governance principles of inclusiveness, adaptability, integration, fairness, and legitimacy (Lockwood et al., 2009). For effective cooperation, the legitimacy of all stakeholders, their roles and responsibilities, need to be recognised in order to allow collective action and outcomes. Ostrom's design principle seven emphasised the need to recognise the rights of resource users to self-governance (legitimacy) by government agencies and other entities at a higher level. The extent of the interactions among stakeholders depends on the available capacity to organise these stakeholders and to enforce rules for collective action to achieve irrigation water governance.

2.12.2.2 Contextual Factors

According to the IAD framework, three sets of contextual attributes structure the action situations facing participants in an irrigation water governance system: (i) the physical attributes of the irrigation system, (ii) the attributes of the community of participants, and (iii) the set of institutional arrangements in use by the participants (Ostrom, 1990, 1992; Tang, 1992). These three sets of attributes combine to create different incentives and constraints that guide the behaviour of participants in irrigation systems. Because the participants are characterised by bounded rationality and opportunism, they react according to the incentives and constraints inherent in the situations they face. Williamson (1985:47) referred to opportunism as, ‘self-interest seeking with guile.’ Bounded rationality refers to the ‘inability of an individual to process all information relevant for decision-making situation’ (Tang, 1992:15). Because individual information processing capability is limited, they make decisions without considering all the possible alternatives and likely outcomes. Thus, opportunism and bounded rationality create difficulties in both negotiation and enforcing cooperation and affect collective action situations. The interactions among the participants in different action situations therefore produce different irrigation governance outcomes (Ostrom, 1990, 1992, Tang, 1992).

The outcomes for the participants in the irrigation system include the following:

1. Whether the water supply in the system does or does not meet the water requirement of the crops in the fields served by the system. Farmers’ vulnerability to scarcity and uncertainty in water supply affects their incentive for collective action. Farmers have fewer incentives to organise if they do not have predictable

or sufficient supply of water. As the water supply decreases, there is the temptation to free ride.

2. Whether participants follow the extant rules depends on the available enforcement capacities, and their degree of acceptance of the authority of their leaders to design and enforce the rules as legitimate.
3. Whether the irrigation canals and lateral facilities are well maintained are influenced by the extent to which the irrigators cooperate in the operation and maintenance of the irrigation system which in turn depends on the extent to which rules are enforced and complied with. The operational rules are an important means of coordinating water allocation and maintenance. Maintenance of the irrigation system not only depends on the willingness of the irrigators to cooperate but also the available capacities (human and financial), either from within or without the locality, to support irrigation facility repair and maintenance. Community attributes such as income levels, and presence or absence of social, economic, cultural, and locational differences also affect the irrigators' incentives to cooperate. The capacities of the irrigators can be leveraged by external stakeholders such as government agencies and NGOs through available network systems.
4. Some participants have or have not been consistently disadvantaged in relation to the system depending on the concept of fairness the irrigators share as a value and adhere to.

Either by themselves or in combination with others, each of these attributes affects collective action and outcomes in the irrigation system (Tang, 1992). The degree to which the farmers depend on an irrigation system as (i) a major source of income, and (ii) a major source of water for irrigation, may affect their incentives to cooperate or

not. Also, the size of the irrigated area and number of the irrigators affect irrigators' collective action. Information gathering, communication, decision making, and monitoring costs increase as a result of size and as the number of irrigators involved increases. Also, differences among the irrigators, such as gender, age, and ethnicity, affect cooperation and collective action (Tang, 1992, Ostrom, 1990, 1992), and create potential for conflict. Unequal access to land based on gender, ethnicity and age can also affect cooperation (Ostrom, 2005; Bravo & Marelli, 2008).

2.12.2.3 Institutional Arrangements

As noted by Tang (1992) though the physical and community attributes can affect irrigators' collective action, in some cases institutional arrangements can reduce the effects of physical and community attributes. Institutional arrangements that the irrigators face are the most important of the three contextual attributes underpinning action situations (Tang, 1992). Irrigation water resource governance institutions represent decision-making arrangements that water users adopt to facilitate recurrent transactions among themselves. Decision-making arrangements provide an understanding as to what is designed to be enforced and complied with. Institutions determine water user participation in terms of decision making and power sharing, ownership and control. Institutions shape individual actions and determine collective outcomes. Ostrom (1990, 1992) argued that the effectiveness of irrigation systems depends on institutions that can accommodate negative behaviours (bounded rationality and opportunistic behaviours) at a manageable level. The resource-governing institutions in the conceptual framework include: i) operational rules, and ii) collective-choice rules.

Operational rules define who can participate in which situations; what the participants may, must or must not do; and how they will be rewarded or punished. In irrigation systems, four kinds of operational rules are particularly important if water users are to solve their collective action problems. These include boundary rules, allocation rules, input rules and penalty rules (Ostrom, 1990, 1992). Collective-choice rules stipulate the conditions for adopting, enforcing, and modifying operational rules. Ostrom's design principle 3, a polycentric governance system, ensures that individuals, households, local communities and other entities affected by the operational rules at a lower level have the ability to participate in and to influence the modification of the operational rules at their levels (Cox et al., 2010). The type of institutional arrangements in place, how rules are enforced, and how disputes are settled affect the capacities for governance, interaction among stakeholders and in turn affect the governance outcomes. Effective cooperation among the irrigators depends upon local capacities to monitor rules and sanction non-compliance (Ostrom, 1990, 1992, Tang, 1992).

2.12.2.4 Governance Principles

Table 2.2 presents eight governance principles identified by Lockwood et al (2009). In the case studies these principles provide a guide for stakeholders' interaction and decision-making at regional, district, and community levels in irrigation water resources governance. Inclusiveness, fairness, accountability and legitimacy of leadership affect participants' cooperation and in turn affect collective action and irrigation outcomes. Capacity is required to organise stakeholders at the regional, district and community levels for collective action to achieve irrigation water governance goals. Thus, identifying capabilities and limitations inherent in the existing institutional arrangements helps to anticipate different irrigation governance outcomes. The design of the institutional arrangements that ensures accountability from irrigation officials and

group leaders, affects irrigation governance outcomes (Tang, 1992). Capacities are required to adapt the design and monitoring of institutions to physical and community attributes in order to achieve positive irrigation governance outcomes. To encourage stakeholders' cooperation in irrigation governance requires that the processes are transparent, fair, inclusive, and accountable (Fenemor et al., 2011).

2.12.2.5 Governance Capacity

FAO (2004:7) described *capacity* simply as: “the ability to perform functions, solve problems, and set and achieve objectives.” This raises the importance of requisite knowledge and skills of the stakeholders to interact and effectively achieve irrigation water governance at the community level. Accordingly, Chaskin (2001:295) defined community capacity as “the interaction of human capital, organisational resources, and social capital existing within a given community that can be leveraged to solve collective problems and improve or maintain the well-being of a given community.”

The term governance capacity, as used in this study, refers to the capacity to set and enforce rules, to monitor and enforce compliance of rules, to ensure accountability, to plan and establish conflict resolution mechanisms, to develop and maintain trust and legitimacy, provide effective leadership, mobilise the community, communicate, and network with other stakeholders. The three major categories of capacity available for governance that interact with each other and together create governance capacities are organisational resources, social capital and human capital. These capacities influence the extent to which the governance principles as well as Ostrom's design principles can work to solve collective action problems faced when improving community-based irrigation water resource governance in the case study communities (to be identified in section 4.8).

Organisational resources (financial and logistic) available at the regional, district, and local levels affect capacities for irrigation governance. It also affects the level of interaction among the stakeholders, as their interaction and coordination involves costs.

Human capital refers to the skills, experiences, knowledge, and learning possessed by individuals within a group or an organisation (Becker, 2009, Ingham, 2012). As stated by North (1990, 1995), organisations are made up of groups of individuals bound together by some common purpose to achieve certain objectives. The organisations in the case study area within which the human capital is embedded are the traditional authorities, the WUAs, and ICOUR management and decentralised district and regional agency staff. Knowledge and experience of individuals in these organisations represent the available capacity to achieve collective action.

Ostrom (1992) argued that institutional design which involves many stakeholders and creates social capital as a new relationship is developed in the action arena. Bourdieu (1986:246) defined social capital as “the aggregate of the actual and potential resources that are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition”. In this study, social capital will be considered as durable social networks, norms, trust, reciprocity (social support systems), sense of community and problem solving drivers among the irrigators within the case study villages. The literature on social capital distinguishes between bonding, bridging and linking social ties (Woolcock, 1998). Bonding social ties are defined as the relations among relatively homogenous groups. The relations between relatively heterogeneous groups of people are referred to as bridging social ties (Woolcock, 1998). The term ‘linking social ties’ describes the relations between individuals and groups in different social strata, in a hierarchy where power, social status and wealth are accessed

by different groups (Woolcock, 1998; Halpern, 2005; Kasarjyan, Fritsch, Buchenrieder & Korf, 2007:598). The availability of capacity for irrigation water resource governance at the local level partly depends on the ability to harness and harmonise these three forms of social capital.

Social capital manifests as the ability of actors (individuals within a group) to extract benefits from their social structures, networks, and memberships (Portes, 1998). Social networks provided by extended family, community-based or organisational relationships supplement the effects of human capital (individual skills, training, knowledge, experience), and organisational capital within the group or organisation (Bourdieu, 1986; Coleman, 1988; 1990).

2.12.2.6 Governance Performance Monitoring and Evaluation

Progressive monitoring and evaluation of inputs, outputs, and outcomes are needed to adjust the course of action when required and motivate those driving the process (Jønch-Clausen, 2005). Harvey and Reed (2004) stated that monitoring, evaluation and review are important factors for resource sustainability. Monitoring and evaluation (M&E) is only useful in this regard if there is a mechanism for collecting and sharing the M&E information, and more importantly, an agreed upon and structured process for acting on this knowledge. Thus M&E is an important part of the governance process. M&E will help to know who the stakeholders are, what capacities are available, rules enforcement and compliance. It will help to know whether water resource governance processes are on the right track or not. It promotes inclusiveness, transparency, effectiveness and efficiency. It can identify what works, what does not, and the reasons why. Thus, lessons learned can be used to improve the governance process. Thus, the level of

performance in the governance outcomes can be used to identify problems, thus allowing corrective action to be taken.

Good institutional arrangements, design principles, and governance principles are not always sufficient for achieving irrigation water governance outcomes. Every aspect of governance needs to be monitored and evaluated on a regular basis to give feedback on performance and required corrective actions. Ostrom's design principle four identified two aspects of governance performance monitoring as: i) monitoring users, i.e. accountable functionaries monitor the appropriation and provision levels of the CPR users; ii) monitoring the resource, i.e. those who are accountable to the users monitor the condition of the resource. When users are genuinely engaged in decisions about rules affecting their use, there is a greater likelihood of them following the rules and monitoring others than when an external authority simply imposes the rules (Ostrom and Nagendra, 2007).

In conclusion, local governance capacity depends on the harnessing of the three kinds of capital likely to be available locally, human, social and financial. To maintain integrity of governance there must be effective monitoring, followed by ongoing feedback and correction, which in turn is influenced by the extent of stakeholder's inclusiveness. All this should contribute to the development of good irrigation water governance by local people.

Chapter 3 An Overview of the Water Sector and Governance Regimes in Ghana

3.1 Introduction

Chapter two examined scholarly materials on resource governance, decentralisation, and community-based approaches as a paradigm shift to local or devolved resource governance. It also underscored the weaknesses in these governance approaches. Chapter two therefore provided the theoretical foundations for understanding irrigation water governance generally, and in particular in Ghana.

This chapter presents an overview of the water sector and water resource governance regimes in Ghana, with particular reference to irrigation water governance reforms. The chapter reviews recent water sector reforms and institutional changes in Ghana with a focus on the irrigation sub-sector. In the light of emerging theories of institutional change in general, and in the water resource sector in particular (North, 1990; Saleth and Dinar, 2004; Bressers and Kuks, 2013), the chapter examines whether the reform process provides evidence of effective institutional design and implementation.

The chapter is organised as follows. First, the national context and key features of the water sector are presented. The next section provides an overview of the historical and current institutional developments in the water resources sector in Ghana, especially the policy, legal and organisational features. This is followed by an examination of water institutional reforms, achievements and challenges, with particular reference to the irrigation sub-sector. The remainder of the chapter contributes to defining the research statement, aims, objectives, and questions. It also identifies appropriate case studies for analysis, and identifies the knowledge gap this thesis seeks to address.

3.2 The National Context

Ghana is located in West Africa, and lies within longitudes 3°5'W and 1°10'E and latitudes 4°35'N and 11°N. It borders Burkina Faso to the north with, Togo to the east, Côte d'Ivoire to the west by and to the south, the Gulf of Guinea and the Atlantic Ocean (Figure 3.1).

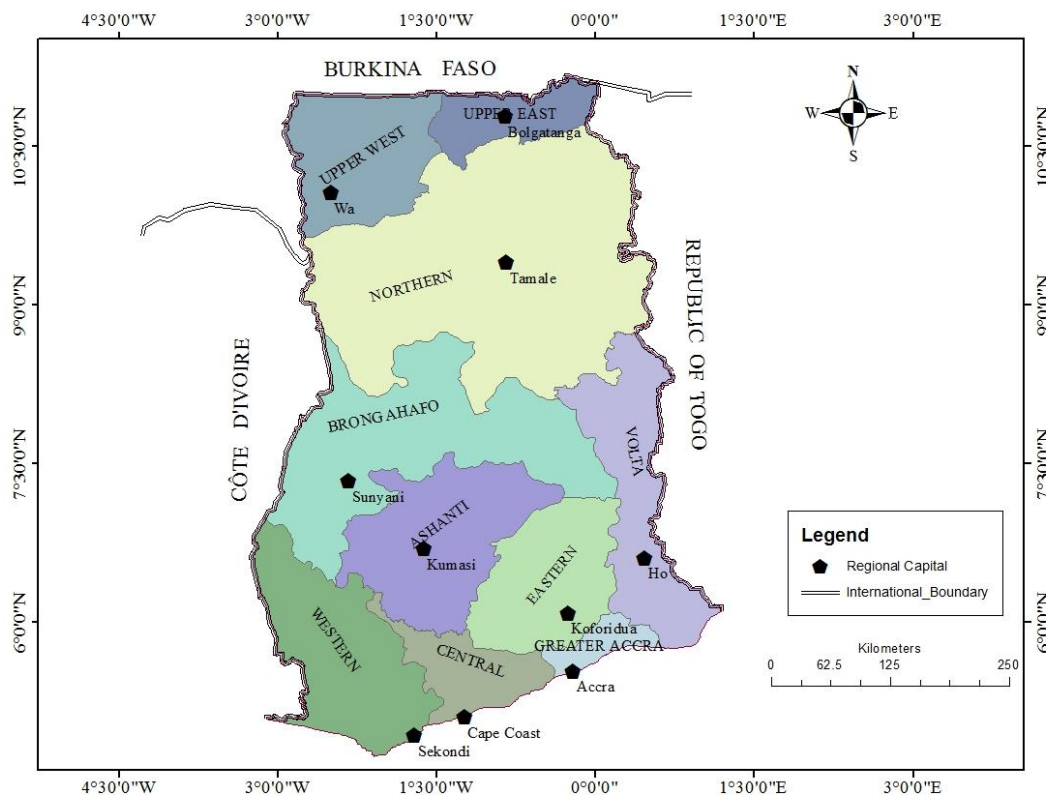


Figure 3-1 Administrative regions of Ghana and major irrigation schemes

3.3 Key Features of the Water Sector

Ghana is relatively well endowed with water resources, but the amount of water available changes markedly from season to season as well as from year to year. The water resources sector of Ghana is dominated by surface water sources. Groundwater use is largely limited to rural domestic water supply and small-scale irrigation (Gyau-Boakye & Dapaah-Siakwan, 2000). Despite Ghana’s abundant freshwater resources,

disparity in distribution leads to water stress and scarcity. In addition, the country's water resources are at risk of depletion and degradation due to the uncertainties posed by climate change and variability, rapid population growth, urbanisation, catchment degradation and pollution (GoG/WRC, 2012).

3.3.1 Sectoral Pattern of Water Use

As in many other less developed countries, irrigation is the largest water user in Ghana accounting for more than 60% of total water use (FAO, 2005; MOFA, 2008). The irrigation sector consists of 22 public irrigation districts scattered across the country with a total command area of 8,800 hectares. They comprise five large-scale irrigation schemes with command areas of more than 500 hectares, five medium-scale schemes of between 100 and 500 hectares, and 13 small-scale systems of more than 100 hectares. The Tono and Veve medium scale schemes in the Upper East region are managed by the Irrigation Company of Upper Region (ICOUR) while the rest are managed by the Ghana Irrigation Development Authority (GIDA) (Namara et al., 2011). Due to deterioration of the infrastructure in these public irrigation schemes, only 5,600 hectares of the 8,587 hectares equipped (65%), were actually irrigated in 2000 (MOFA, 2008). Although irrigation dominates total water use, there is a growing demand for water for domestic and industrial uses (MWRWH, 2009).

3.4 Historical Water Governance and Institutional Changes

Water and natural resource governance in Ghana underwent various historical changes as the governance and control of these resources became formalised. This section of the chapter traces some of the key institutional and historical changes in water resource governance over the years. The history of water resource governance is viewed in terms of institutional (formal and informal) and organisational changes. The current

institutional setting of the country's water resource sector covers both the general 'institutional environment' as defined by the constitutional, political and economic arrangements as well as the specific 'institutional structure' as defined by water resource-related laws, policies and organisations. While the institutional environment influences the evolution of the institutional structure, the latter governs the operation and performance of the water sector (Ostrom, 1990; North, 1990; Saleth and Dinar, 2004). Ostrom (1990) emphasised the importance of local institutional arrangements (common property arrangements) which are often based on a long tradition of informal but commonly shared water rights.

3.4.1 Pre-Colonial Era (Before 1844)

The literature (Opoku-Ankomah et al. 2006; Laube, 2007; Sarpong, 2008) highlighted that before the advent of the British colonial rule in the Gold Coast (now Ghana), various traditional jurisdictions had evolved customary water usage rules and regulations, principally to regulate use of common pool water resources for domestic, fishing and limited agricultural purposes. These rules and regulations were embodied in customary law, reflecting the beliefs and practices of the different ethnic groups. Allen (1939) cited in Mukoro, (2011:139)), in analysing the Gold Coast Colony Native Administration Ordinance 1927, defined native customary law as "a rule or a body of rules regulating rights and imposing correlative duties, being a rule or a body of rules which obtains and is fortified by established native usage and which is appropriate and applicable to any particular cause, action, suit, matter, disputes, and includes also any native customary law recorded as such ...". Customary law is also defined under Article 11 (3) of the Ghanaian constitution as 'the rules of law, which by custom, are applicable to particular communities in Ghana' (GoG, 1992:9).

Water and land were treated as sacred, inherited from the ancestors and the land gods. Water and land were guided by customary rules which were to be enforced by the chiefs and fetish priests on behalf of the ancestors and land gods (Nukunya, 2003). In most parts of Ghana, allodial title to land is held by communities under customary law (Djokoto & Opoku, 2010). 'Allodial' land title is simply an interest in land beyond which there is no superior interest at customary law. However, the position of the allodial land title holder is titular, holding the land in trust for the whole community (Kasanga & Kotey, 2001). Secondary customary land title, also called usufruct right, is held by individuals or families who are part of the community holding the allodial title. In practice, the governance of land and water resources at the local level is largely under the control of traditional authorities and families under customary law (Laube, 2007). The customary law evolved rules for equitable use of water resources among communities through which a river or stream flows (Opoku-Agyemang, 2005; Opoku-Ankomah et al. 2006; Lautze et al., 2006; Laube, 2007; Sarpong, 2008).

The ownership of water resources in consonance with customary law was vested in stools, skins, communities and families (Opoku-Agyemang, 2005; Sarpong, 2008). Family in this context is defined as a group of individuals related to one another by ties of consanguinity, marriage or adoption (Nukunya 2003:49). The term 'Stools' used in southern Ghana and 'Skins' in Northern Ghana denote forms of political, social and religious organisation. The chiefs were the political heads of the stool or the skin. For political purposes, it was from the stool that decisions were taken in consent with the elders who were counselors of the chief (Hammer, 1998; Kasanga and Kotey, 2001). These beliefs are still generally held. The protection of the environment including water resources was the responsibility of the entire community (Odame-Ababio, 2005; Opoku-Ankomah et al. 2006; Opoku-Agyemang, 2005; Sarpong, 2008).

3.4.2 Colonial Era (1844-1956)

As early as the 1900s, the colonial government recognised the need to control the use of water resources. The first attempt to regulate water resource utilisation comprehensively other than for domestic use was the enactment of the Rivers Ordinance (CAP 226 of 1903), but it did not have any practical impact as the customary laws were still in force. The riparian water rights¹ that regulated access to water at the local level largely still prevailed (Laube, 2009a). A related legislative Act was the Forests Ordinance (1949, Cap 157). The Forest Ordinance of 1927 made provisions for catchment area protection and control of water abstraction in forest reserves; the Land Planning and Soil Conservation Ordinance of 1953 had sections for checking soil erosion and for the control of water courses (Odame-Ababio, 2005; Opoku-Ankomah et al., 2006). Tasks such as water and land distribution and measures to prevent soil erosion were the responsibilities of the local communities (Opoku-Ankomah et al., 2006).

Under the British Gold Coast Common Law rules on riparian rights, the owner of any land abutting on water, known as the riparian owner, had unrestricted access to the water insofar as his land was in actual daily contact with the water (Opoku-Agyemang et al., 2006). In essence, at least two systems of water governance—state-regulated and

¹ The riparian water rights system prevailed in Ghana until the promulgation of the Water Resources Commission Act in 1996. Acquisition of water rights was under the general common law as part of the land law. Under the riparian rules, surface water resources were considered public resources held in trust by the state on behalf of the people. The 1992 Constitution of Ghana vests property rights and control of water in the President, who holds them in trust for the people of Ghana (see Article 12 of WRC Act (Act) of 1996).

customary-regulated were concurrently practiced (Odame-Ababio, 2002; Laube (2006), cited in Lautze et al. (2006)).

3.4.3 Post-Independence Era (1957 to present)

After independence in 1957, water resource governance underwent major changes. Mindful that the full set of water resource sector stakeholders extends beyond the boundaries of the water resources sector itself and government stakeholders, the detailed review of stakeholders in this section will be limited to the key public sector actors playing roles related to the irrigation water resource sub-sector.

Over the years, a number of state organisations have been established and charged with the responsibility of managing some aspects of Ghana's water resources. The water resource sector actors can be distinguished by their principal levels of institutional operation: 1) national corporate bodies, 2) regional or district level bodies, 3) local traditional authorities and groups. Moreover, activities in the water resource sector depend heavily on: 1) donors (bi-lateral, multilateral and NGO), 2) the private sector and 3) research and scientific institutes (Fuest et al., 2005).

3.5 Key Water Resource Sector Organisations and Actors

Water resource governance arrangements in Ghana are polycentric in that they involve many actors and agencies as a way of adopting the new governance principles of inclusiveness as discussed earlier in chapter two. As the concept of water resource governance focuses on the integration and synchronisation of multiple interest groups the actors at the various levels and domains are to interact to contribute to outcomes in the water resource sector.

The Ministry of Water Resources, Works and Housing (MWRWH), Ministry of Food and Agriculture (MOFA), Ministry of Lands and Natural Resources (MLNR) and Ministry of Local Government and Rural Development (MLGRD) are the key national public agencies responsible for land, water and irrigation development policy. The Ghana Irrigation Development Authority (GIDA) and Irrigation Company of Upper Region (ICOUR) are the major organisations vested with the responsibility of policy implementation in the irrigation sub-sector, while the Water Resources Commission (WRC) is responsible for overall water resources sector regulation and coordination (GoG/MOFA, 2011).

Multi-lateral development agencies such the World Bank Group, European Union, UN Agencies – International Fund for Agriculture Development (IFAD), Food and Agriculture Organisation (FAO), and United Nations Development Programme (UNDP) and bi-lateral development agencies such as the Canadian International Development Agency (CIDA), Danish International Development Agency, United States of America International Development (USAID), the Agence Française de Développement, German Technical Cooperation, and Australian Aid were involved in the sector. These donor agencies were the external forces that drove the development of the water sector policies and strategies. Some national and international NGOs, civil society organisations (e.g. CONIWAS²) as well as private enterprises have also contributed to water resources governance and have been involved in the construction of small reservoirs for the rural population (Fuest et al., 2005).

² CONIWAS - Coalition of NGOs in Water and Sanitation

3.5.1 Key Sector Ministries for Sectoral Policy Development

3.5.1.1 Ministry of Water Resources, Works and Housing

The Ministry of Water Resources, Works and Housing (MWRWH) is responsible for setting policies and strategies for the water sector – including water resources management and supply of drinking water to both urban and rural communities. There are three key public sector agencies under the MWRWH: the Water Resources Commission (WRC), Ghana Water Company Limited (GWCL) and the Community Water and Sanitation Agency (CWSA). They implement the Ministry's programmes, policies, plans and strategies. The Ministry has established a Water Resource Directorate to oversee sector policy formulation and review, monitoring and evaluation of the activities of the agencies, and co-ordination of donor activities (GoG/MWRWH, 2009).

3.5.1.2 The Ministry of Food and Agriculture

The Ministry of Food and Agriculture (MOFA) is responsible for developing agriculture sector policies and strategies within the context of a coordinated national socio-economic growth and development agenda. By means of a sector-wide approach, the Ministry's plans and programmes are developed, coordinated and implemented through policy and strategy frameworks. In this regard, MOFA facilitated the preparation of the National Irrigation Policy (NIP), and is responsible for policy coordination, monitoring and evaluation (GoG/MOFA, 2011).

3.5.1.3 The Ministry of Local Government and Rural Development

The Ministry of Local Government and Rural Development (MLGRD) is responsible for the overall policy formulation and strategic guidelines, planning, coordination, collaboration, monitoring and evaluation of programmes relating to local government

and rural development. It is also responsible for the efficient administration of all local government institutions including the Metropolitan, Municipal, and District Assemblies (MMDAs). Under the National Irrigation Policy (NIP), the MMDAs are responsible for managing medium-scale irrigation schemes in their districts in conjunction with the farmers, and also provide oversight over small-scale schemes WUAs (MWRWH, 2009).

3.5.1.4 The Ministry of Lands and Natural Resource (MLNR)

This Ministry is responsible for policy formulation, coordination, monitoring and evaluation and supervision of departments and agencies in land, forest, wildlife and the mineral resources sector of the country. It is responsible for protecting the country's water catchments.

3.5.2 Organisations Responsible for Irrigation Policy Implementation

3.5.2.1 Ghana Irrigation Development Authority

The Ghana Irrigation Development Authority (GIDA) was established by the Supreme Military Council (SMC) Decree No. 85 and is the main national public agency in charge of irrigation development. It is expected to exercise management control over its irrigation reservoirs, catchment areas and drainage of irrigated areas and general water quality, especially within its project areas (FAO, 2005). Under the new NIP, GIDA is expected to play a key role in promoting both public and private irrigation development with much more effectiveness than previous arrangements (GIDA and MOFA; 2003; GoG/MOFA, 2011).

3.5.2.2 Irrigation Company for the Upper Region

The Irrigation Company of Upper Region (ICOUR) was established as a para-statal agency to promote irrigated agricultural production in the Upper East Region of Ghana.

ICOUR is an autonomous company wholly owned by the Government of Ghana (GoG), with GIDA as its representative, and directly financed by the Ministry of Finance. Its original mandate included: providing training and development of community irrigation farmer groups to play an increasing role in the operation and management of irrigation schemes; providing technical advisory services for crops, livestock, forestry and fisheries development; providing tractor hire services, irrigation water and farm inputs; and maintaining irrigation infrastructure (ICOUR, 1985).

3.5.2.3 Water Research Institute

The Water Research Institute (WRI) was formed in 1996 from the merger of the Institute of Aquatic Biology and the Water Resources Research Institute. It has a mandate to conduct research into water and related resources. It engages, among other things, in research on groundwater resources on hydrometeorological and hydrological data for planning and research, on irrigation technology, rainwater harvesting, and water management in valley bottoms for rice production (FAO, 2005).

3.6 Decentralisation Processes in Ghana

Within the last three decades, the political economy of Ghana has undergone transformation through neo-liberal restructuring of state responsibilities and administrative processes through decentralisation and local government reforms (Crawford, 2004). The decentralised government system consists of regions, which are governed by the Regional Co-ordinating Councils (RCC), and districts, which are governed by the District Assemblies. The sub-district local government structures are the Zonal/Town/Area Councils with Unit Committees being the lowest level. The Ghana decentralised governance structure is shown in Figure 3.2.

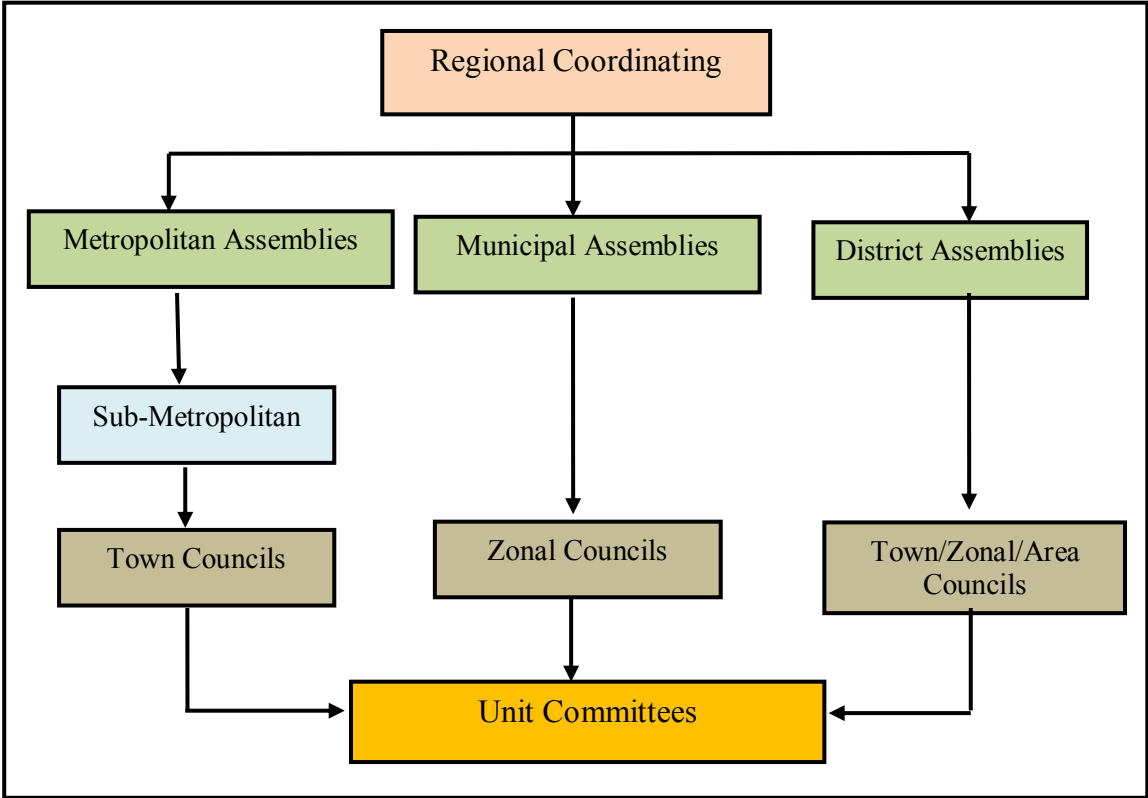


Figure 3-2 Structure of Ghana’s Decentralised Governance

The district is the highest political authority for the development and implementation of policy objectives (Local Government Act of 1993, Act 462). The District Assembly (DA) is both the legislative and administrative body of the district. The DAs prepare, formulate and implement annual development plans, budgets and strategies for the mobilisation of resources necessary for the overall development of the district, including provision of basic infrastructure (GoG, 2003). The RCCs play mainly a co-ordinating role (Local Government Act of 1993, Act 462). The DAs are the relevant bodies for the rural areas where irrigation is undertaken.

The DAs are empowered as the highest political and administrative decision-making authorities at the local level (Gyimah-Boadi, 2009; Ahwoi, 2010). They coordinate and supervise all programmes by Government Ministries, Departments and Agencies (MDAs), as well as those of non-governmental actors (GoG, 1993; Tettey, 2006;

Gyimah-Boadi, 2009; Ofei-Aboagye, 2009; Ahwoi, 2010). In principle, the DAs are the focal points for promoting broad-based citizen participation in local government and governance (GoG, 1993). The major decision making powers with respect to planning and public investment in water and irrigation infrastructure are either vested with the national government or the District Assemblies (Schiffer et al., 2008).

The DAs are however faced with problems of inadequate financial, human and other resources to enable local government structures to function well. There are problems of accountability to the local communities. The DAs particularly the sub-district structures are also ineffective in delivering their mandates. Citizens' participation in local governance decision-making is also limited (GoG/MLGRD, 2010; Adusei-Asante, 2012). The role of traditional authorities in local governance arrangements and collaboration between the DAs and civil society groups are limited. Fiscal decentralisation, integration of district level departments in Assemblies, composite budgeting and staffing requirements of local authorities were found to be unsatisfactory, thus frustrating the smooth implementation of the decentralisation and local governance process (GoG/MLGRD, 2010). These weaknesses in the implementation of the decentralisation process in Ghana have limited its effectiveness as a good governance approach.

3.7 Water Sector Reforms

3.7.1 Rationale for the Water Sector Reform

Prior to the 1980s there was an absence of a holistic water policy that included all aspects of water resources management to guide water reforms. Starting from the late 1980s, the Government of Ghana embarked on a number of policy reforms intended to improve efficiency in rural, urban and irrigation water use as well as to ensure

environmental protection and conservation. With donor support, a “Five-Year Rehabilitation and Development Plan” for the sector was prepared in 1987. This led to the launch of the Water Sector Restructuring Project (WSRP) (MWRWH, 2009).

3.7.2 National Water Policy

Until recently, Ghana did not have a single policy framework or agency that had overall responsibility to manage the country’s water resources. Sector laws were fragmented among different state agencies like the Ghana Water and Sewerage Corporation (GWSC), the Volta River Authority (VRA), and the Irrigation Development Agency (IDA). These public agencies pursued their individual mandates with little co-ordination (Mensah, 1999). The fragmentation and multiplicity of water laws and policies created problems for water resource use regulations for various purposes, such as for domestic water supply, irrigation, transportation, inland freshwater fishing, hydro-electric power generation, and recreation, as these sectoral laws and policies lacked external coordination and internal consistency. In the absence of an overall framework for regulating and managing water resources and allocation among multiple users, conflicts and unsustainable management of water resources were inevitable (Mensah, 1999).

The WRC introduced a draft Water Policy in 2000, and through a wider stakeholder consultative process initiated later in 2004. In 2007, the National Water Policy (NWP), which was underpinned by the integrated water resources management (IWRM) approach, was approved. The main objective of the NWP of 2007 is to develop a comprehensive framework for sustainable governance and management of the nation's water resources, and put in place an effective legal and institutional framework for its implementation. The policy aimed at ensuring that beneficiaries participate fully in all stages of water resource development. Therefore, it is targeted at all water users, water

managers and practitioners, investors, decision-makers and policy makers within central governmental and decentralised structures, non-governmental organisations and international agencies (GoG/MWRWH, 2007). The NWP adopted an Integrated Water Resource Management (IWRM) approach that sought to involve all stakeholders in key stages of the planning process, and emphasised an iterative and adaptive approach as a way of adopting of good water governance. The IWRM approach has been defined as “a process, which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems,” with emphasis on management within a basin-wide context, under the principles of good governance and public participation (UN, 1992).

Several policy measures were proposed to ensure sustainable conservation and utilisation of the water resources. These measures included strengthening DAs to assume a central role in supporting community operation and maintenance of small-scale irrigation schemes (GoG/MWRWH, 2007) which is the focus of investigation in this study. The water resource sector reforms also led to the passing of a legislative instrument, LI 1350 of 1987, which specified clearly the roles of GIDA and also encouraged farmer participation in irrigation project management. The water resource reform also led to the establishment of Ghana's Environmental Protection Agency (EPA) in 1994. It also led to the establishment of the Public Utilities Regulatory Commission (PURC) in 1997 to regulate and oversee the provision of utilities, and the Ghana Water Company Limited (GWC Ltd) in 1998 to provide water supply to urban areas. The same year, the Community Water and Sanitation Agency (CWSA) was established to administer rural water supplies (GoG/NDPC, 2003; FAO, 2005; Andah, Ampomah, Adjei & Andah, 2012; GoG/WRC, 2012).

3.7.3 Water Sector-related Institutional and Legal Frameworks

The key water related legislations and regulatory bodies in the post-independent Ghana among others are listed in Table 3.1 and discussed briefly in the subsequent sections.

The details are provided in Appendix 1.

Table 3-1 Key Agencies and Legislations for Water Resources Governance

Actors/Organisations	Laws	Mission and Responsibilities
Environmental Protection Agency (EPA)	Environmental Protection Agency Act, 1994 (Act 490)	Environmental regulation enforcement.
	Environmental Assessment Regulations 1999 (L.I. 1652)	Defines the procedures for acquiring Environmental Permits and conducting Environmental impact Assessments.
Forestry Commission	Forestry Commission Act 1999 (Act 571)	Forests and catchment protection.
Ghana Irrigation Development Authority (GIDA)	Supreme Military Council Decree 85	Irrigation development in Ghana
Government of Ghana	1992 Constitution of the Republic of Ghana	Article 269 seeks to protect water resources.
Local Government	Local Government Act 1993 (Act 462)	Defines the key government actors in the decentralisation process: the Regional Co-ordinating Councils (RCC), the Metropolitan, Municipal and District Assemblies (MMDAs), and their sub-structures (GoG, 1993).
	Local Government Law 1988 (PNDC Law 207)	The DAs as the key institution for the local government system.
	Local Government Service Act 2003 (Act 656)	For effective administration of local government in the country.
Lands Commission	Lands Commission Act 1994 (Act 483)	To co-ordinate land related issues with other relevant public agencies
Minerals and Mining	Minerals and Mining Law 1986 (PNDC Law 153)	Laws on diverting water for mining or other industrial purposes (GoG, 1986).
Water Resources Commission (WRC)	Water Resources Commission Act 1996 (Act 552)	WRC mandated to regulate and manage the country's water resources, and to coordinate the sector policies.
	Water Use Regulations 2001 (L.I. 1692)	The procedures to obtain water use permits (WRC, 2003).

Source: Adapted from Fuest, Ampomah, Haffner and Tweneboah (2005)

3.7.3.1 Water Resources Commission (WRC)

The WRC was created in 1996 by Act 522. It is responsible for the regulation and management of the utilisation of water resources and the coordination of policies related to its functions. Among its major tasks are the granting of water rights and the allocation of water resources among competing users (GoG, 1996).

3.7.3.2 Environmental Protection Agency (EPA)

The Environmental Protection Agency was established by an Act of Parliament, Act 490 of 1994. Its functions include: advising the sector ministry on the formulation of policies on the environment and making recommendations for the protection of the environment; ensuring compliance with the laid down environmental impact assessment procedures in the planning and execution of development projects (including irrigation projects); working with other government agencies, District Assemblies and any other bodies and institutions to control pollution and generally protect the environment, and promote effective planning in the management of the environment (GoG, 1994).

3.8 Irrigation Sub-sector Institutional Reforms

The approach to large and medium-scale irrigation systems development from the 1950s through to the 1970s was technology-driven and managed by government agencies. These approaches were hinged on the understanding that a combination of ‘correct’ technology, ‘efficient’ markets, and ‘capable’ centralised technocratic agencies would lead to optimum performance (World Bank, 1997, Vermillion, 2001). Thus, during the colonial and immediate post-colonial periods in Ghana and elsewhere in the developing world, governments constructed and managed large and medium irrigation infrastructure (Namara et al., 2011; Kulkarni and Tgayi, 2013).

Over the years, irrigation system management under centrally-controlled structures failed to meet the needs of irrigation water users, particularly of smallholders. Due to inadequate funding for operation and maintenance of government-managed schemes, which led to their consequent deterioration, two major institutional reforms were introduced in the 1980s which were ‘Irrigation Management Transfer’ (IMT) and ‘Participatory Irrigation Management’ (PIM) strategies (van Edig, Engel and Laube, 2002; Groenfeldt, 2003; Vermillion, 1997). While IMT refers to the process of transferring specific management responsibilities from government agencies to organised farmer groups, participatory irrigation management (PIM) sought to promote participation of farmers in the management of the irrigation system (Groenfeldt, 2003).

Ghana moved to adopt PIM in the early 1990s, as it became clear that the centralised government management style was unworkable. Since then, the operation and management of public irrigation facilities has been carried out largely using funds collected from irrigation service charges paid by beneficiary farmers. Irrigation service charges are determined by factors such as the irrigated land area of each farmer, the irrigation type (pump, gravity, etc), and the standard of the facility (Namara et al., 2011).

The farmer-managed irrigation schemes were transferred from the government to the villages and Water User Associations (WUAs). The government-managed Veve irrigation scheme, on the other hand, was transferred to the Irrigation Company of Upper Region (ICOUR) in 1983, to be managed on behalf of the government and the communities, with the participation of the communities. Decentralisation of irrigation water management decisions led to the formation of the WUAs in the farmer-managed schemes as the governing bodies to which the irrigation schemes were transferred. In

the government-managed schemes, Village Committees (VCs) (now termed lateral groups) were established in 1987 by ICOUR to represent irrigation farmers from each village. The VCs were to oversee land and water allocation within the irrigation areas, collect water and land levies from the farmers on behalf of ICOUR (ICOUR, 2010). The lateral groups were the local level irrigation water governing bodies whose leaders liaised between ICOUR on one hand, and the villages and irrigators on the other hand.

ICOUR was supposed to involve the irrigators and the villages in the governance of the Veia irrigation scheme. ICOUR was also supposed to hand over the governance of the scheme to the irrigators, and concentrate on water supply in the long-term (ICOUR, 1985). Thus, irrigation water resource governance had been devolved from the government to the decentralised structures, namely WUAs and traditional authorities in the case of the farmer-managed schemes. In the case of the government-managed schemes it was decentralised to the lateral groups (formerly known as Village Committees) and traditional authorities in the eight villages and ICOUR.

With the support of FAO, the Government prepared a draft policy document in 2007 to guide irrigation development within the NWP. The policy sought to address: i) low agricultural productivity; ii) socio-economic constraints to land and water resources development; iii) environmental degradation associated with irrigation production, and iv) lack of irrigation support services (MOFA, 2008). The irrigation policy document was adopted in 2011 as the National Irrigation Policy based on the principles of decentralisation and subsidiarity. The policy thrust was for the national government to construct and/or rehabilitate medium-scale irrigation schemes for the District Assemblies (DA) and farmers to co-manage and maintain, with small-scale schemes

farmer-managed through Water Users Associations (WUAs) with DAs providing public interest regulatory functions (GoG/MOFA, 2011).

3.9 Drivers of Water Sector Reforms in the 1990s

The water sector reforms that Ghana undertook in the 1990s were informed by both internal and external exigencies. Uncontrolled basin catchment area degradation, pressure on land and water resources due to climate change and variability, rapid population growth and urbanisation that put enormous stress on water resources became major issues to be tackled through a coordinated multi-sectoral approach (GoG/WRC, 2012). In addition, public domestic water supply utilities and centralised irrigation schemes were recognised as inefficient due to organisational weaknesses and inadequate funding, thus creating a need to strengthen user participation and ownership at various levels (Mensah, 1999; Opoku-Ankomah et al., 2006:12). These were but some of the underlying internal factors that necessitated the water sector reforms. The 1992 Constitution of Ghana strengthened the country's decentralisation and local government policy, which began in 1988³. The Constitution and the Local Government Act, 1993 (Act 462) created a three-tier structure of sub-national government at the regional, district and sub-district levels⁴.

The current water sector reforms (WSRs) in Ghana, were thus also inspired and directed by major global landmark events captured in a series of statements and documents such as the 1992 Rio World Summit on Sustainable Development, the Dublin Statement of 1992, the 1998 Paris Declaration on Water and Sustainable Development, World

³ Article 35(6)(d) and Chapter 20 of the 1992 Constitution of the Republic of Ghana

⁴ Section 3 and Part X of the Local Government Act, 1993 (Act 462)

Commission on Reservoirs Report, the 2002 Johannesburg Declaration on Sustainable Development (Rio+10), the World Water Vision, the Millennium Development Goals, the outcome of the United Nations Commission on Sustainable Development, and the Ministerial Declaration of the 5th World Water Forum (Iza and Stein, 2009; GoG/WRC, 2012).

Regional and sub-regional agreements also informed the national water sector policies and approaches. For instance, the West African Ministerial Conference on IWRM in 1998, urged sub-regional Governments to adopt IWRM strategies through regional co-operation and harmonisation of water policies and regulations (Global Water Partnership, 2003). A host of donor partners, including the World Bank, International Monetary Fund, African Development Bank (ADB), the United Nations system, European Union, Agence Française de Développement, Canadian International Development Agency, United Kingdom Department for International Development, USAID and DANIDA played key roles and facilitated the reform processes (Mensah, 1999; van Edig and Laube, 2002; Fuest et al., 2005).

3.10 Outcomes of the Water Reforms

The WSRs have made some moderate and general achievements in terms of implementation under different domains. These include:

1. formulation of water sector and irrigation sub-sector policies;
2. establishment of water sector institutional and legal frameworks;
3. transfer of state owned small scale irrigation schemes to the communities through the IMT policy facilities (Turrall, 1995; IFAD, 2001; Schiffer et al., 2007);

4. introduction of participatory irrigation management whereby irrigation farmers and others were encouraged to participate in irrigation management decision making processes;
5. recognition of local people in water resource management;
6. communities encouraged to manage rural and peri-urban water supply systems through water and sanitation committees and water boards;
7. establishment of three river basin management projects in the Densu basin (2002), White Volta basin (2004) and Ankobrah basin (2007);
8. establishment of the Volta River Basin Authority in West Africa; and
9. privatisation of urban water (van Edig et al, 2001, Birner et al, 2005; CWSA, 2005; Laube, 2007; Opoku-Ankomah et al., 2006; Opoku-Agyemang, 2005; Ampomah, Adjei & Youkhana, 2008; Laube, 2009; Namara et al., 2011).

Notwithstanding the above achievements, the implementation of water sector reform has been confronted with a number of challenges. Some of these challenges are discussed briefly.

3.11 Water Reform Implementation Challenges

Policy problems, including those concerned with water resources are often called ‘wicked’ because they are persistent despite considerable efforts to solve them (van Bueren et al., 2003). This section examines the challenges encountered in the implementation of water sector reform generally. These challenges relate to centralised and ‘top-down’ administrative systems, irrigation water resources governance, implementation of IWRM, inter boundary water conflict, institutional capacity and coordination and trans-district basin management. Evidence from irrigation water resources governance in northern Ghana is used to illustrate these challenges.

3.11.1 Centralised and Top-Down Administrative System

Ghana's water resource reform and decentralisation processes have not been able to effectively integrate all stakeholders particularly the local communities whose livelihoods depend largely on water resource governance processes (GoG/MOFA, 2011). Local water resources users are alienated from the process of water resource governance. The current institutional framework for IWRM has not clearly indicated the relationship between the district and the communities on one hand and other stakeholders on the other. Ghana's political and administrative processes are still highly 'centralised' and 'top-down' in character (Antwi-Boasiako, 2010) ignoring the historical background of existing structures (Hauck and Youkhana (2008). Environmental and resource policies tend to be conveyed to the districts as a set of prescriptions which Assembly Members and Unit Committees are required to implement. Amanor and Brown (2002) described the environmental policy of Ghana as external in its derivation, and 'top-down' in its orientation. Thus, the water governance process failed to be inclusive, integrative, and adaptive to current global trends of good water resource governance.

3.11.2 Irrigation Water Resources Governance Challenges

The Ministry of Food and Agriculture (GoG/MOFA, 2011) classified the problems facing the Ghanaian irrigation sub-sector as:

1. low agriculture productivity and slow rates of growth;
2. limited organisational capacity;
3. institutional problems;
4. socio-economic constraints; and
5. ineffective integration and coordination of local level water governance

3.11.2.1 Low Agriculture Productivity and Slow Rates of Growth

Formal public irrigation schemes are operating at approximately half their designed capacity and the informal irrigation sector is not recognised and supported sufficiently to contribute at full potential. The poor performance of the irrigation sub-sector of the Ghanaian economy is attributed to poor governance of the irrigation sector of the economy (GoG/MOFA, 2011). Yields of most crops are still far below their potential, and the level of modern technology adoption in agricultural production and processing is still extremely low (Seini, 2002; Diao, 2010; GoG/MOFA, 2011; Namara et al., 2011).

3.11.2.2 Limited Organisational Capacity

The implementation of the WSRs faces the challenge of inadequate organisational capacity at all levels (national, regional and local) (van Edig et al., 2003; Laube, 2005). GIDA's limited human and financial resources have severely compromised the extent and quality of service delivery to the irrigators. This constrained the performance of the formal irrigation sector. Of particular concern is GIDA's predominantly engineering bias, as compared to the social mobilisation and agronomic skills necessary for sustainable and profitable irrigation sector management (GoG/MOFA, 2011). Seini (2002) reported that formal agencies such as the National Agricultural Research System (NARS) and agricultural extension services lacked financial and human capacities, and therefore were not able to deliver effective and efficient services to the agricultural sector. This indicates that the governance principle of capacity (Lockwood et al. 2009) and the principle of subsidiarity, which states that requisite capacities should be given to low level organisations to perform tasks devolved to them (Marshall, 2008) have not been well adhered to in the water resource reform and decentralisation processes.

3.11.2.3 Institutional Problems

The organisational mandates on irrigation development are unclear. This is coupled with unclear ownership of irrigation infrastructures. No agency accepts responsibility for building the capacities of irrigation water resource users in on-farm-water-management and farming system decision making (GoG/MOFA, 2011). Seini (2002) reported that national and regional farmers' associations at the national and regional levels that could influence government policies are of a top-down nature. They are urban-based as they are located at the national and regional levels and have little or no contact at all with grassroots farmers. They have failed to lobby for the community level farmer groups.

In the government-managed schemes, decisions taken by the VC leaders were not guided by governance principles of transparency and accountability. The VC leaders compromised the interests of the irrigators they represented by allocating land to outsiders who bribed them (Laube, 2007). The legitimacy of the VC leaders was therefore challenged by the local chiefs. Due to the corruption among the VC leaders, the chiefs made decisions regarding land allocation with the approval of ICOUR management. Land ownership and allocation frequently became a source of local disputes (Laube, 2006). Laube (2007) revealed that water resources use, management, and land allocation in the irrigation sector in the government-managed irrigation schemes was not well-guided by rules and regulations.

3.11.2.4 Socio-cultural Constraints

The GoG/MOFA (2011) noted that community social norms regarding land and water use inhibited the implementation of government policies. Institutions based on customary law have been formally recognised in the 1992 Constitution. As noted by

Birner et al., (2005), the inclusion of customary institutions in the 1992 Constitution is based on the belief that “public affairs would be better managed if public officials were informed by the value systems that underpinned Ghana’s indigenous political institutions.” Government policies regarding water use conflict with customary rights. The establishment of formal land and water governance organisations like WUAs, lateral groups, and ICOUR that tended to disregard these customary governance arrangements often lead to misunderstandings over water resources use between government agencies and the traditional authorities (Amanor, 2002). The current irrigation sub-sector policy also failed to deal with existing imbalances between men’s and women’s land ownership rights that affects women’s involvement in irrigation water governance (GoG/MOFA, 2011). Thus, water resource development programmes have been detrimental to women’s land rights and use of water (GoG/MOFA, 2011). Thus, current water resource governance approaches failed to be integrative, adaptive and inclusive in order to achieve governance outcomes.

3.11.3 Ineffective Integration and Coordination of Local Level Water Governance

Most water catchments in the country are trans-district and trans-community in nature as they pass through more than one district and community. In some cases, catchments may also be inter-regional. There are no provisions in the Water Resources Commission Act or the regulations on how the various districts on one hand and various communities on the other, are to co-operate in the management of trans-district and trans-community waters. The relationships between the trans-district riparian communities are not well defined (Opoku-Agyemang, 2005).

Ghana is a typical case in Africa with “mixed government”, where governance structures based on customary law coexist with those based on modern law. Thus,

within the irrigation sector of Ghana multiple agencies and actors are involved in the management of water resources. In irrigation management authorities, irrigation water user groups, the District Assemblies, and traditional authorities have often overlapping and conflicting responsibilities and objectives (Laube, 2007). Access rights to irrigated land and water resources are frequently contested. The current approach to integrated water resources management (IWRM) implementation has excluded the traditional authorities in water resource governance (van Edig et al., 2003; Laube, 2007). The traditional authorities do not have a formal representation at the District and sub-district level political administration. However, they play an important role in managing public affairs including land and water resources at the sub-district level (Birner et al., (2005). Thus, international guidelines and national programmes promote policies that are not well guided by governance principles of inclusiveness, integration, and adaptation to customary approaches to water resources governance in the communities.

3.12 Research Focus

Ghana has well-crafted policies on natural resources governance including water, which contain considerable emphasis on decentralisation. The rationale of current institutional reforms towards participatory irrigation water governance in Ghana is to gradually transfer irrigation resource governance to District Assemblies and the users (WUAs) (van Edig et al., 2003; GoG/MOFA, 2010). Water policy is aimed at promoting and establishing community-based irrigation schemes, with the support of the District Assemblies (DAs). It also stressed the need to strengthen the DAs to play key roles in supporting water users in operation and maintenance of irrigation schemes at the community level (GoG/MWRWH, 2007). Irrigation policy emphasise that implementation of irrigation sector policy ought to adhere to the principle of subsidiarity in devolving management roles, ownership and control to DAs and water

users (GoG/MoFA, 2010). Thus in principle, there is a clear policy in Ghana for irrigation water users' active participation in irrigation water resource governance processes to ensure accountability and sense of ownership and control.

The establishment of WUAs as community level organisations to manage farmer-managed schemes (small-scale irrigation schemes) is intended to devolve state functions and responsibilities, such as the design and enforcement of institutions, water allocation, user fee collection, conflict resolution, operation and maintenance, and ownership of the irrigation facilities, to the people at the local level (van Koppen et al., 2007; IFAD, 2001). In addition, the establishment of community level irrigation water resource governance structures offers scope for empowering the users at the local level, allowing them to exercise control over major decisions which affect their livelihoods, such as equity in water distribution, access to water by multiple users, equity in access to land by all users, and in some cases empowerment of the poorer water users and women (IFAD, 2001).

However, evidence from the literature indicates that the policy intent of local level control, participation and ownership has not been achieved. For instance, local organisations lacked the human and organisational capacity to design effective institutional arrangements for irrigation water resource governance. Policy implementers overlooked the need to build the capacities of irrigation water users and DAs in irrigation water resource governance (Snyder et al., 2013). This resulted in the low capacity of staff of government departments and agencies charged with irrigation development at the District and community levels. The lack of managerial and technical expertise at the intermediate level have adversely affected the quality of knowledge transfer to the newly created WUAs established to manage small scale irrigation

schemes sustainably (Venot et al., 2012). The DAs and sub-structures also lacked capacities to plan, initiate, coordinate, and manage partnerships with the private and civil society organisations in multi-stakeholder governance regimes (GoG/MLGRD, 2010). The water users also lacked effective legal frameworks that recognised them as independent decision-making bodies (see Snyder et al., 2013; Venot, 2011; Birner et al., 2010; IFAD, 2001).

The policy promotes cross-agency collaboration, especially with the Water Resources Commission (WRC) and the Department of Cooperatives (for marketing purposes). Similarly, the National Water Policy of 2007 emphasises a ‘holistic’ approach to water resources governance and development in the form of ‘Integrated Water Resources Management’ (IWRM) (GoG/MWRWH, 2007) and, like the irrigation policy, makes it clear that a cross-sectoral, decentralised and participatory water planning and decision-making approach is the way forward. Nevertheless, there has been insufficient collaboration between development partners and other actors such as NGOs in water resource governance (van Edig et al., 2007, Laube, 2007; MOFA, 2010; Venot et al., 2012).

Others problems include excessive focus on technical and financial issues to the detriment of other issues such as the formulation of clear irrigation governance and management policies (Kyei-Baffour & Ofori, 2006; Eguavoen & Youkhana, 2008), and conflict of interests (Laube, 2009b:16). The farmer-managed irrigation schemes are also faced with significant physical, social, and institutional governance problems (Birner, et al., 2010; Namara et al, 2011). Consequently, the long term sustainable governance of farmer-managed irrigation schemes under WUAs, particularly those in the poverty endemic Upper East Region, is fragile. Irrigation water resources development

programmes have been detrimental to women's land rights (MOFA, 2010; MWRWH, 2010). Although participation of women was a requirement of public irrigation projects, women's participation was limited in most cases. Women's access to land and participation in irrigation water resources governance is still constrained by local gender inequalities and stereotyping (Bacho, 2003). The land tenure system has negatively affected widespread participation in irrigation water resource governance (Venot et al., 2012).

The outcome of poor irrigation water resource governance at the local level is that the performance and productivity of existing irrigation schemes, particularly those that were publicly developed, continue to deteriorate (Kyei-Baffour & Ofori, 2006; Namara et al., 2011:4). Currently, formal large and medium-scale irrigation systems play insignificant roles in the overall agricultural productivity of Ghana, despite substantial investments to develop the sector since the 1950s. Capacity under-utilisation is a major problem in many existing irrigation facilities due to poor governance (Kyei-Baffour & Ofori, 2006; Namara et al., 2011).

The outcome is a very slow progress in translating water and irrigation sector governance policies into action. The water and irrigation resources sector reforms appear to be empty promises that take the form of declared policies that are not implemented. The situation raises serious gaps in knowledge regarding the sustainability of community level irrigation water resource governance institutional arrangements in Ghana. The questions left unanswered include whether the problem has to do with the unpreparedness of government agencies to translate policies into practice, or the lack of local capacity to implement and coordinate the stakeholders to be involved in the irrigation water resources governance process to achieve the intended

governance outcomes. Thus, what warrants investigation is whether there is a low engagement of stakeholders, and why there is low engagement, particularly by the water users in irrigation water resource governance at the community level.

Hence, the overarching question arising from the above discussion which is worth investigating is: To what extent are the current decentralised local government and governance structures and processes at the regional, district and sub-district levels supporting a community-based approach to irrigation water governance? The sub-questions arising from this focal question that the study seeks to answer more specifically are the following:

1. To what extent has irrigation water resource governance been decentralised to the community level?
2. What are the institutional arrangements for irrigation water governance at the district and community levels and how well are these institutions working?
3. What are the impacts of the current local level decentralised structures and processes on community-based irrigation water resources governance?
4. To what extent have normative standards and by-laws promulgated as a guide for irrigation water governance been enforced by relevant stakeholders?
5. What capacities exist for irrigation water governance and how are these capacities supporting community-based irrigation water governance at the local level?
6. To what extent have decentralised process promoted water users participation in community-based irrigation water governance?
7. How has the decentralisation initiative promoted stakeholders' interaction and collaboration and how are the stakeholders coordinated for irrigation water governance at the local level?

3.12.1 Research Aims and Objectives

The aim of the research is to evaluate the current governance structures and processes and assess whether these are effectively supporting a community-based approach to irrigation water resource governance, with special emphasis on comparing farmer-managed and government-managed irrigation schemes under the decentralisation policy of Ghana. The study will therefore examine the two kinds of institutional and governance arrangements and processes in place (farmer- and government-managed), and assess how well these contribute to supporting community-based irrigation water resource governance. Specific objectives of the study are:

1. To examine the current governance structures and processes at the district and community levels in irrigation water governance in the study area.
2. To compare farmer-managed and government-managed irrigation schemes to assess which best furthers the decentralisation process to support irrigation water resources governance at the community level.
3. To examine any difference in the farmer-managed and government-managed irrigation schemes in the study area on the impact at the community level of the current institutional structures on irrigation governance.

3.12.2 Significance of the Study

Although the economy of Ghana depends largely on agricultural and irrigation development, irrigation water resource governance is not as effective as it could be in its contribution to national development (Kyei-Baffour & Ofori, 2006:1; Namara et al., 2011:1). This study therefore will contribute to an understanding of the extent to which decentralised governance and community level structures have promoted or impeded community-based irrigation water resource governance. It will assess, how well the

current approaches are meeting the challenges inherent in irrigation water resource governance at the community level. The literature on irrigation water resource governance and specifically in the context of Ghana is inconclusive on several vital questions within the irrigation water resource governance discourse. Earlier research on Ghana's irrigation water resource governance tended to focus more on the technical issues, rather than on the institutional dimensions (Akudago, Chegbeleh, Nishigaki & Nanedo, 2009; Yilma, 2005; Liebe, van de Gieen & Andrein, 2005; Annor et al., 2009; Mdemu, 2008). In contrast, the literature on natural resource management increasingly places emphasis on the importance of the institutional aspects. The institutional elements of irrigation water resource governance and management in Ghana have received less attention in the past, and hence are still poorly understood and emphasised. However, the institutional aspects of water governance are considered globally as crucial to poverty reduction and improvement of food security at the global, national, regional, and local levels (Saleth & Dinar, 2004; WWC, 2009; Miranda et al., 2011; Uhlen Dahl et al., 2011).

While other studies (van Edig et al., 2003; Gyasi, 2004; Kyei-Baffour & Ofori, 2006; Eguavoen & Youkhana, 2008; Birner et al., 2010; Faulkner, 2006; Laube, 2007, 2009; Namara et al., 2011; Venot et al., 2011; Snyder, et al, 2013) are related to the current study in focusing on institutional aspects of irrigation water governance, these previous studies focused on either cost-benefit analysis, financial issues, or corruption in contracting within the irrigation sector. In addition, they also focused on a single institutional arrangement at a time, that is either on 'farmer-managed' schemes (FMS) or 'government-managed' irrigation schemes (GMS). Decentralisation is a governance approach adopted by Ghana to devolve irrigation water resource governance to the local level. However, none of the previous studies examined the performances of the local

level institutional arrangements through the lenses of decentralisation, especially the efficacy of government- versus farmer-managed institutional arrangements. Consequently, these studies did not present a comprehensive and comparative view or understanding of the two types of institutional arrangements and their respective performances in furthering decentralisation and an equitable devolvement of power and responsibility. The current study attempts to fill this gap. Hence, it focuses specifically on the two institutional arrangements of irrigation water resource governance in order to present an understanding of the performances of irrigation water resource governance from a broader perspective. A comprehensive understanding of the two institutional forms through a comparative analysis will fill the knowledge gap in the performances of farmer-managed and government-managed irrigation schemes under the decentralisation policy. Without a holistic and comparative institutional performance analysis of the two arrangements, recommendations for reform will be based on incomplete knowledge and understanding of what might be the most cost-effective and socially equitable method of irrigation water resource governance, what circumstances may favour one or the other, and which approach may be best to promote at each local level. Also, this study combines governance and community-based natural resource management that are often treated in separate bodies of literature.

PART II

CASE STUDY: CONTEXT, RATIONALE AND METHOD

Chapter 4 Research Philosophy and Methodology

4.1 Introduction

Chapter three examined the history of water resources governance in Ghana. It also presented a short account of irrigation water resource sector reforms in Ghana, including highlighting the policy intent of decentralisation and community-based irrigation water governance in the implementation of the water reforms. It further examined the achievements and the constraints in the implementation of the water resource sector reforms. Chapter three identified research gaps to be filled and discussed the present study's intended contribution to developing new knowledge. The research gaps identified helped to define the research aim, objectives, and questions that this thesis seeks to address as well as focusing on suitable study areas for research.

Chapter four explains and justifies the methodological approach used to address the research questions. It also outlines and discusses the procedures followed in: selecting case studies, data collection and data organisation and analysis.

This chapter is structured as follows. Case study research methodology and its relevance to the study are examined in section 4.2. The research philosophy is discussed in section 4.3 followed by qualitative methods in 4.4. Section 4.5 discusses the various qualitative research methods used for data collection. The selection criteria used for choosing the case studies are explained in 4.6 and the research study areas are discussed in section 4.7 followed by the general description of the individual study areas in section 4.8. Section 4.9 describes the research participants and selection of participants. Section 4.10 discusses the ethical considerations of the study and section 4.11 explains data analysis and interpretation. Section 4.12 outlines the limitations of the study methodology and

section 4.13 summarises the chapter. The case study research methodology is examined in the next section.

4.2 Research Philosophy

The research philosophy relates to the development of knowledge and the nature of that knowledge. Saunders et al., (2007) stated that the research philosophy one adopts contains important assumptions about the way one views the world. These assumptions will underpin one's research strategy and methods chosen. However, the main influence is likely to be one's view of the relationship between knowledge and the process by which it is developed. Philosophical frameworks or research paradigms contain different ontological (worldview) and epistemological (knowledge derivation) perspectives on knowledge.

4.2.1 Assumptions Regarding the Nature of Knowledge

To further justify the research approach in this study, assumptions underlying the nature of knowledge are discussed briefly. The two assumptions underlying knowledge are ontology and epistemology.

Ontology is the study of the questions of what exists, what is the nature of being, what is the nature of reality. The first aspect of ontology is objectivism. In the logical positivist research tradition the world is viewed as an objective entity: reality is objectively recorded and interpreted (Saunders, 2007). The second aspect of ontology is subjectivism which holds that social phenomena are created from the perceptions and consequent actions of those social actors concerned with their existence. This is a continual process in that through the process of social interaction these social phenomena are in a constant state of revision (Saunders, 2007). Within the interpretive research paradigm, knowledge is often regarded as a subjective construct.

Remenyi et al. (1998:35) stressed the necessity of studying ‘the details of the situation to understand the reality or perhaps the reality working behind them’. This is often associated with the term constructionism, or social constructionism. This follows from the interpretive position that it is necessary to explore the subjective meanings motivating the actions of social actors in order that the researcher may understand these actions. Social constructionism views reality as being socially constructed (Saunders et al., 2007).

This study adopts the subjectivism aspect of ontology because the study aims to understand the perceptions and experiences of irrigators and stakeholders in the case study areas in order to gain insights into irrigation water resources governance. It also aims to examine the outcomes of collective actions of the irrigators at the community level on the one hand and the stakeholders at the regional and district level on the other in order to gain an understanding of the performances of community-based irrigation water resource governance at the community level. It aims to understand the subjective meanings motivating the actions of social actors at the regional, district, and community level in order to be able to understand these actions. This study therefore aims to examine the outcomes of stakeholder interactions by gaining insight through the participants’ lived experiences and knowledge. Consequently, it is appropriate for this research to adopt the social constructivist (subjectivism) approach as it will be useful to learn about diverse range of perspectives which may not easily fit together into one ‘world view’. The interpretive approach adopted in this study, where the selection, weighting and arrangement of data is inevitably influenced by the researcher’s world view and experience, means that the knowledge gained through the study may be regarded as substantially a ‘subjective construct’.

Epistemology is the branch of philosophy dealing with the study of knowledge. It is what constitutes acceptable knowledge in a field of study. An epistemological question is ‘can the approach to the study of the social world be the same as the approach to studying natural science?’ (Saunders et al., 2007:108). Important themes in the study of knowledge involve (Higgs & Cant, 1998):

1. the manner through which knowledge is developed e.g. through experience or the application of scientific method;
2. the relevance of context or subject in the approach to knowing; and
3. the verification or grounding of claims to knowledge.

Underpinning qualitative research are five important assumptions about the nature of knowledge (Lincoln & Guba 1985). These assumptions establish the general ontological and epistemological positions of qualitative enquiry. These assumptions are:

1. there may be multiple constructed realities: people may perceive reality differently even when sharing the same (apparently) objective experience or event;
2. the process of inquiry changes both the researcher and the research subjects, that is the researcher is not entirely independent of the research process;
3. the research process is value-laden as the researcher brings their values and beliefs to the entire research process;
4. knowledge is dependent upon both context and time, the ‘universal truths’ sometimes sought by quantitative research are less frequently the primary object of qualitative research which is more concerned with exploring the deeper meaning of social experience; and
5. it is better to describe and interpret events than to control them.

The current study is predicated upon the above assumptions. In seeking the opinions of participants to be interviewed in this study, it is accepted that, while the participants collectively shared the same experience, their perceptions of this experience may at times differ. The interpretative challenge for this enquiry is, where possible and where relevant, to attempt to explain those differences which lend themselves to a qualitative approach. By the very act of asking thematic questions, the researcher influences the participants. In turn, the responses of the participants and the progressive knowledge gained by the researcher iteratively influence his or her understanding and perspectives. Thus, the research focus evolves in a spiral and iterative manner as the study progresses.

4.2.2 Interpretive Research Philosophy

This research is situated in the interpretive paradigm in that there are multiple realities of irrigation water resource governance to be understood in the case study communities. The aim is to explain and understand what is going on in irrigation water resources governance at the local level. The interpretive paradigm provides a philosophical alternative for this study to the empirico-analytic research approach. Saunders et al. (2007) asserted that the social world is far too complex to lend itself to theorising by definite 'laws' in the same way as the physical sciences. Rittel and Webber (1973) described most environmental and natural resource challenges as complex problems. Rich insights into complex world are lost if such complexity is reduced entirely to a series of law-like generalisations. The research matter of this study invokes many interwoven complexities of a social, cultural, political and physical nature. This strongly suggests that an interpretive research approach might be better suited to explore the research 'problem' and research questions being posed. A quantitative research approach and methodology might highlight the costs but not the values that determine what costs the stakeholders might or might not be prepared to pay. The interpretive

approach provides ways of studying everyday experience and practice in its real context (Patton, 2002) and the values and cultural beliefs that underlie these, as this study on irrigation water resource governance hopes to do.

The interpretive paradigm comprises hermeneutics, phenomenology, ethnography and heuristic enquiry among many others. A perspective of the interpretive approach relevant to this study is the hermeneutics undertaken in the interpretation of the data. This is discussed briefly below.

Patton (2002:113) stated that the foundational question to answer in hermeneutics is:

What are the conditions under which a human act took place or a product was produced that make it possible to interpret its meanings?

Patton (2002) asserted that hermeneutics is a theoretical approach that can inform qualitative enquiry. It reminds the researcher that what something means depends on the socio-cultural context in which it was originally created as well as the socio-cultural context within which it is subsequently interpreted. Hermeneutists emphasise that they are constructing 'reality' on the basis of their interpretations of data with the help of the study participants who provided the data.

The processes involved in natural resource governance are complex and it will be difficult to understand the scope and intricacy of the processes involved without a proper understanding of the socio-cultural beliefs, attitudes, motives, and behaviours that impinged on irrigation water resource governance at the local level. Through the use of a qualitative research methodology, the research participants had the opportunity to share their insights, beliefs, experiences and concerns regarding irrigation water resource governance at the regional, district and community levels. The nature of the

research therefore indicates that a qualitative approach is best suited to achieve the aims of the study. This approach is discussed in the next section.

4.3 Qualitative Research Methods

The term ‘qualitative research’ refers to research that presents highly specialised methods for acquiring key informant responses in order to comprehend what people think and how they feel about particular issues. Strauss and Corbin (1998: 10-11) referred to qualitative research as: ‘any type of research that produces findings not arrived at by statistical procedures or other means of quantification’, but rather studies that produce findings from real-world situations where the ‘phenomenon of interest unfolds naturally’ (Patton, 2002:39). Qualitative data analysis involves non-numerical assessment of observations made through open-ended questions (Patton, 2002:39), using focus group discussions, participant observation, content analysis, key informant interviews, and other qualitative techniques (Babbie, 2010:393).

Most qualitative studies adopt multi-method, interpretative, and naturalistic approaches to understand the complex and multiple realities experienced by study participants (Denzin and Lincoln, 1994). Qualitative methods facilitate the study of issues in depth and detail (Patton (2002). By these processes, qualitative researchers try to understand the attitudes, beliefs, motives, and behaviours of the target study population as mentioned earlier in section 4.3.2. Thus, qualitative research deals with the contextual aspects of human responses rather than with objectively measurable behaviour and attitudes. Hence, Osuala (2005: 171) contends that:

The task of the qualitative methodologist is to capture what people say and do as a product of how they interpret the complexity of their world, to understand events from the viewpoints of the participants. It is the life world

of the participants that constitutes the investigative field. 'Truth' within this context is bound to humanistic caprice.

The preceding definitions and procedures of qualitative research show that it differs markedly from quantitative research. Quantitative research deals with a problem that calls for an explanation. The researcher decides what to study; asks specific, narrow questions, collects quantifiable data from participants, analyses these numbers using statistics, and conducts inquiry in what purports to be an unbiased and objective manner (Clark & Creswell, 2010:66). Labuschagne (2003) stated that quantitative research is usually based on theoretical or empirical considerations and quantifying phenomena. On the other hand, qualitative investigators are of the conviction that it is difficult, if not impossible, to have one objective reality that can be observed and quantified neutrally. They do not believe human beings are so homogenous and that they can be simplistically categorised. Golafshani (2003) argued that whilst quantitative researchers inquire about causal relationships, prediction, and generalisation of findings, scholars of the qualitative paradigm of inquiry rather seek illumination, understanding, and extrapolation to better understand similar situations.

The characteristic limitations of the quantitative approach which are relevant to this study are the following (Patton 2002):

1. methodologically it is not well suited to dealing with complex, dynamic social environments, where the 'reality' as perceived by individuals is a social construct;
2. its underpinning assumptions about the nature and origins of knowledge are difficult to apply in many social science research contexts; and

3. it assumes the important ‘variables’ can or should be measured and thus favours certain types of problems or issues worthy of researching, and avoids others that do not lend themselves to quantifiable variables.

Lincoln and Guba (1985) provided analysis which is relevant to this study of the five major assumptions about the construction of and nature of knowledge that underpin qualitative and quantitative research. These assumptions characterise qualitative research as a constructivist approach in which findings shaped by multiple realities, emerge as the research proceeds, through interaction between the investigator and subjects or respondents.

1. Qualitative research assumes that the world consist of “multiple constructed realities”. Multiple implies that there are always several versions of reality, depending on from which or whose perspective it is viewed. “Constructed” means that the participants attribute meaning to events as they occur; that meaning is part of the event and not separate from it.
2. Qualitative research assumes that the process of inquiry changes both the investigator and the subject: that the investigator and the subject are interdependent. This assumption is in contrast to the “independence” of research and researcher demanded by quantitative research.
3. Qualitative enquiry is “value bound,” it is seen as impossible to separate value from inquiry; values are revealed in the way questions are asked and results interpreted.

The choice of a qualitative research approach for this study is based on the nature of the problems being investigated. The rationale is consistent with the argument of Strauss and Corbin (1998: 11) who contend that:

Research that attempts to understand the meaning or nature of experience of persons with problems...and the act of 'coming out' lends itself to getting out into the field and finding out what people are doing and thinking. Qualitative methods can be used to explore substantive areas about which little is known or about which much is known to gain novel understandings.

As stated in section 3.12.2, very little irrigation water resource governance study has been carried out in Ghana, particularly of the type focusing comparatively on farmer-managed and government-managed institutional arrangements. The current study is exploratory and breaking new ground by adopting an integrative conceptual framework to understand the performances of the two types of institutional arrangements, of which very little is known. The various qualitative research methods used gathered rich data to achieve the study objectives and their relevance to the study are discussed in the next section.

4.4 Case Study Research Methodology

Yin (2009:18) provided two-fold definitions of a case study which will be used in this study:

1. As empirical enquiry that investigates a contemporary phenomenon within its real life context. In other words, a case study methodology is used because one wants to understand a real-life phenomenon which encompasses important contextual conditions which are highly pertinent to the phenomenon of the study.
2. Case study is an enquiry that:
 - copes with the technically distinctive situations in which there will be many more variables of interest than data points,
 - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion; and

- benefits from the prior development of theoretical propositions to guide data collection and analysis.

Yin's (2009) two-fold definition shows how case study research comprises an all-encompassing method: covering the logic of design, data collection techniques, and specific approaches to data analysis. Yin (2009) added that, within a case study, the boundaries between the phenomenon being studied, and the context within which it is being studied, are not clearly evident.

Case study methodology is useful, because it is a non-experimental design, used to gain participants' understanding of a process, event, or situation and explain why results occurred. The principal merit of case study methodology lies in its ability to examine and assist the researcher in understanding the complex real-life activities through which multiple sources of evidence will be gathered. Therefore, reliance on case study methodology enabled the researcher to carry out a participatory study of the 'units of analysis', which were Durongo, Winkogo, Nyariga, and Vea irrigation schemes. Furthermore, the case study methodology enabled an understanding to be gained of the real life context of irrigation water resource governance, the similarities and differences between and among these four irrigation schemes, and what lessons could be learned from the governance processes at the local level. The reasons advanced for the choice of case study methodology are that case study methodology should be considered as appropriate by the investigator when: the research focus is to answer research questions about 'how' something works and 'why' something happens; when the investigator has little control over events; when the focus is on a contemporary phenomenon within a real-life context, and the behaviour of the research subjects cannot be manipulated, and

there is an overall attempt to cover contextual conditions(Yin, 2009; Baxter and Jack 2008; Morra Imas and Rist, 2009).

In brief, a case study methodology was chosen because irrigation water resources governance at the local level may not be properly understood in the absence of analysing relevant cases. This will also reinforce and support a deeper understanding of the context within which the governance process takes place. It would be difficult to construct an accurate picture of irrigation water resource governance at the local level without considering relevant cases.

Therefore, four distinct cases were selected purposively to best represent government-managed and farmer-managed irrigation schemes in the same geographical, socio-cultural and economic context in Ghana's Upper East Region. The multiple-case study approach adopted in this study will enable the researcher to examine within each setting and across contexts (Stake, 1995; Yin, 2003). The approach was to select information-rich cases, the analysis of which will illuminate the questions under study.

Yin (2009) and Robson (1993) pointed out that a case study is a method of learning about a complex instance, based on a comprehensive understanding obtained through extensive description and analysis of that instance taken as a whole and in its context. The importance of the case study methodology as a form of qualitative research is further provided by Baxter and Jack (2008: 544) who argued that: "case study methodology ensures that the issue is not explored through one lens, but rather a variety of lenses which allows for multiple facets of the phenomenon to be revealed and understood." Case study research methodology helps social researchers to comprehend a complex and difficult problem, issue or object such as those pertaining to irrigation water resources.

The case study approach is compatible with the interpretive, hermeneutic approaches adopted for the study and explained in previous sections. Diesing (1972) argued that a case study methodology allows an intensive examination of a phenomenon and the interaction of individuals within and outside it. Irrigation water user groups as an experiential entity are a very important component of this context. Also, differences in institutional arrangements between the farmer-managed and government-managed schemes and their history meant that experiences between the water users groups in these two different schemes may vary and provide explanatory insights into the interpretations of individual as well as group experiences. The use of case studies will enable analysis of the participants to identify critical issues influencing irrigation water resources governance in its real-life context within the two different governance arrangements.

4.5 Research Methods and Data Sources

4.5.1 Data Sources

Data inputs for the four village-level case studies were gathered from both primary and secondary sources. The secondary data were generated from published materials including reports and journal articles that dealt with themes related to the study. Primary data were collected from November 2011 to February 2012 in the four nominated villages across three Districts. Figure 4.6 shows graphically how the primary data sources were incorporated into the research.

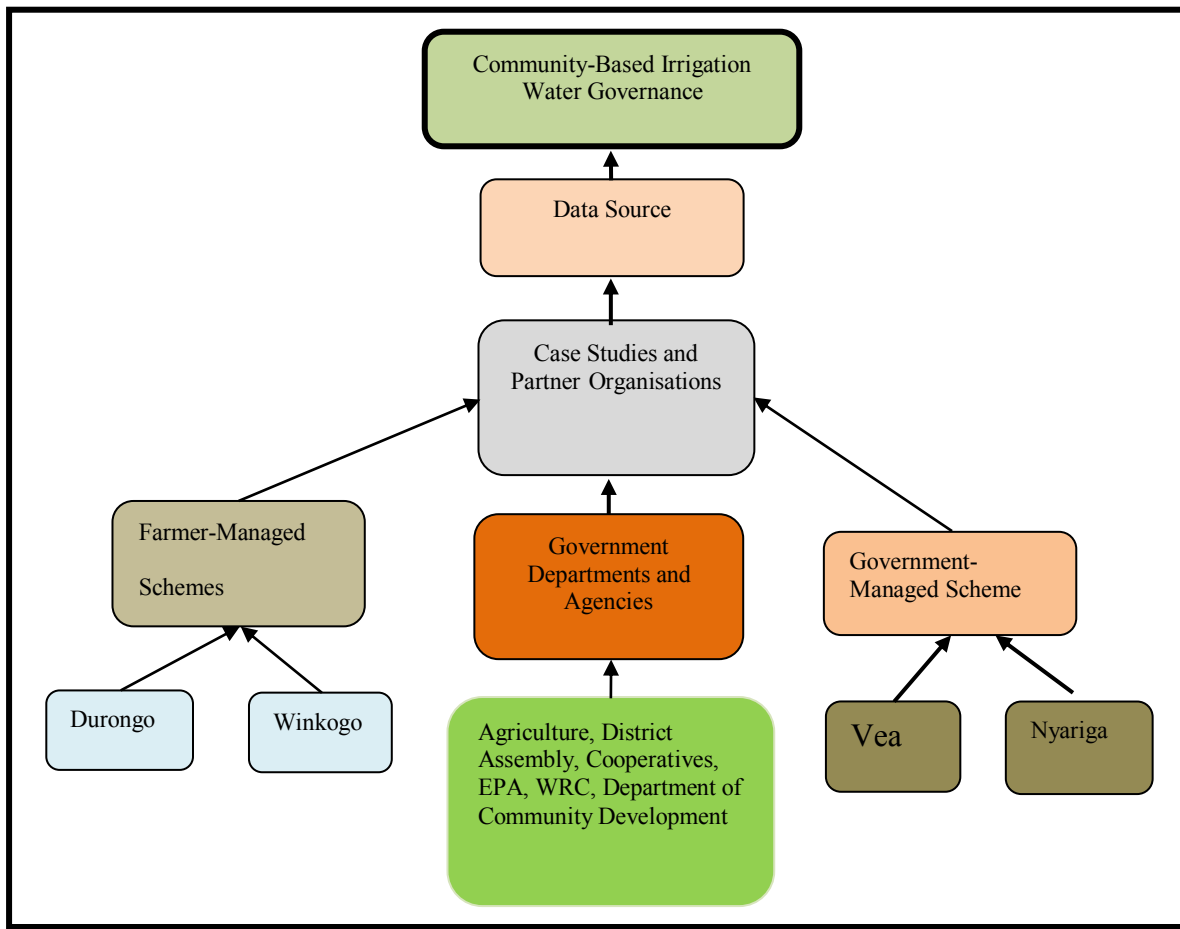


Figure 4-1 Primary data sources for the study

4.5.2 Data Collection Methods

The primary data collection methods used included individual farmers and key informant interviews, focus group discussions, and field observations. Secondary data were collected from project reports (including evaluation reports) and farmer group (WUA) documents. Data was also collected from different participants, namely, irrigation farmers including farmer leaders, community leaders, and government officials at the regional and district levels. The use of multiple data collection techniques and multiple data sources were primarily to ensure data triangulation. This was in order to increase the validity, reliability, and credibility of the study findings (Miles and Huberman, 1994). Triangulation in qualitative research is referred to as the use of multiple methods of data collection in a single research project (Osuala 2005;

Sarantakos 2005; Taylor and Bogdan 1998) to corroborate evidence about findings from different individuals or types of data (Clark & Creswell, 2010). The data were therefore collected where relevant across the range of appropriate settings, times, and respondents as suggested by the research question and conceptual framework applied.

The researcher examined each information source and found evidence to support the themes and categories developed. To increase the accuracy and authenticity of the data collected, one of the local researchers who transcribed over 60% of the audio tapes was asked to peer review all the analysis chapters (5 to 9) to check whether the findings accurately reflected the participants' responses expressed in the raw data. This likely increased the level of generalisability (external validity and transferability). The qualitative data collection methods used under the umbrella of the case study methodology were described briefly in the following section.

4.5.2.1 Individual Interviews

Individual interviews are face-to-face encounters between the researcher and participants. These encounters are aimed at understanding the participants' perspectives on their lives, experiences or situations (Minicheiello, Aroni & Hays, 2008). The individual interviews were appropriate to gather the data as it enabled detailed exploration of the individual farmers' world in relation to irrigation water resource governance. Further, this research is being conducted from a social constructivist position, seeking to understand the world of the farmers from the farmer's point of view. As discussed earlier in sub-section 4.5.2, the type of data collected and instruments used were influenced by several factors. In line with the objectives, research questions of this study, individual farmers' interview was used to explore the research topic in greater depth. The aim was to gain the broad range of views of farmers. One

hundred and thirteen (113) individual farmers including forty-two (42) women were randomly selected from the farmer groups' lists obtained from the farmer groups leaders in each village and interviewed on their farms in order to avoid any interruption. The individual farmers' interviews lasted between 40 minutes to one hour.

4.5.2.2 Key Informant Interviews

Key informant interviews refer to an interview with a person in the field who is completely familiar with the culture, and by the virtue of his/her position has to participate in the interview to provide relevant information to the researcher (Neuman (2009). Key informant interviews, often described as 'a conversation with a purpose' (Marshall and Rossman 1989: 82) allowed flexibility and also the opportunity to explore the research topic in greater depth than possible using only published evidence. Separate interviews with community leaders (15 in number), farmer leaders (17 in number), Apex group leaders (2 in number) and government officials (15 in number) as key informants from the three districts were purposively selected to provide additional information. The community leaders, chiefs and their counsellors, unit committee members, and Assembly persons in the area were also purposively selected and interviewed. The two key informants from the federation of irrigation farmers' association in the government-managed scheme called the Apex Group were also purposively selected and interviewed. A senior official from ICOUR was also a key informant that was purposively selected and interviewed. In all, a total of forty-nine key informants were interviewed (see Table 4.2 and 4.3).

The aim of selecting the key informants for interview was to gain insights into their positions and/or experience on irrigation water resource governance in the study area. Patton (2002) argued that the key informant interview method is a very important means

through which investigators are able to uncover what is in and on someone's mind, and that in most cases this cannot be directly observed. Furthermore, the choice of individual and key informant interviewees for this study helped the researcher to understand participants' views of reality. For this reason Mack et al. (2005: 30) argued that:

Key informant interviews are useful for learning about the perspectives of individuals, as opposed to, for example, group norms of a community, for which focus groups are more appropriate. They are an effective qualitative method for getting people to talk about their personal feelings, opinions, and experiences. They are also an opportunity for us to gain insight into how people interpret and order the world

The method enabled the participants to speak freely, particularly in appreciation of the researcher's quest for insight into their experiences in irrigation water resource governance in their communities.

Individual and key informant interviews using semi-structured interview guide (see Appendix 5) formed the core data collection method. Interview guides which contained separate thematic sections based on how they fit the Ostrom design principles and Lockwood governance principles with associated open-ended questions were developed and adapted for this process. Khairul (2008) contended that the use of semi-structured rather than structured interviews offers sufficient flexibility to approach different respondents differently while still covering the same areas of data collection.

The researcher posed clear and appropriate questions to be able to elicit relevant information from the participants. Most questions in the interview guides (see Appendix 5) served as topics that corresponded with the main factors identified in the literature to influence discussion about irrigation water resource governance, as discussed earlier.

The researcher retained an open conversational interviewing style in order to allow the participants to digress towards issues that they deemed to be important. It was emphasised to the participants that they could raise any topic related to irrigation water resource governance. The researcher allowed greater probing beyond the answers and entered into a dialogue with the respondents. The researcher's objectivity with his subjectivity was to allow the participants to express their experiences, values, and expectations without constraint. Patton (2002) emphasised the importance of open-ended prompts as they yield key informant responses about people's experiences, perceptions, opinions, feelings and knowledge.

The telephone contact details of the key informants were taken during the interviews and some were contacted again for further clarification as necessary, following a preliminary review of the findings. Negative evidences were sought and where found they were addressed to achieve internal validity of the data. This is because as noted by Lincoln and Guba (1985), in seeking the opinions of participants to be interviewed, while the participants collectively shared the same experience, their perceptions of this experience may at times differ. Interviews with the key informants lasted from 2 to 2.5 hours each. In total, forty-nine (49) key informant interviews were conducted (See Tables 4.2 and 4.3).

After the design of the draft research instrument (See Appendix 5) for the key informant, individual farmers, community leaders, and government officials at the regional and district levels by the researcher, three local researchers reviewed the draft instruments to ascertain its cultural appropriateness and clarity. It was then piloted among twenty selected irrigators including five women in Durango in order to identify any problems in terms of wording and ordering of questions. Piloting the interview

instrument also offered the benefit of being able to assess how long the interviews were likely to take and, if necessary, streamline the instrument accordingly. Van Teijlingen and Hundley (2001) stated that pilot studies give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated.

4.5.2.3 Focus Group Discussions

Focus group discussion requires that data are collected from a small number of selected people to participate in a naturalistic open group conversation (Neuman, 2009). Neuman (2009:287) defined a focus group as, ‘a typical special qualitative research technique in which people are informally interviewed in a group setting.’ Two focus group interviews were organised in each village: one that was female only and another that was mixed gender. They comprised: four female focus groups discussions and four mixed gender focus groups interviews - representing irrigators, group leaders, and representatives of the village leadership. Different questions (Appendix 5) were posed in the focus groups to gain advantage of group discussions in terms of depth, broad range of information from representatives from different social groups in the community. The focus group was also used to triangulate the data collected through households and key informant interviews. Males and females in the mixed focus group interviews were randomly selected from the list of the village farmer groups. The leaders of the farmer groups and the community leaders were purposively selected to represent their groups and the communities at large. Two women were randomly selected from each village farmer group to form the women’s focus group for the discussion. The participants who took part in the focus group discussions were different from the informants who were interviewed so as to be able to triangulate the findings from different groups to achieve internal validity.

The rationale for separate focus groups was to be able to elicit women's particular perspectives regarding irrigation water resource governance as it affects their participation in local water governance process. In addition, it was thought that without any influence from the presence of their male counterparts, the women would be able to talk more freely about their concerns than would be advisable in the presence of men. Most Ghanaian village societies are patriarchal, so community norms typically discourage women from speaking openly about sensitive issues such as land ownership and common pool resource governance that are traditionally considered to be the preserve of men- even though these matters may disproportionately affect women. The process of having a separate women's focus group interview helped the researcher to gain a deeper understanding and validation of some of the issues that arose from individual key interviews. As a matter of policy rival explanations were considered and explanations of inconsistencies sought through triangulation of participants and methods to achieve internal validity, credibility, and authenticity. Each of the focus group discussions lasted about two hours. The researcher facilitated the discussion in a non-directive and free, open discussion among all the group members. The schedule of questions used to guide these discussions is presented in Appendix 5.

The individual key informant interview and focus group discussions were conducted by the researcher with the assistance of a translator whose first language is Gurune, the local language spoken in the study area. Interpretation was carried out simultaneously. The background and purpose of the research were shared with the participants in order to build rapport, trust and to encourage them to open up. With permission from the participants, the proceedings were audio taped and later transcribed into notes. The researcher recorded and documented 'what happened' using direct quotations of the participants to achieve internal validity, credibility and authenticity of the data

collected. The recording allowed the researcher to concentrate and pay attention to the interview discussion without any interruption. Brief notes were also taken simultaneously to highlight key issues emerging from the interviews. The participants found the focus group discussions useful and hence were willing to contribute to the discussion. The insights and feelings they shared during the discussions provided important additional insights into their perspectives and subjective meanings in respect of irrigation water resources governance.

4.5.2.4 Field Observations

The researcher also engaged in direct observation. Because the household interviews were conducted on the individual irrigation farms, the researcher had many opportunities to take transect walks through the irrigation fields and through the irrigation systems with the farmers to observe the physical conditions of the irrigation infrastructure, water use in the individual farms, and types of crops cultivated. This provided the researcher with first-hand information on the physical environment of the sites. The field observations helped the researcher to listen, question and interpret what the participants shared with the researcher. It further shaped the interview questions and discussions.

4.5.2.5 Document Review

The researcher collected and reviewed secondary data as part of the case studies. The data included project reports, including evaluation reports, WUA documents and strategic plans from ICOUR, the Department of Agriculture and other decentralised departments that are involved in irrigation water resource governance. These provided critical background information that helped the researcher to understand the contextual issues in order to better analyse responses from the participants of the study area.

4.6 Case Study Site Selection and General Description

This section describes the four case studies sites selected and the selection criteria. These case studies were carefully selected to represent the viewpoints and experiences that reflect key issues in the research problem. The goal was to produce data that were conceptually, not statistically, representative of people in a specific context (Ulin et al., 2005). In this way, it helps external validity to allow the findings, outcomes and lessons learned from the case study to be relevant to both farmer-managed and government-managed irrigation schemes with similar contextual factors.

The choice of the study area follows from water scarcity within the predominantly agrarian region of Upper Region of Ghana (Hauck and Youkhana, 2008). Irrigation development is critical to sustainable livelihoods and agricultural development in the area. Government and donor policies in recent years sought to encourage community-based irrigation water resource governance within the area (Birner et al., 2005; FAO, 2006). The Upper East Region (UER) has the highest concentration of government-managed and farmer-managed irrigation schemes in Ghana (Mdemu, 2008). The purpose of a case study is to select information-rich cases to provide answers to the research questions and to meet the objectives. Four multiple cases were therefore purposively selected for the design of the study based on their distinctive characteristics that were most likely to help achieve the research objectives. The rationale was to cover a variety of approaches to irrigation water resources governance in the region in order to be able to identify patterns by comparing and contrasting the different cases. The logic of selecting cases with different characteristics was that lessons might be learned about unusual conditions or extreme outcomes that are relevant to improving more typical projects. It also facilitated identification of patterns by comparing and contrasting the cases. Four main criteria were used for site selection.

The first criteria was based on their particular differences in institutional arrangements, namely farmer-managed (Birner et al., 2005; IFAD, 2006) and government-managed irrigation systems (Laube 2007, 2009). Vea and Nyariga Villages fall under the Vea medium-scale irrigation scheme, which is managed by ICOUR. Durongo and Winkogo farmer-managed irrigation schemes are under the management of Water Users Associations (WUA). The literature (Seini, 2002; Laube 2005, 2009) suggested that irrigation water resources governance in government-managed irrigation schemes in the region was highly centralised, thus alienating water users and other stakeholders from decision making processes. This suggests that water users in these schemes lacked power to influence community level changes in accordance with their interests. Farmer participation and leadership of water user associations in the government-managed schemes had not been promoted despite the original intentions of policy makers (Asare, 2002, Laube, 2005, MOFA, 2010).

Second, the four selected villages chosen have similar socio-cultural, economic and biophysical characteristics. The natives speak the same language (Gurune) with slight dialectical variations, and share similar traditional as well as socio-cultural institutional arrangements. Hence, different performance in irrigation water resources governance across the four selected villages could not be attributed to differences in socio-cultural, economic and biophysical characteristics of the villages, but rather to other factors related to the governance arrangements.

Third, the four villages were chosen because they have similar cropping patterns, again to aid comparisons of the impacts of governance arrangements. At Nyariga and Vea, tomato, rice and leafy vegetables were cultivated. Tomatoes, onions and leafy vegetables were common in Durongo and Winkogo. Durongo and Winkogo were

selected because tomato and leafy vegetables were the main irrigated crops, allowing comparison with the Nyariga and Veia cases under the Veia government controlled scheme.

Fourth, the researcher also sought to maximise the geographic proximity and accessibility of the case study villages to enable closer interaction with study participants for longer periods during the fieldwork. Distances from Bolgatanga, the regional capital, to these villages were: Veia 10 km, Durongo, 6 km; Winkogo, 14 km; and Nyariga, 8 km. By comparing the experiences of each of these cases under the two systems of irrigation water resource governance, insights could be gained into the influence of governance structures and processes of farmer-managed and government-managed irrigation water resource governance in Ghana.

4.7 Case Study Area

This section describes the study areas in order to provide a clear understanding of the study contexts. The rationale is to allow this study to be applied (external validity/transferability) to other irrigation communities with similar contexts using the theoretical and conceptual framework developed. Thus, the research context is described adequately including the characteristics of the participants in the case studies.

4.7.1 Geographical Location

The case study irrigation schemes are located in the Bolgatanga Municipality, Bongo and Talensi districts in the Upper East Region of Ghana (Figure 4.2). The UER is the smallest of 10 administrative regions in Ghana. It is located on the northeast corner of Ghana between latitudes 10°30' to 11°15' North and longitudes 0° to 1°30' West. It covers a land surface area of 8860 km² which accounts for about 3 per cent of Ghana (238534 km²). Internationally, the UER borders Burkina Faso to the north and Togo to

the east. Nationally it shares borders with the Upper West and Northern Regions to the west and south respectively. The UER is divided into thirteen administrative districts. The regional capital is Bolgatanga.

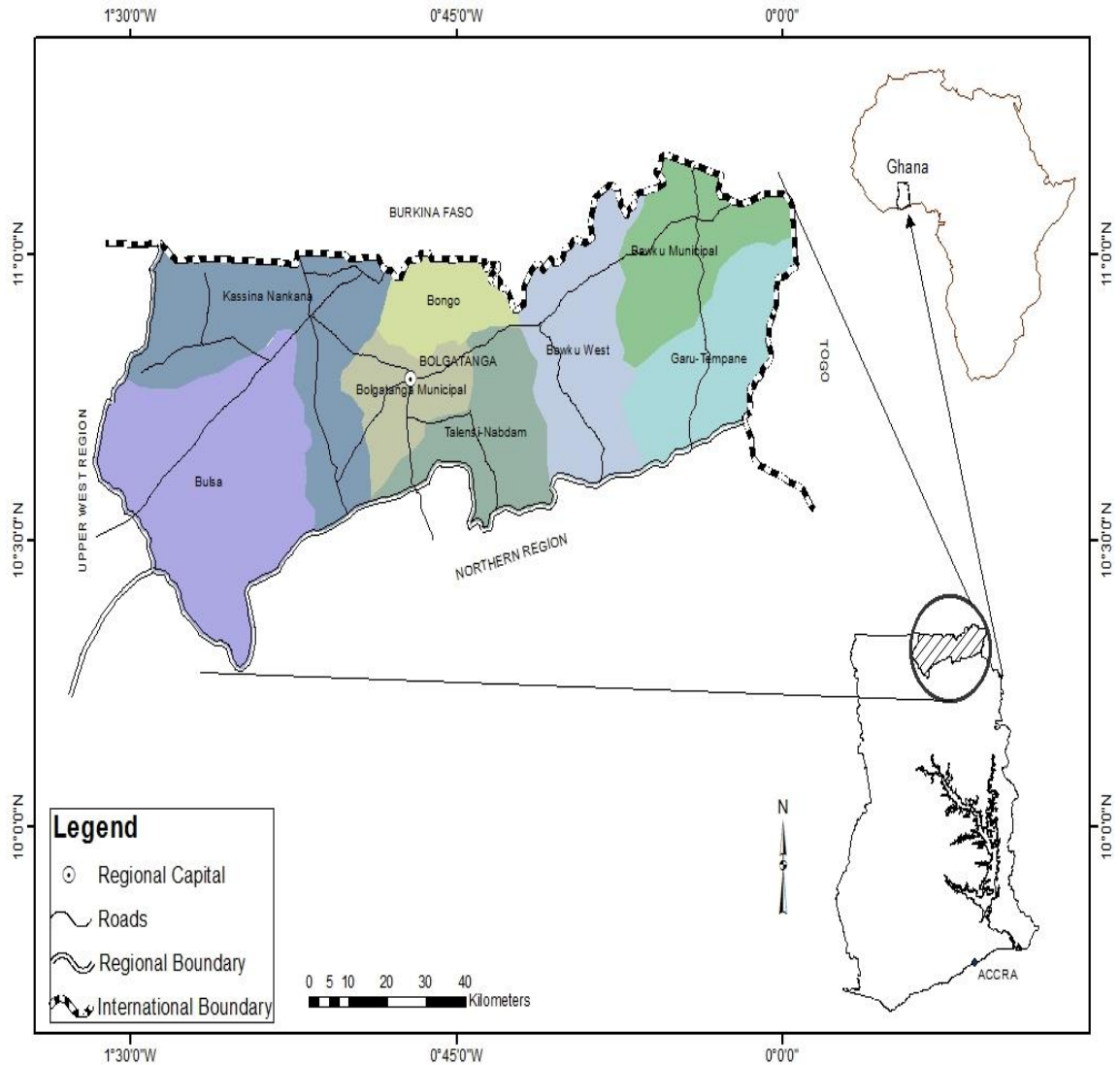


Figure 4-2 Upper East Region in the context of Ghana

4.7.2 Climate

The climate of the UER is influenced by the movement of two types of air masses: the Tropical continental air mass or the North East (NE) Trade Wind (also known as the harmattan), and the Tropical maritime air mass or the South West (SW) Monsoon wind.

The NE Trade Wind originates from the Sahara Desert and it is characterised by dry air masses. The SW Monsoon wind originates from the Gulf of Guinea and carries moist air from the Gulf of Guinea thus bringing rains upon converging with the NE trade winds. The two distinct seasons are the result of the movement of the Inter-Tropical Convergence Zone (ITCZ) separating these two air masses (Dickson & Benneh, 1988, Kranjac-Berisavljevic et al., 1998). Figure 4.3 shows the climate of the UER in the context of Ghana.

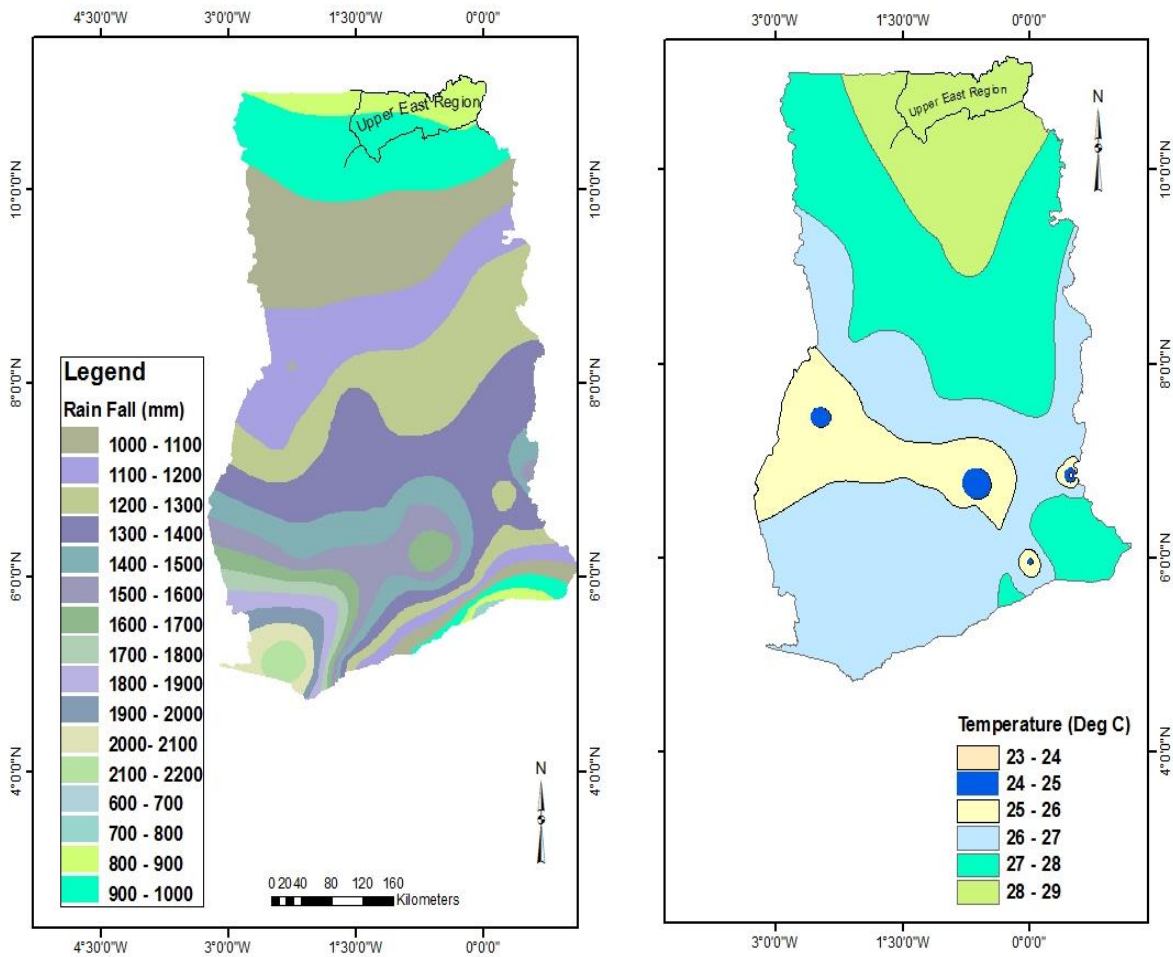


Figure 4-3 Climate of UER in the context of Ghana

The Upper East region experiences both dry and rainy seasons. The rainy season starts from May and ends in October with the maximum rainfall between August and September. The annual rainfall ranges between 800 to 1,100 mm. Rainfall is generally erratic and spatially variable. The dry season lasts for a maximum of seven months and starts from November to April/May. It is marked by dry and hot winds during the day and cold air in the night. Temperatures in the region are consistently high, with the hottest months being March and April with average temperature between 40-45°C. Annual potential evapotranspiration is high. This therefore necessitates construction of water storage reservoirs to ensure water availability for various uses in the dry season (Dickson & Benneh, 1988). The study area is characterised with high climate and ecological variability that affect rain-fed agriculture (Eguavoen, 2013).

4.7.3 Drainage

The area is drained mainly by two rivers, the White and Red Volta Rivers that form part of the Greater Volta Basin. Other smaller rivers present are the Tamne, Nahan, Kulupielugu and Biankuri (Edmonds, 1956). At the south-eastern part of the area, the Morago River joins the White Volta and the two serve as a boundary between the Northern and the Upper East Regions. Figure 4.4 shows the drainage of UER. Also, the Kulpawn River which has its catchment to the south-west of the region is joined by the Sissile just before its confluence at the White Volta. Besides these, there are other smaller water bodies that give the region a great potential for irrigation development (Okrah 2010). Both small and large-sized irrigation reservoirs have been constructed in the inland valleys (Liebe, 2002).

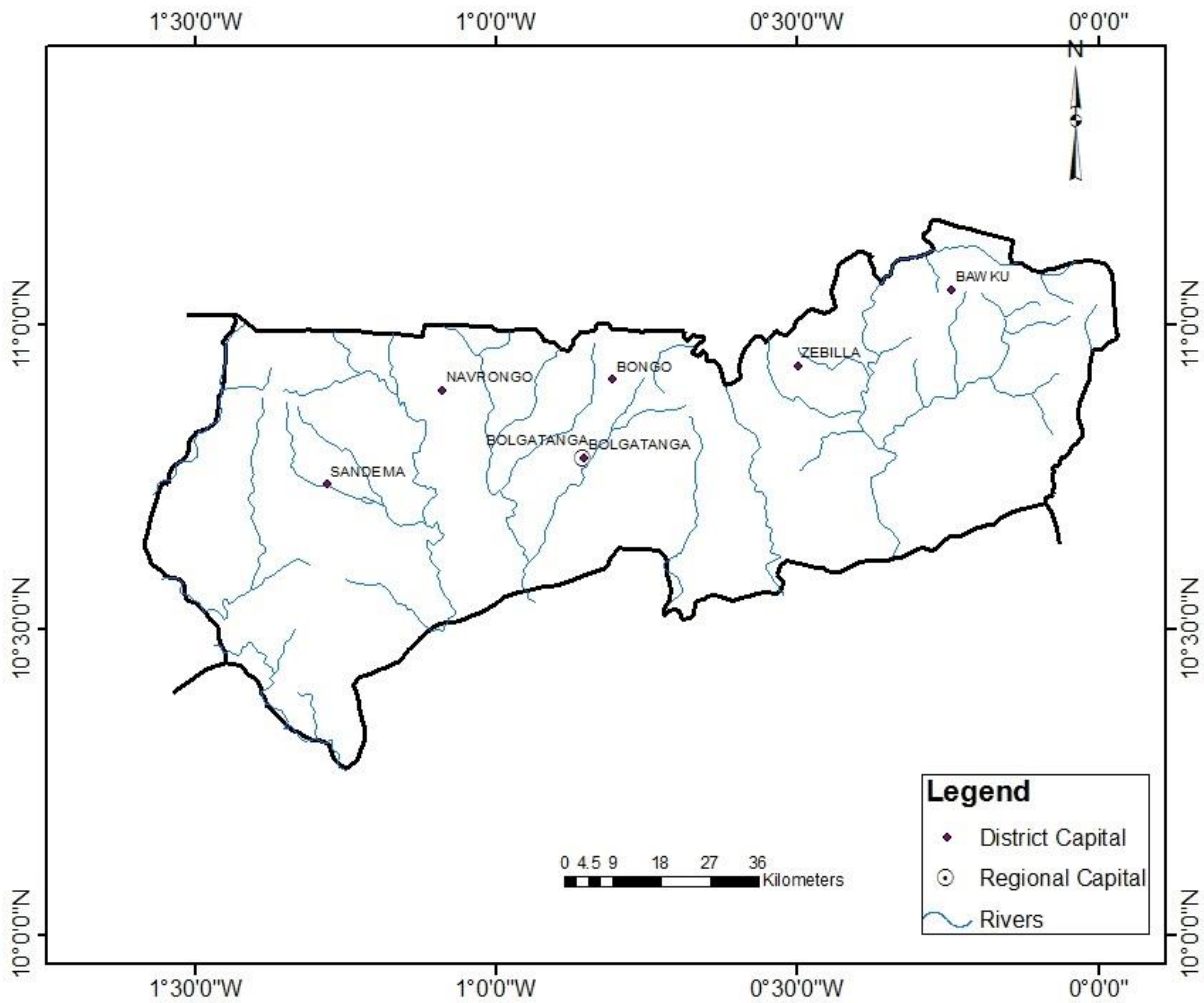


Figure 4-4 Drainage of Upper East Region

4.7.4 Soil Quality

Generally agriculture lands in the area are infertile, except soils occurring in seasonally flooded areas (Ghana Statistical Service, 2013). This is due to low accumulation of organic matter in the surface horizons due to continuous cropping of the land resulting from population pressure and land fragmentation and annual burning of the vegetation cover that reduces the amount of organic matter in the soils (Boateng and Ayamga, 1992). The high temperatures also cause rapid decomposition of organic matter in the soil. The soil is difficult to till and are prone to seasonal water logging and floods. Thus, the region is one of the most affected regions in terms of soil erosion (Veihe, 2000).

4.7.5 Social Structure

There are three major ethnic groups in the three case study districts. There are Gurune, Talensi and Boone (Veihe, 2000). They are collectively known as the Frafra speaking people (Atinga 2006). The Gurune speaking group occupies the Bolgatanga municipality and the northern part of the Talensi district as well as the southern part of the Bongo district. All the four case studies are located in the Gurune speaking communities.

All the three ethnic groups in the three districts practice the patrilineal system (Ghana Statistical Service, 2013; Hart, 1971). The “tindana” is the custodian (landlord) of the land and priest of the earthly god. The inheritance system of the “tindana” is not limited to only sex (men), but also determined by genealogical seniority.

Lands belong to the ancestors and allodial title is vested in the “tindana.” The tindana apportions land to the patrilineal clans within their jurisdiction. Farmland is held by the family head who owes his position to genealogical seniority. The family head may divide the land among the (married) male members of the family. In the event of the death of a family head, the land is sub-divided up amongst his male children, thus creating a situation in which land is excessively fragmented. Traditionally, women in the family have no rights over land, but women may acquire temporary possession of land from their husbands, friends or relatives on which they can cultivate. Non-natives never acquire ownership of land (Konings, 1981). By rule, the tindana, chief and elders (who are mostly family heads) own more land than any other person in the community. Though age and gender are important in land allocation in the study area, the “tindanship” which position is genealogical, is more important. Being older than a

“tinadana does not necessarily mean owing more land than him. Thus, land is therefore allocated with reference to the social structure, social norms and ethnicity.

4.7.6 Demographic Characteristics

The total population of the UER is 1,046,545 in 2010 of which 199,565 (19%) are located in the three case study districts. The population of Bolgatanga municipality in 2010 was 131, 550 of which 68,767 were females (52.3%). The population of Talensi-Nabdam district was 115,020 of which 57,318 (49.8%) were females. Also, the total population of Bongo district was 84,545 with females accounting for 44,461 (52.6%) (Ghana Statistical Service, 2013). The sex structure of the population shows that, in the case study districts, there were more females, (52.3%) of Bolgatanga Municipality, and 52.6% in Bongo except 49.8% in Talensi-Nabdam than males. Bolgatanga municipality has a population density of 180.5 persons per square kilometre, Talensi-Nabdam, 126.1 persons per square kilometre and Bongo 173 persons per square kilometre. The population densities of the case study districts are high, an indication of high population pressure, therefore limited available land for farming activities in the area.

4.7.6.1 Education

Generally, in the case study districts literacy level is low among population of 11 years and older. In Bolgatanga Municipality, 49.6% were literate in English and 1.0% were literate in English and Ghanaian language combined. About 35% of the total population age 11 and above were illiterate. In Talensi-Nabdam, 35.1% of the population at the age of 11 years and above were literate in English only and 0.5% in Ghanaian language and English combined and 58.1% were illiterate. Similarly, in Bongo, only 28.7% of the population age 11 and older were literate in English and 1.6% were literate in English and Ghanaian language and 52.2% were illiterate. Generally, the male population age

11 years and older is literate compared to females in all the districts (Ghana Statistical Service, 2013) indicating gender imbalance in literacy in the study area.

4.7.7 Economic Activities

The area is predominantly rural, with almost 90% of the population engaging in agricultural-related activities (Veihe, 2000). The main produce are millet, guinea-corn, maize, groundnut, beans, sorghum and dry season tomatoes and onions. Livestock and poultry production are also important. The Region produces about 25 percent of the nation's cattle herd and some proportion of sheep and goats (Ghana Statistical Service, 2008). Upper West has high highest incidence of poverty in Ghana (Ghana Statistical Service, 2008). The UER has average annual per capita incomes of less than GH¢130 (about US\$43).

To reduce the harsh physical conditions in the region, the Ghanaian government, with assistance from foreign donors, constructed many irrigation schemes from the mid-1960s to the 1990s (Mdemu, 2008). There are two main irrigation projects, the Veia Project in Bolgatanga covering 850 hectares and the Tono Project in Navrongo covering 2,490 hectares. Altogether they provide employment to about 6,000 small-scale farmers. About 172 dams and dugouts scattered over the region that support agriculture and its related activities are located in the UER (FAO, 1968). The irrigation schemes were seen as important to improve food security and rural income by providing water for dry season farming, livestock and fishery, which are now the main sources of income for rural households in the region (Gyasi, 2004). Food crops and high-value crops such as rice, onions, tomatoes, pepper, and traditional leaf vegetables are produced from the irrigation schemes in the area during the dry season (Ndemu, 2008:14).

4.8 Individual Case Studies

The four case study villages, representing two ‘farmer-managed’ irrigation schemes (FMS) and two ‘government-managed’ irrigation schemes (GMS) were purposively selected from three administrative districts in UER with irrigation schemes. These were Dorungo FMS and Nyariga GMS both in Bolgatanga Municipality, Winkogo FMS in Talensi / Nabdam District and Vea GMS in Bongo District (Figure 4.5).

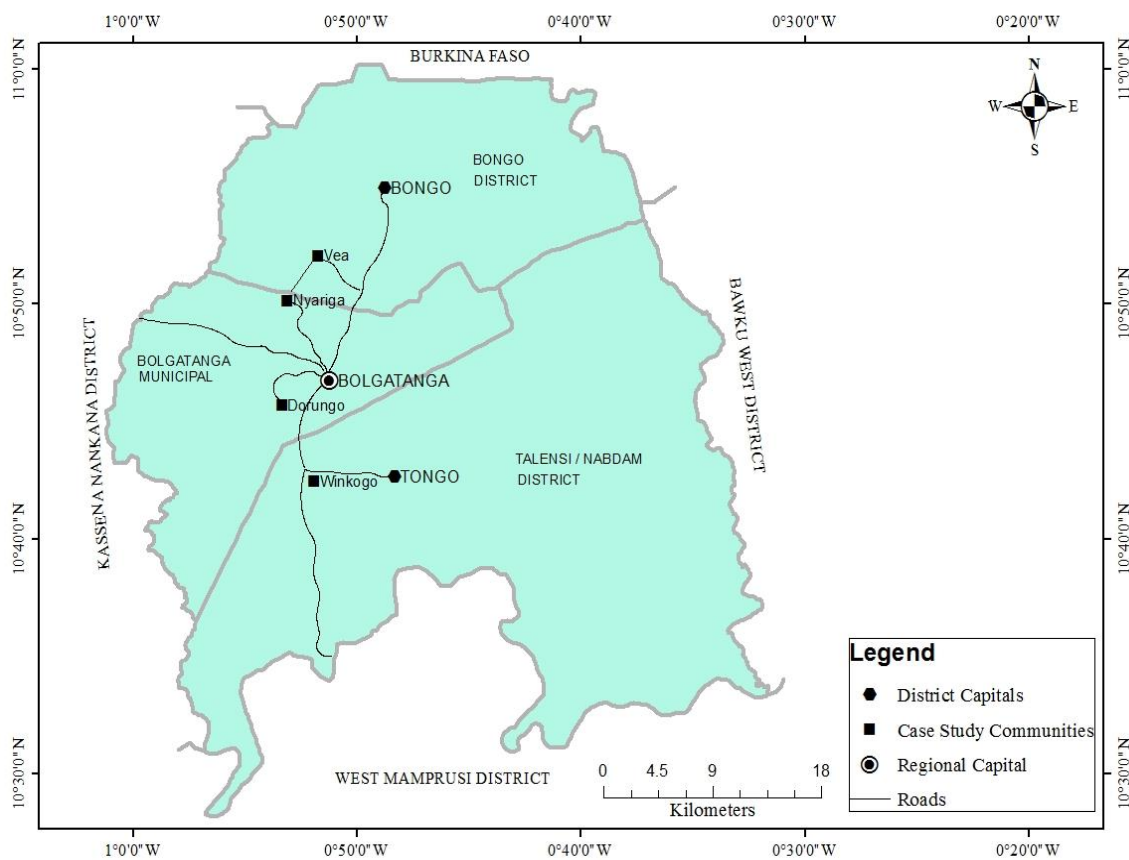


Figure 4-5 Case study sites

The selected irrigation schemes and their characteristics are shown in Table 4.1. For the purpose of this study, small scale irrigation schemes are referred to as “farmer-managed” and medium scale irrigation schemes as “government-managed.” Each of the farmer-managed schemes had irrigation facilities confined within one village, while the government-managed irrigation scheme stretched across 8 villages. Thus, the scale is

determined by the size of the irrigation area covered as well as the size of the irrigation infrastructure. The different schemes, FMS and GMS are described subsequently.

Table 4-1 Types of irrigation management systems selected in the study area

Type of management	Scale	Villages
Farmer-managed	small	Durongo
		Winkongo
Government-managed	large	Vea
		Nyariga

4.8.1 Government-Managed Scheme

The researcher's initial interaction with ICOUR and officials of the Department of Agriculture in Bongo District and Bolgatanga Municipality revealed that four villages within the GMS were not getting water supply for irrigation. To confirm this, a reconnaissance survey was undertaken in all the eight villages under the scheme. The researcher found that only Vea, Nyariga, Gowrie and Bongo-Nyariga villages furthest upstream within the service area (closest to the reservoir) were receiving some water for irrigation. Vea the nearest village to the reservoir received more water than the other four villages. Nyariga, which is upstream of the remaining three villages also received less irrigation water compared to the other three villages. Vea and Nyariga villages were purposively selected due to the variation in the amount of water received for irrigation activities at the time of the study. Two villages were selected under the GMS because of its size and the extent of coverage. The irrigable land covers a gross area of 1197 hectares with about 850 ha developed for irrigation that spans across eight villages (Agyare et al. 2008; ICOUR, 1985). Selecting only one irrigation village might not give the true picture of irrigation water governance under the GMS and its impact on the

beneficiary villages. Also two villages were selected under the government-managed scheme in order to balance the two villages selected for the farmer-managed category.

4.8.2 Farmer-Managed Schemes

4.8.2.1 Durongo Irrigation Scheme

Durongo scheme was constructed in 1963 with a capacity of 435,000m³ with a gross irrigable land area of about 16.0 hectares (Ayaala, 2008). The scheme was built and operated by the Department of Agriculture with little involvement of the community in management and operation (Gyasi, 2008). Over the years, the scheme became neglected and not properly managed, and as a result the canals collapsed resulting in the abandonment of the scheme (Ayaala, 2008; Gyasi, 2008). The scheme was rehabilitated in the early 1980s under the Upper Region Agricultural Development Project, but it fell into disrepair again after many years (World Bank, 1987). It was again rehabilitated between June 2002 and August 2003 under the IFAD funded Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP) Phase II and transferred to the Durongo village in 2003 (Gyasi, 2008; Ayaala, 2008; Mdemu, 2008; A. Ayinbire, personal communication, November 18, 2011).

4.8.2.2 Winkogo irrigation scheme

The Winkogo irrigation reservoir was constructed in 1961 and rehabilitated in the early 1980s and in 1998 under the Upper Region Agriculture Development Programme (URADep) and LACOSREP Phase I projects respectively (World Bank, 1987; IFAD, 2006). The canals were extended to enhance dry season irrigation farming (Agyenim, 2011). The management of the scheme was transferred to the village under the Water Users Association (WUA) immediately after the rehabilitation.

Winkogo irrigation scheme was rehabilitated and handed over to the WUAs under Phase I of LACOSREP in 1998 (Agyenim, 2011) whilst Durongo scheme was transferred to the WUAs in 2003 (Mdemu, 2008). The LACOSREP ended in 2005 signifying that Winkogo and Durongo were under the management of the WUAs for 7 and 2 years respectively before LACOSREP ended in 2005. During the life cycle of LACOSREP I and II, all the FMS were supported by the Department of Cooperatives, Department of Community Development and Department of Agriculture to form water user associations (WUAs). They were also given initial training (Department of Cooperatives, 2005). Winkogo and Durongo were selected because they were transferred to the WUAs under different phases of LACOSREP. Also, the two villages are close to the GMS.

4.9 Participants and Selection of Participants

The participants for this study included irrigation farmers and their group leaders, traditional authorities and government officials. The participants were selected using: (i) group membership, and (ii) experience of the participants in irrigation farming and number of years they lived in the village as criteria.

The first participant selection criterion used in selecting irrigator participants related to their group membership. In the field, the nature of the irrigation water lateral from the main canal that serves a number of farmers were also taken into account. Only fields that received water through the laterals to enable irrigation farming at the time of the study were selected. In Vea, the irrigators were grouped along five lateral lines that were all receiving water for irrigation. Each lateral was headed by a lateral leader. First, three laterals were randomly selected from the five laterals. Second, thirty-five farmers were also randomly selected from the three laterals and interviewed. In Nyariga, the

irrigators belonged to five different irrigation farmer groups though not based on lateral lines. Six irrigation farmers including women were randomly selected from each irrigation farmers' groups and seven leaders were purposively selected from the five irrigation farmer groups for interview, totaling 37 participants.

All the irrigators in the GMS belonged to a federation of irrigation water users association called the Apex Group, with leaders who represented the group at ICOUR. The chair person and secretary of the Apex Group who lived in Vea and Nyariga villages were purposively selected and interviewed. The two Apex group leaders were interviewed in order to triangulate the information gathered from the focus group discussions and key informant interviews from the farms in Vea and Nyariga. Interviewing the Apex group leaders also helped to ensure the validity of the data gathered from the government-managed schemes.

In Dorungo, the irrigation farmers interviewed were chosen based on the sub-divisions of the village. The Durungo village is divided into six clans or sections. Five irrigation farmers including two women were randomly selected from each clan. In Winkogo, all the farmers in the village belonged to the WUA. Twenty-two irrigators including twelve women were randomly selected and interviewed. Two of their leaders (chairperson and secretary) were purposely selected and interviewed. In all the four communities (Durungo, Winkogo, Vea, and Nyariga) fifteen village leaders consisting of the traditional authorities, Unit Committee⁵ and District Assembly members were purposively selected and interviewed. Table 4.3 shows the numbers of irrigators selected per village. Officials from the District Assembly decentralised departments

⁵ District Assembly sub-structures

who were supposed to provide support to the farmers in irrigation activities were also purposively selected and interviewed. Table 4.2 and 4.3 show village and district level's interviews. At the regional level, four representatives, one each from the Environmental Protection Agency, Water Resources Commission, Irrigation Development Authority and ICOUR, were purposively selected and interviewed.

Table 4-2 Community Level Interviews

Village Level Interviews	Government-managed scheme				Farmer-managed scheme				Total
	Nyariga		Ve a		Durongo		Winkogo		
	Male	Female	Male	Female	Male	Female	Male	Female	
Village leaders	3	1	4	-	3	1	3	-	15
Farmer leaders	7	-	5	-	2	-	3	-	17
Farmers	20	10	20	10	22	10	9	12	113
Apex Group	1	-	1	-	-	-	-	-	2
Mixed FOCUS GROUP DISCUSSION	7	5	6	6	7	4	5	7	47
Women FGD	-	12	-	12	-	12	-	9	45
TOTAL	38	28	36	28	34	27	20	26	239

FG = Focus Group Discussion

Table 4-3 District Level Government Stakeholders Interviews

District	MOFA	Department of Community Development	Department of Cooperatives	Planning Department	Total
Bolgatanga	1	1	1	1	4
Talensi-Nabdam	1	1	1	1	4
Bongo	1	1	1	-	3
TOTAL	3	3	3	2	11

The second selection criterion was based on the experience of the participants in irrigation farming and number of years they lived in the village. Irrigation farmers who had lived in the village and were involved in irrigation farming for at least three years were selected. Each of the prospective farmer participants was asked, *“how long have you lived in this village and how long have you been involved in irrigation farming?”* to identify who had lived and farmed in the village for less than three years. The rationale was to interview farmers who had enough opportunity to experience the institutions and factors affecting compliance with, and enforcement of, local irrigation water governance more generally.

4.10 Ethical Considerations

Ethical principles were followed and respected in the qualitative research to protect research participants' interests. Mack et al. (2005: 8) explained the importance of research ethics when they argued that ‘whenever we conduct research on people, the well-being of research participants must be our top priority. The research question is always of secondary importance. This means that if a choice must be made between doing harm to a participant and doing harm to the research, it is the research that is sacrificed.’ As part of this process, permission to carry out field research was first sought from the University of New England’s Human Research Ethics Committee. This research was approved by the University of New England Human Research Ethics Committee on October 7, 2011 with an approval No. HE11/184. An introduction letter (Appendix 3) was sent to the three District Assemblies and regional agencies to introduce the researcher and the purpose of the research. The transcribers were advised to keep the transcriptions confidential in accordance with the approved code of ethics set by University of New England Human Research Ethic Committee. All appropriate

measures were taken to ensure that the study posed no risks in whatever way or form to the participants.

Verbal informed consent was also sought before the start of interviews and group discussions. In the words of Mack et al. (2005: 9) informed consent is a ‘mechanism for ensuring that people understand what it means to participate in a particular research study so they can decide in a conscious, deliberate way whether they want to participate.’ An information (Appendix 2) and consent form (Appendix 4) were given directly to the key informants who can read and to the farmer group leaders who can read to explain to the farmers selected from their groups. The aim was to let the participants know (1) what to expect during the interview; (2) that they will be recorded but only with their permission; (3) that an initial agreement to participate did not commit them to continuing their involvement, and that they had the right to withdraw from the interview at any time if they wanted; and (4) that they might be quoted in a research report, but if they are quoted, their confidentiality would be maintained as they will be identified only by codes (the quote reflected their gender and nothing else).

4.11 Data Analysis and Interpretation

4.11.1 Immersion in the Data

To enhance the efficiency of data analysis a Computer Assisted Qualitative Data Analysis Software (CAQDAS) known as NVivo 9.2 developed by QSR International (2010) was used. NVivo CAQDAS was relevant because this study included a lot of household and key informant interviewees (162) and eight focus group discussions and the software was useful in analysing the data thematically (see Tables 4.2 and 4.3). The 162 household and key informant interviews and eight focus group discussions were downloaded from the digital voice recorder and transcribed verbatim by two

transcribers from the local language into English. The software has the ability to efficiently store, organise, manage, and reconfigure the data to enable analytic reflections. NVivo 9.2 software enabled the transcribed data to be imported into Microsoft Word for coding. The transcribed data were coded into nodes or interpretive categories using the NVivo software. Coding was a mechanism that allowed the vast amount of data collected from the field to be reduced. The qualitative interviews were coded, based on facts, views and opinions expressed by the participants in response to the questions and probing the researcher carried out. Tree nodes were created to allow major nodes containing more refined branch nodes which gradually built more complex groups of codes. Examples of the nodes and sub-nodes from first coding from the Durongo case study are shown in Table 4. 4.

Data analysis and interpretation began as insights emerged whilst the researcher was in the field, hence data collection, analysis, and interpretation overlapped. In an attempt to get a better understanding and insight into the emerging issues, further clarifications were sought from the respondents by going back to interview some of the participants again. The analysis of the data was an iterative process, each time exploring the data, looking for the “underlying” meaning, while at the same time becoming more familiar with the data. Initially, the interview transcript was read several times, and a few notes were made at the margin to gain a general sense of what the interviewees said. The researcher then re-read the text in the transcriptions several times looking for key themes and patterns as they relate to the key factors identified through the literature review that were said to affect natural resource governance. The data was coded and recoded as patterns, meanings, and significance emerged from the data through analytic reflections. NVivo provided rapid access to the concepts generated as well as data which supported these.

Table 4-4 Coding frameworks illustrating tree and branch nodes

Durongo Community					
Name	Sources	References	Created On	Created By	
[-] Governance Principles	39	852	29/03/2012 9:48 PM	NUKUNU	
[-] Fairness in Governance Processes	36	104	29/03/2012 9:48 PM	NUKUNU	
Stewardship of the Environment	24	44	29/03/2012 9:48 PM	NUKUNU	
Distribution of Benefits and Costs	30	58	29/03/2012 9:48 PM	NUKUNU	
[-] Adaptability to External Factors (Learning to live with Ch	37	203	29/03/2012 9:48 PM	NUKUNU	
Threats and Challenges	23	46	29/03/2012 9:48 PM	NUKUNU	
Strategies to deal with Threats and Challenges	34	110	29/03/2012 9:48 PM	NUKUNU	
Strategies to Utilise Opportunities	9	18	29/03/2012 9:48 PM	NUKUNU	
Opportunities	10	11	29/03/2012 9:48 PM	NUKUNU	
Decentralised Powers for Management Decision Ma	7	18	3/04/2012 6:42 PM	NUKUNU	
[-] Accountability to Stakeholders	23	48	29/03/2012 9:48 PM	NUKUNU	
Financial Resources Utilisation	9	13	29/03/2012 9:48 PM	NUKUNU	
Output Performance	18	25	29/03/2012 9:48 PM	NUKUNU	
Defined Plans and Strategies	2	6	10/04/2012 12:59 PM	NUKUNU	
Poor Financial Accountability	1	4	23/07/2012 7:57 PM	NUKUNU	
[+] Legitimacy of Leaders and Organisations	35	111	29/03/2012 9:48 PM	NUKUNU	
[-] Stakeholders Capacity	35	74	29/03/2012 9:48 PM	NUKUNU	
Non-Agronomic Skills (Water, Soil, Environment)	25	39	29/03/2012 9:48 PM	NUKUNU	
Adequacy of Financial Resources	7	12	29/03/2012 9:48 PM	NUKUNU	
Agronomic Skills (Crop Management)	12	13	31/03/2012 6:21 PM	NUKUNU	
Capacity Gap (Lack of Training & Resource)	6	9	10/04/2012 8:47 PM	NUKUNU	
[-] Stakeholders Inclusiveness	38	134	29/03/2012 9:48 PM	NUKUNU	
Internal Stakeholders	33	55	8/05/2012 11:28 AM	NUKUNU	
External Stakeholders (Invited by Community)	8	12	8/05/2012 11:30 AM	NUKUNU	
Non Inclusion-Internal	11	21	8/05/2012 11:42 AM	NUKUNU	
Non Inclusion in Partners' Decisions	0	0	11/05/2012 1:42 PM	NUKUNU	
Inclusion In Partners' Decisions	0	0	11/05/2012 1:45 PM	NUKUNU	
[+] Transparency in Decision-Making Processes	35	118	29/03/2012 9:48 PM	NUKUNU	

4.11.2 Thematic Analysis and Interpretation

The next step followed was a thematic analysis, a systematic process that involves familiarisation with the data resulting from categorisation and interpretation. Thematic categories were derived using pre-determined and emerging codes. The researcher focused on key themes and relationships that emerged from the participants' responses, guided by the conceptual framework (see Section 2.12) which synthesised the key factors from the literature review relating to water resources governance processes. The conceptual framework (mainly influenced by the Lockwood et al. (2009) governance principles and Ostrom (1990, 1992) design principles) aided the development of the

themes and interpretation of the data. The researcher also used an inductive approach to identify other themes such as “stakeholders’ interaction and coordination,” and “governance monitoring and evaluation” that emerged from the interview data. Prevalence of responses from most of the participants (50% and above) as indicated in Table 4.6 were considered as themes. These central themes were further broken down into sub-themes. At the same time other concepts that emerged from the data that the researcher considered important were coded as shown in Figure 4.4. In this study the researcher used major factors identified from the literature, governance principles, Ostrom design principles and other themes that emerged inductively to structure the thesis chapters 5-9 (as shown in Figure 1.1). Thus the central themes from the analysis which form the basis for the thesis chapters include:

1. local level structures and institutional arrangements;
2. stakeholders’ capacity;
3. institution design and enforcement;
4. water users’ participation; and
5. stakeholders’ interaction and coordination.

The various sub-themes of each main theme constituted the sub-sections of the discussion chapters (chapters 5-9) in the thesis. The analysis of the data followed a gradual refinement towards the key factors identified from the literature including Lockwood et al.’s (2009) governance principles and Ostrom’s (1990, 1992) design principles and institutional analysis and development (IAD) framework. Throughout the process of the coding the researcher was actively interpreting the data, reflecting on the significance of the findings and how they address the research questions and the potential contribution it could make to development of theory and policy.

Open coding involving the questioning of who, when, what, how and why was done with constant comparisons between documents and case studies. The researcher sought patterns and contradictions as the data was coded. Axial coding of text was done to refine the open coding system to bring out the dominant themes that were categorised hermeneutically and interpretatively based on Ostrom design principles and Lockwood governance principles. To achieve internal validity, credibility and authenticity, NVivo coding was employed using the participants' own words to keep their stories close to the data. This helped to represent the views of the study participants more fully and credibly. Thus the qualitative data generated offered explanations that were consistent with data collected and would be understandable to people from whom it was collected. In the process of interpretation, the researcher tried to gain an understanding of an event and experiences as told by the interviewees. Extensive use of NVivo's memoing functionality helped to ensure transparency by keeping track of analytical ideas and connections, and authenticity by helping to keep the researcher's preconceptions separated from the analysis process. The fact that this research was undertaken under an interpretive set of paradigm assumptions the researcher was not completely detached and neutral. However, the researcher was conscious of his own subjectivity, so that he could better understand and limit its effects on the data analysis and interpretation to achieve a considerable level of objectivity.

4.11.3 Synthesis and Discussion

A comprehensive synthesis of the findings from chapters 5 to 9 guided by the literature review was conducted. The process combines findings across the five the five result chapters (see Appendix 9) and literature review to arrive at common themes as key findings in the study to strengthen evidence or establish the validity of a result. The approach was hermeneutic and interpretive in nature, seeking a deeper understanding

and explanation of irrigation water resource governance phenomena as the focus of the study. The synthesis of the results chapters vis-à-vis the literature review was important in order to provide a deeper understanding and interpretation of the issues that emerged from the data analysis and to be able to articulate the lessons learned from the study. The process helped to provide deeper understanding and interpretation of the themes that emerged from the five report chapters. This in turn helped to draw relevant lessons for policy formulation, conclusion and recommendations for future research. The aim is to fill in knowledge gaps in the performances of farmer-managed and government-managed institutional arrangements under the decentralisation policy. Four main themes were identified in this synthesis process that helped to answer the overarching research question. These were the influences of community structure, culture, and power differentials on community-based irrigation water governance; the effects of policy design and implementation frameworks on community-based irrigation water governance. The effects of organisational leadership quality on community-based irrigation water governance; and the influence of community level attitudes and behaviours on community-based irrigation water governance were the other issues that emerged. The four themes are discussed in detail in section 10.2.

4.11.4 Prevalence of Interview Responses in Discussion

The results of interviews with 15 district and regional government stakeholders, and 157 community stakeholders were analysed using the Lockwood et al. (2009) governance principles and Ostrom design principles and other governance concepts used in the conceptual framework. This helped outline the findings from the study, and sought to address how these principles could be implemented to improve decision making about irrigation water. Relevant quotations from the participants were used to illustrate key findings. The results and discussions are presented together so as to provide greater

immediate interpretation and meaning to the responses given by the participants. The findings of this study are disaggregated into those relating to farmer-managed and government-managed irrigation schemes so as to bring out clearly the differences and similarities. However, where there are similarities in the two schemes, the findings are discussed together. Also due to the qualitative nature of the study terms such as ‘some’, ‘most’, ‘all’, ‘majority’, ‘minority’ were used to describe the prevalence of participants’ responses to an issue. Table 4.4 shows the prevalence level for each of the terms used.

Table 4-5 Data Discussion and Interpretation

Terminology used	Prevalence
All	100%
Majority	60%
Most	50%
Some	30%
Minority	10%

Conflicting evidence from the participants were also presented and analysed in order to achieve internal validity and objectivity in the interpretation of the results.

4.11.5 Formatting Style of Quotations from Interview Respondents

The formatting style for quotations cited within the thesis from the interview responses is illustrated in Table 4.6 and in the example provided below. Quotation from participants are indented and italicised. Each participant is represented by an identification numbered code. The first letter in the code, for example, **DFM008** represents the community (case study) or organisation from which the participant was selected. All stakeholders from the regional and district level are represented with identification numbered code beginning with ‘**P,**’ followed by a number. The identification numbered codes are bolded capital letters. See Table 4.6 for details.

Table 4-6 Formatting Style for Quotations

Quotation categories	Example of representation
Quotation from participants	Indented and italicised
Identification numbered code for each participants	
Beginning with ‘ N ’ means participant is from Nyariga case study,	NFL108,
Beginning with ‘ V ’ means participant is from Vea case study	VFL069,
Beginning with ‘ D ’ means participant is from Durongo case study	DFM008
Beginning with ‘ W ’ means participant is from Winkogo case study	WFM051
Beginning with ‘ P ’ means participant is from district and regional stakeholders	P148, P151
Beginning with ‘ IM ’ means participant is from ICOUR	IM 160

An example of quotation excerpt is provided below.

*Before the construction of the reservoir, we had traditional rules regarding water resources use. The tindaana supervised the governance of land and water. He enacted laws and enforced them. Whatever he said was final (Community leader, Nyariga, **NCL103**, December 3, 2011).*

4.12 Limitations of the Study Method

Because of the nature of the study, the researcher coded the data and identified the themes alone and then discussed the analysis with his supervisors. This process allowed for consistency in the method but failed to provide multiple perspectives from a variety of people with differing expertise. When using this method for another study, the coding of data could involve several individuals with themes being developed using discussions with other researchers to bring multiple perspectives.

Also by the very act of asking thematic questions, the researcher influenced the participants. In turn, the responses of the participants and the progressive knowledge gained by the researcher iteratively influenced the researchers' understanding and perspectives. Thus, the research focus evolved in a spiral and iterative manner as the study progressed.

The interviewees were those available at the time of the study and provided information within their time constraints. Most of the time, it was very difficult to get the interviewees to interview during market days and social events such as funerals, child naming ceremonies, and weddings. Therefore the researcher had to postpone interview schedules to accommodate interviewees' convenient times. This had caused a lot of delays in the interview process. Also, some of the selected participants were not willing to be interviewed as they did not see any benefit from previous researches. Also, they expected to be rewarded financially for the time spent in responding to the interview questions.

Interviewees offered perspectives based on their experiences and provided information to the best of their knowledge, but it was not always detailed no matter the efforts to probe deeper. The first research assistant misconstrued the purpose of the research to mean that the data was being collected for either the government or donor agencies for development intervention in the study areas. Hence, he tried to influence the responses from the interviewees. This was discovered when the audio tape was transcribed by an experienced native qualitative researcher. Consequently, the earlier interviews conducted had to be discarded, to achieve trustworthiness of the data collected. Also, the terminologies used to describe key concepts were difficult to explain in the local language. Trying to get the appropriate meanings caused considerable delay.

4.13 Summary

This chapter provided justification for the case study methodological approach, interpretive paradigm, and qualitative data collection methods used to address the research objectives and questions. Within the interpretive paradigm, hermeneutics were used as an appropriate research philosophy to explore irrigation water resource governance at the local level. The case study methodological approach and the qualitative data collection methods used provided deep insights into the experiences of the four communities in the government-managed and farmer-managed irrigation schemes. This approach and tools used provided a flexibility to generate rich data from a variety of participants from regional, district and community levels.

The next chapter commences the presentation of the case study findings in respect of the main research question, *To what extent are the current decentralised local government and governance structures and processes at the regional, district and sub-district levels supporting a community-based approach to irrigation water governance?* and subsidiary research questions posed in chapter three. Accordingly, it focuses on an analysis of the governance structures for irrigation water governance at the regional, district and local level.

PART III

CASE-STUDY FINDINGS

Chapter 5 Governance Structures and Processes for Irrigation Water Governance

5.1 Introduction

This chapter commences the presentation of the case study findings. It is focussed on the main research question, *to what extent are the current decentralised local government and governance structures and processes at the regional, district and sub-district levels supporting a community-based approach to irrigation water governance?* as well as subsidiary research questions posed in chapter three. The term ‘governance structures’ as used here refers to the institutional and organisational dimensions of governance that shape policy processes, formulation, adoption, and implementation of decisions related to enabling irrigation water resource governance. This chapter is concerned with answering the research questions:

1. *To what extent has irrigation water resource governance been decentralised to the community level?*
2. *What are the institutional arrangements for irrigation water resources governance at the regional, district and community levels?*
3. *What are the impacts of the current local level governance structures and processes on irrigation water resource governance at the community level?*

Accordingly, this chapter presents an analysis of relevant institutions as well as the roles and responsibilities of regional, district, and community level irrigation water resource governance actors. The chapter elaborates on aspects of the institutional theory of collective action and governance principles that were considered in chapter three. More specifically, the analysis dwells on the institutional and organisational dimensions of governance and governance principles influencing collective action of irrigation farmers

involved in this study. As discussed in sections 3.12, 4.6, and 4.7, the case study communities face irrigation water-related dilemmas wherein frequent drought and poor irrigation water resource governance pose risks to sustainable irrigation water resources and livelihoods.

As explained in section 2.9, decentralisation is a governance approach adopted by Ghana to devolve irrigation water resource governance to the local level. Local level institutional arrangement is critical for successful common pool resource governance, as discussed in section 2.4 under institutional theory. According to the IAD framework of institutional theory, discussed earlier in section 2.4, institutional arrangements are the most important of the three contextual attributes that structure the situations facing participants in irrigation water resource governance. Also, as discussed in section 2.8 and Table 2.1, there are good governance principles and design principles that should guide collective action situations in natural resource governance. An integrative conceptual framework developed in section 2.12 based on the IAD framework, governance principles and other concepts were used to formulate the research questions and structure and guide the analysis. All these principles provided a guide for analysing collective actions in irrigation water resources governance among the stakeholders at regional, district, and community levels in the case-studies in this chapter.

Accordingly, this chapter seeks to examine how institutional arrangements impacted community-based irrigation water resource governance at the local level. Individual farmers' and key informant interviews, focus group discussions, and field observations constitute the data upon which this chapter is based (see section 4.5.2).

The regional, district and community level irrigation water resource governance organisations and actors identified during the field work, their roles and responsibilities

in irrigation water resource governance are analysed in section 5.2. The observed water resource governance systems and associated roles within each of these governance systems are discussed briefly in section 5.3. Sections 5.4 and 5.5 discuss the existing formal and informal organisations as well as their roles, responsibilities, and challenges. Section 5.6 provides answers to each of the three questions posed and concludes the chapter.

5.2 Decentralisation of Irrigation Water Resource Governance to the Local Level

This section examines the processes of decentralising irrigation water resource governance to the local level. It therefore engages with the first and second questions posed above: *(i) to what extent has irrigation water governance been decentralised to the community level?* *(ii) what are the institutional (organisational) arrangements for irrigation water governance at the regional, district, and community levels?* As a way of implementing the decentralised irrigation water governance initiative, irrigation facility ownership and management responsibilities were devolved to the communities, under the guidance of the key sector ministries, departments, and agencies responsible for irrigation development. At the community level, the water users and the traditional authority systems were recognised by the government as important local level structures that should play key roles in water resources governance. The regional, district and community level decentralised structures (organisations) for irrigation water resource governance are examined in the next section.

5.2.1 Decentralised Structures for Local Level Irrigation Water Governance

For the analysis of governance structures in this study, it is useful to distinguish two sectors: public and private (communities, NGOs, civil society). The latter sector

includes formalised water user groups and the traditional (informal) community irrigation water resource governance arrangements, as well as community-level civil society groups. These were one of the main focuses of the study. The public sector includes regional level ministries, departments and agencies (MDAs), and the District Assemblies (DAs) and their decentralised departments. Regional level MDAs that play some regulatory and implementation roles related to irrigation water governance were the Environmental Protection Agency (EPA), Water Resources Commission (WRC) and the Ministry of Food and Agriculture (MOFA)/Irrigation Development Authority (IDA) and the Irrigation Company of the Upper Region (ICOUR). The DA decentralised departments identified were the Departments of Food and Agriculture, Cooperatives, and Community Development. The community (village) level organisations included the Water User Associations (WUAs) under the farmer-managed systems and lateral groups, and the Apex body under the government-managed scheme. Across both types of systems, these organisations also included Unit Committees⁶, Assembly members⁷, and traditional actors (chiefs, tindaanas⁸, elders, clan heads and magazia (women leaders)). These organisations are grouped into formal and informal organisations and graphically represented with Figures 5.1 and 5.2. These are the organisations that are associated with the District Assembly (DA). Figures 5.1 and 5.2

⁶Unit committees are the lowest district assembly sub-structures intended to be the base of ‘grass roots’ political incorporation and accountability in Ghana. Unit committee members should act as intermediaries between the assembly members and local constituents, taking issues of concern to the assembly members and sharing assembly activities and assembly meeting outcomes with constituents.

⁷The assembly member is the elected representative of an electoral area at the district assembly.

⁸ Plural for tindaana, meaning land or earth priest

illustrate the pathways of relationships between these organisations and social groups and their influence on irrigation water resource governance at the community level at the time of the study. The formal governance organisations included all regional level MDAs, ICOUR, DA decentralised departments and sub-structures, WUAs, Lateral Groups and the Apex body of lateral groups. Informal organisations consisted of the various forms of traditional authority structures. The strength of the relationships between these district and regional level organisations and the WUAs and lateral groups on one hand and the community level organisations and the WUAs and lateral groups on the other hand was assessed through household, key informant and farmers' focus group interviews. Indicators used to judge the strength and weaknesses of the interactions were collaborations and financial and technical support received. The extent of financial and technical support received by the WUAs and lateral groups from the regional, district, and community level organisations determines the strength of relationships between these organisations and the WUAs and lateral groups at the community level. Similarly, the quality of collaboration between the WUAs, lateral groups and community level organisations such as the traditional authorities, and unit committees determines the quality of the relationships within them. It is assumed in this study that the strength of the relationships constitutes social capital and may influence irrigation water resource governance at the community level. The strength of the relationship is denoted by the nature of the line connecting the organisations as shown in Figure 5.1 for government-managed and 5.2 for farmer-managed schemes. Although there were some direct influences from these regional and district level organisations at the community level, most of the influences were indirectly via the local groups: WUAs in the case of farmer-managed schemes and lateral groups in the case of government-managed schemes.

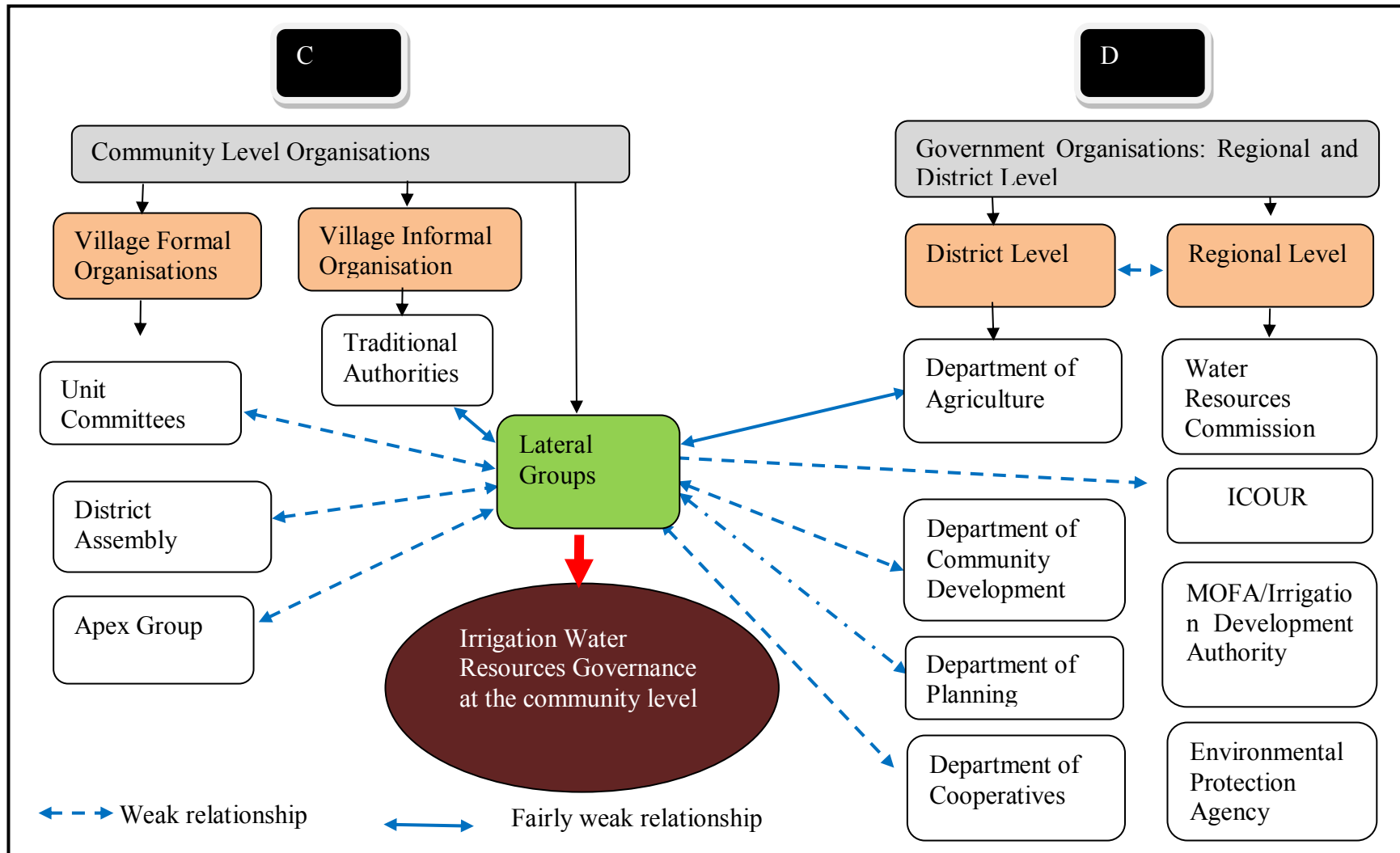


Figure 5-1 Pathways of community level organisational influence for government-managed irrigation schemes

Source: Data Analysis

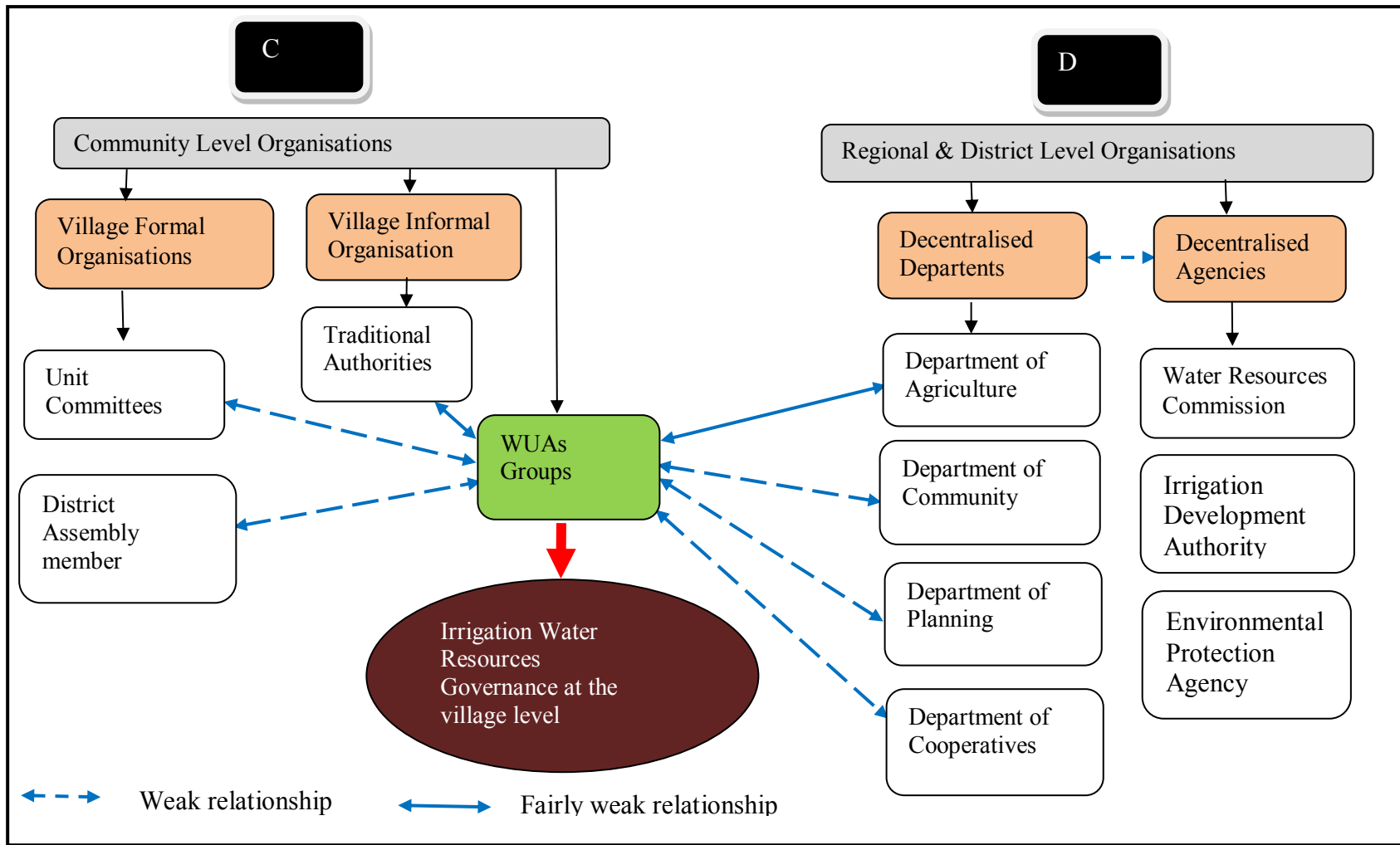


Figure 5-2 Pathways of village level organisational influence farmer-managed irrigation schemes

Source: Data Analysis

5.3 Identified Types of Governance

Two types of irrigation water resource governance systems were identified through responses from the participants in both farmer-managed schemes (FMS) and government-managed schemes (GMS). These were delineated as primary and secondary governance systems. The primary system refers to the modern, formalised institutional arrangements initiated in the early 1990s. The primary system was largely influenced by donor agency requirements, particularly those of IFAD and its sector policies. The secondary governance system refers to the traditional, less formalised authority system for water governance that was prevalent in the study area before the advent of modern governance structures. Table 5.1 shows the identified governance systems, and provides a summary of the roles of each. The identified roles of the primary governance system (formal) were documented in the WUA by-laws and constitutions and their performances could be monitored by the WUAs and district level organisations. However, the secondary (traditional) roles were not documented but were part of the traditional roles performed by the traditional authorities in their communities. The implicit roles refer to situations where the traditional authorities are used to mobilise the irrigators to participate in collective actions such as resource mobilisation (labour and financial) or to use their authoritative status to enforce the rules.

Table 5-1 Identified Governance Systems, Roles and Responsibilities

Governance roles performed	Existing governance systems			
	Primary (formal/modern)			Secondary (Traditional Authorities)
	WUA	Lateral groups	ICOOR	
Development and enforcement of institutions	✓	✓	✓	✓
Community mobilisation	✓	✓		✓
Land allocation	✓	✓	✓	✓

Governance roles performed	Existing governance systems			
	Primary (formal/modern)			Secondary (Traditional Authorities)
	WUA	Lateral groups	ICOIR	
Conflict resolution	✓	✓	✓	✓
Performance of rituals on land and water resources				✓
Water management	✓	✓	✓	
Water scheduling and supply	✓		✓	
Repair and maintenance	✓	✓	✓	✓
Financial and in-kind contributions	✓	✓		✓
Catchment area protection	✓		✓	✓

Source: Field Data Analysis

The awareness and acceptance of irrigation water governance roles by the WUAs in the FMS were highlighted by the following remark from a mixed focus group:

It was an idea from the Department of Agriculture office that we should form the WUA to be responsible for the management of the reservoir and we welcomed it and went ahead to form the WUAs. It wasn't imposed on us (mixed farmer focus group, Winkogo, WMFG2. February 4, 2012).

Included in the irrigation water governance transfer plans of the GMS, ICOIR was supposed to involve the irrigators and the villages in the governance of the Vea irrigation scheme. ICOIR was also supposed to hand over the governance of the scheme to the irrigators, and concentrate on water supply in the long-term (ICOIR, 1985) as discussed earlier in section 3.8. Thus, irrigation water resource governance had been devolved by the government to the decentralised structures namely WUAs and traditional authorities in Durongu and Winkogo in the case of the FMS; and to ICOIR, and lateral groups and the District Assemblies in the case of the GMS.

5.4 Traditional (Informal) Governance Institutions

This section examines the roles of the traditional, less formalised governance institutions in community level irrigation water resource governance. The traditional institutional arrangements, which constitute the secondary irrigation water governance system in the study areas, are illustrated in Table 5.1 for both FMS and GMS and in Figures 5.1 for GMS and 5.2 for FMS respectively. The traditional authority system had operational rules which included the boundary, allocation, input, and penalty rules regarding water and land resources governance. As noted in the IAD framework in section 2.9, the operational rules are neither self-generating nor self-enforcing, hence in both FMS and GMS, there were traditionally established institutional arrangements that allowed the family and clan heads to be responsible for intra-family social and collective contracts, and resolving disputes. The chief or tindaana allocated land to patrilineal clans within their jurisdiction. It was clear from the interviews that, prior to the formation of the WUAs in the case of the FMS, and lateral groups and ICOUR, in the case of the GMS, the traditional authorities had the sole responsibility for water resource governance in the communities.

Before the construction of the reservoir, we had traditional rules regarding water resources use. The tindaana supervised the governance of land and water. He enacted laws and enforced them. Whatever he said was final (Community leader, Nyariga, NCL103, December 3, 2011).

The chief, elders and some opinion leaders were in charge of the management of the irrigation reservoir before the formation of the WUA. There were rules to prevent people from farming along the banks of the reservoir. There was also a law to plant kulkaatima [vetiver] grass along the banks of the reservoir. Also, using chemicals to fish was prohibited (Traditional leader, Winkogo, WCL040, December 30 2011).

As discussed in section 3.4.1, in practice, the governance of land and water resources in the communities was largely under the control of traditional authorities and families under customary law. Despite the establishment of formal WUAs and lateral groups, the role of traditional institutions still influenced irrigation water resource governance, as the traditional authorities still claimed ownership of the land on which the water is. The legitimacy of WUAs and lateral groups was partly dependent on the substantial support they got from the traditional authorities. These local level groups play complementary and synergistic roles.

Before the allocation of plots to farmers was successful, it was the traditional leaders that set up a committee to be in charge of the plot allocation to farmers. When ICOUR suggested that the plots should be shared and allocated to the farmers, many people did not agree initially..... It took the intervention of the traditional authorities before people accepted the plot allocation proposal (lateral leader, Vea, VFL070. January 5, 2012).

Responses from key informant interviews with irrigators, with community representatives and during focus group discussions revealed that these traditional socio-political hierarchies continued to play an important mediating role in: (i) land and water allocation, (ii) community mobilisation for collective actions, (iii) rule enactment and enforcement, (iv) internal conflict resolution and (v) enforcement of traditional religious beliefs relating to land and water. These supports received by the WUAs and lateral groups from the traditional authorities indicated that the secondary system has strong relationship with the WUAs and lateral groups. The strength of relationships between the traditional authorities and the WUAs and lateral groups determined the strength of the influence they exerted on water resources governance. The strength of this

relationship is shown Figures 5.1 for GMS and 5.2 for FMS. The roles of the traditional authorities are considered in turn below.

5.4.1 Institution of Land Ownership and Sharing

It emerged from the key informant interviews and focus group discussions in both FMS and GMS that the traditional rulers were instrumental in ensuring harmony in irrigation land allotment, ownership, and user rights. The concept of land ownership and sharing as it applies to the case study areas relate to user rights and the right of access to land for irrigation purposes. The irrigable lands in the government-controlled irrigation scheme were expropriated from the land owners when the scheme was constructed in the early 1970s (Konings, 1981), and the land management and allocation role is now assigned formally to ICOUR. Nevertheless, the traditional authorities still played key informal roles in allocating irrigable land to the farmers. Interviews with the participants revealed that to avoid absolute control of the land by government and the WUAs, the irrigable lands usually revert to the usufruct title holders (original landowners) during the rainy season (May-October), despite being controlled by ICOUR in the GMS and the WUAs in the FMS for irrigation farming during the dry season.

The traditional authorities did not have direct control over irrigation water supply and management in the FMS and GMS, but were called upon when there were conflicts between irrigators and ICOUR, between irrigators, between irrigators and other water users, and between villages. The WUAs tried to conform to traditional rules regarding land and water governance.

It is the practice of the farmers to invite the tindaana to perform religious rituals at the irrigation site before the season begins. The reservoir and irrigable land is under the authority of the chief and the tindaana, and the tindaana's role is to pacify the land gods before people can work on any

piece of land under his jurisdiction. We don't allow any individual to work on their community lands if they do not comply with the rules (Traditional leader, Durongo, DCL003. November 18, 2011).

As explained in section 3.4.1 the allodial title to land is held by communities under customary law and is vested in the chiefs and tindaana, the earth priest who hold the land in trust for the whole community. Secondary customary land title (usufruct right) is held by individuals or families who are part of the community holding the allodial title. The individuals or families have an obligation to comply with the traditional rules regarding land and water resources. Hence, informal institutions to some extent influenced water resources governance in the case-study area.

5.4.2 Community Mobilisation

It also emerged from the data analysis that community mobilisation was another pivotal role traditional institutions played in irrigation water resource governance in both FMS and GMS. Community mobilisation as used here refers to how the irrigators were organised to support the strengthening of irrigation water resource institutional development and governance, and making labour and financial contributions for facility repair and maintenance. Interview responses revealed that traditional institutions and leaders influenced community organisation, and that their functional roles ensured compliance with the rules, norms and beliefs regarding irrigation water resources and land use. The traditional leadership in the communities employed various methods of social mobilisation to formulate solutions, mobilise resources, and to demand resources from the irrigators for the maintenance of the irrigation systems. Thus, the WUAs and lateral group leaders relied on the chiefs and elders as trusted channels of information dissemination, and for assistance in mobilising the people including collection of water and land levies from recalcitrant farmers. The WUAs and lateral group leaders relied on

the chiefs and elders because the traditional leaders are revered and held in high esteem, and therefore command compliance with established rules, as confirmed by some irrigators:

The chief plays a key role by helping to collect the water and land levies from the farmers. The chief usually advises the farmers to make their payments within a certain time period. He also helps to mobilise the farmers to clean and weed around the canal. ... The chief of this community plays a major role in the management of water in irrigation activities in this community (male irrigator, Ve, VFM074, December 19, 2011).

The traditional leaders have been effective and helpful in seeing to it that we perform our roles and responsibilities (male irrigator, Ve, VFM075, January 1, 2012).

Reciprocally, the WUAs and lateral group leaders also acknowledged the role of the traditional authorities in helping to re-enforce their legitimacy through endorsement. Reciprocally, the WUA and lateral leaders also supported the traditional authorities to allocate land and mediate conflicts in accordance with traditional practices. Observations from the field revealed that membership in these formal and informal institutions and community organisations overlapped, as some WUA and lateral group leaders were also community elders. Also the legitimacy of the lateral and WUA leaders was accepted by the traditional system. Compliance with these operational and collective-choice rules enhanced cooperation among the community stakeholders.

5.4.3 Enactment and Enforcement of Institutions

The development and enforcement of institutions emerged from a majority of the participants as an important role of the traditional authorities in both farmer-managed and government-managed irrigation schemes. The WUAs involved the chiefs and elders in the design of the WUA institutions, because regulations endorsed by chiefs and

elders were more likely to be seen as legitimate and obeyed by members of WUAs and lateral groups. Consequently, the WUAs and lateral groups presented their formal institutions and decisions to the chiefs and elders for review and subsequent endorsement.

The WUA leaders who are now in charge of the management of the water were chosen by the chief and given that responsibility to ensure that the rules and regulations are put in place to manage the water resources effectively (community leader, Winkogo. WCL041. December 30, 2011).

We the lateral leaders alone do not have absolute power. We normally collaborate with the chief to take major decisions. If we take decisions alone without the knowledge of the chief and anything happens, we cannot go back to the chief again. Before the leaders are elected, the chief and elders will call the community members and they will then choose people who can read and write to take up the leadership responsibilities. My power comes from ICOUR, the chief, elders and community members because they endorsed my leadership role (lateral group leader, Vea, VFL072, January 26, 2012).

Approval of the rules by traditional authorities gave legitimacy to the rules, and power to the WUA and lateral leaders to enforce them. The inclusion of traditional authorities in the selection of WUA leaders gave automatic endorsement to the WUA leaders. Disrespect for the WUA and lateral leaders and non-compliance with the rules were regarded as disrespect for the traditional authorities, since they were involved in the selection of the WUA leaders and also endorsed the rules. Responses from a majority of the participants indicated that the traditional authorities were normally included in the process of selecting WUA and lateral group leaders.

It is customary for the people to obey the decisions and rules of the chief and elders. Failure to obey the chief and his elders means that, you will

incur displeasure from the whole community because the rules and regulations were made by the chief and his elders. This made it easy for us to enforce the rules and regulations regarding the irrigation water use and management (traditional leader, Vea. VCL064. December 29, 2011).

Yes, the WUA usually presents its rules and decisions to the chief for endorsement, who also consults the tindaana for his advice and inputs (traditional leader, Durongo. DCL003. November 18, 2011).

Any breach of the rules by the irrigators was reported to the traditional authorities, and this attracted sanctions as stated in their penalty rules. This was the general trend in Durongo, Winkogo and Vea villages but not in Nyariga village in the FMS. In Nyariga, the traditional authorities were not involved in the design and enforcement of the rules, as they were in the other three communities. Differences in involvement between Vea and Nyariga which are both in the GMS was that the Vea chief and the tindaana hold the allodial land title rights to the land on which the GMS is situated. Thus, the Vea chief appeared to be very concerned about the governance of the Vea irrigation schemes because the Vea community experienced greater negative environmental impacts from the irrigation scheme than other communities downstream like Nyariga. Hence, the traditional authorities in Vea appeared more concerned about the plight of irrigators and the community as a whole than the Nyariga chief, who was a public servant.

5.4.4 Conflict Resolution

From the interviews in all the case studies, conflict mediation regarding land allocation and water use emerged as a complex issue which required the intervention of the traditional authorities. The chiefs' palace constituted the last authority for adjudication on land and water-related disputes. Land and water allocation disputes were sent to the chiefs and council of elders for resolution. In the words of most irrigators, the traditional authorities played major roles in conflict resolution:

Yes, we were able to resolve some of the conflicts and those we could not resolve were sent to the chief to solve. The chief is the father of the land and he has the final say in everything. That is why we refer most of the cases to the chief to resolve (lateral leader, Ve. VFL072, January 26, 2012)

The Tindaana resolves conflicts related to land ownership (Traditional leader, Ve. VCL065. December 22, 2011).

5.4.4.1 Available Conflict Resolution Mechanisms

The available conflict resolution mechanisms observed were classified into three main categories, depending on the nature of the conflict: social, institutional, or legal. Miller's (2003:8) definition of conflict resolution as, "a variety of approaches aimed at terminating conflicts through the constructive solving of problems," is consistent with the different approaches identified in the villages. The social mechanism approach is where community leaders and significant others (e.g. chiefs, village elders, and respected farmers) were used to resolve conflicts. The institutional mechanisms approach is where established formal social groups such as WUA leaderships, ICOUR and the Department of Food and Agriculture were involved in conflict resolution. Legal mechanisms involved resort to the courts or security systems like the police for dispute resolution. The use of the legal approach was however limited in the case-study areas.

The social mechanisms inherent in community social structures and organisation were the dominant approach in resolving local irrigation land and water-related disputes in the case-study villages. A majority of the irrigators indicated that the chiefs and elders had roles in resolving conflicts:

If there is any dispute between two people or if there is indiscipline in the community, these issues are taken to the chief and elders in the community for it to be solved (Durongo Mixed Focus Group, DMFG2. February 4, 2012).

I think we the farmers are capable of resolving our own conflicts even without the help of our elders depending on how big or small the conflict is (Nyariga, NMF121. January 29, 2012).

The institutional mechanism for conflict mediation is discussed in detail in section 5.5.1.4 under the title of formal institutions in irrigation water governance.

Evidence from the analysis revealed that irrigation water resource governance in the case-study villages was influenced by community attributes such as their social norms, values, and religious beliefs. Land, water and many natural resources have religious beliefs attached to them. Religion as defined by Nukunya (2003:55) is, “the beliefs and practices with the supernatural.” The belief that the tindaana and the chiefs had the ability to communicate with the earth gods and the ancestral spirits, served as a strong bond between the irrigators and the traditional authorities. These beliefs influenced the acceptance of the legitimacy and authority of the chiefs and elders, and in turn influenced the cooperation they received from the farmers and the community as a whole regarding enforcement and compliance with the operational and collective-choice institutions regarding land and water resource governance. Thus, the traditional authority structures and processes had impacted irrigation water resources governance at the local level.

5.4.5 Challenges faced by Informal Organisations

Notwithstanding the important roles played by the informal organisations in irrigation water governance, particularly in the government-managed schemes their effectiveness was moderated to some extent by the establishment of the lateral groups and ICOUR. Moderation in the influence of traditional institutions was more evident in the GMS than the FMS because of ICOUR’s control over the GMS. Thus, lateral groups and traditional authorities in government-managed schemes played limited direct roles in

water allocation and scheduling, but were consulted in land allocation, conflict mediation, and community resource mobilisation. Also, because the GMS stretches across many communities unlike the FMS that are located in only one community, it was difficult to have all the individual village traditional leaders to come together to influence water scheduling and allocation in the GMS. Thus, community attributes had affected irrigation governance processes in the GMS and FMS differently. Interview responses from some representatives of traditional and farmer group leaders from the GMS explained some of these limitations of traditional institutions.

Though there are still traditional rules governing water resources use, they are no longer very effective. The tindaana's role in supervising the management of water resources as well as enforcing the community land resource management rules has been usurped by modern institutions and organisations or the white man's rules [formal rules]. The tindaana is now just an institution existing by name. With the presence of the white man's laws, everybody does what he/she likes (traditional leader, Nyariga. NCL103, December 3, 2011).

Though the traditional authorities had significant power in conflict mediation, land allocation, and community resources mobilisation, their power had diminished in relation to decisions-making on water allocation and scheduling. Nevertheless, the perceived reduction in power in relation to water allocation and scheduling by the traditional authorities did not necessarily mean that the traditional political leadership system was no longer important. The traditional authorities still had some significant power in conflict mediation, land allocation, and community resources mobilisation which was important for collective action for irrigation water governance. The traditional authorities still exercised considerable power in this domain due to their influence over how modern institutions were applied. It would be a mistake to

underestimate the importance of traditional authorities in irrigation water resource governance in the case-study areas. Though they might be limited in their understanding of the complexities surrounding water resources governance, traditional authorities nevertheless had the knowledge and skills in addressing community attributes such as social norms that affected decisions regarding natural resources governance. As was observed in Nyariga, total reliance on formal organisations to provide solutions to land and water resources governance could be viewed as dancing with one leg instead of two, where the tendency to fall is high.

5.5 Formal Organisations

Formal organisations for irrigation water resource governance existed at regional, district and village levels within the farmer-managed and government-managed schemes. Regional and district level formal organisations with irrigation water-related roles and responsibilities included the regional office of MOFA, Departments of Food and Agriculture in the Districts, Department of Cooperatives, and Department of Community Development, Environmental Protection Agency (EPA), Water Resources Commission (WRC), Irrigation Development Authority (IDA), and ICOUR. The village level formal organisations included the Unit Committees, the District Assembly (represented by the Assembly member), WUAs, lateral groups, Lateral Group, and Apex body. These organisations and their pathways of influence on irrigation water resource governance are shown in Figures 5.1 and 5.2. Their roles, responsibilities, and performances are described below.

5.5.1 Water Users Associations and Lateral Groups

The Water Users' Associations (WUAs) are village level organisations responsible for water resource governance of FMS, while the lateral groups are village level

organisations for the GMS. The WUAs and lateral groups elected leaders that mobilised community effort for the maintenance of the reservoir and irrigation facilities. WUAs and lateral groups had leadership committees comprising a chairperson, vice chairperson, secretary, assistant secretary, treasurer, and organiser.

The guidelines developed by MOFA to promote the formation of WUAs under the IFAD funded LACOSREP small scale irrigation projects required them to be registered as independent and legal cooperatives with full autonomy and authority for: (1) design and enforcement of rules; (2) conflict resolution; (3) the allocation and sharing of irrigable land; (4) distribution and management of irrigation water; (5) ensuring equitable and judicious use of irrigation water; (6) maintenance of irrigation and drainage systems; (7) mobilisation and effective utilisation of funds; and (8) the protection of catchment areas of reservoirs to reduce siltation. The WUAs were also expected to identify offences and develop penalty rules, develop dispute resolution mechanisms and address gender equity concerns. These were the formal rules that guided irrigation water resource governance at the community level (Appendix 8).

5.5.1.1 Institutional Design and Enforcement by WUAs and Lateral Groups

Institution design and enforcement emerged during the field interviews as an important role and responsibility of the WUAs. The self-governing rules developed by the WUAs were largely influenced by their defined roles, stated in the guidelines provided by the Department of Agriculture (See Table 5.1). These included rules in respect of water management and utilisation, users' contributions towards repair and maintenance, penalties for non-compliance, and conflict resolution mechanisms.

Realising that ICOUR was more interested in farmer group formation to facilitate land and water fee collection than in the well-being of the farmers, the irrigators in the GMS also developed operational rules similar to those WUAs in the FMS. Some examples of responses on how the irrigators in the government-managed schemes perceived ICOUR is provided below.

Oh, what is the company doing? The company is doing nothing; they are just collecting money, so we don't know what they are doing. If you see the canals they are in disrepair. For the past ten years the canals have not been repaired. We the farmers are repairing it small small [little by little] as we farm (lateral group leader, Nyariga. NFL107. November 27, 2011).

The rules adopted from the FMS by the water users in the GMS provided the framework for maintaining social order around the use of irrigation infrastructure and water as common-pool resources (Ostrom, 1990, 1992), thereby avoiding the free-rider problem (Olson, 1965) and as a result the tragedy of the commons predicted by Hardin (1968). The penalty for farmers who refused to pay land and water fees, or defaulted, was to deny them water supply until they comply. Thus, both operational rules and collective-choices rules designed by the farmers had accommodated negative behaviours (bounded rationality and opportunistic behaviours) at a manageable level.

5.5.1.2 Land Allocation

Farmers' participation in irrigation, and thus in irrigation water resource governance, was contingent on access to irrigable land. Land was a limiting factor for increasing agricultural production in the case-studies, and thus was a major source of conflict. With the formation of the WUAs to manage FMS, land in the irrigable areas was to be allocated equally among the irrigators irrespective of gender, age, and ethnicity. As explained earlier, the land owners (the people who owned the land before the irrigation

reservoirs and channels were built) cultivate the irrigable lands during the rainy season (May-October), but these lands come under the control of WUAs during the dry season (November-April) for irrigation purposes. The WUAs were responsible for allocating and sharing land based on membership and agreed-upon criteria adopted at the WUA general meeting before the irrigation farming season begins. The usufruct land owners could have access to the land during the dry season only if they were members of the WUA. Even where they were members, they were not to be given any preferential treatment according to their operational rule. However, this was a source of disagreement in some communities, where the land owners thought they should be given preferential treatment in terms of land allocation and the payment of water user levies. However, land allocation in the FMS was not on the basis of equity grounds, although this was stated in the WUA operational rules. 'Equity' as a rule in the WUA operational rules refers to equal access to irrigable land and participation in decision-making irrespective of gender, age, and ethnicity. Community attributes such as gender, age, and ethnicity influenced land allocation in the FMS contrary to what 'equity' meant in the WUA operational rule compared to the GMS. In the GMS, however, ICOUR allocated irrigable land to farmers on the basis of first-come-first-served and ability to pay. Community attributes in terms of gender, age, ethnicity, and government policy affected both FMS and GMS water resource governance to some extent differently, particularly in irrigable land allocation.

5.5.1.3 Water Management

The WUAs were responsible for the supply of water to irrigators under the FMS on a weekly rotation schedule. Irrigators in different zones of the Durongo scheme received water on different days in a contiguous order from one zone to another. In Winkogo, all the farmers worked in one irrigable area, where water was supplied on agreed days on

scheduled intervals. The WUA executives ensured that the farmers complied with the water allocation institutions and procedures. In the GMS, the lateral group leaders had no control over water distribution and scheduling, which was determined by ICOUR.

The area of irrigable land allowed for each farmer during each dry season in the FMS was dependent on the level of water in the reservoir at the beginning of the season. Before the dry season farming began, the water users met to determine the acreage of land to put under cultivation considering the water level in the reservoir. This was to avoid water shortage and to conserve water for animal watering and other uses for the end of the dry season. In the words of a 37 year old irrigator in Durongo village:

*We have the WUA leaders who supervise our activities to ensure that we use the water efficiently. When we have enough water in the reservoir, an irrigator is allowed to cultivate one or more acres, but when the water level is low we are required to cultivate small plots say ½ acre or less (male farmer, Durongo, **DFM012**. December 31, 2011).*

In the FMS, the WUAs organised the farmers to protect the catchment area to deal with the threats posed by physical factors such as drought, high temperatures and siltation as a way of adapting to environmental and climatic changes as good resource governance principles. The WUAs planted local grass, known in Gurune as kulkaatima as well as vetiver along the banks and catchment area of the reservoirs to control soil erosion as well as evapo-transpiration.

*We are supposed to protect the reservoir. We ensure catchment area protection by not allowing irrigators to farm closer to the reservoir. We plant vetiver grass along the reservoir embankment and valleys to reduce soil erosion and siltation (male irrigator, Durongo, **DFM012**. December 31, 2011).*

To some extent, the WUAs in the FMS were guided by the principles of adaptation (Lockwood et al., 2009) to environmental and climatic changes by monitoring of the water level. However, adapting to physical attributes affecting irrigation water governance such as environmental and climatic changes by way of planting trees to protect the catchment area was not enforced by the lateral leaders in the GMS as they were by the WUAs in the FMS. The irrigators in the GMS considered catchment area protection as the responsibility of ICOUR, because the farmers still perceived the irrigation reservoir as government property and not theirs, as discussed in chapter eight. The analysis revealed that the WUAs in the FMS were more sensitive to environmental and climatic changes, and hence more consistent in their behaviour to the principle of adaptation, compared with lateral groups in the GMS. In this regard, the FMS, as would be expected, are more community-based than the GMS.

5.5.1.4 Conflict Resolution

Conflict mediation was one of the crucial responsibilities of the WUAs and lateral groups. Other formal organisations involved occasionally in conflict resolution among the irrigators included ICOUR, in the case of the GMS, and the Department of Agriculture, in the case of FMS. Common sources of conflict were irrigators' disregard for water allocation schedules, land allocation, lack of financial accountability by the WUA and lateral group leaders to the group members, destruction of crops by unherded animals, and disregard for catchment area protection, poor infrastructure, non-payment of land and water levies, irregular supply of water, water shortage, and unfair payment for land levies. Thus, conflict resolution emerged during field interviews as an important role of the WUA and lateral leaders in both FMS and GMS. The WUAs and lateral groups were able to resolve conflicts among the irrigators at low transaction costs through institutional mechanisms, as one of the conflict mediation approaches discussed

briefly earlier in section 5.4.4.1. This is consistent with Ostrom's (1990) design principle six which states that "resource users have access to low cost and local arenas to resolve conflicts." Interview responses from a majority of the farmer interviewees supported the view that irrigators in both FMS and GMS used local institutional mechanisms in resolving conflicts:

Conflicts regarding water use and management are managed by the WUA leaders. When it is above their mandate, they invite the chief and the Agricultural Extension Officers to assist in addressing such issues (Winkogo community leader, WCL040. December 30, 2011).

ICOUR intervenes to resolve conflicts regarding the demarcation of the land at the irrigation site while the "Tindaana" resolves conflicts related land ownership (Vea. VCL065. December 22, 2011).

The lateral leaders help to resolve conflicts and misunderstandings between the farmers (Farmer, Nyariga, NFL109. December 1, 2011).

5.5.1.5 Gender and Fairness

In the traditional system, women had very limited involvement in decision making processes. Women also had limited access to economic assets such as land. However, the WUAs in the FMS were required to allocate land to women and also include them in irrigation water resource governance decision making processes. However, the traditional system still limited women's participation in irrigation water resource governance decision making. Limiting women's participation in decision making and limiting their opportunities to be included in the governance process fails to satisfy the governance principle of inclusiveness (see section 2.8 and Table 2.2). There were differences in the extent to which the women were allocated land in the four villages. Compared with GMS in Vea and Nyariga, women in the FMS of Durongo and Winkogo had very limited access to irrigable land. Irrigable land in Durongo and Winkogo was

still allocated by the WUAs based on traditional rules. Hence, distribution of irrigable land, and participation in irrigation water resource governance was not underpinned in the FMS by the principles of fairness and inclusiveness. Some women in Durongo expressed their concern about disproportionate allocation of land as:

Water is allocated fairly to each farmer within the community but when it comes to land allocation; the men have more plots than women. This is because the plots are inherited. In terms of payment we pay equal fee (female irrigator, Winkogo, WFF052. December 27, 2011).

Fairness in relation to land distribution was however a contested issue in the FMS. Land allocation was informed mainly by community attributes such as social norms and economic factors which differed from Lockwood et al. (2009) and other authors' definition of fairness (see 2.8 and Table 2.2). Interviews with the village level stakeholders unearthed a diversity of perceptions amongst the irrigators on what constituted 'fairness'.

There were differences in perceptions of fairness in the FMS and GMS. Generally, the perception of 'fairness' by the irrigators in the FMS differed from 'equity' (equal access, equal power, and participation) as explained in WUA's operational rule, but rather from socio-cultural (gender and age), ethnicity and capacity perspectives. The socio-cultural perspectives meant that land resources are shared according to differences in age, gender, ethnicity, and capacity. Socio-cultural perspectives also meant that participation in decision-making and leadership position are also determined by age, gender, and ethnicity. To be fair meant that male adults received more than the younger males. Also only males had access to land in general contrary to what is stated in the WUAs operation rules. On the other hand, irrigators in the GMS perceived fairness from equity perspectives which are consistent with Lockwood et al. (2009) as discussed

in section 2.8 and Table 2.2. The differences in perspectives on fairness between the FMS and GMS could be explained by the control of the GMS by ICOUR, the government irrigation company, whose influence had moderated the effects of traditional norms on the governance of the GMS. Examples of responses from some of the irrigators on fairness of land allocation from a socio-cultural perspective are:

*Everybody is treated fairly in the use of water for irrigation. However, land allocation is based on seniority. The WUA leaders take bigger portions than we the young ones. You know when you have to share something with your elder, you should not expect equal shares, and the elder person has a right to a bigger share (male irrigator, Durong, **DFM014**, January 9, 2012).*

*The leaders are like our fathers and when there is something to be shared you don't share it equally with your father (male irrigator, Durong, **DFM012**, December 31, 2011).*

Generally, parents and adults in Ghanaian societies and homes have greater responsibilities than their children or younger people. Also, whatever male adults own as the head of the family, in terms of property (for example land) is considered to belong to the entire family, and thus a source of their livelihoods. As a result, in land allocation, the elderly men received more than the younger men. This was perceived as a sign of respect and recognition of the elderly man's roles and responsibilities in the family. It was therefore judged from a socio-cultural point of view as 'fair' for fathers to have access to more irrigable land than their male children. In the case-study areas, women did not own land, but rather worked on the irrigable land allocated to their husbands. This is evident from interview responses from some of the female irrigators:

In terms of irrigable land allocation, men who are the land owners take bigger shares. It is the men who in turn allocate small pieces of land to their

wives for leafy vegetable cultivation (female irrigator, Durong, DFF027, January 11, 2012).

Other perceptions of fairness were based on ethnicity. These perceptions influenced irrigable land allocation in the farmer-managed schemes. Natives were given priority over non-natives.

Yes, we usually have disputes with the non-natives who apply to do irrigation farming here. The practice here is that the natives of this community have priority in terms of land allocation and the size of the plot (male irrigator, Durong, DFM011. December 31, 2011).

By tradition, the primary beneficiaries of the land in the case-study areas were the natives, hence they were given a priority in land allocation in the FMS. It was considered unfair to share limited land resource with non-natives. By customary rule, the time period non-native males lived in the village had no influence on their access to land. Allocation of land to non-natives thus ran contrary to traditional land tenure procedures in the case-study areas (Konings, 1981, Blench, 2007). Prioritising land allocation in favour of natives in the case-study areas is consistent with Ostrom's (1990, 1992) design principle one of clearly defined boundaries as to who has the right of access to resource units from CPR (see Table 2.1). Thus, exclusion of non-natives was consistent with the governance principles of adaptation to physical attributes such as limited land, though inconsistent with inclusiveness from the perspective of Lockwood et al.'s (2009) governance principles.

In addition to the socio-cultural perceptions and practices, fairness was also perceived in terms of irrigators' capability to use optimally the irrigable land allocated to them. Interview responses from some of the irrigators explained this interpretation of fairness in irrigable land allocation as follows:

*In terms of irrigable land allocation, the WUA leaders and other well-to-do farmers get bigger portions than the others. The reason is that not all members of the association have the resources to expand their farm sizes. Land allocation is based on the individual's ability and available resources. You may be given a bigger plot, but if you don't have the resources you won't be able to cultivate it. We the farmers met to agree on that decision (male irrigator, Durong, **DFM012**, December 31, 2011).*

Due to limited land for agricultural purposes, the WUAs were careful not to allocate irrigable land to farmers who did not have the financial capacity to optimise its use. The quantity of irrigable land allocated took into account local conditions of limited access to land. It was judged unfair to allocate land to a farmer who allowed the land to lie fallow or left it unutilised whilst others with the resources to utilise it may not have access to it. Thus, the perception of fairness was socially constructed.

Whilst fairness was largely perceived in socio-cultural terms in the FMS, it was viewed in the GMS in terms of equity. The process of irrigable land allocation differed between the FMS and GMS. Socio-cultural values in relation to gender, age, and ethnicity differences were not a barrier to the size of irrigable land that a farmer leased, rather it was determined by the farmer's financial capability. A majority of the irrigators in the GMS understood fairness in terms of equity along the following lines:

*I think we are treated fairly. There is no discrimination in land and water allocation to us. We are supplied water according to the size of our farmlands. We farmers also are made to pay land levies according to the size of our land and not on a gender basis. Even if one can pay for 100 hectares why not? We are allowed provided we can afford to pay land levies (female irrigator, Nyariga, **NFF141**, January 31, 2012).*

The suggestion that irrigable land be allocated fairly reflected the wishes of only a few women and non-natives in the FMS. As discussed earlier (See section 5.3.1), women

were not traditionally land owners in the study area. However, under the LACOSREP in the 1990s, the WUAs encouraged allocation of irrigable land directly to women to improve their income status, independence and empowerment, in order that the women could participate actively in decision-making at the household and community levels (IFAD, 2006). The efforts initiated by the WUAs to influence existing traditional norms under LACOSREP, might have informed the argument of the women in the FMS for a more equitable allocation of irrigable land. Nevertheless, as discussed throughout this section there was continued discrimination against women, non-natives and young irrigators in the FMS in terms of access to land, power sharing, and participation in decision-making due to socio-cultural factors.

This finding highlighted that the socio-cultural norms and differentials in power were more significant in determining allocation of land and water resources to farmers in the FMS than in the GMS. Though the WUA was supposed to be a formal institution, and operate on formal rules, the leaders of the WUA shared the same norms, values and culture as the communities. Hence they were influenced largely by the socio-cultural contexts within which they operated.

5.5.1.6 Financial and Labour Resources Mobilisation

The WUAs in the FMS were responsible for repair and maintenance of the irrigation facilities. Thus, in accordance with the WUA's input rules, the WUAs took collective action and mobilised financial and labour resources towards facility repair and maintenance. In the FMS villages, WUAs based the amount the farmers paid on the type of crops cultivated. Tomato farmers paid more than pepper and leafy vegetable growers, because tomatoes had more market value. As a contribution towards repair and maintenance of the irrigation facilities, tomato growers from Durongo and Wikongo

paid Gh¢ 2 (US\$1) per acre annually whilst pepper growers paid GH¢1 (US\$0.50) per acre annually. Though each WUA could set its own fees and vary them, the fees paid in the two farmer-managed schemes were the same. This could be explained by the fact that these communities are close to each other and therefore shared information. Pepper and leafy vegetables were produced primarily for domestic consumption and not for sale, and hence attracted a lower levy.

The irrigators in the GMS villages were charged GH¢30 (US\$15) per acre of land per year. The lateral leaders collected the water and land levies from the farmers on behalf of ICOUR. Because the laterals were broken and could not transport sufficient water to the farms, the irrigators in each lateral contributed additional money besides ICOUR's pre-determined fee as and when it was needed to mend the broken laterals. Cash contributions were in addition to the labour contribution for weeding, cleaning and desilting of the canals and laterals.

5.5.1.7 Information Dissemination through Meetings

Meetings were the main channel of information dissemination among the irrigators to promote transparency in irrigation water resource governance. As one of the farmers' operational rules, the irrigators in both FMS and GMS were to hold monthly and annual meetings. However, these meeting schedules were not followed in either FMS or GMS. In Winkogo for instance, the irrigators could not remember the last time they met. Examination of their minutes' books indicated that the last time they held their general meeting was on September 14, 2010. Similarly, according to their records book, the WUAs in Durongo held their last leadership meeting on March 12, 2005. Like the FMS, the GMS were also not able to hold regular meetings. The reasons given for the irregularity of meetings included lack of its importance to the irrigators, ineffective

leadership, and lack of financial reward for meetings. Most of the participants interviewed explain their failure along the following lines:

We are not able to hold meetings. This is due to the fact that farmers do not realise the importance of meetings (male irrigator, Nyariga, NMF133. December 20, 2011).

The only way we can perform these role [attend meetings] is to have a strong leaders who will serve as good examples for us to see (male irrigator, Winkogo, WFM048. December 28, 2011).

Other difficulties the WUA and lateral leaders had in organising meetings were the irrigators' demand for money as a reward to attend meetings. Some of the NGOs in the case-study areas paid the irrigators after they held meetings with them. One of the lateral leaders stated:

The NGOs have spoilt our farmers, when they call them for meetings they give them money, so now when we call them for meetings and after we say thank you, the next time we call meeting we don't get anyone. So, that is the problem (lateral leader, Nyariga, NFL107. November 27, 2011).

The practice of NGOs paying water user groups members when they attend meetings raises important development issues for reflection. It revealed a lack of understanding of fundamental and enduring principles of community development, and it implied that money was being used by the NGOs to influence project implementation process in order to obtain quick, but unsustainable results rather than building community consensus and capacity.

Despite the difficulties, some of the irrigators interviewed in Durongu indicated that they were able to meet at least every year to identify the farmers who wanted to participate in dry season irrigation farming, and to decide on land allocation. Whilst in

the field conducting this research, an emergency meeting was organised by the Durongo farmers in the irrigable area. Thus, one is led to believe that the irrigators did have ad hoc meetings, as and when needed, but failed to record them in their minutes. In spite of irrigators' inability to meet regularly, they were able to disseminate information by word of mouth through individual irrigators, and in the case of Vea, through the chief's palace, to achieve some level of transparency in irrigation water resource governance.

5.5.2 Challenges of the WUAs and Lateral Groups

A community development officer from the Bolgatanga Municipal Assembly summarised the challenges faced by the WUAs and lateral groups as follows:

Politics have chopped into the society so much. For instance if I am the Assembly man for Winkogo this year, and in the fourth year there is a change of government; whatever relationship I have with the WUA and lateral groups will end. So the politician will do everything possible to always have new people to always support them. Another problem is that when people [trained irrigators] leave the village those who replace them, if they are not trained or oriented they will have different ideas from the old members and as a result difference in opinions. Sometimes too the WUAs members contribute money and give to the WUA leaders which are not accounted for. In summary the problems that make the WUAs ineffective are: too much interference from the politicians, migration of some of the trained WUAs to other villages, lack of financial accountability by the WUA leaders, politics of the day, poor supervision, over stay in power by the WUAs leaders and also conflict over land (District Officer, Department of Community Development, Bolgatanga. P149, January 27, 2012).

Based on the summary above and other observations, the challenges faced by the WUAs and lateral groups can be summarised as follows:

1. low internally generated funds;

2. political interference; and
3. ineffective leadership.

5.5.2.1 Low Internally Generated Funds

The lack of financial capacity for village-level irrigation water resource governance emanated from small landholdings, poor yields, limited market, low profit margins, and generally high poverty levels in the case study areas. Interview responses representing the majority view of the irrigators are stated below, and explain the problem of low internally generated funds.

Currently most of the irrigators have small landholdings and with that it is difficult to pay the water and land levies and still cope with family expenses and responsibilities... (female irrigator, Nyariga, NFF134. December 1, 2011).

The payment of the water levy is the obligation that we are not performing well and this is as a result of poverty. In my opinion it is difficult to talk about money. Formally we used to get good yield and good market for our crops but now we don't have good market and that is why it is difficult to pay our contribution (male irrigator, Nyariga, NMF129. December 28, 2011).

Most of the irrigators interviewed stated that their income level was too low to make any significant financial contribution towards facility repair and maintenance. To assess the profitability of the irrigators' crop production, data were collected from ten irrigators in both the FMS and GMS on production of tomato, rice, and leafy vegetables. Summary of profits made on of the three major irrigated crops produced by the twenty irrigators interviewed from both FMS and GMS is shown in Appendix 6. ANOVA of the profitability of tomato, rice, and leafy vegetables is presented in Appendix 7. It is evident that the majority of the irrigators made losses. This explained the difficulty they

had to make any significant contribution to the facility repair and maintenance in both farmer-managed and government-managed schemes.

Another explanation for the low internally generated funds was lack of financial accountability by the WUA and lateral leaders and ICOUR field staff. In both FMS and GMS, some of the irrigators interviewed claimed that the leaders lacked financial integrity and therefore failed to account for all the monies collected for facility repair and maintenance.

We pay levies to our leaders but they don't even tell us whether they take the money to the bank or not. We don't even know the total amount and it is difficult for me as a woman to go and confront them about it (women's focus group, Winkogo, WWFG. January 2, 2012).

Most of lateral leaders who collect the water and land levies sometimes condone and connive with some of the ICOUR officials not to report on the exact amount collected from us (female irrigator, Nyariga, NFF142. January 31, 2012).

What we generate from the farmers ranges between 25 to 30% of the total cost of our operation. Sometimes the farmers come to us to tell us that they want to cultivate say 7 hectares of land and so they pay the levy for the 7 hectares of land instead of for example 10 hectares of land they intended to cultivate (senior staff, ICOUR, IM160. January 19, 2012).

Water and land levies paid to the WUA and lateral leaders were not accounted for, and thus demotivated irrigators from complying with the input rules of financial contributions towards facility repair and maintenance. The inability of the irrigators to demand accountability from the leaders was probably because some of the WUA leaders were also traditional or village leaders who by custom are rarely challenged in terms of and accountability, probity, and transparency.

Lack of accountability, effective monitoring, and control systems in irrigation water resource governance processes in the FMS and GMS have contributed to some level of corruption among the water user group leaders and ICOUR management. Access to information about the performance of the leaders and ICOUR management in relation to irrigation water resource governance objectives and financial resource use is critical. Thus, transparency is a requirement of accountability. It is important to distinguish between what constitutes disrespect, and demand for accountability, so that leaders do not equate demand for accountability to mean disrespect and therefore subtly promote a culture of silence to provide grounds for non-accountability, corruption, and non-performance. Effective irrigation water resources governance requires trust building, transparency, and financial accountability, and probity which are consistent with the Lockwood et al. (2010) governance principles.

5.5.2.2 Migration of Trained Leaders

Rural-urban migration is a major phenomenon in socio-economically deprived areas in Ghana (GoG, 2010). Thus, trained WUA leaders were also caught up in the rural-urban migration syndrome, mostly migrating to the southern part of the country in search of jobs. This created knowledge gaps among the leaders and the WUAs in general since the District Assemblies no longer provided any leadership training. In the words of a district agricultural officer:

I don't think the irrigators would still have the knowledge and skills. This is because most of the farmers, who began, have left the villages for one or other reasons, and the new ones that have come in do not have that knowledge and skill. I think that there is the need for yearly retraining programmes so that those who came in new can receive the needed knowledge. Apart from this, technologies have changed and there is the need to train the farmers yearly so that they can get abreast with new

developments (District Officer, Department of Agriculture, P148, January 20, 2012).

5.5.2.3 Political Interference

Interviews with some of the WUA leaders and some government officials revealed that interference from some politicians affected irrigation water resource governance. Some politicians made promises to the communities to vote for them on the basis of promises that, in return, they would repair the irrigation facilities for them. Some also interfered in the enforcement of the institutions, thereby weakening the power of the enforcement bodies and therefore institutional compliance. Some also influenced external support received by the irrigators in favour of their party supporters. Examples of interview responses from some of the participants below illustrate various ways politicians interfered in enforcement of institutions.

Now in my case no politician interferes with my work, but they do interfere with other partner organisations' work, which turns to affect me. For instance farmers farm close to the river banks, they destroy forest trees and when they are arrested by forestry officials, the politicians go in to release them and this interference in forestry goes to affect my water resources (Government official, Water Resources Commission, P147. January 18, 2012).

Ostrom's (1990) design principle seven encouraged not only minimal recognition of rights to organise, but also the rights to devise institutions are not challenged [interfered with] by external government authorities. Although the politicians did not challenge directly order of local groups, the unfulfilled promises they made tended to be a barrier for cooperation and compliance with the rules.

5.5.2.4 Leadership

Leadership remained an important factor in irrigation water governance in the communities. Kim and Renee (1992:124) said leadership is “the ability to inspire confidence and support among the people who are needed to achieve organisational goals.” Dubrin (2004:3) identified several other representative definitions of leadership as follows:

1. interpersonal influence, directed through communication toward goal attainment;
2. the influential increment over and above mechanical compliance with directions and orders;
3. an act that causes others to act or respond in a shared direction;
4. the art of influencing people by persuasion or example to follow a line of action;
and
5. the principal dynamic force that motivates and coordinates the organisation in the accomplishment of its objectives.

Ineffectiveness of the WUA and lateral leaders in both FMS and GMS emerged during the interviews as a factor affecting irrigation water governance. The ineffectiveness of the WUA and lateral leaders was in part due to leadership performance and motivation. There were frequent interview responses from most of the irrigators that their leaders were not effective in enforcing the institutions regarding the management of the water and that partly contributed to the siltation of the reservoirs. The ineffectiveness of the leaders indicated that, they fell short of the leadership qualities stated above.

The desilting of the canals is the role that we are not able to play very well. We are not able to do it well because the leaders are not very firm on the farmers to do the cleaning. If the leaders don't instruct the followers to do it

how would you expect us to do it? (male farmer, Durongo, DFM016. January 11, 2012).

No, we are not able to perform our roles well because our leaders fail to direct us as to how to perform such activities (female irrigator, Winkogo, WFF055. December 27, 2011).

Related to effectiveness of the leadership, was the issue of lack of monetary incentives to motivate the leaders.

We needed the WUA leaders to work very hard to mobilise us to desilt the reservoir in order to increase the volume of the reservoir. They are not able to do this because we don't pay them for what they are doing. It is voluntary (mixed focus group, Durongo, DMFG1. December 15, 2011).

Sometimes we are informed about the non-compliance of the rules, but we are not motivated to take any action against the law breakers because ICOUR does not reward us for our efforts to ensure compliance with the rules. If we get ourselves into trouble as a result of enforcing the law, it is at your own cost (lateral leader, Vea, VFL068. January 6, 2012).

As shown in Figure 5.1 for GMS and 5.2 for FMS, the lateral and WUAs groups remained the hub of irrigation water resource governance in the case-study areas. They were the main ways through which district decentralised departments and regional agencies used as entry points to the irrigators in the communities. Thus, the effectiveness of the WUAs and lateral groups remain significant to sustainable irrigation water governance in the case study villages.

5.5.3 The Irrigation Company of the Upper Region

ICOUR's roles and responsibilities included: (1) training and developing the farmers in the communities to play an increasing role in the operation of the scheme; (2) providing agricultural extension and technical advisory services to farmers; (3) providing tractor

hire services, irrigation water and farm inputs; (4) providing/maintaining the irrigation infrastructure, and (5) assisting in the organisation of credit and marketing for small-scale farmers. ICOUR works with lateral groups with regard to land allocation to increase farmer participation in the irrigation water governance.

The water levies collected by ICOUR were an important source of revenue for the survival of the company, even though determination of levy rates was often a contentious issue between irrigators and ICOUR management. An official of ICOUR reported that, when it became necessary to revise the levy rates, the matter was often determined in a consultative stakeholders' meeting with representatives of the village committees, the District Assemblies, the chiefs, the Regional Coordinating Council (RCC) and the ICOUR management. The management presented and justified their proposal and consensus was reached based on realities on the ground.

ICOUR was expected to cover all operation costs, including facility repair and maintenance, monitoring, administrative costs and so on by the user levies, except for the salaries of the staff, which were paid by the central government. The village committees and lateral groups assisted in collecting the fees. Field observations revealed that the irrigation scheme had seen very little rehabilitation since it was constructed more than three decades ago. The costs for rehabilitation according to ICOUR management had become so high that the government alone could not fund the renovation works. Villages downstream from the main canal such as Yikine, Zaare, Sumbrungu and Dindusisi, had stopped irrigation farming due to broken down canals and laterals.

At the time of the study, ICOUR's functions were limited to only water supply. Interviews with a majority of irrigators revealed that ICOUR sometimes failed to supply

water to the farmers on time to start their irrigation activities, and sometimes stopped water supply before the rice crops had to mature for harvesting. ICOUR was also constrained in its operation and maintenance responsibilities of the scheme, as well as the ability to provide tractor services to farmers. The current status of the canals and laterals affected the farmers' production capacity and income levels, compelling the youth of the communities to migrate to the urban areas in search of jobs. Interviews with ICOUR management, community leaders and the farmers highlighted the constraints faced by the GMS as institutional, technical and economic factors. An ICOUR management staff member stated:

*The government is not giving us enough support in terms of funds as we would have wished and that is why we are struggling. What we generate from the levies collected from the farmers and other service charges is just nothing to talk about ... as it ranges between 25 to 30% of the total cost of our operations (ICOUR Official, **IM160**. January 19, 2012).*

ICOUR's poor performance also seems to be compromising its credibility among farmers in the management and operation of the scheme.

*...because of the current state of the infrastructure, farmers are sometimes not sure whether if they pay their water levies, they will get enough water considering where their farms are located and the nature of the canal there. Considering our current state of infrastructure, farmers don't trust us for reliable supply of water (ICOUR official, **IM160**. January 19, 2012)*

More so, the irrigators and community leaders generally agreed that the Company was not interested in promoting farmer participation in the operation and management of the scheme. One female irrigator states:

I don't think ICOUR considers our views seriously in decision-making. For me it is the payment of the water levies that matter to ICOUR, but they do

not care about the progress of the farmers (female irrigator, Vea, VFM080, January 4, 2012).

Interviews with the farmers and community representatives generally revealed that the local people wanted to be more involved in the operation and management of the scheme, which is a major source of their livelihoods. Most of them suggested that the operation and management responsibilities of the scheme should be devolved to the local communities, as elaborated in farmers' focus group discussions with community representatives and in interviews with community leaders. A community leader expressed the community's desire to be actively involved in the governance of the GMS scheme as:

We want to be included in the management of the water because we have realised that our absence in the management retards farmers' activities and subsequently the growth and development of the community. Sometimes times when canals and laterals are broken and ICOUR people come to repair them; they did not last and break again. (village leader, Vea, VCL066, December 31, 2011).

The findings of the study revealed that though ICOUR was incapable of ensuring effective governance of the GMS, at the same time it was unwilling to share governance decision-making power with resource users and the communities as a whole. The findings also revealed that ICOUR as the sole parastatal responsible for the management of the Vea scheme is not the answer to ensuring good governance of the Vea irrigation scheme.

5.5.4 Formal Irrigation Water Governance at the District Level

5.5.4.1 District Assemblies

The major responsibilities of the District Assemblies (DAs) with regard to water resources governance included investment decisions in irrigation water resource development. The DAs were to work in close collaboration with the irrigation agencies at regional levels, NGOs and the private sector. Second, the DAs also had responsibility to provide management support to irrigation agencies and WUAs in the communities to manage the farmer-managed irrigation schemes. The irrigated lands under the small reservoirs were to be registered in the name of the DAs, making them the formal owners of the command lands. In addition, the DAs were to mediate conflicts regarding land use around the small schemes. Third, the DAs had the responsibility to pass by-laws that regulate water resources use in the district.

However, interviews with the district decentralised departments and line agencies staff showed that the DAs were not currently performing these roles as expected due to insufficient financial resources and human capacities as is discussed later in section 7.2.1 and 7.2.2. The departments of cooperatives and community development of the District Assemblies, which also have regional level offices, were involved in the organisational issues of the small-scale irrigation schemes transferred to WUAs under the IFAD funded LACOSREP projects. They were engaged to facilitate the formalisation of the Water User Associations (WUAs) as cooperative societies and provided training to their members, with a focus on issues such as group dynamics and financial management. Interviews with regional level officers of the two departments, and with WUA leaders, revealed that they could not accomplish the tasks of registering

the WUAs as cooperatives before the project ended. Their outreach support to the WUAs was also curtailed due to lack of funds and logistical support, and also human resource capacity constraints. Also, according to the local government authority system described in section 3.6, the activities of the DAs should be supported by the sub-district structures at the lowest level. Interviews and observations at the community-level revealed that the Area Councils and Unit Committees were not functioning, and hence did not play any significant roles in local level irrigation water resources governance.

5.6 Synthesis and Conclusion

This chapter sought to answer the following research questions:

1. *To what extent has irrigation water resource governance been decentralised to the community level?*
2. *What are the institutional arrangements for irrigation water resources governance at the regional, district and community levels?*
3. *What are the impacts of the current local level governance structures and processes on irrigation water resource governance at the community level?*

The answers are summarised under each question briefly.

1. *To what extent has irrigation water resource governance been decentralised to the community level?*

Irrigation water governance has been devolved to the communities, and key sector ministries, departments, and agencies at the regional, district and community levels. At the community level, irrigation water governance has been decentralised to the WUAs in the case of FMS and lateral groups in the case of GMS. At the community level, the

traditional authority system has also been recognised by the government as important local level structures to play key roles in water resources governance in both FMS and GMS. At the regional and district levels irrigation water resource governance has been decentralised to sector ministries, departments and agencies (MDAs), ICOUR, DA decentralised departments and sub-structures. Although management responsibilities have been devolved to the local level, this has not been accompanied by developing requisite capacities at local level governance bodies to fulfil their roles effectively.

What are the institutional arrangements for irrigation water resources governance at the regional, district and community?

There were two types of institutional arrangements for community level irrigation water resource governance. These were primary (formal) and secondary (informal) governance arrangements. The formal institutional arrangements were the WUAs in the case of the FMS, and ICOUR and lateral groups in the case of GMS. The informal institutional arrangement which was the traditional institutional arrangement prevailed in both FMS and GMS institutional arrangements. The FMS designed self-organised operational and collective-choices rules guided by the guidelines provided by the MOFA to regulate farmers' behaviours regarding water and land uses. The main operational rule developed by ICOUR to guide farmers' behaviours was input rules (financial contributions towards facility repair and maintenance). The irrigators in the GMS had adopted the institutions being used by the FMS to complement ICOUR's input rules.

2. *What are the impacts of the current local level governance structures and processes on irrigation water resource governance at the community level?*

The community level structures played key roles in irrigation water management, communication, conflict mediation, resource mobilisation, and catchment area protection necessary for local level irrigation water governance. The WUA, lateral and traditional groups were the driving forces for collective action in both FMS and GMS. The lateral and traditional leaders were more involved in mobilising the irrigators for collective action for the governance of the GMS than ICOUR, the government company. The lateral leaders and traditional authorities had closer contacts with the irrigators, and were more able to mobilise the irrigators for collection actions than was ICOUR. They were the main drivers in the governance process in the government-managed scheme. Thus, ICOUR's presence in the villages was very limited due to its limited human and financial resources. Hence, effectiveness of the WUAs and lateral groups and traditional authority systems remain significant to sustainable irrigation water governance in the case-study villages, despite the fact that the impact of the traditional systems on local level irrigation water governance was moderated due to lack of formal integration of the traditional system into the formal structures, due to weaknesses in policy design and implementation.

Notwithstanding the impact of the WUA and lateral groups on irrigation water resource governance, their impact was low due to low internally generated funds, political interference, lack of capacity, lack of financial accountability by WUA and lateral leaders, negative effects of social-norms, and ineffective leadership. Performances of ICOUR, district decentralised departments, and regional agencies in irrigation water resource governance was also ineffective due to limited human and financial resources. The ineffectiveness of ICOUR and its control over the management of the water limited the lateral groups' participation to only payment of and collection of water and land

charges. Low participation in governance decision making and ownership negatively affected irrigation water governance outcomes on the following lines:

1. the water supply in the system did not meet the water requirement of the crops in the field served by the system;
2. most farmers did not follow rules in use in the system due to lack of available enforcement capacities; and
3. the irrigation canals and lateral facilities were not well maintained because there was lack of cooperation among the irrigators.

There were some differences between the governance effectiveness of both FMS and GMS. The moderation of the influence of traditional institutions was more evident in the GMS than the FMS because of ICOUR's control over the GMS. Thus, lateral groups and traditional authorities in GMS played limited direct roles in water allocation and scheduling, but were consulted in land allocation, conflict mediation, and community resources mobilisation. Also, because the GMS stretch across many communities, unlike the FMS that are located in only one community, it was difficult to have all the individual village traditional leaders come together to influence ICOUR's decisions in the GMS. Thus, community attributes had affected irrigation governance process in the GMS and FMS differently.

There were differences in the perceptions of fairness in relation to irrigable land allocation in the FMS and GMS. Generally, the FMS perceived fairness from socio-cultural (gender and age), ethnicity and capacity perspectives. On the other hand, irrigators in the GMS perceived fairness from equity perspectives. The differences in perspectives on fairness between the FMS and GMS could be explained by the imposition of fairness (equity) rules in the GMS which succeeded in moderating the

impact of social norms on irrigation water resource governance in the GMS. Community attributes such as gender, age, and ethnicity influenced irrigable land allocation in the FMS compared to the GMS. Community attributes in terms of gender, age, ethnicity, and government policy affected both FMS and GMS irrigation water resource governance to some extent differently.

The analysis revealed that the WUAs in the FMS schemes were more sensitive to environmental and climatic changes, and hence were more consistent in their behaviour, compared with lateral groups in the GMS, with the governance principle of adaptation. In this regard the FMS were more community-based than the GMS.

The GMS were evolving to become more like FMS, because the irrigators had to self-organise themselves and adopt the institutions being used by the FMS. The traditional authority system had also influenced irrigation water governance processes in the GMS to some extent. The community-based approach to irrigation water governance that was supposed to be promoted through the decentralisation process in the FMS was not working any better than the GMS. This was due to ineffective project design that failed to make adequate provision for post-project support capacity building. A GMS had no significant advantage over the FMS. Also traditional water governance institutions, though still relevant, need to adapt to modern day complexities of common resource use. Likewise, in establishing the formal WUAs governance structures, there is the need to recognise the context of the local traditional norms and practices. The two governance systems have played complementary roles in framing irrigation water governance in the study areas.

Chapter 6 Institutional Enforcement

6.1 Introduction

This is the second of the five result chapters expected in section 1.6, this one being concerned with institutional enforcement. In chapter five, the study examined institutions and organisations for community-based irrigation water governance. Institutional enforcement was identified as critical for effective community-based irrigation water governance. The focus in chapter six is to answer the fourth research question as identified in chapter three:

4. To what extent have any normative standards and by-laws promulgated as a guide for irrigation water resource governance been enforced by relevant stakeholders?

The purpose in this chapter is to understand the factors that affect institutional enforcement and compliance in respect of solving irrigation water governance problems in the study areas. This collective-action problem constitutes the social dilemma faced by the irrigators as indicated by the collective action theory in section 2.4.2. This chapter is constructed around a framework of institutional analysis that emphasises the importance of institutions, enforcement and compliance for successful self-organised resource governance (Ostrom, 1990, 1992). The analysis in this chapter is also guided by the governance principles of inclusiveness, accountability, transparency, legitimacy, and capacity included in the conceptual framework (Table 2.2). North's (1990) definition of institutions, and his distinction between formal and informal institutions, is also used to guide analysis.

Institutional enforcement regarding irrigation water resource governance is examined in section 6.2 and institutional compliance by the irrigators in section 6.3. Conclusion to the chapter is made at the end in section 6.4.

6.2 Institutional Enforcement

In this section, institutional enforcement among the irrigators is examined. The institutions listed in sections 5.4 and 5.5 are related to the functions and responsibilities performed by the WUA, lateral groups and traditional authorities discussed in chapter five of the study. In effect the extent to which these functions and responsibilities were fulfilled corresponds to the extent to which they were complied with and enforced. Therefore to avoid overlap with chapter five, the general approach to the enforcement of the institutional arrangements is discussed and then more emphasis is placed on compliances in section 6.3.

Interview responses from some of the irrigators revealed that efforts were made by the WUA leaders in the case of FMS and lateral leaders in the case of GMS to enforce institutional arrangements through various forms of social sanctions for irrigators who violated them. The social sanctions used in enforcement in the FMS and GMS were similar. Graduated sanctions as indicated in Ostrom design principle five (see Table 2.1) were applied in both FMS and GMS. The sanctions ranged from lenient sanctions to strong punishment, depending on the context and seriousness of the offence. Since it was graduated to suit the offence, the scale of punishment was very important in controlling repeat offenders. In both FMS and GMS, the sanctions included (in ascending order) warnings, denial of access to water and land, fines, and expulsion from the group membership. Sometimes, the defaulters were reported to the chiefs and elders to be sanctioned or reprimanded. The irrigators also put social pressure on defaulters to

comply with the institutions. First time offenders were warned or fined. However, sanctions changed gradually from leniency to strong penalties such as denial of land and water or expulsion from the farmer group depending on the gravity of the offense. Interviews with a majority of the participants revealed the following varied forms of sanctions that were applied:

*The first thing we do to the one who breaks a rule is to advise him/her, and if he/she still continues to disobey, we report him/her to the leaders. The final sanction is to withdraw him/her from the WUA and he/she is not allowed to use the water to farm in the irrigable area (male farmer, Winkogo, **WFM050**. December 29, 2011).*

*We fine the cattle owners 5.00 Ghana Cedis, whilst the pig owners are fined 3.00 Ghana Cedis and goat and sheep owners are fined 2.00 Ghana Cedis for breaking the rules (Mixed Focus Group, Durongo, **DMFG1**. December 15, 2011)*

*The plot of irrigators who have not been able to pay their water levies have their plots re-allocated to people who have the money to pay so that we can get water early to start our farming. In such situations we inform the elders to sell the land to another farmer so that we can get water early (male farmer, Vea, **VFM083**. January 6, 2012).*

*The WUA leaders have engaged one person to be responsible for water allocation to the various sections of the irrigable land on a schedule (community leader, Durongo, **DCL001**. November 16, 2011).*

6.3 Institutional Compliance and Non-Compliance

In all the four case study communities, participants frequently mentioned the functionality of both informal and formal institutions. The main reasons given by participants for compliance with the institutions are grouped into 4 categories:

1. the irrigators needed the system to work for their livelihoods, so they complied;

2. the irrigators felt ownership of the institutions because they participated in developing them, so they were committed to complying with them;
3. the irrigators felt socially inter-connected through family bonds, so they needed to cooperate with one another by complying with the institutions;
4. the degree of financial resources accountability and probity of the leaders and incentives.

These categories of interview responses are discussed below.

6.3.1 Compliance Based on Livelihoods

Crop production and livestock rearing are the main economic activities and sources of livelihood in the case-study communities. However, the long dry seasons (November through May) often interspersed with dry spells and negatively affected agricultural productivity as discussed earlier in section 4.7.2. Therefore, sustainable irrigation agriculture remains a critical alternative to rain-fed agriculture in the study area. The following interview responses with some of the irrigators show the importance of ensuring the sustainability of small irrigation facilities, thus explaining the need to comply with the institutional arrangements:

*We comply with rules because the rules are helping us to sustain the reservoir for us as a major source of livelihood here. Take me as an example, I don't have formal education but through the dry season farming I am able to support my children to go school and so I have to abide by the rules (female farmer, Durongo, **DFF027**, January 11, 2012).*

*The reason we comply is that, this is what our stomachs depend on. We are able to feed our families, pay our children's school fees from the crops we get through our irrigation activities. Therefore there is no way a farmer will not comply with these rules and regulations (male farmer, Nyariga, **NMF126**, January 30, 2012).*

The social and economic benefits the local people derived from the irrigation facilities such as food availability and nutrition improvement, ability to pay children's school fees, employment, and the general improvement in the lives of individuals and members of the communities had influenced institutional compliance by irrigators. Conversely, the perceived lack of benefits due to lack of access to water due to degraded nature of the canals and laterals, and the perceived corruption of the lateral and WUA leaders and ICOUR staff partly accounted for non-compliance with institutions in 3 of the 4 case-study communities, namely, Nyariga, Vea and Winkogo. Examples of interview responses from some of the irrigators are stated below:

*ICOUR itself doesn't even follow the rules. Look at how all the canals are broken all over and yet we keep on paying the water levy and nothing is being done about it.The water that leaks destroys people's farm which discourages them from paying their water levies. What is the need to pay for the water when the canals are not repaired? (farmer leader, Vea, **VFL072**. January 26, 2012).*

*As for me, we are not getting any benefit. We pay contributions to our leaders but they don't even tell us as to whether they take the money to the bank or not. We don't even know the total amount and it is difficult for me as a woman to go and confront them about it (Mixed focus group, Winkogo, **WMFG2**. February 4, 2012).*

*For now no, the farmers cannot trust us, because of the current state of the infrastructure. Sometimes, the farmers are not sure whether if they pay their water levy they will get water considering where their farms are located and the nature of the canal there. Considering our current state of infrastructure, farmers don't trust us for reliable supply of water (senior staff, ICOUR, **IM160**. January 19, 2012)*

Whilst irrigators' willingness to comply with the institutions was partly dependent on socio-economic benefits derived from the availability of water for irrigation, farmers

that did comply with the payment of water levies but did not get adequate water for irrigation reported being unfairly treated by ICOUR and the WUA leaders, and therefore did not see the need to continue complying with the rules. There were similar findings from three marine protected areas in Indonesia by Alder et al. (1994). In their study, they noticed that fairness in how benefits and costs were distributed increased compliance. Similarly, based on experience in South Asia, Chambers (1980:90) argued that “main system management to ensure an adequate, convenient, predictable and timely water supply to the outlet is a precondition for irrigators’ willingness to comply with repair and maintenance and land-sharing institutions. Emphasising the benefits of irrigation system to the irrigators, Tang (1990) stated that if supply of water to a water course is highly unpredictable and depends entirely on the arbitrary decisions of officials operating at the system level, it is hard to expect irrigators to comply with operation and maintenance institutions. Thus, if the benefits increased, the irrigators were more likely to comply. In effect, physical attributes in terms of the nature of the canals and the quantity of water supplied through the canals affected the economic and social benefits derived by the farmers which in turn affected compliance with the rules.

6.3.2 Users’ Participation in Institutional Design

Some irrigators felt ownership of the WUA institutions because they had participated in developing them, and so were committed to complying with the collective decisions. The irrigators perceived that the rules and regulations collectively designed had imposed obligations and expectations on them that must be fulfilled through compliance. Irrigators in Durongo community in particular appeared united and could count on WUA members to comply with their collective decisions:

*The rules are all working very well. The rules are working well because we were involved in developing them and committed to their enforcement (male farmer, Durongo, **DFM012**. December 31, 2011).*

*We the farmers here are united and respect the collective decisions of the WUA. This is because we all understand the value and importance of the rules and as a result we don't have disagreements among us (male farmer, Durongo, **DFM018**. January 11, 2012).*

Because some of the irrigators in some communities participated in the design of the institutions it affected their commitment to comply with them. An interview response with an irrigator in Veja community clarified the relationship between participation in institutional design and institutional compliance.

*Compliance with the rules is due to the fact that all members were involved in formulating these rules and regulations (male farmer, Veja, **VFM088**. January 7, 2012).*

Users' participation in institutional design in some case study communities like Dorungo, gave them the sense of ownership and therefore the drive to comply with the institutions. In contrast, in a farmers' focus group discussion in Winkogo, a participant indicated that the low participation of irrigators in the design of the institutions that introduced user fees partly explained non-compliance. Participants in Winkogo claimed they were ignorant of how the institutions were made at the time the irrigation facility was handed from the government over to them. The introduction of user fees was novel in the FMS, because prior to the formation of the WUAs the water users were not paying user fees. This partly explained some of the irrigators' reluctance to accept and comply with the fee payment rules. It is therefore important to involve the resource users in planning decisions by adequately informing the wider public of users on the importance and purpose of institutions as good governance principles (see section 2.8

and Table 2.2). As Beierle (1998:5) aptly noted, public education is a precursor to behavioral change, and therefore “plays an increasingly important role ...on issues in which the collective effects of individual decisions are crucial.” Ensuring resource users’ active participation in the decision-making process can nurture cooperation and a sense of ownership as important community-based resource governance outcomes (Chou, 2010).

6.3.3 Social and Kinship Ties

Social ties (inter-connectedness) are important for collective action. In kinship-based collective action arrangements involving multiple water users, as prevailed in the study localities, Tooby and Cosmides (2000:803) observed that where social norms have sufficiently widespread appeal, they were likely to be relevant to generating possible rules that a sufficient number of people will recognise as simultaneously self and mutually beneficial in achieving the collective action goal. The irrigators felt socially inter-connected through family bonds, inter-marriages, friendships and other social connections like age-mates and so could in some cases exert community social pressure engendering cooperation around compliance with the institutions.

What also makes it easy for the rules and regulations to work well is the fact that we know each other and live in the same community (male irrigator, Vea, VFM088. January 7, 2012).

We the farmers here are united and respect the collective decisions of the WUA. (male irrigator, Durongo, DFM018. January 11, 2012).

Social inter-connectedness, unity, and social values considered as social capital helped to ensure compliance with rules. The essence of social capital in the case study communities was the network of relationships that united them through which trust for one another to comply with the institutions was built. The irrigators saw themselves as

one family descending through the same ancestral genealogy (lineage⁹). The feeling of being related through a common ancestor ensured trust among the irrigators, promoted cooperation and compliance with institutions. The pro social ties also put social pressure and moral obligation on the irrigators to comply with the institutions. In the words of a 35 year old female irrigator in Nyariga,

We the farmers in my lateral consider it disgrace and embarrassment if we are not able to irrigate our crops because of our failure to pay for our water and land levies” (female farmer, Nyariga, NFF142. January 31, 2012).

The fear of being disgraced and embarrassed, which would arise from the social pressure from the group when an irrigator failed to comply with the institutions could be explained by the level of the social inter-connectedness of the irrigators in the village. Conversely, some irrigators were of the view that the social ties had rather weakened the powers of WUA and lateral group leaders to strictly enforce some institutions because of the consequences of strained family, clan and community ties. Thus, the concept of ‘*mabia*’ (member of my family) comes into play. As used in the study area, *mabia* refers to a situation where every member of the community is considered as a sibling, regardless of strength of close family ties. Examples of interview responses from the irrigators illustrate this point.

What I have observed is that, the rules are not enforced. As we are here, we live together and do things in common, so when one person breaks the rules, it becomes very difficult to apply any sanctions for his/her non-compliance

⁹ Lineage is regarded as a group of people, male and female, who are descended through one line only from a common ancestor or ancestress. Lineage is a segment of a clan found in one locality (Nukunya, 2004: 19)

with the rules; because of that family bond we have with that person (mixed focus group, Winkogo, WMFG2. January 2, 2012).

Well, sometimes we end up sympathising with them. Even for those farmers who haven't paid, when we go to their farms and realise that their tomatoes are dying we don't usually feel good and because of this we always open the water for them with the hope that when they harvest, they would come to pay us. Sometimes some of them are honest and do come to pay us the levy but a lot of them go away with our money. In fact this has been one of our main weaknesses in our attempts to enforce the rules (senior staff, ICOUR, IM160. January 19, 2012).

Social inter-connectedness in this case can be viewed as a double-edged sword. It promoted institutional compliance in some cases, but also weakened water users' leadership ability to enforce some of the institutions because of the social bonding. The inability of the WUAs to enforce some institutions rendered the resource users' adaptive strategies ineffective, and hence increased the vulnerability of community water resources to over-exploitation. As argued by Dietz et al. (2003), effective governance requires that all institutions of resource use are obeyed and enforced, with reasonable standards for tolerating modest violations.

6.3.4 The Degree of Financial Resource Accountability and Probity by Leaders and Incentives

The lack of financial accountability and probity by the lateral leaders in the GMS and WUA leaders in the Winkogo FMS was a major factor that affected irrigators' motivation to comply with repair and maintenance contribution rules. Thus, lack of the good governance principles of accountability and transparency (Lockwood et al., 2009) which were not adhered to negatively affected rule compliance in the study area. As noted by some irrigators:

*The law on contribution towards repair and maintenance is not working because those who are in charge of collecting the contributions do not report to us on how much they have collected. They do not account to us on the money we contribute. What can be done to make this law work is for the leaders to be transparent and report to us those who contributed and how much we have contributed (male farmer, Winkogo, **WFMO43**, December 27, 2011)*

*There are instances we farmers paid for the water and land levies but some the laterals leaders and ICOUR official embezzled these monies collected from us. This behaviour creates problem for us since ICOUR delays supplying us water thinking that we have not completed paying our water and land levies (female irrigator, Nyariga, **NFF142**, January 31, 2012).*

Due to levies collected from the irrigators on behalf of ICOUR being embezzled by some lateral leaders and ICOUR field officials, ICOUR management assumed that the affected irrigators had failed to comply with their obligations. This provided the basis for denying them access to water. The refusal to supply water to irrigators for defaulting user levies through no fault of their own adversely affected irrigation activities and served as an incentive for them to disregard some institutions regarding water allocation. For instance, such farmers were likely to steal water for irrigation by diverting water meant for other irrigators.

The experience of the researcher in the field corroborated the views expressed by study participants regarding the apparent lack of financial accountability, probity, and transparency by their leaders. For instance, while ICOUR could not account for all the registered irrigators in the Nyariga community under the GMS during the 2011/12 irrigation season (the time of the study), the lateral group leaders had a more accurate figure of registered irrigators that was not available to the irrigation agency. The list of registered irrigators provided by ICOUR for the community was substantially lower

than that provided by the water user leaders, which was used to identify irrigators for interview. An interview response from a lateral leader in Vea confirmed the corrupt practices among some lateral leaders and ICOUR officials.

*Sometimes, we the lateral leaders “chop” [embezzle] the water levies that we collect from farmers on behalf of ICOUR (farmer leader, Vea, **VFL068**. January 6, 2012).*

Similarly, in the Winkogo FMS, a lack of financial accountability, probity and transparency was reported. While the irrigators were willing to comply with the input rules by contributing funds for irrigation facility repairs and maintenance, they could not trust their leaders to be accountable for the monies collected. There were concerns that the WUA leaders were corrupt and unable to properly account for monies collected from irrigators:

*The problem we have is that those in charge of the money we contributed towards the facility repair and maintenance, don't render accounts to us. We don't trust them. You imagine, when your husband gives you money to go and buy ingredients to cook and you decide to take that money to pay for your water and land levy and the man [the leader] who collects this money from you goes and spend it with his wife, how will you feel? Will you continue to pay? It hurts a lot. The only way we can solve this is to replace them with new leaders do the work (female irrigator, Winkogo, **WFF052**. December 27, 2011).*

A female irrigator from Winkogo expressed her disappointment and hurt over the corrupt behaviours of the WUA leaders who failed to account for their financial stewardship. Her response revealed the difficulty women faced in getting money to pay water and land user levies for irrigation, often resulting in them selling household personal effects to pay for water allocation fees for dry season gardening. The

understanding is that with irrigation farming during the long dry season, it is possible to produce crops for both household consumption and for cash to pay children's school fees.

The legitimacy of leaders (an important governance principle: Lockwood et al., 2009) was largely determined by their effectiveness in inducing respect, cooperation, acceptance and trust placed in them. The inability of ICOUR staff, lateral, and WUA leaders in Winkogo, Vea, and Nyariga to fully account for their financial stewardship partly explained why the irrigators failed to comply with some institutions. The study participants were also dissatisfied with the poor record keeping of the WUA leaders, which indicated that the leaders lacked transparency in financial management. The water users perceived that the WUA leaders themselves were not adhering to the rules, and therefore should not expect the members to do likewise. Though the WUA and lateral leaders could count on the support of the traditional authorities to demand compliance with operational input rules, it was evident that irrigators in Winkogo, Vea, and Nyariga were losing confidence in their leaders due to diminishing trust. The effectiveness of the leaders can play a key role in resource governance, but such leadership must be built on the kind of trust that can mobilise resource users for collective action.

It was observed that the WUA and lateral leaders were working as volunteers and there were no incentive packages to commit them to perform their functions, therefore, leadership commitment was low. Incentives might involve money or increased access to productive resources such as land or water, or something else decided upon by the community. ICOUR staff employed to monitor and ensure rule compliance in the GMS also complained about low salaries. The low remuneration of the ICOUR staff created

an opportunity for them to collude with some irrigators to violate the rules in return for personal gains such as tips from farmers. The lack of incentives and remuneration for WUA or lateral leadership positions, and the low motivation of ICOUR field staff resulted in low levels of commitment and opportunistic behaviours. This contributed to the low enforcement of compliance with institutional arrangements, which led to more general non-compliance.

*The lateral leaders are to ensure that those who do not pay their levy do not use the water but they don't do it. Because it is a voluntary work and they are not paid, they don't care about it (village leader, Ve, **VCL067**. January 9, 2012).*

*The leaders are not able to work hard because we [the WUA] don't pay them for what they are doing. It is voluntary (mixed focus group, Durong, **DMFG1**. December 15, 2011).*

*Because we are unable to monitor these rules well, it leads to water wastage since we are not at the farms to see how farmers are using the water. Honestly our commitment level to work is quite low. Sometimes, some of my staff members don't come to work. This is because of lack of resources for them to work. We need motor bikes, fuel, and maintenance allowances for the motor bikes. The motivation for staff is very low (senior staff, ICOUR, **IM160**. January 19, 2012).*

In the case of GMS, irrigators perceived the irrigation facility to be owned by the government therefore the lateral leaders felt they were not obliged to collect water and land levies on behalf of ICOUR without being rewarded. Despite that the fact that the WUA leaders in the Durong FMS received larger land allocations as compared to ordinary members, some of the irrigators still considered their performance unsatisfactory. One would have thought that the performance of the Durong WUA leaders would have been better than those in Winkogo, Ve, and Nyariga since they

received more land than the rest of the irrigators. The findings of the current study strongly suggest that further work is needed into designing the type of incentives that will motivate both irrigators and their leaders to realise the desired collective water governance.

6.4 Synthesis and Conclusion

This chapter explored institutional enforcement and compliance at the community level regarding irrigation water governance in FMS and GMS. It sought to answer the research question: *To what extent have any normative standards and by-laws promulgated as a guide for irrigation water resource governance been enforced by relevant stakeholders?*

It was clear from the evidence that irrigation water resource governance institutions in all case studies were grouped into formal and informal institutions. The informal institutions around traditional chieftaincy governance arrangements played prominent roles with regard to land allocation, community mobilisation and conflict resolution, while the formal institutions with respect to WUAs, ICOUR, and lateral groups and irrigation agency dealt with land and water allocation, water distribution and management, water utilisation, user fee contributions towards repair and maintenance, penalty enforcement, conflict resolution, and gender issues. The informal institutions in all case-studies were similar, due to similar socio-cultural and political traditions. Likewise the formal institutions did not differ significantly among the FMS schemes as they were developed from the same source - guidelines developed by MOFA under LACOSREP. However, there were significant institutional differences between FMS and GMS. Whilst the GMS institutional arrangements continued to be top-down,

particularly in water scheduling and distribution, the FMS sector was a more community-level institutional arrangement.

Institutional enforcement and compliance in all case studies tended to be weak because it was influenced by several negative factors. These included social kinship ties (inter-connectedness), lack of financial accountability and probity, ineffective leadership, lack of clear cut rights and entitlements between water organisations and their members, and the low capacity of enforcement bodies. Ineffective enforcement and compliance with institutions had resulted in low governance capacity and consequently resulting in a further deterioration of infrastructure, water wastage, and limited access of irrigators to water in all case studies. Traditional institutions were actively involved in irrigation water governance and in the activities of WUAs as well as exerting strong influence on rule compliance and enforcement. Thus, collaborative governance of irrigation water resources between formal structures like the WUAs and traditional authorities is important for effective enforcement of arrangements at the local level.

The research presented in this chapter leads to the conclusion that enforcement and compliance with institutions, which is a pre-requisite for achieving effective irrigation water resource governance outcomes, has not been effective in any of the case study areas. Lack of financial accountability and transparency and ineffective leadership contributed to low enforcement of the rules and compliance with the institutions. Ineffective institutional enforcement and compliance suggest institutional failures in the study areas.

Chapter 7 Capacities for Community-Based Irrigation Water Governance

7.1 Introduction

This is the third of the five result chapters foreshadowed in section 1.6. This chapter is concerned with capacities for community-based irrigation water governance, and so aims to answer the research questions:

5a. what capacities exist for irrigation water resources governance?

5b. how are these capacities supporting community-based irrigation water resources governance at the community level?

Devolution of irrigation water governance to the local level can only be meaningful if WUAs and lateral groups have the requisite capacity to carry out the assigned functions. Capacity development of WUAs and lateral groups is essential for irrigation water resource governance. Irrigation agencies at the regional and district levels also need sufficient capacity to train, establish and strengthen WUAs and lateral groups. This chapter focuses mainly on the capacity component of the governance principles presented in the conceptual framework in Table 2.2. Other elements of the governance principles which underpin the discussions in this chapter include legitimacy, transparency, accountability, and adaptation. Monitoring as one of Ostrom's design principles of the IAD framework presented in Table 2.1 is also discussed. This chapter explores the existing capacities and capacity gaps which need to be improved to properly enable community-based irrigation water governance under Ghana's decentralised governance arrangements. The exploration is based on the individual interviews with irrigators and agency staff, as well as focus group discussions with representatives of community stakeholders in the four case-studies.

Section 7.2 of the chapter investigates the effectiveness of existing capacities for irrigation water governance at the district and community levels. Section 7.3 examines how the available capacities supported community-based governance structures like the WUAs and Village Committees, and section 7.4 presents a synthesis and conclusions.

7.2 District and Community Level Capacities

This section engages the first of the research question listed above: (5a) *what local capacities exist for irrigation water resources governance?* The term governance capacity as used in this study refers to the capacities (abilities) to set and enforce rules, monitor and enforce compliance of rules, ensure accountability, plan, establish conflict resolution mechanisms, develop and maintain trust and legitimacy, provide effective leadership, mobilise the community, communicate, and network with other stakeholders. The availability of these capacities at the local level is analysed. Figure 7.1 presents a conceptual framework for analysing the capacities available for irrigation water resource governance at the regional, district and community levels. How they interact to affect performance will be examined in section 7.3.

The three major interconnected categories of governance capacities are organisational resources, social capital and human capital as shown in Figure 7.1. The three categories have been explained in section 2.12 in the description of the conceptual framework. These governance capacities can be leveraged to improve community-based irrigation water resources governance and management in the case study communities. Executing a governance task satisfactorily at any given level partly depends on having sufficient access to all dimensions of the governance capacity categories. Organisational resources refer to the available funds and logistics at the regional, district, and community levels.

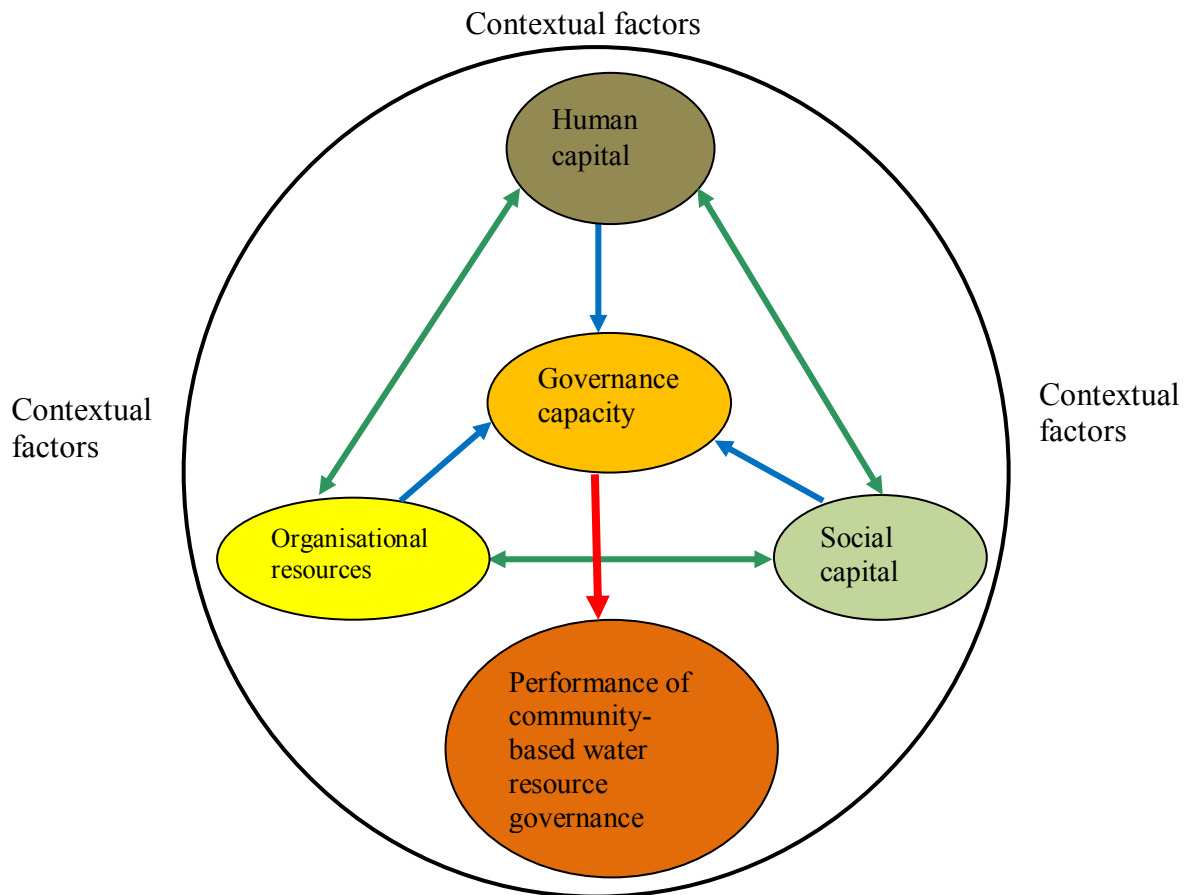


Figure 7-1 Governance capacity and performance of community-based irrigation water governance framework

Human capital refers to the existing knowledge, abilities and skill sets available within the locality for irrigation water governance and management either at the community or district levels. Social capital is viewed differently by many theorists (see section 2.12). In this study social capital will be considered as durable social networks, norms, trust, reciprocity (social support systems), sense of community and problem solving drivers among the irrigators within the community.

The contextual factors (socio-economic and biophysical) (as shown in Figure 7.1) within which the water users operated had influenced the available capacities for irrigation water resource governance at the community level which in turn influenced the performances of community-based irrigation water governance. The aggregated

governance capacities which influenced community-based irrigation water governance at the local level are examined in section 7.3.

7.2.1 Human Capital Capacities

The capacities identified from the case-study research as available human capital for local irrigation water resource governance included:

1. institutions and enforcement of institutions
2. leadership;
3. community mobilisation (organisation);
4. strategic planning;
5. conflict resolution mechanisms; and
6. communication.

7.2.1.1 Institutions and Enforcement Capacities

Institutions designed to control and monitor the behaviours of the water users were a major function of irrigation water resource governance in the study areas. Thus, the ability of WUA and farmer group leaders to enforce and ensure compliance with these institutions was an important capacity requirement for achieving local level irrigation water governance. The WUA and lateral group leaders had the responsibility and authority to make and enforce the institutions, as discussed in earlier chapters five and six. Institutional design and enforcement capacities for irrigation water resource governance were provided through leadership functions embedded in the social capital existing in the communities and supported through networking with relevant actors at the district level. The presence of local irrigation water resource governance capacity is evident from the following interview responses with a traditional leader, and corroborated by a WUA leader:

*The chief is the traditional political leader of the community and the rules and regulations made by him and his elders are respected and obeyed by the communities. So, once the chief endorses rules and regulations set by the WUAs, then they have the support of the people (community leader, Durongo, **DCL002**. November 16, 1011).*

*Yes we have the power to make rules and regulations, because the people elected us and gave us the mandate to take decisions. We can make rules on contributions, irrigable land allocation, and water use (WUA leader, Winkogo, **WFL039**. January 3, 2012).*

It was evident from the interviews with irrigators in all the communities that the village sub-chiefs and WUA leaders had the legitimate authority to design institutions and enforce them for local management of the irrigation schemes. Study participants reported that the WUAs, in collaboration with the chiefs, also tried to monitor and enforce the institutions through various forms of social sanctions as discussed in chapter five. Regarding the sanctions for an irrigator's inability to pay his/her water levy on time, a farmer stated:

*We in this lateral also have a rule, irrigators who have not been able to pay their water levies have their plots re-allocated to people who have the money to pay so that we can get water early to start our farming. In such situations we will inform the elders to sell the land to another farmer so that we can get water quickly (male farmer, Veá, **VF083**. January 6, 2012).*

However, data from both focus groups and individual farmers' interviews with water users revealed that though the WUA and lateral leaders and traditional authorities had the power to design and enforce the institutions and had made some effort to enforce them, enforcement was not as effective as expected due to many factors discussed earlier in chapters five and six. Examples of interview responses from some of the

participants provided reasons for the inability of the leaders to enforce the rules effectively.

*What I have observed is that, the rules are not enforced. As we are here, we live together and do things in common, so when one person breaks the rules, it becomes very difficult to apply any sanctions for his/her non-compliance with the rules; because of that family bond we have with that person (mixed focus group, Winkogo, **WMFG2**. January 2, 2012).*

*There is no sanction against those who do not comply with the rules and regulations because we see ourselves as one and friends in the community (female irrigator, Winkogo, **WFF055**. December 27, 2011).*

As in the FMS, social, economic, and physical attributes affected institution enforcement and compliance in the GMS. ICOUR, the main enforcement body in the GMS did not have adequate organisational and human capacities (adequate staff, logistics, and financial resources) to effectively monitor and enforce institutional compliance. Similarly, irrigation agencies at the district and regional levels, which are responsible for performance monitoring of community governance structures lacked, the requisite capacity (human and organisational) to perform their functions. ICOUR staff and a district planning officer reported their challenges as:

*None of my extension staff has reliable means of transport in order to visit the field always. Even sometimes fuel to run our motor bikes is always a problem (senior staff, ICOUR, **IM160**, January 19, 2012).*

*We are not able to go to the fields to monitor how they are managing the facilities. The problem is the time and funds (District Planning Officer, **P150**, February 5, 2012)*

Community-based institutional enforcement is viewed as an effective and complementary alternative to formal centralised approaches (Reis & D’Incao, 2000;

Thomas, 2001), particularly where central government enforcement systems are weak. However, ICOUR, a local decentralised government management organisation, did not have sufficient capacity to effectively enforce village institutions. These findings support the observations of some authors (Lane et al. 2004; Armitage, 2005) that responsibilities are devolved to lower levels without requisite financial and human resources. Thus, the capacity of governance bodies to deliver effective outcomes is compromised. The deteriorated nature of the irrigation canals in the GMS resulted in inadequate and unreliable water supply to irrigators. The inability of the farmers to receive adequate water to irrigate their crops resulted in non-compliance with the institutions in the GMS. In general, limited human and organisational capacities in both FMS and GMS had affected the governance capacities for institution enforcement of water allocation and access as ingredients for effective community water governance.

The water allocation rule is not very effective because ICOUR does not always follow its schedule as expected, they don't supply water according to the schedule. Sometimes we need the water and they would not give us and our crops will wither (male irrigator, Vea, VFM079. January 4, 2012).

We have rules regarding contributions toward repairs and maintenance, but only few farmers are able to comply with this rule. The reason why they refused to comply is that, they expect ICOUR to use the water and land levies collected from the farmers to repair and maintain the canals instead of asking the farmers to contribute additional money (female irrigator, Nyariga, NFF141. January 31, 2012).

Low crop yields due to a host of factors; including pests and disease (parasitic nematode infection), poor soil fertility and salinity, coupled with the high cost of farming inputs and low prices for irrigated crops (tomatoes in particular) translate into low farmer

incomes and high transaction costs. This in turn resulted in low financial capacity thereby affecting compliance with the institutions.

Yes, some of the rules are not working. For instance, it is difficult for some members of the group to pay their monthly dues when the harvest is poor. This is a genuine problem, so it is often difficult to compel people to comply with the rules (male farmer, Nyariga, NFM107. November 27, 2011).

Designing effective irrigation system requires a continual commitment toward WUA capacity development. In other words, the WUA leaders need requisite capacities and skills to make appropriate rules and enforce them to sustain the commitment of their members to the rules. They also needed capacities to be able to adapt to environmental threats and economic conditions such as physical conditions of the soil, pests and diseases, market conditions and so on. During the implementation of the LACOSREP Phases I and II, MOFA provided guidelines for the formation of WUAs. These guidelines were adapted by the WUAs in the FMS to formulate their by-laws/constitutions (see Appendix 8: Durongu by-laws). However, the guidelines lacked the basic elements mandating best practice that all constitutions of WUAs should contain. These include: (i) details of the principal and ancillary functions, (ii) the procedures and requirements for admitting new members, (iii) the voting powers of members, (iv) procedures for terminating membership, (v) procedures for electing the leadership committee, (vi) procedural requirements for the appointment of employees (if any), and (vii) procedural requirements for obtaining loans and the financial obligations of members towards the association (South African Department of Water Affairs and Forestry, 2000). This notwithstanding, the content of the WUA constitutions should be flexible enough to allow for the requirements of specific local contexts and characteristics of the different WUAs such as size and function. It was observed that the

WUA leaders in all case studies lacked the required structures, capacities and skills for sustained WUA functioning.

Capacity requirements of WUA and lateral leaders needed to ensure the functioning of the organisations were absent. These included bookkeeping, the monitoring and collection of water use charges and financial reporting in the case of the treasurer; administrative skills in the case of the secretary; and financial management, conflict management, report writing and leadership skills in the case of the chairperson. In all cases, the formal education qualification of the WUA leaders was low, and in some cases the chairpersons were illiterate. This negatively affected the functioning of the WUAs and their leaders' ability to enforce rules and sanctions.

The local government system and the irrigation policy (MoFA, 2011) empowers the District Assemblies to co-manage the GMS with ICOUR and local farmers, and to regulate the management of FMS. These local government authorities, however, lacked both human and financial capabilities to monitor irrigation activities, including institutional enforcement and compliance. In the words of a district planning officer:

We are not able to go to the fields to monitor how they are managing the facilities. The problem is the time and funds.” (District Planning Officer, P150, February 5, 2012).

The difficulties of the Assemblies had been further compounded by the inability of MOFA/GIDA to develop operational guidelines for the new irrigation policy. For instance, there were no national guidelines that define the relationships between and among the Assemblies, irrigation agencies like ICOUR, and other organisations, nor on new irrigation agency functions and organisational considerations, or on the WUA

establishment process, or on appropriate public participation for irrigation agencies and WUAs towards cooperative governance.

An example of institutional failure, observed during the fieldwork, was the uncontrolled waste of water during irrigation in all the case-studies. A lot of water was wasted in all the case-study areas, but it appeared no one took notice of it. Water wastage was evident during the pumping process from the reservoirs into the main canals, and during diversions into secondary canals and laterals and into the farms. Water was also lost through broken canals and laterals. Plate 7.1 shows examples of water wastage through pipes joined together to transport water from the reservoirs to the farms and broken canals and laterals in Durongo, Winkogo, and Nyariga. Most of the water pipes were old, and leaked in several sections, resulting in substantial wastage. Apart from the leaks in the pipes, several water pipes had to be joined to convey the water across long distances. However, the joints between the pipes were weak and therefore resulted in leakage and wastage as shown in Plate 7.1. In addition, the irrigators used open channel irrigation methods, which wasted significant amounts of water. Open unsealed canal with collapsed concrete walls were subject to substrate loss and evaporation.



Broken pipes connected to draw water from a reservoir



Water leaking from broken pipes, Durongo



Collapsing canal wall, Winkogo



Canal with concrete walls removed, Vea

Plate 7-1 Water wastage through broken canals and leaking pipes

Daily loss of water through transportation, infiltration, and excessive evapo-transpiration also contributed to the rapid decrease of the water levels in the reservoirs and canals. Little attention was paid to water wastage, probably because irrigators' water use was not metered for the quantity of water used. Once water was supplied, irrigators were allowed to use any quantity they wanted without monitoring.

Hence, physical attributes such as quality of irrigation infrastructure, and community attributes such as trust building, social inter-connectedness, and leaders' financial integrity affected enforcement and compliance capacities and produced limited enforcement capacities for irrigation water resource governance at the local level. There is a difference between having the authority and power to design and enforce institutions and enforcing the institutions in practice. The actual implementation of the institutional arrangements was dependent on several community and physical attribute factors, as discussed in chapters two and five, some of which were beyond the control of the leaders. The overall situation was an unfortunate demonstration of Weber and Rittel's (1973) observation that natural resource management is complex, and thus needs complex well thought out responses.

7.2.1.2 Leadership Capacities

Leadership is an important capacity for irrigation water resource governance as discussed in section 5.5.2.4. The majority of study participants in both key informant interviews and focus group discussions, reported that the traditional authorities, WUA and lateral group leaders provided leadership for collective action around irrigation water resource governance, though not uniformly across all the case studies. Leaders helped design and enforce institutions, and monitor water use among irrigators. Leaders in Nyariga, Vea, and Durongu were more committed to irrigation water governance than the WUA leaders in Winkogo.

Notwithstanding the important roles that both the formal (WUA) and informal (traditional authority) leaders played in local irrigation water governance, the majority of study participants indicated that local leadership in both FMS and GMS had a limited ability to mobilise irrigators for collective action or for accessing the available economic, cultural and human resources for systems operation and maintenance. For instance, in the FMS, the leaders rarely motivated and inspired confidence and support among the WUAs for collective action and self-governing initiatives.

We are not able to desilt the canals because the leaders are not able to mobilise the farmers well to do the cleaning. If the leaders don't instruct the followers to do it how would you expect us to do it?" (male irrigator, Durongu, DFM016.January 11, 2012).

It was evident from the focus group discussions and individual farmers' interviews that most collective action decisions were usually taken and communicated to the farmers during meetings organised for the WUA members. However, the WUA leadership in some cases was not able to organise meetings regularly as discussed in section 5.5.1.7. Invariably, the inability of the WUA leaders to organise meetings regularly affected

water users' collective actions around making financial and labour contributions towards facility repair and maintenance.

The success of a group depends on good leadership. We used to share ideas with other farmers in neighbouring communities in the past when our leaders were doing their work well, but the leaders we have now do not even call for meetings, so how then can they have knowledge of the problems we have? (participant in Winkogo mixed focus group discussion, WMFG1. January, 2, 2012).

Our leaders lack leadership qualities. The leaders don't even attend meetings regularly. This is a problem (male irrigator, Winkogo, WFM048. December 28, 2011).

Leadership as a management function and capacity invariably affected community mobilisation around labour and financial contributions. It hindered communication and information flow among the irrigators as meetings were not organised regularly. The ineffectiveness of WUA leadership also retarded irrigation activities, as the leaders could not motivate farmers to commit themselves to the local water governance reform process.

I am not satisfied with how the WUA leaders are managing the water resources in the community. Generally, farming activities are not progressing well. By this time we should have started cultivation but we haven't yet started due to the way our leaders are managing things (female farmer, Winkogo, WFF047. December 28, 2011).

Another issue is this, if you sent a child to go and buy you kola nut and the child went and bought you toffee, next time will you send such a child again? Our former leaders were not effective so we voted for new leaders to replace them, but these new leaders too are ineffective (mixed focus group, Winkogo, WMFG. February 4, 2012).

The above quotes indicated that some farmers were dissatisfied with the performance of the leaders in certain areas. The effectiveness of irrigation water resource governance is largely affected by the WUA leaders' financial and performance accountability to the WUA members and the way the leaders guide the WUAs in the governance processes. However, interviews with most of the participants revealed that financial management and reporting processes were not very transparent in some cases. The leaders' lack of financial accountability deepened the mistrust by water users and lessened their legitimacy and these in turn reduced the support they received from the members for collective action.

We pay contributions to our leaders but they don't even tell us as to whether they take the money to the bank or not. We don't even know the total amount we have contributed (participant in Winkogo women's focus group, WWFG. January 2, 2012).

The law which requires us to contribute money, which we keep in the bank for repair and maintenance, is not working well because of the ineffectiveness of our leaders. (female, Winkogo, WFF060. December 28, 2011).

We don't trust them. You imagine that when your husband gives you money to go and buy ingredients to cook and you decided to take that money to pay for your water and land levy contributions and the man [the leader] who collects this money from you goes and spend it with his wife, how will you feel? It hurts a lot! Next time will you pay? (female, Winkogo, WFF052. December 27, 2011).

The WUA leaders' inability to demonstrate good financial stewardship could be partly explained by lack of well-designed financial reporting and control mechanisms and incentive structures to motivate the leaders as discussed in chapter five. The absence of

specified financial control mechanisms further provided opportunities for embezzlement of funds and corruption. Interviews with some of the farmer group leaders indicated that the leaders expect rewards for their services.

Sometimes we are informed about the non-compliance of the rules, but we are not motivated to take any action against the law breakers because ICOUR does not reward us for our efforts to ensure compliance with the rules. If we get ourselves into trouble as a result of enforcing the law, it is at our own cost. Therefore, there is no motivation for working on behalf of ICOUR (lateral leader, Vea, VFL068. January 6, 2012).

7.2.1.3 Community Mobilisation Capacities

The traditional authority structures and WUA leaderships played pivotal roles for community mobilisation capacity for governance in both FMS and GMS. Water users had to be mobilised for financial and labour contributions toward facility repair and maintenance and catchment area protection. The chiefs in communities that exhibited characteristics of common interests and social cohesion were relied upon to achieve community mobilisation. Roles played by chiefs in community resource mobilisation have been described differently by some of the participants interviewed as:

Usually, ICOUR passes its messages through our sub-chief and farmer leaders, the chief then make roof-top announcements through his clan heads for farmers in the community to meet and discuss the content of the message. Our chief also plays a key role by helping the farmer leaders to collect the water and land levies from the farmers. The chief helps to mobilise the farmers to clean and weed around the canals. (male irrigator, Vea, VFM074, December 19, 2011).

Anytime there is a problem with the reservoir, the WUA leaders will organise us to carry out the repairs. If it is beyond our ability, they (WUA

leaders) will use money from our contributions to buy cement or hire an artisan to do the repairs (male, Durongo, DFM021. January 12, 2012).

It was observed during the fieldwork that the infrastructure in both FMS and GMS was in a state of disrepair. The canals in the FMS were broken and had no linings to reduce water loss through leakage. The GMS had better main canals, but broken branch canals in upstream villages, while canals and laterals in villages downstream were broken beyond lateral groups' capacity to maintain. The nature of availability of water differed among cases. Farmers in Durongo FMS faced less water shortages and had access to more water resources than farmers in Winkogo FMS. The differences in water for irrigation in Winkogo and Durongo, FMS were due to differences in leadership capacities to enforce operational rules regarding water use. Winkogo had ineffective leadership compared to the leadership in Durongo. Similarly, farmers in Vea village GMS had more water for irrigation compared to farmers downstream in Nyariga GMS due to differences in the quality of the canals and laterals. The physical conditions of the irrigation infrastructure in both FMS and GMS had influenced the capacities of WUAs and lateral group leaders to enforce operational rules on contributions towards facility repair and maintenance. An Apex group leader interviewed described the effect of the physical condition of the irrigation infrastructure on their community capacity as:

When a house is fallen, it is difficult to rebuild it. Whatever we used to tell the farmers, they always obeyed, but now that the canals are broken and most farmers do not get water, whatever we say now is not taken serious by the farmers because they want the canals to be repaired first before they can also make any contribution. We have a law on attendance to meetings. Most farmers do not show up for meetings especially communities such as Yikene, Dondubisi and Sumbrungo. These communities do not get access to water because the main canal is broken and as a result of that when we call for

meetings, they don't show up (Vea Scheme Apex group member, P143. January 26, 2012).

In summary, leaders in the case-study areas had difficulty mobilising irrigators to participate in irrigation water governance decisions under conditions of water scarcity, because irrigators had no motivation to be involved. Thus, the quality of irrigation infrastructure limited mobilisation capacities for irrigators' participation in water governance.

7.2.1.4 Conflict Resolution Capacities

As discussed earlier in section 5.4.4 conflict mediation mechanisms in the form of institutional, social and legal matters were available for irrigators. The community social structures provided avenues for conflict mediation around water and land disputes. Irrigators acknowledged that their operational rules, social structures and family ties offered opportunities for resolving conflicts.

Formerly when we have disputes, we usually run to the police station, but now government has put in place unit committees as part of our community structures to resolve disputes in the community. The unit committees and the chief of the community ensure that the disputes are resolved without us having to run to the police station (mixed focus group, Durongo, DMFG1. December 15, 2011).

There are leaders in our individual farmer groups and a leader for all the farmer groups in the community called the chief farmer. Whenever there is any misunderstanding among the group members, the issues are referred to the group leader to solve. If these leaders cannot resolve them, it is referred to community leaders (chief and elders) for redress (Female, Nyariga, NFFI41. January 31, 2012).

We have elderly people among us so when there is any conflict it is our elders who put their heads together to resolve such disputes by calling the

people involved in the conflict for mediation. If our elders fail to resolve it, we refer the case to the chief of the land who then resolves it for us (Male, Nyariga, NFM129. December 28, 2011).

A majority of interviewees revealed that they had fewer conflicts regarding land allocation and water use in the communities, because of the available conflict resolution capacities through the decentralised local government sub-structures and the available social and institutional conflict resolution mechanisms discussed in section 5.4.4. The traditional authorities, youth groups, WUA and lateral leaders served as avenues for conflict mediation.

We haven't had any conflicts because the people in this community are from one ancestral lineage and therefore consider ourselves as brothers (male, Duronggo, DFM014. January 9, 2012).

What also makes it easy for us to work as a group without conflict is that we know each other and we live in the same community. Also our fathers taught us to regard one another as brothers and sisters (male, Nyariga, NFM126. January 30, 2012).

We have managed to live peacefully for all these years because of the unity among us. The leaders call for a general meeting to serve as platforms to unite us together and we are able to go about our farming without any disputes (male, Nyariga, NFM129. December 28, 2011).

Thus, the existing social structures and pro-family relations enhanced the capacities for conflict resolution, which in turn strengthened capacities for community-based irrigation water resources governance.

7.2.1.5 Planning Capacity

Planning involves defining organisational goals, establishing an overall strategy for achieving goals and developing comprehensive implementation strategies. It is

concerned with both ends (what is to be done) and means (how it is to be done) (Robbins et al., 2003). Planning can either be formal or informal. Informal planning does not usually contain written goals and objectives and is largely unshared with other organisations. Formal planning involves written goals, objectives, and implementation strategies covering a certain time frame. Because these goals are documented, it is easy to share them within and outside the organisation (Robbins et al. 2003).

The term ‘planning’ as used in this study refers to both informal and formal planning since the study focuses on irrigation water resource plans at the district and community levels. However, planning as used at the community level refers to informal planning, since the water users did not have the technical skills needed for formal planning. This section examines the available basic strategic planning capacity for irrigation water resource governance at the local level.

Interviewees in both FMS and GMS reported that they set unwritten goals (best described as wishes) for their farming operations, were aware of the constraints and opportunities associated with irrigation water governance, and made efforts to minimise the constraints in order to take advantage of the opportunities. The WUAs, lateral groups as well as government irrigation agencies had no formal strategic plans for irrigation water governance. Interview response from a lateral leader in the GMS representing interview responses of most of the participants interviewed in both FMS and GMS is stated below:

We do not have any plan for the last five years regarding the management of the water (lateral leader, Vea, VFL070. January 5, 2012).

The WUAs and lateral groups in the FMS and GMS rarely developed strategic plans to enhance irrigation water governance, but rather depended on intuitive reactions to the

exigencies of the day. Also, interviews with all the district level stakeholder officials indicated that they had no strategic plans for irrigation water governance.

However, some farmers and community leaders had a shared vision regarding irrigation water governance, which they expressed in various ways, though this was not captured in any formal plans. Being unwritten, these are not easily accessible to government departments, which tend to privilege written documents in their decision-making.

We hope to see improvement in irrigation water resource management in the next five years. Farmers would be more committed to repairing and maintaining the reservoir, regular at all meetings and willingly contributing money into the group's account for repair works (lateral leader, Nyariga, NFL112. December 28, 2011)

In the next five years, I will want to see an improvement in dry season irrigation farming, particularly an expansion of the reservoir to contain more water for all year round farming. This will reduce poverty significantly (community leader, Durongo, DCL004. November 16, 2011).

Some operational plans the water users intended to carry out in order to address the irrigation water governance problems included the development of repair and maintenance schedules, taking ownership of the reservoirs in the case of the GMS, land and water conservation, and adoption of improved seed to improve yields. The water users' unwritten plans for irrigation facility repair and maintenance in five years' time were expressed as follows:

Our plan is to repair and repair the broken canals in the next five years. Those that we cannot repair we will contact ICOUR to help. Though these plans are not written down, when we sit in our meetings, we talk about these plans we want to achieve (lateral leader, Vea, VFL069. January 5, 2012).

*In the next five years we want to desilt and expand the reservoir to increase the volume of the reservoir to contain more water so that we can increase the land sizes for cultivation (WUA leader, Durongo, **DFL006**. November 15, 2011).*

In the government-managed schemes, the lateral groups also had plans to own, control and manage the irrigation scheme by themselves, because of the ineffectiveness of ICOUR. Some of the participants interviewed stated:

*We planned that we the farmers should own the project and manage it by ourselves. This has not been achieved. ICOUR are still managing the project (lateral leader, Nyariga, **NFL112**. December 28, 2011).*

Responses from a majority of the water users revealed that limited financial capacities constrained the implementation of their unwritten plans for irrigation water resource governance.

*We don't have any other job apart from the irrigation farming. The money we get from the irrigation farming is not sufficient to meet the required contributions for maintenance. There is poverty in the community which limits our ability to raise funds (women's focus group, Durongo, **DWFG**, December 15, 2011).*

As noted by Robbins et al. (2003) the quality of planning processes and appropriate implementation of the plans contribute more to high performance than does the extent of the planning. A well-structured irrigation management plan could attract external support from government and development agencies. A good plan can also affect the water users' external outlook towards the complexities surrounding irrigation water resource governance since implementation of irrigation water governance goals and objectives depends on planning and using the plan as means to mobilising both material and human resources. A good plan can also affect the water users' external outlook

towards the complexities surrounding irrigation water resource governance since implementation of irrigation water governance goals and objectives depends on planning and using the plan as a means of mobilising both material and human resources. Lack of plans meant a lack of governance principles of adaptation (Lockwood et al., 2009) and this negatively affected the performances of both FMS and GMS and the ability of the WUAs and lateral groups to deal effectively with the opportunities and threats of irrigation water resource governance.

7.2.2 Organisational Resource Capacities

The term organisational resources as used in this study refers to the financial and logistic capacities available at the regional, district, and community levels for irrigation water resource governance. Limited financial resources reduced the resource mobilisation capacities available for irrigation infrastructure repair and maintenance. The extent to which financial resource capacity constrained resource mobilisation for irrigation governance outcomes was summarised in Durongo women's focus group as:

We don't have any other job apart from the irrigation farming. The difficulty is that most of us are jobless and what others also get from the irrigation farming is not sufficient to meet the contributions. In a nutshell there is poverty in the community which hinders any contribution or fund raising or repair and maintenance (women's focus group, Durongo, DWFG, December 15, 2011).

Funds mobilised from water users in the government-scheme through water and land levies were also inadequate for financing irrigation water resources governance. A senior staff at ICOUR management stated:

What we generate from the levies from the farmers and other services we provide is just nothing to talk about. What we generate from the farmers

ranges between 25 to 30% of the total cost of our operation (ICOUR management, IM160, January 19, 2012).

7.2.3 Social Capital

Social capital as described in the conceptual framework in section 2.8 influenced capacities for irrigation water resource governance at the community level. It also influences the governance outcomes of participation, ownership, and control. The various forms of social capital identified that constituted capacities for irrigation water resource governance and thus affected the governance outcomes are discussed below.

7.2.3.1 Sense of Community

As in most agrarian rural communities in Ghana, responses from the interviews with most of the irrigators revealed that they were socially inter-connected to one another due to extended pro-family relations derived through the same genealogical roots and ancestors. The social system of the villages had provided avenues for conflict resolution, community mobilisation and social support or reciprocity. Reciprocity of support for one another is a function of social capital as highlighted by Portes (1998). The social inter-connectedness resulting in reciprocity was expressed in frequent responses by the majority of the participants as:

Our fathers taught us to regard one another as brothers and sisters and help each other in whatever way we can (irrigator from Nyariga. NMF126, January 30, 2012).

We live together and do things together because of the family relationships we have (mixed focus group, Winkogo, WMFG2. February 4, 2012).

Moser (1998) argued that active reciprocal support networks within communities and participation in community activities facilitate trust and collaboration. Bonding social

capital available in the water user groups resulted in support and collaboration for collective actions required for irrigation water resource governance at the local level.

We initially used to pay our water and land levies individually to ICOUR but we realised that the elderly people among us who could not ride a bicycle find it difficult in paying their levies to ICOUR. We therefore decided to appoint someone to take up the responsibility to collect the levies and send it to ICOUR on behalf of the group (male farmer, Nyariga, NMF124, January 3, 2012).

We had a traditional system of communal agricultural labour exchange to support each other. This arrangement is based on community solidarity, cooperation and mutual support. This reciprocal social arrangement is still relevant to us in the management of the irrigation water resource (community leader, Durongo, DCL002, November 16, 2011).

7.2.3.2 Problem Solving Mechanisms

Responses from a majority of the water users and village leaders showed they translated their sense of belonging to capacities into solving collective problems relating to the irrigation water governance. Responses from some of the participants reflect their drive to solve their problems:

The responsibility of maintaining the reservoir solely lies in the community. The time that part of the reservoir got broken, we ran helter-skelter looking for help from everywhere (mixed focus group, Winkogo, WMFG2, February 4, 2012).

We do not have rules that oblige us to make contribution towards repairs and maintenance. Nevertheless, we the farmers see it necessary to contribute money to buy cement to mend the broken canals since ICOUR has failed to take up their responsibilities for the repairs and maintenance (male irrigator, Nyariga, NMF121, January 29, 2012).

The sense of community, as evident in the interview responses provided internal drivers to agree to form WUAs and lateral groups for irrigation water governance as suggested to them externally. However, the formation of the water user groups did not necessarily provide adequate capacities to drive collective actions in the case study villages. The WUAs and the lateral groups were not able to maintain irrigation canals. Nevertheless, these mobilised resource user groups constituted a capacity to be leveraged for irrigation water resource governance at the local level.

7.2.3.3 Building Trust

Trust played an important role in irrigators' willingness to comply with input rules of financial and labour contributions. Trust-building among the stakeholders occurred both vertically and horizontally. Vertical trust related to trust between the decentralised departments and agencies at the district level and the water user groups at the village level. Horizontal trust was trust between the WUA and lateral leaders and the members of these groups, and also between the members themselves.

Interviews with the WUAs and Department of Agriculture revealed varying views of trust among the two organisations that had a relatively close working relationship as illustrated in Figure 5.2. Interview with MOFA representative revealed that MOFA could not trust the WUAs to perform their roles. MOFA representative explained MOFA's lack of trust for the WUAs in this line:

Unfortunately, we haven't seen any sign of sustainability of these reservoirs. So it is difficult to trust the WUAs to take decisions on their own. We don't trust the WUAs. We had advised them several times not to put the irrigable land under cultivation when the water level in the reservoir was below, but when we left the village, the WUAs went ahead and cultivated the irrigable lands. We can't also trust the WUAs because considering what LACOSREP

project has done, it was expected that after two or three years of the project ended, the irrigation reservoirs in the communities would continue to function well. But that is not the case. In fact, we cannot trust the WUAs to sustain the irrigation facilities (MOFA, P148, January 20, 2012).

On the other hand, the farmers from the farmer-managed schemes had varying levels of trust for MOFA. These different levels of trust were stated as follows:

We trust MOFA because they have been helping us with farm inputs but we don't trust them to help us manage the water. We cannot trust them to provide us any training on water management (WUA leader, Winkogo, WFL038. December 27, 2011).

Interview responses from the participants in the GMS also revealed that, ICOUR did not trust the farmers, particularly in terms of financial issues; neither did the farmers trust ICOUR for reliable water supply. A lateral leader explained a lack of trust for lateral groups by ICOUR in the following line:

ICOUR doesn't trust us the farmers regarding the payment of the water levy. We don't attach seriousness into it all (lateral leader, Vea, VFL068. January 6, 2012).

The farmers cannot trust ICOUR, because of the current state of the infrastructure. Sometimes, the farmers are not sure whether if they pay their water levy they will get water because of the deteriorating state of the canals and laterals. The farmers don't trust us for reliable supply of water. (senior staff, ICOUR, IM160. January 19, 2012).

The above interview responses revealed a lack of trust between the WUAs and the Department of Agriculture in the case of FMS and between ICOUR and lateral groups in the case of government-managed schemes. In the GMS the irrigators could not trust ICOUR for reliable water supply, hence were not motivated to cooperate with the lateral leaders by complying with the input rules.

At the community level there were varying views from the irrigation participants regarding trust for the WUA and lateral leaders. However, there was a relatively high level of trust placed in the WUA and lateral leaders by some of the irrigators. Some of the irrigators interviewed indicated that they trusted their leaders for decisions taken on behalf of the groups, and they trusted feedback received when their leaders went to meetings on their behalf, and their commitment to irrigation improvement through voluntary services and satisfactory performances. Below is an example of interview responses from some of the irrigators showing reasons for the trust placed in the leaders.

Yes, we trust our group leaders. If we have no trust in them, we would have changed them by now. Most of our leaders have been holding the leadership position for about fifteen years without been changed. This shows how hardworking and trustworthy they are (male irrigator, Nyariga, NMF125. January 30, 2012).

[Laughs....]. Yes, I trust the WUA leaders because in my opinion, they perform their roles well. Because of this we don't have disagreements over water management issues (female irrigator, Durongo, DFF027. January 11, 2012).

This trust in the leaders' performance had the outcome to some extent in cooperation for collective actions for irrigation water governance, as indicated in the above quote. However, interviews with some of the participants in both FMS and GMS indicated varying views regarding trust for the WUA and lateral leaders. One area where trust was diminished was the leaders' lack of financial accountability, as discussed earlier. Some views expressed regarding lack of trust include:

I do not trust the current leaders in everything. I cannot entrust them with financial matters. I do not think I can trust them to manage our finances well (female irrigator, Winkogo, WFF047. December 28, 2011).

*The problem we have concerning making contributions is that those in charge of the money we contributed towards the facility repair and maintenance don't render accounts to us. We don't trust them. It hurts a lot. The only way we can solve this problem is to replace them with new leaders who can do the work (female irrigator, Winkogo, **WFF052**. December 27, 2011).*

*I don't trust our leaders because, sometimes, ICOUR complains that we haven't paid our levies, though we paid the money to our leaders. We cannot trust them, because the leaders who collect the money from us sometimes failed to pay the money to ICOUR. (male farmer, Nyariga, **NMF137**. January 31, 2012).*

The lack of trust in the leaders for their financial accountability and transparency by some of the water users had reduced the ability of the leaders to motivate the irrigators to contribute towards irrigation infrastructure maintenance. Interviews with the majority of the irrigators revealed that trust, honesty and, financial resource management integrity were some of the key qualities considered in electing the leaders. What this meant was that the water user groups were to some extent guided by the governance principles of legitimacy, accountability, transparency (Lockwood et al., 2009) in electing their leaders, and therefore to some extent evaluated their performances against these governance principles. Distrust for WUA leadership in the case-study community like Winkogo reduced the credibility and ability of the leaders to mobilise members to provide free labour and contribute money for irrigation facility repair and maintenance. Thus, legitimacy of the WUA and lateral group leaders depended largely on the trust placed in them by the group members and this to a large extent was the source of authority and power the WUA and lateral leaders had to be able to mobilise the irrigators for collective action.

7.2.3.4 Social Networks

In this study the relevant social networks consist of social interactions among the irrigators within and outside their communities, and with the district decentralised departments with the view of getting both financial and technical support to leverage available capacities for irrigation water resource governance. Responses from some of the irrigators signified that they had social networks within and outside their locality through which they received support.

We normally meet in Bolga, the regional capital, with the other WUAs and farmer groups to discuss our problems. Sometimes we invite the Department of Agriculture to give us technical advice (WUA leader, Durongo, DFL36. November 19, 2011).

Sometime ago some people paid a visit to our farms and then realised that we might run out of water from the reservoir if nothing was done to preserve the water in it. The visitors called us together and advised us how to protect the reservoir. The outcome of the meeting was the by-laws to guide the reservoir (male irrigator, Winkogo, WFM047. December 28, 2011).

Networks with other irrigators outside their communities served as a platform to discuss common problems confronting irrigation water resource governance. The water users also received technical advice such as agronomic practices from MOFA. The responses from the water users signified that irrigation water resource users may not always be aware of problems affecting water resource use unless pointed out to them by experts in agronomy and irrigation who had technical knowledge in irrigation through field monitoring. Thus, support from MOFA technical officers through field monitoring, which resulted in knowledge sharing with the WUAs, formed bridging social capital

that enhanced existing indigenous knowledge and thus aided irrigation water resource governance.

There were however, varying views from some irrigators from both FMS and GMS that they had limited or no networks outside their localities apart from MOFA, and ICOUR in the case of government-managed schemes.

Apart from ICOUR and the Ministry of Agriculture, we have no interaction with any other organisation. We haven't established any relationship with any NGOs or government agencies. It is only the Ministry of Agriculture that visits us once in a year to advise us on our farming activities (community leader, Vea, VCL069. January 5, 2012).

We had network with other farmers in other communities in the past due to effective leadership, but the leaders we have now do not even call for meetings, so how then can they organise us to travel and interact with others? (mixed focus group, Winkogo, WMFG1, January 2, 2011).

Although some irrigators indicated that they received support from MOFA through their interaction with it, there were varying views from some irrigators: some received no support from MOFA in spite of several efforts they had made to seek support.

For the past seven years we haven't heard from MOFA and they haven't heard from us (WUA leader, Durong, DFL005. December 11, 2011).

Also, the variance in the views among the irrigators in Durong and Winkogo, in the case of the FMS on one hand and Vea and Nyariga in the case of GMS on the other hand, could be that the irrigators in Durong and Vea did connect with other communities some time ago, but were not able to maintain those social networks. Rather than being durable networks, they were intermittent opportunistic connections, from which they obtained useful information, but not a continuous relationship they could benefit from.

Thus, the irrigators who held the view that they had no social network did not consider a one-time visit to other irrigation communities as a viable network that could leverage the necessary capacities needed for irrigation water resources governance. Rather, they expected regular and functional social network systems that would result in leveraging their organisational and human capacities for effective irrigation water resource governance. The weak relationship between the WUAs and lateral groups with the decentralised district departments illustrated in Figures 5.1 in the case of GMS and Figure 5.2 in the case of FMS corroborated these views. The fact that the irrigators did not consider the weak relationships they had with other irrigation communities and development organisations outside their villages as important followed from their perceptions that those relationships were not enduring. Such relationships therefore could not really be counted on as constituting an ongoing network that could serve as bridging social capital that in turn could provide capacity for irrigation water governance.

The irrigators explained that the primary reasons why they had weak social networks were due to ineffective leadership that could not link them to organisations outside their communities. As discussed earlier in chapter five, leadership played an important role building capacities for irrigation resource governance at the community level as they were the main channels through which the irrigators could be networked and access bridging capital.

The various capacities identified were, however, influenced by the contextual factors within the communities, thereby limiting the available capacities for irrigation water resources governance at the local level. How these capacities have supported

community-based irrigation water resources governance at the local level is discussed in the next section.

7.3 Governance Capacities and Performance of Community-Based Irrigation Water Resource Governance

This section answers the second research question identified at the start of this chapter: *‘how are these capacities supporting community-based irrigation water resources governance at the local level?’* Chou (2010) identified participation, ownership and control as the three key variables that enable both community-based and decentralised natural resource management to function effectively. Thus, in answering the second part of the research question, the performance of irrigation water resource governance is viewed to the extent in which the governance capacity first affected participation, ownership and control, and how these in turn affected the performance of irrigation water resource governance, including the extent to which it is actually community-based. It is also expected that participation, ownership and control will affect each other in the governance process.

Governance capacities that affected water users’ participation, ownership, and control in irrigation water resource governance were found to include those of institutional design and enforcement, leadership, community mobilisation, planning, conflict resolution mechanisms, and communication, sense of community, trust-building, social networks, human and financial resources. The collective effects of these governance capacities on water users’ participation, ownership, and control of community-based irrigation water resource governance processes are discussed below.

7.3.1 Governance Capacities and Water Users' Participation

Participation is discussed in detail in chapter eight. To avoid repetition, participation in relation to governance capacity and its effects on community-based irrigation water resource governance is discussed briefly in this section. More attention is given to ownership and control in the subsequent sections. However, where participation affected ownership and control in the governance process it is discussed under the sections of ownership and control.

Participation of the water users in irrigation water resource governance was influenced by the capacity of leadership to mobilise water users, in order to design and enforce institutions, resolve conflicts, and monitor water use, communicate at organised meetings, and network with external agencies for the collective actions necessary for successful community-based governance. However, the reported corruption among the ICOUR staff and lateral and WUA leaders in Winkogo, Vea, and Nyariga reduced trust in them and contributed to low cooperation, participation and therefore limited governance capacities required for community ownership and control to achieve community-based resource governance.

7.3.2 Governance Capacity and Water users' Ownership of Irrigation Infrastructure

Leach et al. (1999) and Johnson (2004) stated that sense of ownership should be expressed in accountability and readiness to take care and manage resources. Similarly, Ackerman (2004) argued that local people must feel ownership of a resource, otherwise they may cheat and break rules.

Responses from some of the participants in the FMS revealed that the irrigators accepted the transfer of the irrigation infrastructure from MOFA to the communities and

as a result they elected their own leaders for infrastructure management. The participants in the FMS explained that to show a sense of ownership, the leaders designed institutional arrangements, enforced them to some extent, and punished rule violators, as discussed in earlier chapters. Thus, ownership of irrigation infrastructure was facilitated to some extent through the leadership and thus institutional capacities for irrigation water resource governance at the community level were enhanced. The extent to which the irrigators felt ownership of the facilities in turn affected irrigators' participation and control of the irrigation infrastructure. Interview responses from some of the participants illustrated the sense of community ownership of irrigation infrastructure as follows.

We have elected our own people as leaders to be responsible for the management of the water. We elected them because the water has been handed over to us to manage (mixed focus group, Durongo, DMFG1. December 15, 2011).

Yes, we own the reservoir and it is our sole responsibility to keep it functioning so it is our responsibility to repair and maintain the canals (mixed focus group, Winkogo, WMFG 2. February 4, 2012).

Notwithstanding the sense of ownership expressed by some of the participants in the FMS, interviews with the majority of the irrigators still felt the government owned the irrigation infrastructure for several reasons as stated below.

*Even though the government has handed the reservoir to us, we still feel it is the property of the government, and we are only made to take care of it. The government has not informed us that we are responsible for managing the reservoir (mixed focus group, Durongo. **DMFG1**. December 15, 2011).*

The divergent views expressed by the water users in the FMS regarding facility ownership and therefore their participation in irrigation water resource governance

could be explained by lack of clear roles and responsibilities for the communities. The ownership of irrigation infrastructure expressed by some of the irrigators in the FMS did not translate into practice by good maintenance of the irrigation canals in the FMS. Field observations revealed that all the canals were broken down and water could not be transported through them to the farms. Generally, water users had limited capacities to translate their sense of ownership into infrastructure management.

The generally held view among the irrigators in the GMS was that the government owned the irrigation infrastructure and it is ICOUR represented by government's responsibility to repair and maintain it.

As for the irrigation facility it is for ICOUR the government company. If we pay the water levy they will give us water and if we don't pay we don't get water (lateral leader, Nyariga, NFL107. November 27, 2011).

In principle, decentralised resource governance policy promises to engender a sense of local ownership and commitment (Kellert et al. 2000; Bradshaw 2003). This did not fully occur in either FMS or GMS. The implementation of the decentralisation policy had not strengthened community level structures to support community-based irrigation water governance. Hence the impact of local level structures on governance outcomes of participation, ownership and control was low. The current decentralised irrigation water resource governance could be described as government's efforts only to hand over irrigation facilities to the water user groups at no cost, but expect them to assume full responsibilities of maintenance, the cost of which they could not afford.

7.3.3 Governance capacities and Irrigation Water Resource Control

Some scholars (Agrawal and Gibson, 1999; Johnson, 2004) stated that communities need to have some control over their resources by electing their own leaders, being

involved in the planning process, designing rules, contributing to project resources, and developing management and leadership skills, in order to have a sense of ownership and the desire to participate. Control over irrigation water resources varied between the FMS and GMS. The water users in the GMS had limited control over irrigation water resource governance. In spite of the efforts made by the lateral groups in the GMS to elect their own leaders, design rules, mobilise resources for support, and set up a management and leadership teams, ICOUR still had a greater control over the management of the irrigation scheme. The water user groups could not make any major decisions regarding canal water supply and schedules. A lateral leader stated:

As for the project [water] it is for ICOUR. If we pay the water levy they give us water and if we don't we won't get water. When the traditional people go to ICOUR, ICOUR will tell them, "the water is for you, but we are managing it" so if you pay we will give you the water. ICOUR has the power over water allocation and we only have to go and pay our levy for ICOUR to supply the water (lateral leader, Nyariga. NFL107. November 27, 2011).

ICOUR had tight control over almost all major management decisions which resulted in limited participation by the lateral groups in the irrigation water governance process. ICOUR's tight control over almost all major management decisions meant that meetings were to inform rather than to discuss or encourage resource users' participation, ownership, and control. The irrigators in the GMS did not have power to influence major decisions concerning the management of the reservoir and therefore felt the irrigation facility was the property of the government. An important element of resource users' control over their own resources as identified by some scholars (Agrawal and Gibson, 1999; Johnson, 2004) is the capacity to participate in resource governance through internal or external resource mobilisation to support community-based

governance processes. As argued by Rogers and Hall (2003) effective water resource governance and water service delivery require the combined effort of governments and various groups in civil society, particularly at the community level, as well as the private sector. A participatory and consultative approach is required in water governance.

In spite of the seemingly strong control of ICOUR over the government-managed scheme, ICOUR management was not able generate adequate resources to meet its operational costs but had to depend on the government for support.

*The government is not giving us enough support as we would have wished and that is why we are struggling. The major thing that affects us is the government inability to provide us with adequate assistance in terms of funds and other resources (senior staff, ICOUR, **IM160**. January 19, 2012).*

The analysis of interview responses from the WUAs in the FMS, showed that the irrigators had a greater level of control over their irrigation water resources than those in the GMS. The WUAs in the FMS elected their own leaders, designed their own institutions regarding access to water and land, and defined sanctions for rule violation. Some of the interviewees in the farmer-managed schemes stated:

*Yes we have the power to make rules, because the people elected us and gave us the mandate to take decisions concerning the water. Yes, we have the power from the people to make all rules and regulations regarding the water use. We can make rules on contribution, land allocation, water use (WUA leader, Winkogo, **WFL039**. January 3, 2012).*

Thus, the available capacities for irrigation water governance in both FMS and GMS had not been enhanced through the decentralisation policy. The study has shown that what decentralisation has achieved in the case-study areas was the formation and

registration of recognised water user groups who lacked the requisite capacities to achieve the intended purposes for which they were formed. In the case-study villages decentralisation had not increased linkages and built social capital among the stakeholders, indicating that there were weaknesses in the design and implementation of irrigation water resource management transfer and participatory irrigation management policies.

7.4 Synthesis and Conclusion

The first part of this chapter, section 7.2 answered the research question, '*what capacities exist for irrigation water resources governance*' in order to answer the second part of the research question, '*how these capacities are supporting community-based irrigation water resource governance at the local level?*' A critical analysis of interview responses from the water users in both FMS and GMS revealed the impacts of leadership, institutional design and enforcement, resource mobilisation, social capital, and planning capacities required for community-based resource governance. These available capacities were insufficient to effectively support community-based irrigation water governance at the local level. It is argued in this study that inadequate leadership capacities constituted the main capacity gap that impeded community-based irrigation water governance at the local level. Leadership capacity was the hub from which all other capacities for community-based irrigation water governance derived their strength. Inadequate leadership capacities affected all other capacities for community-based irrigation water resource governance at the study area.

The GMS had no governance capacity advantage over the FMS, in spite of government's human and financial support. Conversely the FMS rather had some capacity advantage over GMS in terms of community ownership, control, and

participation. This study revealed that there were weaknesses in how both the FMS and GMS were implemented. In both cases, local communities were forced to informally self-organise. Both approaches ended up being largely de facto community-based, but such de facto community-based arrangements would have been more effective if they had been more carefully designed and supported at the outset.

Local level organisations are not inherently equipped with requisite capacities for community-based irrigation water resource governance. To promote effective community-based irrigation water governance programmes, it is desirable to ensure that both human and organisational capacities are built, since these capacities are necessary to enhance community participation, ownership, and control which in turn affects community-based irrigation water resource governance at the local level. The objective in designing governing institutions is to control irrigators' opportunistic behaviours in order to avoid the 'free rider' problem associated with the difficulty of excluding beneficiaries from common pool resources. As noted by Tang (1992) institutional arrangements that effectively monitor and impose sanctions on rule breakers create incentives for individuals to cooperate. Thus, the implementation of the decentralisation policy had not improved the local level capacities required to promote community-based irrigation water governance in both farmer-managed and government-managed schemes.

Chapter 8 : Water Users' Participation in Irrigation Water Governance

8.1 Introduction

This chapter examines whether decentralisation of irrigation water governance to the local level has advanced water users' participation in governance processes. Accordingly, it is concerned with investigating the extent to which decentralisation in practice has strengthened participation of community level stakeholders, particularly water users in the governance of the case-study schemes, and thus rendered governance truly community-based. Hence, the chapter focuses only on participation of stakeholders in irrigation water resource governance processes at the community level, and not on other stakeholders at the regional and district levels. The aim is to address the following research questions based on the findings from the study and document analysis:

6. To what extent has the devolution (decentralisation) of irrigation water governance promoted water users' participation in community-based irrigation water resource governance?

The governance principles of Lockwood et al. (2009) such as inclusiveness, accountability, transparency, capacity, fairness, adaptation, and the IAD framework of Ostrom (1990, 1992) identified in Table 2.2, decentralisation, and other important concepts such as the concept of participation derived from the literature review, underpin the analysis in this chapter.

The chapter is organised as follows. The level of water users' participation in irrigation water resource governance is investigated in section 8.2, and then followed by the

factors that affected irrigation water users' participation in section 8.3. Section 8.4 is devoted to synthesis and conclusion of the chapter.

8.2 Institutionalising Water Users' Participation in Irrigation Water Resource Governance

The term 'community stakeholders' participation' as used in this study, refers to the participation of the water user groups, irrigators, traditional leaders, and the communities in general in irrigation water resource governance at the local level. Community level stakeholders' participation is analysed in terms of governance functions such as institutional design and enforcement, leadership roles, planning, resource mobilisation, conflict resolution, monitoring and information dissemination.

Guided by the typologies of citizen participation discussed in section 2.11.2 and based on the analysis of interview responses, participation in irrigation water resource governance in all case studies is categorised into participation in: (i) decision-making and (ii) directed activities. The two categories were identified through the analysis of the data. The activities comprising the decision-making role include leadership roles, composition and formation of WUAs, selection of leaders, design and enforcement of institutions, land and water allocation, conflict resolution, performance of rituals to appease the gods, facility monitoring, and collection of irrigation water user levies. Directed activities refer to contribution of input resources (financial and labour) for irrigation infrastructure repair and maintenance, catchment area protection, and attendance of meetings. This categorisation helped to shed light on the level of decision making power and control that is vested in water users, their leaders and other community level socio-political groupings involved in the decentralising irrigation water governance process.

In the two FMS case studies (Durong and Winkogo), the decision-making role was mainly performed by the male dominated WUA leaders and traditional authorities. Members of the WUAs, including women and non-natives, participated largely in directive activities. In the FMS case studies, participation in the directive activities included other members of the water user groups and other community groups like the village development committees, as well as women, non-natives, and young irrigators. In the GMS, the decision-making role was mainly performed by the lateral group leaders, ICOUR and the traditional authorities, even though ICOUR had the final decision making power.

Although many of the study participants, including community leaders, reported that the WUA and lateral group leaders were democratically elected by the water users through balloting, the nomination process for the leadership positions favoured the elderly men, progressive irrigation farmers, and people with some level of formal education. These were usually the advantaged and privileged farmers, i.e. those who wielded considerable power and influence in community life. In the Durong FMS, for instance, many irrigators explained that usually the clan heads of the six sections of the community were required to nominate people for WUA leadership positions, and then the leaders were elected at a general meeting. As a result, the local WUAs were in effect the elite, and these had captured the irrigation water resource governance processes. Elite capture is a situation where the elites manipulate the decision-making arena in order to obtain most of the benefits (Wong, 2010:3). The elites may not represent the interests of other water users and community people. The young irrigators in FGDs in the two farmer-managed case studies expressed their dissatisfaction about the domination of the older irrigators in the decision-making process as follows:

*When it comes to decision making I think there is no fairness. During meetings, people can make good suggestions, but they are not taken by our leaders simply because those making the suggestions are young. The good suggestions and ideas from the younger irrigators are discarded. Ideas or suggestions from older irrigators that are not as good as those of the younger farmers are rather considered on the grounds of their age (young male irrigator, Winkogo, **WFM048**. December 28, 2011).*

*You know it is the men who make the rules and regulations, and we the women have to comply, and I may not know much about them (female irrigator, Durongo, **DFF028**, December 8, 2011).*

Unrepresented groups in leadership roles such as women, non-natives, and young irrigators, were dissatisfied by the elite capture of leadership roles within the WUAs and wished they were part of decision-making processes in order to influence them.

*We wished we were part of the leadership to contribute to decision-making. The best way to contribute effectively is to be part of the leadership. We women will benefit a lot if we are part of the leadership (female irrigator, Durongo, **DFF035**. December 7, 2011).*

Interview responses from a majority of the participants revealed that the WUA leaders occasionally consulted the WUAs in order to obtain feedback on some contentious decisions, and for the endorsement of some of their decisions, but collaborative decision-making was very weak. The forms of participation, and corresponding key activities that emerged from the interviews with a majority of the irrigators in all case studies are conceptualised in Figure 8.1. Figure 8.1 shows the two forms of participation, key associated activities, and participation groups for each activity category.

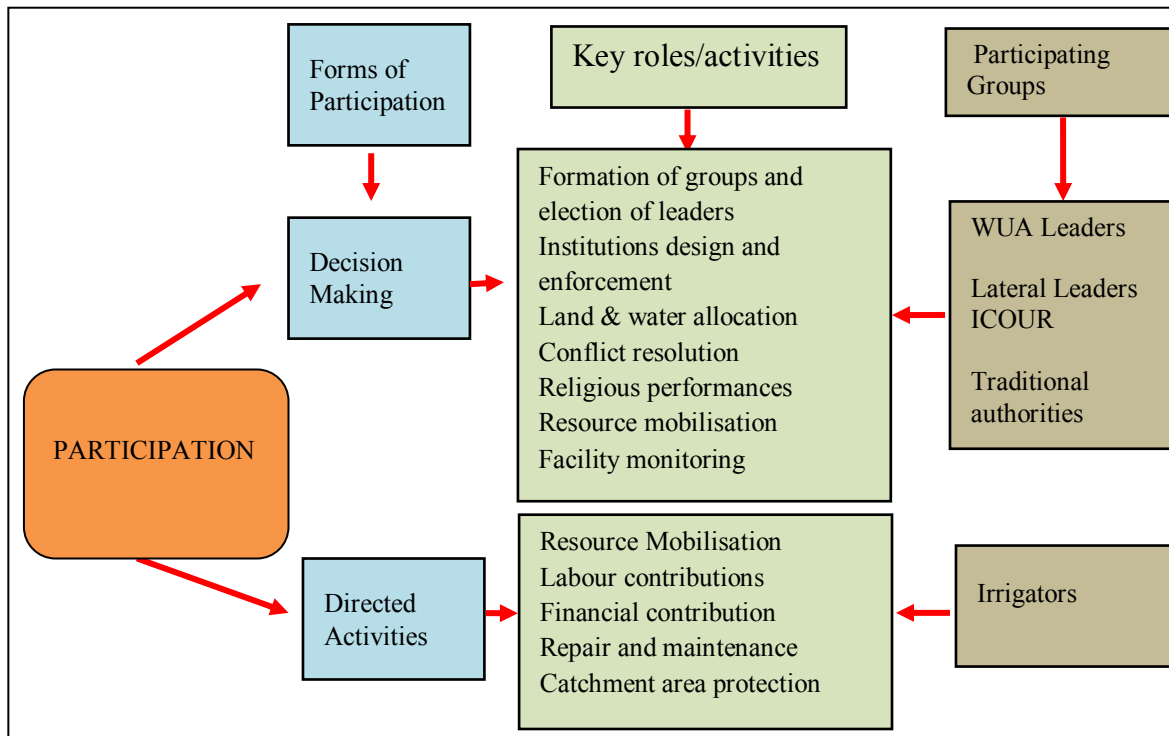


Figure 8-1 Forms of participation, roles and participating groups

Source: Field data (November 2011- February 2012).

In all case studies, whether government or farmer-managed, interviews from most of the WUAs indicated that participation in institutional design was insufficient. Interviews with the majority of irrigators revealed that the general norm was for the WUA leaders to meet to agree on the institutions and then later bring them to the general meeting to be adopted by the WUA members. Responses from the participants revealed that the WUA and lateral group leaders as well as ICOUR staff in government-managed schemes were solely responsible for institutional enforcement and sanctioning recalcitrant members who violated the rules. As illustrated by one WUA Leader:

We the leaders often meet first to formulate the rules and regulations, which are then presented to the general meeting for adoption. (WUA leader, Durongo, DFL006. November, 15, 2011).

In all the case studies, women used water with their partners to grow vegetables under irrigation for home consumption and for income, for domestic purposes, for watering

livestock and for home improvement. It is within this context that Zwarteveen (1995) noted that the anticipated benefits of community governance and management of irrigation schemes, including effective WUAs, can only be achieved when women's responsibilities and tasks with respect to irrigation are recognised and accommodated. Zwarteveen called for due diligence in project design to avoid WUAs reinforcing existing power inequities, and further concentrating decision-making authority and power in the hands of a small elite. In the study communities, decision-making and participation in organisations were traditionally confined to men. Recognising this, the IFAD-funded LACOSREP Project in the Upper East Region of Ghana that introduced the WUA concept, made a conscious effort to promote gender inclusiveness and women's participation in the WUAs' activities as well as in WUA leadership positions (IFAD, 2006). However, this study revealed that not much has changed in the efforts to promote women's participation in irrigation water resource governance in the study communities. Women were virtually absent in the leadership positions of WUAs and lateral groups. In the 10 lateral groups identified in Vea and Nyariga under the GMS, none of the group leaders was female. Only in the Winkogo FMS case-study was the treasurer a female, but she was not active at the time of the study due to ill health.

While most irrigators interviewed individually and in focus groups discussions were supportive of the need to include women in WUA leadership positions, there were a few study participants who felt women should not hold leadership positions. They felt that the women lacked formal education and also their domestic roles could not be combined effectively with leadership roles. In this case, the elite capture however, could be interpreted as a capacity issue, because the most capable among the irrigators were sought out for the leadership roles by the less confident and competent fellows such as women in particular as explained in the quote below.

We nominate people who are educated because they can represent us in meetings with government officials and NGOs where communication in English is required. If you choose somebody like me who is not educated what do you expect me to report to the the group when I return from the meeting? (male irrigator, Durongu, **DFM019**. January 11, 2012).

We are not active in leadership positions because of our low level of education, it is not because the men have ignored us (mixed focus group, Nyariga, **NMFG**. December, 17, 2011).

We women are not in leadership position because of our numerous domestic responsibilities which we cannot combine effectively with leadership responsibilities (mixed focus group, Nyariga, **NMFG**. December, 17, 2011).

The observation of Wondolleck et al. (1996) that hanging on the top of the Arnstein's ladder of participation is not without its own challenges and costs explains the difficulties women faced in effective participation in irrigation water governance. Power issues were therefore not necessarily relevant mainly between groups of 'have' and 'have not', rather within groups on a gender and cultural basis (Ross et al., 2002). Wondolleck et al. (1996) argued that reaching the top of Arnstein's ladder is a challenge that then begets new challenges. Most successful efforts of remaining at the top of the Arnstein's ladder are those in which citizens have requisite skills—political savvy, negotiation, and communication skill, and resources to devote to the process. The quotes above indicated that the women, particularly those in the GMS were given the opportunity to play roles in leadership but did not have the requisite capacities to participate effectively. Hence, empowerment is not about a transfer of power per se, but a challenge to existing power structures which need to change (Kaufman 1997, Martin 1997).

What is important, however is whether the power wielded by the elites is used to the benefit of the whole community or otherwise. As noted by Wondolleck et al. (1996) well-structured collaborative processes can remedy some of the imbalances and other stumbling blocks inherent in participation. Interview responses from some of the women however indicated that, the power wielded by the elites, mainly the educated male leaders was not in their interests because these elites took decisions to satisfy their own parochial interests. This conclusion drawn by the women is explained in the following quotes:

They don't take our views and suggestions into consideration. This is because they (men) have their own agenda and when they (men) go for meetings they don't even come to consult us (female irrigator, Winkogo, WFM048, December 28, 2011).

Because the men knew that we (women) don't have money they don't consult us before taking decisions (female leader, Durongu, DCL001, November 16, 2011).

In the GMS, ICOUR was required to gradually decentralise power to the local communities aimed at moving towards co-management and operation of the Vea irrigation facility. In so doing, ICOUR encouraged the formation of local level structures called lateral groups (formally known as village committees). ICOUR was then expected to train and empower these community water user groups to understand the co-management arrangement processes, and then play active roles in decision-making. However, interviews with all the community leaders (chiefs, elders and assembly members), and the majority of the lateral group leaders in the GMS revealed that actual participation of irrigators in the scheme's governance and management was limited to resource mobilisation for operations and maintenance. Participation by the traditional authorities in GMS governance was also limited to information provision and

consultation on some issues, which could best be described as 'tokenism.' Final irrigation management decision-making rested with ICOUR, whilst the lateral and traditional authorities made the minor decisions, mainly on resource mobilisation and land allocation at the local level.

The most common participation method employed by ICOUR to discuss land and water levy rates was the annual stakeholder consultative meetings. The lateral farmer group leaders, Apex water user group members and the chiefs usually attended the consultative meetings as community and irrigator representatives. However, this study found that these local water user associations had limited power to influence the deliberations and outcomes of the meetings in favour of irrigators. ICOUR had the final say in these 'consultative decision making processes'. Some irrigators argued that ICOUR did try to engage with the farmer leaders to signify that the 'voices of the local people' were represented in the decision making process, though the participation of water user leaders in the consultative meetings fell short of water users' expectations. The process did not allow the farmers to re-negotiate power within the collaborative arrangements to one of mutually beneficial power sharing arrangements. The majority of irrigators and community leaders in the two GMSs indicated that the consultations organised by ICOUR were mere formalities and 'tokenism', as their views were rarely considered in the final decision making and implementation processes. Most study participants, including community leaders, argued that the local water users and irrigators were excluded from the decision making process, despite the fact that they are the most affected by the outcomes of decentralised water resource governance at the local level. Interview responses of some of the participants are illustrated below.

It is true that ICOUR and the irrigators come together to determine the water and land levies, but the irrigators that ICOUR meet are our leaders.

When our leaders and ICOUR agree on a fee and our leaders come to inform us about it and we disagree and we also give our opinions about it and ask the leaders to go back and present our views to ICOUR. However, when the leaders go and present our views to ICOUR, ICOUR doesn't always consider it (male irrigator, Nyariga, NMF129. December 28, 2011).

ICOUR only tells us what we are to do but we are not always involved in decision making especially in determining the water and land levies we pay. ICOUR decides the amount all alone and then inform us on the pre-determined amount. We the traditional authorities only get the information from the farmers and we are all obliged to pay the amount ICOUR decided on (community leader, Vea, VCL065. December 22, 2011).

An interview with a lateral group leader revealed that the management of ICOUR did not expect water user leaders and traditional authorities to interfere with the water allocation and user levy payment rules. The lateral group leader recounted an interaction they had with the management of ICOUR, during which the position of the company concerning water allocation and water levy rules was made clear:

The water is for you and we (ICOUR) are managing it, if you pay your levies, then we (ICOUR) will supply you with water (lateral leader, Nyariga. NFL107. November 27, 2011).

The intention of ICOUR to make all major decisions meant that the water users in the communities could only have access to water for irrigation upon paying their water levies to ICOUR. Under customary law, the water resource belongs to the local communities who can access it at no cost for domestic uses and for livestock watering, but not for irrigation. Irrigators had limited power to negotiate the terms for the payment of their irrigation water levies, and in most cases they could not hold ICOUR accountable for its failure to adhere to irrigation water allocation schedules and rules. Thus, the lack of effective water user participation in the decentralised governance

arrangements disempowered the community stakeholders from holding the irrigation agency accountable for its stewardship. In the eyes of the farmers, this lack of effective participation in decision making contributed to ICOUR's lack of accountability, an important good governance principle.

The fact that the views and concerns of water users, which were often channelled through their leaders during consultative deliberations with ICOUR, were rarely considered in the final decision making, created credibility problems for government's commitment towards decentralising irrigation water resource governance to local government authorities and the water users. This study found that the water users and their leaders became frustrated at the lack of genuine commitment on the part of government irrigation agencies for the devolution of irrigation governance to the water users, as stated in policy documents and statements discussed in chapter three. Some of the irrigators expressed their feelings in this regard as follows:

ICOUR fails to consider our concerns. They do not consider our views in their decisions, but always rather determine what they think is good for us (male irrigator, Vea, VFM076. December 20, 2011).

Interviews with ICOUR management staff corroborated the views of the water users and community leaders that there was in practice limited participation in the irrigation water governance decision making and implementation a process.

...the farmers are not involved in making decisions on water distribution schedules because it is a technical area that we do not actually need to involve them. We decide and then inform them about it (senior staff, ICOUR, IM160. January 19, 2012).

Honestly, we don't involve the chiefs in the management of the water. We only interact with the lateral leaders. Normally we find ourselves dealing

with the chiefs only when we have some problems which we think we cannot keep from them. We haven't seen any situation that demands that we need to involve the chiefs more than we are doing now (senior staff, ICOUR, IM160. January 19, 2012).

ICOUR management's failure to include the traditional authorities and the lateral groups in major irrigation water governance decision-making was based on the technical nature of the water management. In contrast to ICOUR management's claim, Frank (2006) argued that in water governance, knowledge is no longer considered as a unidirectional resource, transferred from the expert to the end-user, but as a resource to be discussed between stakeholders with different perspectives and perceptions. Frank further argued that power is not a commodity to be transacted between elites, but a set of relations for negotiation between different groups through new mechanisms such as alternative dispute resolution.

Institutionalising citizen participation in irrigation water governance at the local level in the study area was further complicated by the unclear delineation of the roles and responsibilities of various actors – community stakeholders (WUAs/Lateral Groups), District Assemblies, and irrigation agencies (ICOUR and MOFA/GIDA). A formal division of management responsibilities and roles between government irrigation agencies and farmers is imperative in any irrigation system requiring co-management arrangements, or where farmers have limitations in the performance of all functions. The analysis revealed that in the case of the governance and management arrangements in the FMS, the schemes were transferred to the WUAs without clear roles and responsibilities being assigned to farmers and MOFA/GIDA (the irrigation agency).

The present unsatisfactory situation stifled local stakeholders' preparedness to clarify their real interests and concerns, so that there was not the sharing of information and

knowledge that may take place in a consultative environment. Instead, there was a tendency for a lack of transparency, mistrust and entrenchment of vested interests that further stifled participation in collective action around water resource governance. The current level of farmer participation in all the case studies fits Arnstein's level of 'tokenism' – water users were informed about some decisions and sometimes consulted on issues where their cooperation and compliance might be needed, but their interests, inputs and concerns were rarely taken seriously during the decision and implementation processes. Employing the IAP2 spectrum, the level of farmer participation is at best equated with that of informing water users and local people of the issues, and consulting with them for feedback on contentious decisions. Water users' fuller involvement in the process, where their aspirations and concerns could be clarified and considered, was clearly lacking.

Interview responses with some participants indicated that the communities in the GMS had limited influence on the governance decision-making process. By and large, water governance was being planned for the communities by ICOUR. Thus, the governance principle of inclusiveness (Lockwood et al., 2009) was compromised. The implication is that widespread participation, including that of the traditional authorities in decision making, was limited. A response from a male irrigator in Nyariga expressed the feeling of alienation, which was supported by majority of the water users:

It would have been good if we sit with ICOUR and agree about the levy. However, ICOUR normally comes out with the price which we have to accept. This means we are forced to accept the levy ICOUR proposes or else we don't get water (male irrigator, Nyariga, NMF115. November 30, 2011).

The traditional authorities, as well as many irrigators, observed that their low participation in major decisions was not only affecting irrigation water resources governance, but also the growth and development of their communities. A traditional leader stated:

We want to be included in the management of the water because we have realised that our absence in the management retards irrigators' activities and subsequently the growth and development of the community. When the canals and laterals were broken and ICOUR staff came to repair them; it did not last and they deteriorated again. This was because some of the cement that was given to the ICOUR workers to be used to repair these canals and laterals were not accounted for. The workers did not use all the cement so a lot of shoddy work was done (village leader, Vea, VCL066. December 31, 2011).

The livelihoods of the irrigators depended on the provision of irrigation water in the GMS, hence they needed to actively participate in the governance decision making process. The first principle of the IAP2 (2009) model of participation presented in section 2.11.2 acknowledged that people have a natural desire to participate in decisions that affect them, as was expressed in the quote from the community and other irrigator leaders above. Interviews with all the traditional authorities and majority of the irrigators in the GMS showed that they were dissatisfied and apprehensive because they were not actively involved in the governance and management of the scheme. They were concerned that the eventual breakdown of the system would deprive them of their livelihoods and source of income. The local water users were demanding a greater level of participation and involvement in management decisions of the scheme, which is consistent with the IAP2 principle of “natural desire for participation.”

Prior (2010) stressed that the 'inform' type of participation is more likely to be important to people at the early stages of the planning process whilst 'consult' or 'involve' may be more appropriate during the later stages. Prior's observation is relevant to the current irrigation water resource governance at the local level. The feelings expressed by all the community leaders and majority of the irrigators indicated that water users expected to have moved beyond 'inform' to the 'consult', 'involve', 'collaboration' and 'empowerment' stage of the IAP2 participation spectrum model, so far as the governance of the government-managed irrigation scheme was concerned. Having a right to be heard is not the same as having the power to influence decisions that affect one's livelihood.

In practice, participation in governance functions in both FMS and GMS case studies did not meet the definition provided by Agrawal and Gibson (1999) in relation to the concept of participation. Participation was merely tokenistic because the marginalised groups in the FMS could not influence the decisions made by their chiefs and elders, but were only required to comply with the institutions. Similarly, in the GMS cases, ICOUR controlled major irrigation water resource governance decisions. Real participation requires that citizens are empowered to 'participate in, negotiate with, influence, control, and to hold accountable institutions that affect their lives' (Arnstein, 1969, World Bank 2002:11, IAP2, 2009). Participation in irrigation water resource governance decisions in the current study fell short of such conceptualisation of participation. The participation of majority of the water users in the study area was largely limited to participation in directive activities.

The result of low participation of the communities in the GMS on one hand, and of women, young irrigators and non-natives in the FMS on the other hand, indicated that

little effort was made to build the capacities of the water users to participate in major decisions at the village level. The analysis also revealed that decision making power was in the hands of the powerful elites which limited the available governance capacities at the local level. The current dichotomy of participation (decision-making and directive activities roles) fell far short of inclusiveness, which is an important good governance principle identified by Lockwood et al. (2010), and seen as a core element in community-based approaches to resource governance.

Ostrom's (1990, 1992) design principles for self-organised irrigation systems dealt with the structure and process of self-organised groups. The design principles also consider the conditions under which self-organised groups participate in collective actions. Thus, in the next section I will expand on the factors that influenced participation in irrigation water resources governance at the local level.

8.3 Factors Affecting Water Users Participation in Irrigation Water Resource Governance

Interviews with participants from both FMS and GMS revealed that participation of the majority of the water users in all schemes was largely influenced by community attributes such as economic, socio-cultural, and institutional factors, as discussed in section 2.12 describing the conceptual framework. These factors influenced the willingness as well as the ability of the irrigators to participate. To avoid repeating the effects of these factors on the irrigators' participation in the governance process as discussed earlier, the factors identified from the analysis are summarised and represented conceptually in Figure 8.2. Findings in respect of each of these factors are discussed briefly in terms of economic, social and institutional factors.

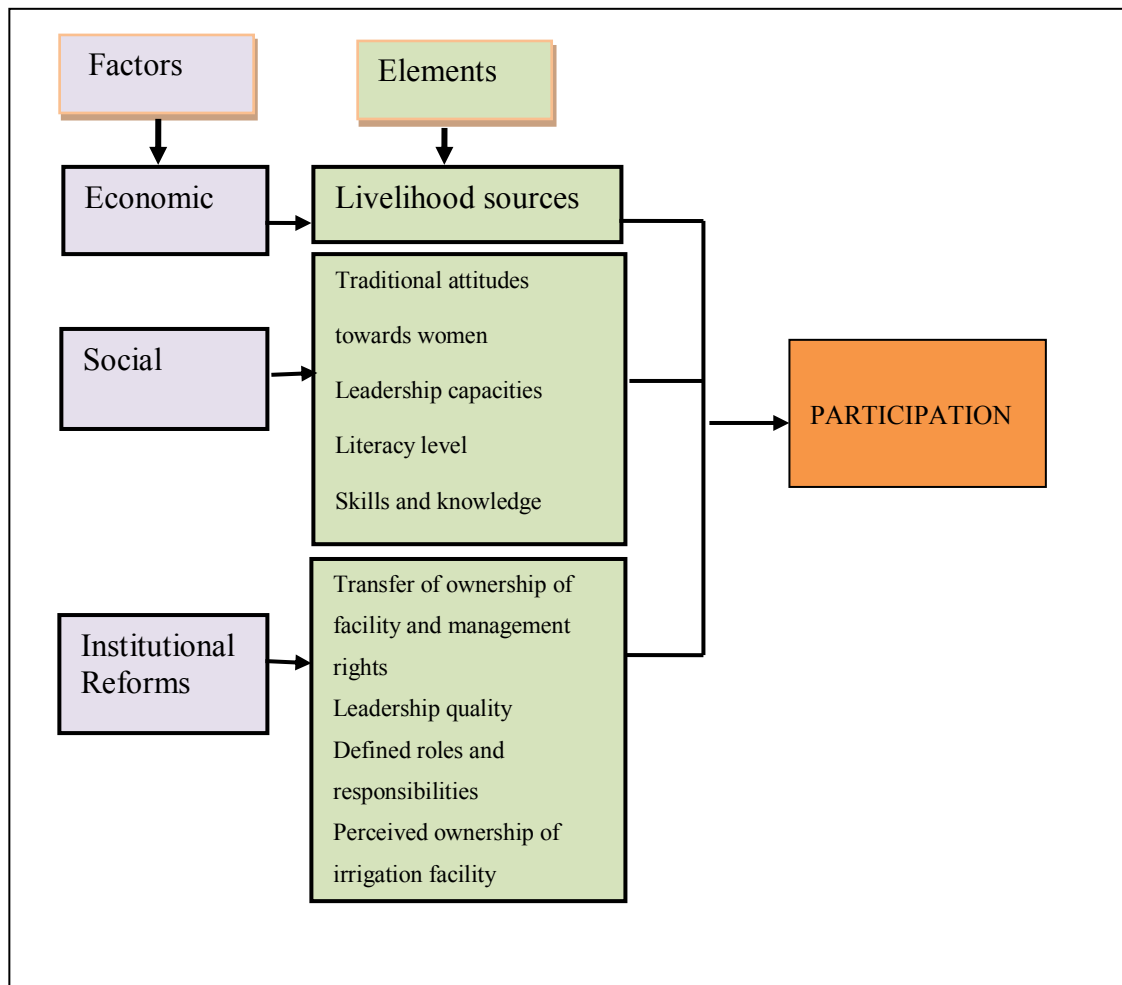


Figure 8-2 Factors that influenced water users' participation in irrigation water resource governance

Source: Field data (November 2011-February 2012).

8.3.1 Economic Factors

As shown in figure 8.2 the main economic factor that influenced the irrigators' participation in irrigation water resources governance in both FMS and GMS, was the fact that the water resources were their main sources of livelihoods, especially during the long dry season when they have no alternative modes of employment. Examples of responses from the majority of the irrigators that highlighted the views on economic factors are stated below.

The reservoir is our source of livelihood. If we allow it to collapse what will we do? If the reservoir collapses then we are also finished. That is the reason why we are able to play our roles well in contributing to the maintenance of the laterals (male irrigator, Vea, VFM073. January 5, 2012).

We mend the canals and pay the water levy because we depend solely on the irrigation, and that encourages us to be involved massively (male irrigator, Vea, VFM089. January

8.3.2 Social Factors

As noted in the previous chapters, the social attributes such as social norms, were found to positively and negatively influence the degree of water users' participation in irrigation water resources governance. Social benefits such as food security, employment opportunities, literacy, and skills and knowledge, leadership capacities, and communication processes also affected community stakeholders' participation.

The economic benefits of irrigation farming in terms of more stable incomes were directly related to the social benefits. A majority of study participants, irrigators and community representatives were of the view that access to dry season irrigation had improved individual and community life, as they could pay children's school fees, take care of their health needs, establish small businesses and improve their housing. Invariably, these benefits derived from the acquisition of irrigation water serving as incentives for users participating in water governance processes, especially the operational aspects of water management. Interview responses from some the participants are stated below.

We are aware of the benefits of food availability to us the farmers. This inspires us to commit ourselves to maintaining the facility in order to

*enhance our farming activities to ensure high increased crop production and food availability (male irrigator, Vea, **VFM076**. December 20, 2011)*

*It is from this irrigation farming that we are able to put a roof on our heads (build a house to live in) (male irrigation farmer, Nyariga, **NFL142**, November 11, 2011).*

Other indirect benefits of participation to the WUAs and lateral groups as observed through field observation related to conflict resolution, teamwork, negotiations, greater appreciation of group dynamics, lobbying, confidence to engage with other stakeholders, and self-reliance. Some of these skills were displayed during fieldwork and sideline interactions the researcher had with study participants, where irrigators as well as their leaders were very articulate about their concerns, and female study participants expressed strong views about the low involvement of women in WUA leadership positions in a male dominated society.

However, some of the study participants acknowledged that women and youth, who also have very innovative ideas, were marginalised in the water resources governance processes and called for measures to redress the imbalance. Some stated:

*The good suggestions and ideas from the younger irrigators during meetings are discarded, but the ideas or suggestions from older irrigators that are not as good as those of the younger farmers are rather considered on the grounds of their age (young male irrigator, Winkogo, **WFM048**. December 28, 2011).*

*As for we the women, we are not natives from this community; we came from other communities and got married to our husbands in this community and because of that we cannot play any leadership role (non-native woman, women's focus group, Winkogo, **WWFG**. January 2, 2012).*

As revealed in the quote above, some women were doubly discriminated against because they were non-native as well as being women.

Also, some of the irrigators interviewed in both farmer-managed and government-managed schemes revealed limited skills in financial resource mobilisation and facility repair and maintenance, all necessary to actively participate in irrigation water resource governance processes. The irrigators therefore expressed the need to be trained in order to be able to participate in governance effectively, as stated below.

We are ready to learn from any form of training that will help us manage the water to improve our irrigation activities. When we are trained on how to repair the canals we will not wait or call on anybody to do it for us (mixed focus group, Winkogo, WMFG. January 2, 2012).

No, the irrigators are not involved in water distribution schedule because it is a technical area that we do not actually need to involve them. (senior staff, ICOUR, IM160. January 19, 2012).

The irrigators needed the necessary capacities to be able to participate effectively in the governance processes. The water users and the traditional leaders in the GMS, for example, could not negotiate effectively with ICOUR management partly because they were disadvantaged due to their low level of literacy and skills. Uphoff (1991) referred to external support from government and development agencies as the paradox of participation, where “top- down” efforts are required to promote “bottom-up” development. Continuous external support to the participants of local level irrigation water governance is important in the study area.

Included in the social factors that influenced the irrigators’ participation was leadership capacity, which was discussed in detail in sub-section 7.2.1.2. Irrigators claimed that some of the WUA and lateral group leaders were more committed than others to water

governance at the local level. Their commitments affected the extent to which they were able to mobilise the irrigators for collective action. Committed and effective leaders also motivated and coordinated the water user groups to participate in the governance process. A majority of the irrigators in Durongo, the FMS, and Vea and Nyariga, GMS perceived their leaders to be effective in organising them for collective action, as discussed in the previous chapters. Notwithstanding the views from the majority of the irrigators interviewed in Durongo, Vea and Nyariga, that their leaders were committed and effective, a minority of the irrigators interviewed felt that their leaders were not very effective in mobilising them for effective participation. As discussed earlier in chapter seven, in Winkogo the majority of the irrigators stated that their leaders were ineffective and rarely organised the WUAs to participate in resource mobilisation.

8.3.3 Institutional Factors

Institutional factors that influenced water users' participation included perceived ownership rights of irrigation facilities, and defined roles and responsibilities. The effects of these factors on irrigation water resource governance have been discussed in the previous chapters in detail.

Irrigators' perceptions about the legal ownership rights of the irrigation facility and clarity of roles and responsibilities affected the extent to which they participated in irrigation water resource governance. The irrigators in Durongo FMS found it difficult to accept ownership and feel a sense of responsibility towards irrigation facility maintenance because of the government's failure to communicate clearly to the community who actually owned the irrigation facility. The irrigators in Durongo also found it difficult to see the link between government's decentralisation process and its decision to engage a contractor to carry out repair works on the village's reservoir

without involving the community. The irrigators were not only excluded, but the process also lacked transparency and accountability. A representative from the WUAs in Durongo stated in a focus group interview that:

The problem we have is that, as at the time the rehabilitation of the reservoir we were not informed about the government's decision to engage a contractor to repair the resource. Neither were we informed about the roles to play (mixed focus group, Durongo, DMFG. February 4, 2012).

The exclusion of the community in participating in the rehabilitation of their irrigation facility raised doubts about government's commitment to decentralised governance which theoretically intended to improve resource users' participation, ownership and control. The exclusion of the community from the rehabilitation of the reservoir limited their sense of ownership of the irrigation facilities and in turn negatively affected their level of participation.

8.4 Synthesis and Conclusion

This chapter explored the extent to which decentralisation policy has contributed to water users' participation, and how much it supported community-based approaches for irrigation water resource governance processes. The chapter sought to address the following research question:

6. To what extent has the devolution (decentralisation) of irrigation water governance promoted water users' participation in community-based irrigation water resource governance?

The study identified two types of participation in the case study area: (i) participation in decision making, and (ii) participation in directive activities. Water users' participation

was largely influenced by economic, socio-cultural, institutional, and physical attributes of the communities.

The decentralised structures and processes have made more contributions to the FMS than to the GMS in terms of community-based resource governance outcomes of participation, and ownership. The study found a significant difference between the performance of the FMS and GMS in respect of achieving community-based governance. Farmer perceptions of ownership of irrigation facilities were stronger in the FMS than in the GMS ones. This is an indication that the FMS had made greater progress towards community-based governance than the GMS. This can be viewed as one way that decentralisation had contributed towards community-based governance.

Although the community stakeholders have expressed the desire to participate in the irrigation water resource governance processes, broad-based participation was largely influenced by economic, socio-cultural, institutional, and physical attributes of the communities. Broad-based participation was limited to directive activities (operational activities). Thus, existing structures had limited broad-based participation among all WUA and lateral group members. Community-based irrigation water resources governance is a process requiring irrigators to participate meaningfully in the governance decision-making processes. Thus, substantive power and control directing the irrigation governance process must reside in the water users for the process to be authentically community-based. This perspective views irrigation water resource governance not as a service to be provided by an outside agency, but rather a self-organised service provided by the irrigators with support from external agencies including government. Management of irrigation schemes from a traditional project

perspective that focuses on project outputs rather than on sustainable livelihood objectives may not achieve governance outcomes of participation as intended in policy.

Chapter 9 Interaction and Collaboration of Stakeholders

9.1 Introduction

Many scholars have argued that decentralisation when implemented well increases linkages and integration of plans and activities and builds social capital between different actors (Andersson, 2004; Dietz et al., 2003; Gibson et al., 1999; Ostrom, 1990). The claimed benefits of decentralisation for stakeholders indicated the need to understand to what extent this has occurred in irrigation water governance at the regional, district, and community levels. This chapter seeks to address the following research questions:

7a. how has the decentralisation initiative promoted stakeholders' interaction and collaboration at the community, district and regional levels?

7b. how are the stakeholders coordinated for irrigation water resources governance at the community, district and regional levels?

Following the global trend, decentralisation has become a tool in water resource governance reform, including efforts to develop community-based approaches to irrigation water resource governance in Ghana (MWRWH, 2007; MOFA, 2011). As a result of the move toward decentralised governance, various community, district and regional stakeholders were engaged by MOFA during the initial stages of the irrigation management transfer process in the early 1990s. Strengthening of stakeholder collaboration and coordination was identified as a desired governance outcome at all levels (MWRWH, 2007; MOFA, 2011). The Webster's English Dictionary defines collaboration as "to work in association with." Collaboration as used in this study

means to work in association with or cooperate with other stakeholders at the regional and district levels to pool resources for achieving effective irrigation water resource governance at the community level. The Webster's English Dictionary also defines 'to coordinate' as "to harmonise." Coordination as used in this study means to bring various stakeholders together at the regional and district levels in order to integrate their annual plans, activities, and resources to achieve irrigation water resource governance outcomes at the community level.

Ostrom's (1990, 1992) design principle eight, encompassing nested enterprises (polycentric governance) (see Table 2.2) emphasised that resource governance should include all individuals in self-organised groups and stakeholder organisations at different scales. Thus, the core of the Institutional Analysis of Development (IAD) framework is the 'action situation', which is the social spaces where stakeholders interact, exchange goods and services, ideas, solve problems within institutional arrangements" (Ostrom 2011:11). As noted in the description of the conceptual framework (section 2.12), in the 'action arena', different stakeholders are involved in decision-making in the governance process (Hufty, 2009). Table 2.2 also presented the eight governance principles identified by Lockwood et al. (2009) that together provide a guide for collective action among many stakeholders at different levels in natural resources governance processes in the case-studies.

Thus, the focus in this chapter is on stakeholders' collaboration and coordination for achieving community-level irrigation water resource governance outcomes, which is distinct from chapter five where the focus was on the role and impacts of the local level structures and institutional arrangements on community-based irrigation water governance.

This chapter in section 9.2 identifies relevant stakeholders participating in irrigation water resource governance. The interaction and collaboration outcomes of these stakeholders are discussed in section 9.3. Section 9.4 synthesises and concludes the chapter.

9.2 Stakeholders in Irrigation Water Governance

This section addresses the research question, *'how has the decentralisation initiative promoted stakeholders' interaction and collaboration at the district, regional and community levels?'* The stakeholders identified in irrigation water governance within the case-study settings have been grouped into regional-district-level stakeholders and community-level stakeholders to align with the categorisation of actors described in chapter five. The major stakeholders were decentralised government ministries, departments and agencies (MDAs) in the region and districts, and a few Non-Governmental Organisations (NGOs) based in the regional capital, but with operations in the districts. Government stakeholders include the Ministry of Food and Agriculture (MOFA)/Irrigation Development Authority (IDA), the Irrigation Company of the Upper Region (ICOUR), the Departments of Cooperatives, Community Development, and Town and Country Planning. The decentralised government agencies at the regional level included the Environmental Protection Agency (EPA), Water Resources Commission (WRC) – mainly responsible for increasing coordination within the water sector. At the time of the study there were no NGOs involved in irrigation water governance in the case study communities. The community-level stakeholders were the District Assembly and Unit Committee members, who served as links between the communities and the Assemblies. Others were the Water Users Associations (WUAs), Lateral Groups, traditional leaders, village development committees, and the Apex Group of Lateral Groups. These stakeholders, and pathways of relationships between

them, are shown in Figures 5.1 and 5.2 of chapter five. For the purpose of this study, references will be made largely to the two categories of stakeholders as district-regional-level and community-level stakeholders respectively. In this chapter, the detailed interactions among the stakeholders and the strengths of these interactions are discussed.

The strength of the relationships between the stakeholders was assessed through key informant interviews with the stakeholders' representatives. Open-ended questions were asked to ascertain the frequency of interactions between the stakeholders in terms of meetings, exchange of reports, face-to-face interaction, participation in each stakeholder's activities, and support received from one another to determine the strength of these relationships.

The WUAs and lateral groups were the focus of the stakeholders' interaction and collaboration. The strength of the relationships among the stakeholders in the regional, district, and community level ranged from fairly weak, to weak, and very weak relationships and interactions. The variables used to determine the existence and strength of the interactions and collaboration between the stakeholders included integration of stakeholders' annual plans, activities and resources; inclusion in other stakeholder's activities; support received by each stakeholder; and communication between the stakeholders. Generally, all the interactions were weak, but some were weaker than others. These relationships are discussed in detail in the subsequent sections.

9.3 Stakeholders' Interaction and Collaboration Outcomes

This section examines the perceived outcomes of the stakeholders' interaction and collaboration at the regional, district and community levels. The stakeholders' interaction and collaboration outcomes examined in this section include:

1. horizontal interaction and collaboration among regional and district stakeholders;
2. integration of district and regional level stakeholders' plans towards irrigation water governance at the community-level;
3. clearly defined roles and responsibilities for the district and regional level stakeholders;
4. vertical interaction between district, regional level stakeholders, and the local level stakeholders;
5. vertical interaction between DA decentralised structures and community-level stakeholders; and
6. vertical and horizontal interaction among district and regional stakeholders and between community stakeholders on irrigation water governance.

9.3.1 Horizontal Interaction and Collaboration among Regional and District Stakeholders

As discussed in section 9.1 one anticipated outcome of decentralisation is increased linkages between stakeholders. Thus, this sub-section examines the horizontal interaction among the district-regional stakeholders and the outcomes of such interactions in relation to irrigation water governance at the community level.

Responses from a majority of the district and regional level stakeholders described their relationships and interactions as very weak. The majority explained that they had interaction with some of the other stakeholders several years ago, for instance in the

early 1990s when they were involved in the LACOSREP phase I and II. Some stated that they did not even know the locations of some of the district and regional stakeholders and therefore did not know their roles and responsibilities in relation to irrigation water resource governance. Also, some stated that they did not have any direct interaction with the other stakeholders in the region. Interview responses for some of these stakeholders are presented below:

*We don't have much interaction with the Environmental Protection Agency (EPA). It was during the LACOSREP era that they saw the need to assess the environmental impacts of the reservoirs. So they contracted a consultant and EPA was tasked to supervise the contractors. Since EPA submitted its report, we haven't had any interaction with them at the municipal level (Director, Bolgatanga Municipal Department of Agriculture. **P148**. January 20, 2012).*

*The Municipal Agriculture Development Unit doesn't even know that the Water Resources Commission (WRC) is in the region and so in effect we have no relationship with them (Director, Bolgatanga Municipal Department of Agriculture. **P148**. January 20, 2012).*

*Apart from a training workshop that we invited ICOUR to attend, we have not had any regular interaction with them. With the WUAs, we don't deal with them directly (Regional Officer, Water Resources Commission, **P147**. January 18, 2012).*

The weak interaction and collaboration among the stakeholders at the district and regional levels meant that there was rarely joint planning and implementation at district and regional levels in relation to community level irrigation water resource governance. The Ghanaian irrigation policy required effective stakeholders' partnerships in irrigation water resource governance, involving both formal and informal sector organisations and actors. The policy (MOFA, 2011:13-15) states:

The strategy for implementing this major policy objective will be driven by Ghana Irrigation Development Authority (GIDA) and Women in Agricultural Development (WIAD) as the key implementing units within MOFA. Key collaborating agencies will be the Ministry of Lands and Natural Resources; Ministry of Local Government and Rural Development; (MLG& RD); Ministry of Women and Children's Affairs; Traditional Authorities; the private sector; and field based NGOs.

The key implementing units will be GIDA (for MOFA), the District Assemblies (DAs), and Water Resources Commission (WRC) with close collaboration from the Department of Cooperatives, the private sector and field based NGOs and farmer associations.”

Interviews with ICOUR revealed that its staff rarely interacted or collaborated with district and regional stakeholders on irrigation water resource governance. The ICOUR representative interviewed stated that ICOUR’s interaction with MOFA and GIDA was mainly motivated by responses to interview questionnaires from MOFA and GIDA researchers which had nothing to do with irrigation water resource governance decisions. Furthermore, the interaction between ICOUR, MOFA, GIDA, and WRC usually occurred at the regional and national levels regarding policy and sectoral budgeting, and not in relation to water governance at the local level. ICOUR’s interaction with the District Assemblies was also in response to an invitation to attend the District Assembly meetings to share information on the Veia irrigation scheme, and not about irrigation water governance planning decisions. ICOUR management explained its interaction with other decentralised departments and agencies broadly as follows:

It is our Managing Director who has direct relationship with GIDA and MOFA at the national level. Our budgets are approved by the government under MOFA’s budget, so our directors interact more with MOFA than any

of the partner groups. There was no occasion when MOFA staff were directly involved in the management of irrigation water resources. The only time we see MOFA, GIDA, WRC and EPA is when they are carrying out research, and want us to respond to research questionnaires. We have never invited MOFA, WRC, GIDA and EPA before, and we have never received any invitation from them. Apart from EPA that has ever invited us to attend their workshops some time ago, I haven't seen any organisation that has shown any interest in working with us (senior officer, ICOUR, IM160. January 19, 2012).

Interviews with the district-regional-level stakeholders in order to understand the reasons for the weak interaction and collaboration between them revealed that they held negative perceptions about each other. A representative from the Department of Community Development explained that the attitude and behaviour of MOFA as the lead agency during the irrigation water management transfer in the 1990s partly accounted for the weak relationships. Reflecting on events in the past, he expressed dissatisfaction with the role MOFA played during the formation of WUAs and transfer of small scale irrigation schemes, which were either constructed or rehabilitated under IFAD funded LACOSREP I & II, to community WUAs:

The sad thing is that when they ask you to be a lead agency of a project, the tendency for you to hijack the whole project is high and because of this attitude it made the other stakeholders to stay back and watch (officer, Department of Community Development. P149, January 31, 2012. January 27, 2012).

Thus, lack of interaction and collaboration among the regional and district decentralised MDAs was partly explained by the monopolistic attitude adopted by MOFA in the decision-making and implementation of irrigation water management transfer in the early 1990s. MOFA's dominant and technocratic control over irrigation water

management transfer prevented other regional and district government agencies, which had various roles to play as partners, from participating effectively in the irrigation water governance processes in the communities. Apart from MOFA and ICOUR, no other ministry, department and agency had interacted or collaborated with either the WUAs in the farmer-managed schemes or the lateral groups in the government-managed schemes.

As Ostrom (2011) noted, achieving efficiency requires that accurate information is provided to all actors to make decisions. She argued that effective sharing of information increases accountability. However, the feeling by other stakeholders that MOFA hijacked and monopolised the governance process stemmed from the fact that MOFA had been granted more power and resources than other stakeholders, so that it (MOFA) appeared to dominate the governance processes even if other stakeholders had access to the same information. This explained the feeling of exclusion by some of the stakeholders, resulting in the withdrawal of the rest of the stakeholders during the LACOSREP phases I and II implementation. The feeling that MOFA excluded other stakeholders explains the apathetic attitude adopted by the other decentralised departments and agencies after the project had ended.

Because of the negative attitudes the district and regional level stakeholders had towards each other they also did not feel obliged to share information with each other. The quotes below provide the reasons for the failure to share information with other stakeholders.

Actually we are not obliged to provide GIDA with information about what we do but we do give them any specific information they asked for. There is no structured way by which we have regular contact with these institutions [organisations] where we exchange information. The Chief Executive of

GIDA is a board member of ICOUR and we have quarterly reports that are compiled by our Chief Monitoring Officer at the national office and he makes copies to all those who matter including the board members (senior officer, ICOUR, IM160. January 19, 2012).

Sometimes the NGOs will link up with the District Assemblies to construct or maintain some reservoirs without telling MOFA about it (extension officer, Department of Agriculture, P153. January 24, 2012).

Prior (2010) noted that information needs of stakeholders vary at different stages of stakeholders' engagement, therefore continuous information sharing during stakeholders' interaction is important. Information needs are defined by the outcome of continuous stakeholder interaction process as stakeholders identify issues, interests and concerns, and potential disagreements, and conflicts or choices regarding future developments emerge. The above quotations and the wider sample, from which they were drawn, highlighted limited information flow between the regional and district stakeholders due to lack of effective stakeholders' interaction. The more information the district and regional stakeholders had about what existed and was happening on the ground concerning irrigation infrastructure, water use, and management through monitoring and evaluation, and stakeholder interaction, the better would have been their interactions and collaborations for planning decisions regarding the problem at the local level.

In generally assessing the implementation of Ghana's local government decentralisation policy, an officer of the Department of Community Development described the process as theoretical and non-inclusive.

At times I feel bad when people are talking about decentralisation. To me it is not actually on the ground. It is just by name and because of that there is very weak collaboration and interaction among the decentralised

departments and agencies (Department of Community Development. P149, January 31, 2012. January 27, 2012).

Effective stakeholder interaction and collaboration in irrigation water governance requires that all stakeholders must be treated fairly (Lockwood et al., 2009) with well-defined roles, responsibilities, and working rules (Ostrom, 1990, 1992, 2011). Prior (2010:11) noted that poor governance capacity and inadequate institutional frameworks for managing stakeholders' participation or for implementing outcomes of stakeholders' participation render such exercises ineffective, and create stakeholder mistrust in both the process and convening organisations. Lack of effective interaction, collaboration, and networking among the stakeholders could mean limited leveraging of social capital and collective actions required for irrigation water resource governance at the regional, district, and community levels. The more communities or groups or organisations work together, the more social capital is produced; and the less people or organisations work together, the greater the depletion of community stocks of social capital (Putnam, 1993).

Mechanisms for sustainable, on-going collaboration between and among the district and regional stakeholders and water users need to be put in place to facilitate effective irrigation water governance processes at the district and community levels. Prior (2010) argued that both vertical and horizontal social linkages are important among and between stakeholders. However, Prior noted that vertical linkages are more challenging for networks, as the alignment between grass-roots needs and interest and sub-regional and regional needs and interests must be maintained. The more complex those vertical networks are, the more planning processes must be coordinated and integrated in a multi-level participatory fashion. Prior's hypothesis on the complexity of vertical relationship between stakeholders at different levels applies to the current study.

9.3.2 Integration of District and Regional Level Stakeholders' Plans towards Irrigation Water Governance at the Community-Level

This section examines the extent to which regional and district level stakeholders' annual plans were integrated to influence community-level irrigation governance outcomes. Since there are different agencies responsible for different aspects of water resource governance in Ghana, the Ghanaian water policy document stated that a sector-wide (programme) approach (SWAP) should be followed to implement policies, plans and programmes in the water sector. This approach was to ensure effective integration of plans and activities and resources to achieve community-level irrigation water resource governance. This is consistent with the governance principles of integration of Lockwood et al. (2009) which is concerned with reducing the overall transaction costs of programme delivery. The objective was to strengthen linkages between sector programmes at all levels - communities, districts, and regions (GoG/MWRWH, 2007).

The actual planning process was for Ministries, Departments and Agencies (MDAs) at the district level to submit their annual work-plans to their regional offices for collation and submission to national offices for approval and budgeting. However, what is implemented depends on availability of funds and national priorities which is largely politically determined. It is only at the implementation level that inter-sectoral planning was required. However, interviews with all the government-stakeholder agencies and departments at regional and district levels revealed that they did not integrate their annual work plans and activities towards community-level irrigation water resource governance. This trend could be explained by the fact that the initial planning and implementation of small scale (farmer-managed) irrigation schemes funded by IFAD in the early 1990s was done at the regional level and not at the district level. This explains why the district departments did not have plans for irrigation water resources

governance. Therefore district level structures were not put in place for irrigation water resource governance at the time; hence it is taking a long time for integrated planning to develop for irrigation water resources governance at the district level.

The individual sector and agency planning approach created further challenges for cross-sectoral planning, integration, and implementation of community-level irrigation water resource governance. This has contributed to poor irrigation water resource governance outcomes of participation, control, ownership and adequate irrigation water supply. Lack of integrated regional and district levels of irrigation water resource planning meant that there was lack of clear strategic directions regarding irrigation water resource governance in the study area. This is evident from interview responses from some officials from the departments and agencies:

MOFA has its own mission and vision to follow just like the Department of Cooperatives and Department of Community Development. We don't have the same policy that guides us to work together. Each of us has different policy that we follow so our plans are not integrated (director, Department of Agriculture, Bongo, P157. January 26, 2012).

If you don't see us complementing each other then, of course you must know that there isn't any integration. There is nothing like integration and coordination because we don't plan together. Now they say we are decentralised and so I have to report to the District Chief Executive, but we do our planning with our Regional Office and we implement our activities irrespective of that of the District Assembly. (director, Department of Agriculture, Talensi Nabreservoir, P152. January 23, 2012).

EPA works from the Regional Office in Bolgatanga and has its own line of authority; their plans are not integrated with any department. Likewise MOFA has its own line of authority and so are the rest of the departments and agencies. They don't have a common pool resource for joint activities;

they don't plan together. In their planning, they don't make room for funds for inter-departmental meetings. Apart from the geographical distance between the departments and agencies there are issues of power distance [unequal power] (officer, Department of Planning, P155, February 2, 2012).

The lack of integrated regional and district irrigation water annual plans to serve as a reference point for all the stakeholders to achieve irrigation water resource governance at the community-level highlighted the fact that district-level departments were still accountable to their 'parent' Ministries, Departments and Agencies (MDAs) rather than to the District Assemblies. The analysis has shown that priorities for sector annual plans were still defined and controlled by the sector Ministries, Departments and Agencies (MDAs) at the regional and national level. Some district stakeholders explained the lack of integration of annual work plans and activities as follows:

EPA and WRC are not decentralised; their activities are not integrated with that of the district. EPA and WRC are not obliged to give us their plans and reports but we are at the centre of everything. There is the need for us to integrate more (officer, District Planning Department, P150, February 5, 2012).

I must be honest with you. We haven't tried to coordinate because all the organisations are parallel in their work. All of them including MOFA have their own line of authority so they don't plan together (District Planning Department, P155, February 2, 2012).

Interviews with some of the district stakeholders also revealed that there were no specific water resources governance plans in the districts based on their own assessment of the reality on the ground. The lack of specific water resources governance plans in the districts was due to the vertical and hierarchical reporting structure of the decentralised departments to their parent ministries in the regional and national offices.

Some of the representatives from the district decentralised departments interviewed described the situation as:

In the last five years we did not have any plans for irrigation water management. We brought the inputs from the stakeholders into our planning some of which may have to do with irrigation, but the implementation depends on the availability of funds and human capacity. I cannot say we have the capacity to manage irrigation water resources. Much of the problem has to do with funding. Once we did not have funds, we talked theoretically (District Planning Department, P150, February 5, 2012).

To the best of my knowledge... the District Assembly does not have much to do in irrigation. Immediately after the construction of the reservoirs, nothing much is done by the District Assembly (District Agriculture Technical Officer, P153, January 24, 2012).

We didn't plan anything. Water management has not been part of MOFA's policies. One of MOFA's objectives is sustainable land management and what we do is soil erosion control and techniques to conserve moisture in the soil (District Agriculture Department, P152, January 23, 2012).

These quotes indicate that irrigation water governance was not a priority for some of the decentralised departments and agencies interviewed.

9.3.3 Roles and Responsibilities of the District and Regional Level Stakeholders

The previous sub-section examined integration challenges in terms of joint planning and harmonisation of work plans and its impact on local level irrigation water governance. In this section, roles and responsibilities of the stakeholders at the regional and district levels are examined in relation to stakeholders' interaction and collaboration efforts.

Interviews with some district and regional level stakeholders revealed that there was lack of clarity of roles and responsibilities regarding irrigation water governance at the local level, as evident from the following responses.

We don't have any defined role specifying who is supposed to do this and who is supposed to do that. If that was in place, we would have known how to integrate and coordinate our activities (director, Department of Agriculture, P152. January 23, 2012).

If you take irrigation water management for example, we don't have any specific task [role] that MOFA should carry out [play]..... (director, Department of Agriculture, P157. January 26, 2012).

Reservoirs constructed in the communities are supposed to be handed over to MOFA and not the District Assemblies even though MOFA is under the District Assembly (extension officer, Department of Agriculture, P153. January 24, 2012).

The findings of the study revealed that roles and responsibilities were not well defined and accepted by all the regional and district level stakeholders. Hence, most of these stakeholders felt they were not engaged on an equal basis in decision-making processes. The fact that most of the stakeholders were excluded meant that the project document that articulated the roles and responsibilities of all stakeholders was not accessible to them. The lack of definition of roles and responsibilities was viewed by other stakeholders as a lack of transparency and fairness. The lack of well-defined roles and responsibilities for district and regional decentralised structures for irrigation water resource governance was partly due to lack of district level integrated and coordinated annual plans for community-level governance. Thus, the impact of the current district and regional level decentralised structures on community-based irrigation governance outcomes at the local level was insignificant.

9.3.4 Vertical Interaction between District- Regional Level Stakeholders and the Local Level Stakeholders

The earlier sections of this chapter examined the horizontal interaction among the district and regional level stakeholders and its outcomes. In the local government system, the District Assembly members and representatives of its sub-structures (area councils and unit committees) serve as links between the communities and the Assemblies in order to facilitate vertical interaction. This sub-section examines outcomes resulting from district-regional stakeholders' interaction with the community-level stakeholders. Vertical support from the decentralised departments and agencies to the WUAs and lateral groups at the community level were considered in this study to be important factors in assessing stakeholders' interaction and collaboration for irrigation water resource governance at the community level. These factors were considered to be important activities because they can affect the level of bridging social capital necessary for governance capacity at the community level discussed in chapters two and eight.

Interviews with some stakeholders at the regional, district, and community levels showed very weak vertical interaction between and among them. Among the government organisations only ICOUR and MOFA had interactions, though fairly with the water users at the community-level. Interview responses from a minority of irrigators revealed that MOFA provided agronomic training to the irrigators several years ago whilst ICOUR interacted with the irrigators in the GMS mainly to discuss land and water levies during yearly consultative meetings with the lateral leaders. Whilst the irrigators in the FMS interacted mainly with MOFA, the irrigators in the GMS had a fairly weak interaction with both MOFA and ICOUR. Responses from some of the irrigators and ICOUR management illustrate these interactions:

*The Ministry of Food and Agriculture (MOFA) is the main organisation working with us (WUA leader, Durongo, **DFL006**. November 15, 2011).*

*The Ministry of Agriculture sometimes gives us guidelines on how we should carry out our irrigation activities (lateral leader, Vea, **VFL069**. January 5, 2012).*

*We normally sit with the farmers and tell them our plans and then expect them to give us their input. And after we are certain on what has been agreed upon between ICOUR and irrigation farmers, we then carry it on to the next level. ICOUR is in charge of carrying out all planned activities relating to the project. When this is done we then present whatever plans we have made to the irrigators for their inputs, and afterward we incorporate whatever inputs they have made into the final plans (senior officer, ICOUR, **IM160**. January 19, 2012).*

Some of the WUA and lateral group leaders further expressed different elements of their interactions with MOFA and ICOUR. Their views indicated that they hardly interacted with MOFA and ICOUR or received any support from any of them. They stated:

*For the past seven years we haven't heard from MOFA and they haven't heard from us (WUA leader, Durongo, **DFL005**. December 11, 2011).*

*We don't interact with MOFA often. It is only when they want to carry out a project that they involve us. They don't have much to do with the project area (community leader, Vea, **VCL067**. January 9, 2012)*

*Yes, the Agriculture Technical Officers from Zaare came here about two years ago to train us on irrigation water use. He also advised us to protect the catchment area. But, these days he doesn't come again (male irrigator, Durongo, **DFM016**. January 11, 2012).*

There has not been enough interaction with the ICOUR authorities except on a few occasions where the ICOUR officials were invited by the farmers

to attend their meetings (community leader, Ve, VCL064. December 29, 2011).

These views expressed by water user groups and community leaders from all the communities in both FMS and GMS further confirmed the weaknesses in the community and government agency vertical interactions. Most interactions between the irrigation water user groups with district-level stakeholders were made through the water user group and community leaders. The views expressed by the leader from FMS and GMS confirmed the assertions made by MOFA, ICOUR and other stakeholders in the previous chapters that, because they were constrained by low financial and human resources, they could not visit the irrigation communities to interact with the water user groups. The irrigators and leaders who thought they had interactions with ICOUR or MOFA referred to interactions they had several years ago as highlighted in the quotes above. This meant that, more recently, MOFA and ICOUR rarely interacted and collaborated with the community water users.

Effective community participation cannot be relied upon to occur spontaneously because irrigation water resource governance transfer from government to the WUAs was a novel idea, introduced in Ghana in the 1990s. Effective participation of the WUAs and lateral groups will require that their capacities are built by external organisations, particularly the government. Interview responses with some of the district and regional stakeholders provided varying reasons for lack of vertical stakeholder support to the communities:

In the last five years, we haven't given the WUA any support in relation to the irrigation water resource management. This is so because of budgetary constraints. We used to provide direct training to the WUAs in crop production technologies and group development. But now due to limited

funds the Department of Agriculture has limited working with the WUAs (director, Department of Agriculture, P148. January 20, 2012).

We had strong interaction with the WUAs some time ago when the District Agriculture Offices were directly training the WUAs in crop production technologies and group development. But now getting funds is a problem, so the Department of Agriculture has limited its role in working with the WUAs (Director, Department of Agriculture. P148. January 20, 2012).

At the moment we don't have any interaction with the WUAs because we have groomed [trained] them for a long time and we thought it was time for them to be on their own (officer, Department of Community Development. P154, January 31, 2012. January 31, 2012).

Interviews with the lateral and WUA leaders in the FMS and some representatives from the decentralised departments revealed that the geographical distance between the communities and the decentralised departments and agencies at the regional and district-level limited access by the communities to the government organisations. Furthermore, the WUAs and lateral groups also lacked knowledge about the government organisations and NGOs in the region and districts that could support them. Examples of participant responses explaining these views are:

Because of lack of education, we don't know the NGOs or organisations that can come to our aid when we have problems (mixed focus group, Durong, DMFG. January 24, 2012).

These organisations are far from the communities. For instance, EPA works from the regional office in Bolga. Many of the communities are not motivated to travel long distances to the offices of the government agencies. The communities do not even know where to go when they have an issue for redress (officer, Department of Planning, P155. February 2, 2012).

Many of the communities do not know where to go to seek help when they have an issue for redress (officer, Department of Planning, P155. February 2, 2012).

Although the irrigators and some of government officials interviewed gave geographical distance and lack of education as a barrier between the communities and decentralised departments and agencies, a critical analysis of the data revealed that these explanations could not be the root causes of the problem. As revealed in section 8.2 some of the WUA and lateral leaders had formal education hence had a comparative advantage over the rest of the irrigators without the formal education desirable for being elected as leaders. Also, some of the leaders lived in the regional and district capital cities where the offices of the decentralised departments and agencies were located. The root causes for the weak interaction between the WUAs, lateral groups and the regional and district decentralised departments and agencies were the weakness of the local level decentralised structures such as the DA Assembly Member and Unit Committee structures that served as links between the communities and DAs. As discussed in subsection 5.5.4.1 the Local Government Act 1993 (Act 462) section 16 stated that the duties of the Assembly members in the communities (MLGRD, 1996) among others, is to serve as the link between the communities and DA. Thus, the main link between the community social groups and the district decentralised departments and regional agencies was supposed to be through the unit committees and DA members.

Due to the inability of the Unit Committees and the DA members to link to the community level stakeholders, especially irrigators to the district and regional stakeholder offices, there was a problem of access by communities to government-based stakeholders. This was particularly the case for regional level stakeholders such as GIDA, who did not have an office at the district level. The weak vertical interaction

between the district, regional and community level stakeholders further explained the weak relationship among the stakeholders, as illustrated in Figure 5.1 and Figure 5.2. The following participant responses by the district level stakeholders support this suggestion:

*My relationship with the WUAs and their leaders is very poor. It is not as cordial as I would have expected. My relationship with them is not all that strong (Assembly member, Durongo, **DCL004**. November 16, 2011).*

*I can't remember ever attending any meetings of the WUAs. The unit committee office has been dormant for several years now. It was just last year that it became active..... (unit committee member, Winkogo, **WCL040**. December 30, 2011).*

The DA members elected from the communities to the District Assembly have the responsibilities to serve as a bridge or a broker between the WUAs/lateral groups and the DA, NGOs at low transaction cost. However, transmission of information to-and-from the DA and communities was costly due to limited access to transportation, low access to modern information technologies, geographical spread of the villages, the communication difficulties that posed a challenge to the District Assembly members. Consequently, the sub-district structures at the local level were not operational and effective because they did not have the capacity to be robust enough to promote community-based irrigation water resource governance. The ineffectiveness of these sub-structures at the local level explained the inability of the WUAs and lateral groups to connect well with the DA departments, agencies, and NGOs at the regional and district levels. It also explained why the Assembly and unit committee members did not interact much with other stakeholders in pursuing their own governance functions. Thus, ineffective local level decentralised sub-structures, limited organisational and human resource capacity, and the assumption that only one episode of training was

adequate to equip the water users, had limited district level stakeholders' interaction and collaboration with the water users' group.

Furthermore, the main governmental actor involved in irrigation water resources use was the MOFA, which has a strong presence at the regional and district offices. MOFA also had agricultural extension workers who were to work with the farmers at the community level. The extension workers who were normally based in the district capital and went out to the fields from there had the responsibility to ensure information flow within the villages they work. Thus, the primary path of hierarchical information flows to and from the WUA was through the Agricultural Extension Agents to their Zonal Supervisor, the District Director of Agriculture, the Regional Office and finally, if necessary to the National Office. Following the classic argument of Granovetter (1973), weak ties in social networks are crucial in promoting vertical information flow between the district decentralised departments, agencies, NGOs, WUAs and lateral groups regarding irrigation water governance. Véron et al. (2006) emphasised the need for strong vertical interaction and accountability between stakeholders at different scales. However, interviews with the MOFA extension officers revealed that they lacked the means of transport to travel to the communities to carry out their jobs. Also, the Ghana Irrigation Development Authority (GIDA) who has direct responsibility for irrigation water governance also did not have adequate human and organisational resources to operate within the districts to fill this capacity gap. Véron et al. (2006) argued that when these vertical relations and accountabilities are weak, horizontal accountability structures designed into community-based monitoring systems can degenerate into corruption networks between community representatives, local elected officials and local government officers. Thus top-down support from the decentralised departments

and agencies was critical for the success of community-based governance at the local level.

9.3.5 Alignment of District-Regional Level Stakeholders Efforts with Local Level Needs

The previous sections examined the vertical interaction between the district, regional and district community-based decentralised structures with the WUAs and lateral groups. This section examines the alignment of district and regional efforts with community-level (irrigation water user) needs.

The analysis of the data revealed that there was more focus on production-based issues (output orientation) than livelihood-based issues (outcome orientation) by the decentralised district departments and regional agencies. The output focus is analogous to irrigation water management while livelihood focus is analogous to governance outcomes of stakeholder inclusiveness, and broad based participation which could result in empowerment of irrigators. These production-based issues include formation of water user associations, creation of irrigable areas, and construction of new irrigation infrastructure and rehabilitation of existing ones, instituting water user charges, and development of by-laws. Interview responses from some of the participants that reflected a focus on production-based issues of water management include:

Our plans have always been to go back and train the irrigators in water management but the problem has been limited funding so we limited ourselves to talking to them about crop production and yields (officer, District Agriculture Department, P148, January 20, 2012).

For the past five years we did not have any irrigation water resource management plan, but now we are trying to rehabilitate two reservoirs (officer, District Planning Department, P155, February 2, 2012).

*Our department normally formulates modern by-laws for all the sectors including the WUAs. These are to guide the WUAs to be within the framework of our management (officer, Department of Cooperatives, **PI51**, January 27, 2012).*

*What I have observed about the Water Resources Commission (WRC) is that their work is limited to only rivers. Their main aim is to ensure that the rivers are well protected, and not irrigation reservoirs. As a result, we haven't collaborated with them on issues concerning the reservoirs. (director, Department of Agriculture, **PI57**, January 26, 2012).*

*Water management is not our focus. We are more focused on agronomy crop production, pests and diseases and other general ways of improving agricultural production. For three years now I realised much has not been done in irrigation water resource management. (extension officer, Department of Agriculture, **PI53**, January 24, 2012).*

Alternatively, the production-based issues were more water management issues than water governance issues (see chapter two). Highlighting the importance of livelihood and governance issues does not imply that this study underestimates the role of production (output orientation) issues. Output issues were however, important at the initial stages of project implementation. Examples of interview responses from the community stakeholders highlighting livelihood and governance needs as priorities include:

*Our role is to help the farmers manage the water resource to ensure that there is unity and collaboration with each other to ensure effective irrigation management that will go a long way to improved our livelihoods and reduce poverty (community leader, Durongu, **DCL004**, November 16, 2011).*

Our vision is to see the WUA leaders interacting and negotiating with our stakeholders to collaborate with us to manage the reservoir to get

*enough water for the irrigation since we ourselves cannot afford to manage the water alone (women's focus group, Durongo, **DWFG**. December 15, 2011).*

*Our desire is that the WUA leaders meet regularly and also involve MOFA and other stakeholders such as the Unit Committee member, Assemblyman and the Chief so that they can discuss issues relating to the management (community leader, Winkogo, **WCL040**. December 30, 2011).*

*I will be happy if we can get somebody to support us with credit facilities to buy inputs. If we get credit facility it will improve our farming to a large extent (female, Durongo, **DF026**. January 9, 2012).*

*My suggestion is that women should be encouraged to play leadership roles. The reason is that most of women are humble and knows how to talk well to other farmers in the group (farmer leader, Ve, **VFL071**. December 20, 2011).*

*I think ICOUR should decentralise some of its responsibilities to the chiefs and opinion leaders in the community. If they do this, the farmers will be forced to pay their levies on time due to the respect they give to the chief and opinion leaders (female irrigator, Ve, **VFM075**. January 1, 2012).*

These interview responses revealed patterns of livelihood issues that reflected community needs, interests, and priorities for irrigation water resource governance. Thus, the greater focus on production issues than livelihood issues explains the difficulties in aligning regional and district stakeholders' efforts with community needs.

9.4 Coordination of Decentralised Departments and Agencies for Irrigation Water Governance at the Community Level

The earlier sections of this chapter addressed the research question, "How has the decentralisation initiative promoted stakeholders' interaction and collaboration at the district, regional and community levels?" This section addresses the second research

question, “*how are the stakeholders coordinated for irrigation water resources governance at the district, regional and community levels?*”

The Local Government Law 1988 (PNDC Law 207) established the District Assembly (DA) as the key institution for the new local government decentralisation system. The Local Government Act 1993 (Act 462) specified the rights and functions of the DAs among others as coordination of decentralised departments, planning, and budgeting (GoG, 1993). Thus, by law the DA is the main decentralised structure for leading integration and coordination of district level mid-term and annual development plans. However, evidence from the interviews with some of the district level stakeholders showed that the DAs lacked a clear appreciation for and commitment to this role, which limited integration within and between individual departmental plans supporting irrigation water governance at the local level. Although the DA had the power to coordinate and integrate the plans of decentralised departments, it lacked financial and human resources particularly the institutional leadership capacities required for this function. The failure of the DA to take its role of coordination and integration more seriously seemed to provide MOFA with more power and opportunity to have control over the implementation of irrigation water management transfer policy, due to MOFA’s capacity advantage. Moreover, the planning and implementation of the IFAD-funded LACOSREP was carried out at the regional level and therefore the DAs could not have coordinated the process. Some of the stakeholders described the current coordination and integration broadly as:

I must be honest with you. We haven’t tried to coordinate because all the organisations are parallel in their work. All of them including MOFA have their own line of authority so they don’t plan together (officer, District Planning Department, P155, February 2, 2012).

*We have an institutional challenge; people look at EPA as the only agency that should care about the environment and they don't also see the link between the environment and their activities. Most of the District Assemblies look at environmental issues as EPA's sole responsibility. What we have realised is that the District Assemblies don't seem to see the relationship between the environment and physical development (senior officer, Environmental Protection Agency, **P145**. January 29, 2012).*

*Administratively we are supposed to report to the District Assembly and when we do that, they don't take us seriously. Whenever we report to the District Assembly about anything, they always think it is our own problem and not theirs (extension officer, Department of Agriculture, **P153**. January 24, 2012).*

*EPA and WRC are not decentralised; their activities are not integrated with that of the district. EPA and WRC are not obliged to give us their plans and reports but we are at the centre of everything. There is the need for us to integrate more (officer, District Planning Department, **P150**, February 5, 2012).*

*The problem is that we make our annual plans without any knowledge of the annual plans of other departments and agencies and as a result we cannot collaborate with them. Our plans are short-term plans whilst that of EPA is a long-term plan so we don't need any integration. ICOUR is a different body on its own and have their own plan, management and jurisdiction. GIDA is basically for construction and rehabilitation of reservoirs. Unless there are serious rehabilitation issues, we have very little to do with them (director, Department of Agriculture, **P148**. January 20, 2012).*

The above quotes provide some explanations for the lack of coordination of annual plans and activities of the water related stakeholders at the district and regional levels to support the uptake of community-based irrigation water governance. However, the main explanation could be the inability of the DA to play its role well in integrating and coordinating the annual plans and activities of the decentralised departments and

agencies for irrigation governance at the community level. The District Assembly must have the capacity to auspice, convene, coordinate, and manage the planning process necessary to bring all stakeholders to agreement in water governance. The basic advantage of integrated and harmonised irrigation water resource governance planning is the comparative advantages held by each of the decentralised departments and agencies. The current individual approach adopted by each decentralised department and agency meant that very limited economies of scale was gained through individual efforts for irrigation water development at the local level.

9.5 Synthesis and Conclusion

This chapter sought to answer the following research questions:

7a. How has the decentralisation initiative promoted stakeholders' interaction and collaboration at the community, district and regional levels?

7b. How are the stakeholders coordinated for irrigation water resources governance at the community, district and regional levels?

The answers to the above research questions are addressed as follows:

7a. How has the decentralisation initiative promoted stakeholders' interaction and collaboration at the community, district and regional levels?

The decentralisation initiative neither promoted significant interaction and collaboration among the district and regional level stakeholders nor between the district and regional level stakeholders and community level stakeholders. Generally, all the interactions and collaborations among the stakeholders at district, regional and community levels, and between the levels, were weak, but some were weaker than others. The perception that MOFA had more power and advantage than other stakeholders in terms of

organisational and human resource capacities resulted in unequal power relations which negatively affected stakeholders' interaction. The perception of MOFA being more important in terms of organisational and human resources than other stakeholders resulted in a lack of transparency, fairness, inclusiveness, and adaptation in irrigation water resource governance decision making at the regional and district levels. The attitude and behaviour exhibited by MOFA, the lead agency, meant that the governance principles shown in Table 2.2 were not achieved in the stakeholder interaction process. The limited application of these principles indicates the poor quality of stakeholder interaction and collaboration resulting from unequal power relations at the district and regional levels. Hence, the decentralisation initiative did not produce the intended impacts of strengthening interaction and collaboration among district-regional and local-level stakeholders. Ineffective collaboration among district and regional level stakeholders and between district-regional level stakeholders and the community level stakeholders was a serious drawback for achieving community-based irrigation water governance.

There was very limited inter-departmental and agency support for the district-regional level stakeholders due to weak stakeholder interactions. There was also limited vertical support from the district level stakeholders to the water users at the village level, leaving the irrigation water user groups as 'islands' or 'orphans.' The impact of these limited vertical and horizontal supports was lack of stakeholders' capacities for irrigation water resource governance at both district and community level.

Furthermore, poor policy design and implementation that focused more on production-based issues (output orientation) of irrigation water management rather than livelihood-based issues (outcome orientation) which relate to sustainable irrigation governance

outcomes, such as improved decision making, stakeholder inclusiveness, and broad based participation which could have resulted in empowerment of the irrigators, was a drawback for achieving integration across the regional and district stakeholders on one hand and community-level stakeholders on the other hand. The focus on production issues resulted in limited support for community level stakeholders to achieve governance outcomes of ownership, control, participation, and sustainable water supply.

7b. How are the stakeholders coordinated for irrigation water resources governance at the community, district and regional levels?

Decentralised departments and agencies worked independently of one another; hence their annual plans of actions were not integrated and coordinated based on the DMTP for community level irrigation water resource governance. The lack of effective coordination of plans and resources at the local level was due to lack of commitment and institutional leadership on the part of the District Assemblies to ensure integration and coordination among the decentralised departments and agencies. The existence of decentralised structures is a necessary, but not a sufficient condition for increased linkages and integration of annual plans, activities, and budgets and to build social capital between different actors, as evident in the study area. Lead agencies in development projects should create equal opportunities for all stakeholders to coordinate. However, this did not occur.

The evidence and analysis presented in this chapter revealed that the district level decentralised structures did not support community-based irrigation water resource governance outcomes adequately in the study area. Centralised bureaucratic tendencies within the district and regional level government stakeholder organisations have persevered and therefore limited stakeholders' interaction and collaboration. Promoting

stakeholders' interaction and collaboration in support of community-based governance is constrained by these challenges. The lack of effective stakeholder interaction and collaboration was partly due to the failure of government agencies to truly decentralise roles and responsibilities to the community level resource governance structures. This study maintains that the important point about decentralised irrigation water governance is not only about responsibilities being devolved to the WUAs, but also rights, resources and externalities that would enable them discharge these rights effectively. Part of the process of developing these capacities involves helping lower level stakeholders to build networks for collaboration. As argued by Lockwood et al. (2009) functional connectivity for interdependence among actors requires institutional arrangements that can integrate separate formal and informal NRM institutional processes, both vertically and horizontally.

PART IV

SYNTHESIS AND CONCLUSIONS

Chapter 10 Synthesis and Discussion of Key Findings

Findings

10.1 Introduction

From 1992, the government of Ghana transferred the ownership and management responsibilities of all FMS in the Upper East Region from the government to the water users. The GMS were also transferred to ICOUR, to be managed on behalf of the government with participation of the local communities. WUAs were established in the communities associated with the FMS to take up management responsibilities of the irrigation facilities. Lateral groups were also formed in communities associated with the GMS to support ICOUR in the management of irrigation facilities. Accordingly, this study was initiated to explore the extent to which the decentralised structures and processes at the regional, district, and community levels have supported community-based irrigation water governance.

The chapter undertakes a synthesis of findings derived from answering the subsidiary questions that were addressed in chapters five to nine. It will undertake an overview that enables a deeper understanding of the study findings, to identify key linkages between identified themes. This provides more comprehensive explanation of the implications of the findings in answering the overarching questions in the thesis which is:

To what extent have the current decentralised structures and processes at the regional, district, and community levels supporting a community-based approach to irrigation water governance at the local level?

The outcome of the synthesis will provide the basis for the conclusions and recommendations of the study to be presented in the closing chapter.

The chapter is organised as follows. The processes used for the synthesis and the major themes identified are listed in section 10.2. The effects of community structure, cultural, and power differentials on community-based irrigation water governance are examined in section 10.3. The effects of policy design and implementation strategies on community water governance are analysed in section 10.4. Section 10.5 considers the effects of quality leadership on irrigation water governance, while section 10.6 examines the influence of community attitudes and behaviours on local level irrigation water governance. Recommendations for further research are provided in section 10.7 and section 10.8 concludes the chapter.

10.2 The Synthesis Processes

As outlined in section 4.11.3, a comprehensive synthesis was conducted of the findings from chapters five to nine and the literature review. A step-wise analysis was carried out over chapters five to nine. Chapters five and six examined institutional arrangements and enforcement by relevant stakeholders. Chapter seven analysed the existing capacities and capacity gaps in irrigation water governance within the regional, district, and community governing bodies. Chapter eight examined the extent to which decentralisation as a governance approach has advanced water users' participation in decision making processes, and to what extent this supported community-based irrigation approaches and governance outcomes in both FMS and GMS. Chapter nine explored regional, district, and local level stakeholder interaction and collaboration, and mechanisms for coordinating regional, district, and community level stakeholders. The chapters from which each theme was developed are illustrated in Figure 10.1 below.

All the previous chapters (1 to 9) were reviewed in order to take a fresh look at the research statement, objectives, questions, theoretical frameworks, concepts, research

methodology, and the findings from the case-studies. The following processes were further used for the synthesis.

1. A matrix with four columns was developed for each of chapters five to nine, one column highlighting key findings whilst the remaining of the columns were used to record emerging themes, patterns and contradictions (Appendix 8). To identify the patterns across the five chapters, emerging concepts that were encountered in more than one chapter analysis were distilled and put together. This helped to group similar ideas into categories to identify the broader themes and relationships that ran across the five chapters. The aim was to compare findings from the two different institutional arrangements in order to fill the knowledge gap this study sought to address. This synthesis provided the basis for the conclusions and recommendations in the next chapter.

The process of organising the findings in the five chapters was directed by the research objectives, the overarching research question, and the conceptual framework used for the study.

2. The emerging themes and patterns resulting from step (1) were synthesised into four main themes to develop a broader descriptive and explanatory narrative. Similarities and contrasts within the findings across the five chapters were sought and integrated into four emerging themes for hermeneutic interpretation. The four main themes identified in this process of the synthesis relate to:
 - I. the influence of community structure, culture, and power differentials on community-based irrigation water governance;
 - II. the effects of policy design and implementation frameworks on community-based irrigation water governance:

- III. the effects of organisational leadership quality on community-based irrigation water governance; and
- IV. the influence of community level attitudes and behaviours on community-based irrigation water governance.

The main themes that together addressed the overarching research question are displayed diagrammatically in Figure 10.1 to more clearly illustrate the patterns. The thicker red line points to the four main themes. The four main themes are grouped and directed to the overarching research question they addressed. The thin blue, red, green, and magenta lines connect the chapters to the various themes they helped to developed.

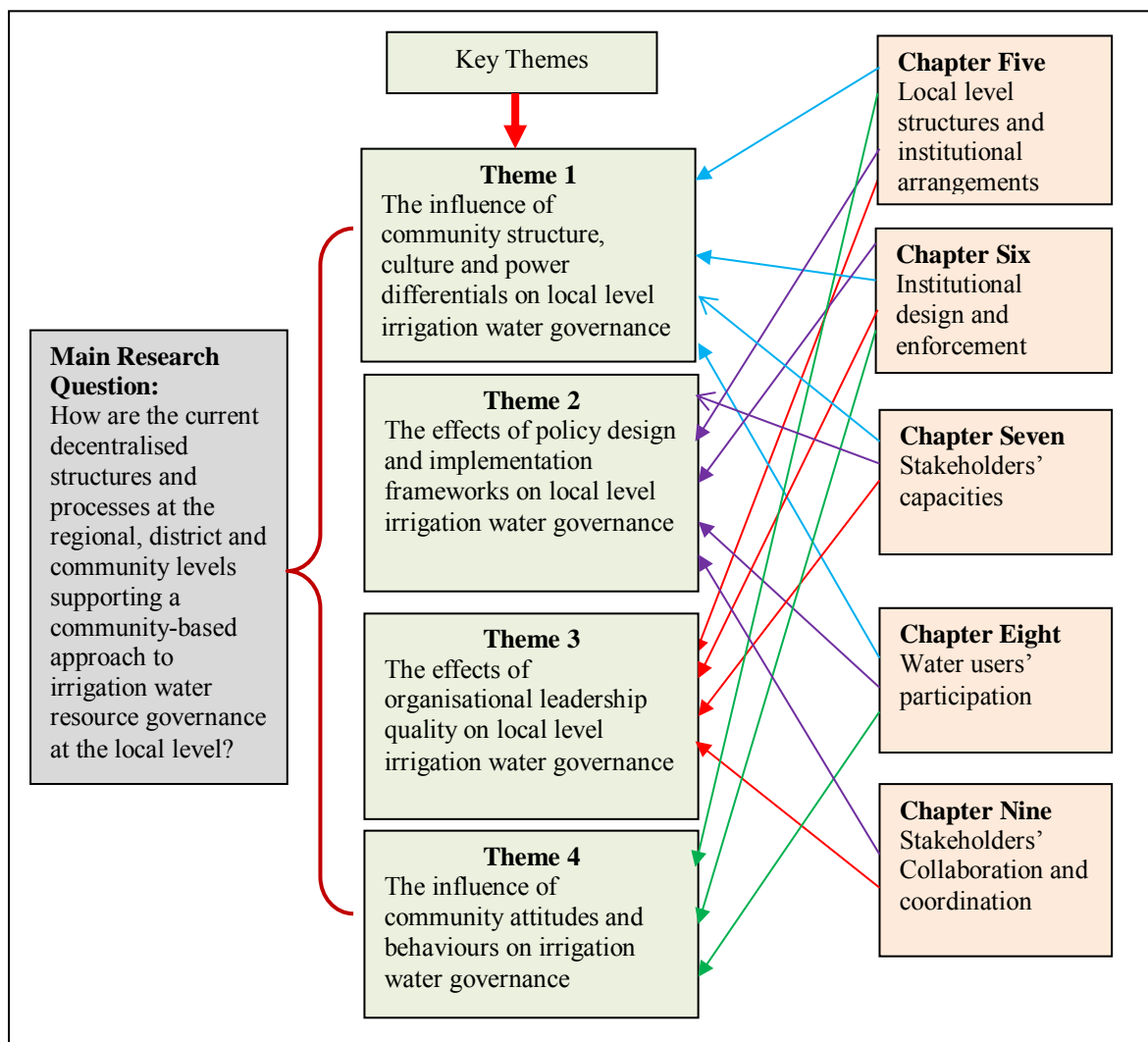


Figure 10-1 Synthesis of result chapters (five to nine).

10.3 Theme 1: The Influence of Community Structure and Culture

The study revealed that adoption of formal institutions was not effective in the case-study areas due to the influence of social norms. There were, however, differences in the extent to which informal institutions influenced formal institutions in FMS and GMS. Whilst land was allocated in the GMS based on ‘equity’ as defined and required by the formal institutions, allocation of land in the FMS was based on a socially constructed understanding of ‘fairness’ somewhat at variance from the official definition of ‘equity’. The study also found that the water governance policy reforms included objectives relating to gender equity and re-distributional equity in relation to access to land, particularly in the FMS, that were in conflict with prevailing traditional norms in the case-study areas. Due to prevailing social norms, the customary interpretation of ‘fairness’ did not necessarily equate with ‘equity’ as interpreted and intended by the policy makers, hence the policies were resisted by the leaders. For this reason for instance, women tended to be excluded from decision-making in both FMS and GMS though surprisingly some women partly agreed with this, on the grounds that in some cases the rights of family groups might take precedence over the rights of individuals. Local social norms such as this, as well as the desire to restrict land rights to locals, had significantly influenced and shaped the nature of irrigation water resources governance in the case-study communities.

Structures emanating from the central government had only a limited impact locally on irrigation water resource governance because the policy design and implementation process failed to address local social norms. The policy design and implementation strategies failed effectively engage in dialogue with local people as to how to solve social problems that were associated with the policy implementation. The evidence

indicated that it was not possible to implement the policy intent without adequately understanding and dealing with social norms. Hence, without a common understanding and application of 'equity' within the communities, the policy intent of 'equity' and broad based participation was not widely supported by those who felt disadvantaged by either the traditional rules or formal rules. For instance, who is to decide how 'broad-based' and 'local' participation should be? Indigenous locals did not want access rights to land extended to those they regarded as 'non-natives.' Likewise, a man supporting a large family might judge 'equity' to be access to land apportioned according to need. Economic and technical capacity to farm must also come into any applied concept of equity, as the interviewees were quick to point out. A common understanding of 'equity' in this case could have enabled traditional authorities, WUA, and lateral groups to adopt a joint plan of action to achieve better irrigation water resource governance outcomes. Unless both the traditional authorities and the WUAs and lateral groups agree as to where the boundaries of inclusion are so that there is some common understanding in what should constitute 'fair rules,' they are unlikely to fully participate and act to achieve a common goal. Defining the boundaries more precisely might also avoid some of the negativities associated with the debates about the 'tragedy of the commons.' Once what constitutes a legitimate 'local water user' is defined, the definition may be expanded on (for instance) gender or birthplace grounds in an orderly manner, so as not to alarm and alienate the present power holders but holding out the promise of the eventual greater inclusiveness that has presumably inspired the formal policy intent .

Most of the WUA and lateral leaders were part of the traditional leadership system, and therefore had the opportunity to weigh the advantages and disadvantages of informal and formal institutions in terms of personal benefits, as well as the relevance of each to their culture. As a result, the WUA and lateral leaders exhibited a preference for the

informal institutions over the formal institutions. The presence of some traditional leaders in the WUA and lateral leadership could be seen as an opportunity to promote formal institutions, but both the traditional, WUA, and lateral structures failed to support the policy intent. The failure of the WUA and lateral leaders to fully support the intended formal rules meant that the policy implementation did not receive the whole-hearted support it needed for the long-term application.

The relationship between the traditional authorities on the one hand and the lateral and WUA leaders on the other meant that the action of any one of them might affect the other. If the aim is to reduce what the government policy implementors might regard as the negative effects of traditional institutions to achieve co-benefits and synergies, there may have to be trade-offs where more traditional authorities are included in the WUA and lateral group leaderships. The benefit of including the traditional leaders lies in their power, legitimacy, the respect for them, and compliance by the local community with the traditional over formal institutions. Including the traditional authorities provides a local level 'action arena' for an on-going policy dialogue on the advantages in adopting formal rules. It would also help to collectively examine the advantages and disadvantages of both traditional and formal institutions on governance outcomes. This may result in transforming both set of rules to the benefit all social groups in the communities.

10.4 Theme 2: Policy Design and Implementation Framework Affecting Community-Based Irrigation Water Resource Governance

The policy design and implementation framework as used here refers to the implementation strategies, structure, and processes used in attempts to achieve intended policy outcomes. The policy design and implementation framework is discussed in

terms of how (i) regional, district, and community stakeholders were involved and coordinated in the implementation processes, and (ii) whether the capacities of the regional, district, and community level organisations were successfully built. These two sub-themes are pertinent to achieving stakeholder interaction in the governance process. These sub-themes are briefly discussed.

10.4.1 Vertical and horizontal integration among regional, district and community level stakeholders

In this sub-section, horizontal relationships among the regional and district stakeholders and vertical relationships between the regional, district and community level stakeholders are examined.

10.4.1.1 Horizontal Relationships among the Regional and District Stakeholders

At the district and regional levels there were no effective mechanisms and processes to promote stakeholders' interaction and coordination. The regional and district level structures failed to (1) provide avenues for stakeholder input and feedback in the decision-making processes, (2) provide a means for including stakeholders at all levels in decision making; (3) facilitate collaborative processes, and (4) share information across stakeholder organisations and actors. There was therefore limited collective decision making among the stakeholders. Reasons for limited stakeholder interaction included limited funds, unclear roles and responsibilities, weak organisational leadership, and the unilateral decision making approach adopted by MOFA, the lead agency. The above barriers were largely due to a lack of an effective institutional framework within which the policy was implemented. Institutions which define 'the rules of the game' need to be developed to direct how changes should occur, power

relationships negotiated between different actors, and roles and responsibilities discharged.

The limited progress achieved by the decentralised irrigation governance policy could be explained by lack of collective action among the regional and district level stakeholders. In order to derive benefits from decentralisation, enduring interactions between stakeholders have to be created and sustained. A combined regional, district, and community level stakeholders' group facilitated by a lead agency that is willing to include and integrate the views of all stakeholders has a better chance of performing well in supporting community-based irrigation water resource governance. A good quality of interaction among regional, district and community level stakeholders is likely to generate more governance capacity than unilateral efforts by water authorities. Having a well-designed and effective institutional framework at the regional and district levels guided by good governance principles is the benchmark needed to help connect all irrigation-related groups for collective action.

10.4.1.2 Vertical Relationships between the Regional, District and Community Level Stakeholders

The communities and their existing social structures and values influenced community level irrigation water resource governance. However, there was very limited vertical integration between community level stakeholders, including the traditional authority structures and WUAs and lateral groups, and the district and regional level stakeholders. As argued by some researchers, pre-existing institutions with which individuals are already conforming can often usefully be built upon to positively affect behavioural outcomes (Young, 1998; Paciotti & Mulder, 2004). It follows that community-based resource governance efforts will be more effective when formal governance institutions and traditional social norms are aligned. It is important to note that community

organisations at the lower level interpreted and shaped policy implementation, more than did the 'top-down' efforts of policy implementers from the district and regional levels, who ignored local community contexts. While expert knowledge is of great value, imposing formal rules which sharply contradict local social norms can create conflict which can make difficult the task of gaining compliance with those rules.

New social structures may be more sustainable if allowed to evolve overtime and by degrees integrate with existing ones, rather than be imposed on them. Such attempts could create conflict and power imbalance. The traditional authority system has strength, legitimacy and power to resolve conflicts, to mobilise community resources, and to enforce both traditional and formal institutions, due to the respect given to it and the power the traditional authorities wield. The formal system on the other hand is more gender-balanced and distributional-equity focused and is able to integrate ideas from different social groups in the communities. Harnessing the comparative advantages of the existing institutions would offer clear benefits in the case-study areas. There is merit in adopting a hybrid system through combining the strengths of the traditional authority with the strengths of the formal system as each system has its own comparative advantage. A hybrid governance approach whereby traditional authorities are included in formal leadership might provide opportunities for higher-level policy makers to engage more with community leaders and cultural traditions in order to deal effectively with cultural sensitivities when seeking to decentralise.

Although the WUAs, lateral groups and ICOUR had some level of support from the traditional authorities and were able to enforce the input and penalty rules and also resolve conflicts to some extent, the WUAs, lateral groups and ICOUR could have performed much better if they were allowed to evolve and integrate gradually with

existing traditional social structures and values in the communities. Such gradual integration could help create opportunities to transform existing perceived negative socio-cultural values that militate against policy intent. Positive traditional institutions should form the basis for the development of formal institutions, with the aim of gradual transformation of negative traditional institutions that militate against effective implementation of formal institutions.

10.4.1.3 Local level capacity building: A missing Link in Irrigation Water Governance.

Capacities for irrigation water resource governance in both FMS and GMS, as well as at district and regional levels in the form of organisational, human and social capital were shown to be limited in the case studies. Multiple factors affected irrigation water resource governance positively and negatively. These factors include the following: (1) limited attention paid by district and regional stakeholders to the irrigation water governance processes; (2) socio-cultural, economic, and biophysical factors; (3) limited interactions between a variety of water-related users for joint action at the regional, district and community levels; and (4) limited attention paid to the role guided participation plays in increasing community-based organisations' capacities to achieve governance outcomes.

The study revealed that very little attention was paid by higher officialdom to developing capacities at the community level. These should include monitoring and evaluation, leadership, resource mobilisation, institutional enforcement and compliance, strategic planning, accountability, trust building, conflict resolution mechanisms, risk management, networking, and communication by the regional and district level stakeholders. Limited governance capacity in the study area was largely due to poor policy design that failed to prioritise and provide conditions for continuous governance

capacity building at regional, district, and community levels as an important policy implementation strategy.

Because capacities at the regional, district and community levels were limited, the governance processes in terms of stakeholder interaction, collaboration, and collective action in both the FMS and GMS tended to be ineffective. However, FMSs achieved greater ownership, participation, and control for farmers than did GMSs, suggesting that the FMSs was greater in building capacity. The FMS had a greater range of advantages and disadvantages in terms of ability to deliver community-based irrigation governance. Due to the lack of government support for the GMS, they tended to end up in the hands of the community. There was intent for decentralisation, but there was no real transfer of resources to implement decentralisation fully. Setting up decentralised structures themselves is ineffective without the concomitant resources required to implement such decisions. By implication, there has not been true decentralisation to support community-based irrigation water governance at the community level because the requisite capacities were not provided or nurtured to implement the intended outcome.

10.4.2 Power Differentials

Exercise of power by government organisations such as ICOUR and MOFA and traditional authorities and elites, reduced broad based participation. In the case of the GMS, the irrigators and the communities in general wielded less power compared to ICOUR management, due to ICOUR's control over the water supply. The limited power and participation in decision-making by the lateral groups and traditional authorities created a culture of one-way decision-making by ICOUR. This in turn reduced the growth of capacity within GMS. By implication there was limited exchange of ideas and information between ICOUR and the stakeholders at the regional and district levels,

and between ICOUR and the lateral groups. Thus, both ICOUR and the water users were preoccupied with short-term solutions, and could not build organisational capacities and produce the social capital needed for long-term problem-solving. Similarly, control of more power by MOFA than other stakeholders in the implementation of LACOSREP Phases I and II negatively affected stakeholders' interaction at the district and regional levels. As argued by Rogers and Hall (2003), power is not a commodity to be transacted between elites, but a set of relations for negotiations between different groups. There was intent for decentralisation, but there was no real transfer of power to implement decentralisation fully. Setting up decentralised structures themselves is ineffective without the concurrent decentralised power and rights to decision making, and the concomitant resources required to implement such decisions.

Unlike the GMS, where all the irrigators and the community as a whole had less power compared to ICOUR, in the FMS, it was the women, young irrigators and non-natives who wielded less power compared to WUAs leaders, adult males in general, and traditional authorities, due to local social norms that gave preference to male adults and leaders in decision making process. The roles of women were underestimated and this needed to be addressed. Traditional norms reinforce and maintain the power base and power imbalance. Participation occurred more in the rhetoric of policy announcements than in practice. Until policy implementation strategies adopt and require appropriate participation techniques that provide incentives for power sharing, and are able to influence social norms, widespread participation will be limited and thus limit capacities at the local level. An equitable allocation of decision-making power among the stakeholders (taking into account the disputed meaning of equity in local parlance) as well as roles is relevant for collective action. This approach may ensure that both

systems share power, which may enable them to work together to negotiate over how to improve access to land by the disadvantaged groups as well as achieve a broad based participation that may enlarge the local concept of ‘the common good’. As noted by Prior and Anderton (1999), participation techniques are the foundations upon which social capital, and community development outcomes are built. District level stakeholders need to build the capacities of the WUAs and lateral group leaders, traditional authorities, and ICOUR in participation techniques, develop community participation indicators and regularly monitor and evaluate progress.

Also, lack of input by professional teams from diverse disciplines like financial and administrative management, engineering and the social sciences in the policy design and implementation contributed to deficiencies in building the capacities needed. Establishing trustworthy relationships between stakeholders at the national, and district levels is crucial for gaining capacity. Thus, capacity development and training of farmers, WUA leaders, and irrigation agency (MOFA and GIDA) staff should be a continuing process. Sustained capacity building for all stakeholders at the regional and district levels and in the communities must be a core component of policy design and implementation that must be adequately resourced.

10.5 Theme 4: The Effect of Leadership Quality on Local Level Irrigation Water Governance

Leadership capacity was observed to strongly influence the development of community-based irrigation water resource governance at the regional, district, and community levels. Leadership served as the fulcrum around which all other governance capacities revolved at the community level. Acceptance and compliance with institutions by the members of WUAs and lateral groups were largely determined by the legitimacy of the

leaders who designed and enforced the institutions. Under this theme, community and regional and district level leadership for coordination are examined.

10.5.1 Community Level Organisational Leadership

Traditional authorities played significant roles in gaining institutional enforcement and compliance, conflict mediation, resource mobilisation and networking. The traditional leadership offered both strengths and weaknesses. The traditional leadership has the strength, legitimacy and power to enforce traditional institutions that no one was supposed to violate, as well as resolve conflicts, and mobilise resources. The mix of traditional leaders, WUA, and lateral group leadership enhanced the capacities for community-based governance. Conversely, the failure of the traditional authority system to accept formal institutions of ‘equity’ or ‘fairness’ discriminated against women, young males, and non-natives, and hence reduced their effective participation, thereby reducing potential governance capacities. There was a strong linkage between the performance of the WUA and lateral group leadership and the context within which they operated.

The leadership quality of the WUA and lateral leaders and ICOUR officials was, however reduced by their lack of financial accountability and monetary incentives to motivate them. This in turn reduced trust for the leaders, and thus reduced the cooperation they received from the WUA and lateral groups in terms of resource mobilisation. Leadership accountability, transparency, and their motivation were crucial for performances of local level community-based interventions.

Coordination was important, as regional and district organisations needed to work together to achieve policy outcomes. Leadership at the regional and district levels, critically important for coordination, was a missing element. The lack of regional and

district level leadership further explains the power imbalances that reduced stakeholders' cooperation. Leadership capacities needed to be built, as policy was implemented. The complex nature of policy issues means that effective action requires a coordinated response by different decentralised departments and agencies within government, between different levels of government, and between community level organisations. Successful implementation requires attention to clarification of responsibilities, sharing of information to ensure sufficient knowledge, and adequate resources.

10.6 Theme 5: Influence of Community Level Attitudes and Behaviours on Irrigation Water Governance

Participation of the community members was influenced by local attitudes and behaviours that worked against achieving effective community-based irrigation water resource governance at the community level. The study revealed that the government was still perceived as the owner of both FMS and GMS in the study area. Hence, the government was still perceived to be responsible for repair and maintenance of irrigation infrastructure. A study by Venot et al (2011) in the case-study areas revealed that the monetary incentives of LACOSREP Phase I to the WUAs were too attractive to be resisted. The findings of Venot et al. (2011) and the findings of this study, show that the communities accepted the WUA concept to opportunistically acquire project benefits, without committing to other changes required. The required changes included acceptance of facility ownership, repair and maintenance responsibility by the communities. However, the opportunistic behaviours of the farmers could also be explained by social and economic factors, in terms of high rates of poverty and low income among the farmers, and limited alternative sources of income. These opportunistic behaviours can, however, be harnessed in a constructive and longer term

manner by investing in local level human capacities. Lack of human capacities reduced the capabilities of the farmers to take advantage of long-term opportunities offered by LACOSREP and also manage the threats posed by biophysical, economic, and social factors. Changing individual and group behaviours through more effective and authentic efforts by government to engage farmers in decision-making processes that affect them is important. The success of policies depends largely on peoples' attitudes towards short-term and long-term benefits. Capacities of the farmers needed to be built so that they did not only seize short-term opportunities but also were able to deal effectively with threats that can reduce long-term benefits.

Also, in representing the lead agency with more resources, the leadership of MOFA exhibited attitudes and behaviours that indicated that the organisation saw itself as more important than other stakeholders. This created problems of unequal power relations which negatively affected stakeholder interaction and collaboration. Ghana's water sector policy reforms and implementation strategies lacked the education components necessary to encourage behavioural change, and were therefore unlikely to influence the attitudes and behaviours of irrigators and other water users towards facility ownership.

Existing social norms among irrigators were persistent and resistant to change. Hence, changes in the attitudes and behaviours needed for adoption were slow. The lack of attitudinal and behavioural changes needed to adopt formal institution can be explained by poor community perceptions about the benefits of the formal institutions. Also, social norms are very resilient: once in place they can be difficult to alter. Hence, institutional change tends to be incremental, rather than totally reconstructive or destructive (Imperial, 1999, Ostrom, 1990). Since the process is incremental, early successes are needed before water users and the communities as a whole will be willing

to make significant commitment to attitudinal and behavioural changes. As Beierle (1998:5) aptly noted, public education is a precursor to behavioural change, and therefore “plays an increasingly important role ...on issues in which the collective effects of individual decisions are crucial.” Effective and sustained engagement with community-level stakeholders through attitudinal and behavioural change and educational strategies could be a way forward. In order to improve policy interventions aimed at influencing the attitudes and behaviours there is the need to focus on awareness-raising campaigns and educational programmes. Awareness and knowledge are necessary to induce behavioural change. It is important to know the negative effects of power differences, limited access to land by some social groups in the community, limited participation, ownership, and control on the sustainability of the irrigation infrastructure. Policy implementers need to ensure that the WUAs, lateral groups and traditional authorities have access to sufficient information to compare the advantages and disadvantages of formal institutions and make informed decisions.

10.7 Further Research

These research findings highlight further research needs in the following areas.

1. Future research should be carried out to examine the function of the proposed stakeholder collaboration, interaction and partnership framework developed in this study.
2. Further research is needed on how to promote community-based irrigation water governance, within the existing local contexts. It is also important to examine how to involve the local organisations, the private sector, and local government in the context of decentralisation, guided by the principles of subsidiarity and nesting to promote community-based irrigation water resource governance.

3. Although the current study reveals weaknesses in stakeholders' interaction and collaboration, it has not been able to uncover the conditions under which stakeholders will be willing to collaborate, and share a vision and the resources of irrigation water governance. Although some of the interview responses from the stakeholders touched on this, there is a need to carry out further study to understand the conditions that will encourage stakeholders in the study area to be willing to integrate their plans, collaborate, and work to achieve common goals and objectives.
4. Further studies need to be carried out to identify effective incentives that will motivate WUA and lateral leaders to fulfil their roles and responsibilities as leaders. What was not clear from the present study is to what extent access to credit facilities and access to additional land could level out the economic and political power differentials between the leaders, women, and young farmers in land allocation decision making in farmer-managed schemes. Would land allocation arrangements have changed if the WUA leaders had continued the initiative by LACOSREP Phase I and II in the 1990s to allocate land based on the principles of equity? The contested meaning of equity revealed by the research suggests that these issues need more investigation in the field.
5. More research is needed on how best to improve regional and district leadership so that it is willing and able to assist, train and collaborate with farmers in the field, a necessary condition to enhance local community involvement in irrigation water governance.

10.8 Synthesis and Conclusion

This chapter synthesised the findings of the study into four major themes as follows:

1. the influence of community structure, cultural and power differentials on local level irrigation water governance;
2. the influence of community level attitudes and behaviours on local level irrigation water governance;
3. the effects of organisational leadership quality on local level irrigation water governance; and
4. the effects of policy design and implementation framework on community-based irrigation water governance in the communities.

The study revealed differential performances among FMS and GMS in terms of community-based irrigation water resource governance. The irrigation institutional arrangements for either FMS or GMS in the study area have not resulted in effective community-based irrigation water governance outcomes of equal power sharing and decision making (participation), control and ownership as intended by the decentralisation policy. However, the FMS had advantages over GMS in terms of community ownership, control, and participation. To a large extent, the communities in the FMS schemes had a better sense of ownership, control, and participated more in irrigation water resource governance than the GMS did. Nevertheless, the governance outcomes of ownership control and participation in the FMS was limited, due to lack of adequate capacities. The decentralised structures at the regional, district and community levels have not contributed effectively to community-based irrigation water resource governance at the local level due to (1) limited capacities, negative social norms, and negative community attitudes and behaviours at the community level, and (2) limited

capacities, poor policy design and implementation framework, and unequal power relationships at the regional and district levels.

Governance capacity was important for the success of the schemes, yet it was low. In practice, the WUAs and lateral groups depended mainly on local knowledge in the communities, but they lacked the required financial and technical capacities from regional and district stakeholders to significantly contribute to community-based irrigation water resource governance for which it is important that not only responsibilities are decentralised to the WUAs, but also rights over water supply. Moreover, the lower-level stakeholders needed to be supported by higher level organisations in building the capacities they needed to discharge these roles and responsibilities effectively. Part of the process of developing these capacities should involve helping lower level stakeholders to build networks for collaboration with NGOs, and other development partners within and outside their communities. Promoting and coordinating stakeholders' partnership at the regional and district levels remains an important condition for effective community-based irrigation water governance for the WUAs and lateral groups.

The adoption of the formal irrigation water governance approach has not been effective. Little evidence was found that its application had led to effective community-based governance in the study area. To be effective governance at the community level must be designed to suit local conditions including the unique social, economic and cultural conditions of the people.

Although the traditional authority structures retained significant strength power, they were unable to deal effectively with the complexities associated with irrigation water resource governance. Similarly the formal system alone cannot also deal effectively

with governance complexities. Hence, there is a need for a hybrid governance system, where the traditional authority system and the formal system complement each other synergistically in accordance with their respective comparative advantages.

Effective stakeholders' collaboration is contingent on the ability of the lead organisation to provide equal opportunities for all stakeholders to interact, and to be able to effectively manage the outcome of such interactions and relationships. Stakeholder interaction and collaboration can be strengthened to the extent that vision and goals become shared, and the legitimacy of roles of all participants becomes more accepted. The outcome of effective stakeholder' interaction may result in enduring relationships as a basis for integration of stakeholders' plans and activities that can support community-based governance. Such enduring relationships may result in the building of social capital among the regional and district stakeholders involved, as these actors will have to rely on each other to achieve the shared community-based irrigation water governance vision and goal. Irrigation water governance was transferred to the local level based on the assumption that decentralisation has the potential to increase local level participation, ownership and control. However, these expected benefits of decentralisation were not well achieved in the study area. This was due to a failure to decentralise rights and resources as well as responsibilities. It was also due to lack of leadership capacity at the regional and district levels to coordinate the decentralised departments and agencies. The existence of decentralised structures is necessary, but not a sufficient condition for increased linkages and integration of plans.

Chapter 11 General Conclusions

11.1 Introduction

The research reported in this thesis was initiated to explore the extent to which decentralisation has supported irrigation water governance at the community level, and its effectiveness in fostering the development of community-based forms of such governance in the Upper East Region (UER) of Ghana. Community-based forms of governance have been shown in some contexts to increase local ownership of institutional choices and thus increase local cooperation in implementing the institutions chosen. This thesis explores some of the issues underpinning governance which demonstrated the importance of context, and the implications of this for community-based irrigation water resource governance in practice. The thesis draws on research and theory from a variety of perspectives.

In implementing the decentralisation policy, the government of Ghana adopted two forms of institutional arrangements, FMS and GMS, as approaches to promote community-based forms of irrigation water resource governance in order to achieve sustainable irrigation water use. However, the performances of these governance forms have proved less than optimal, and thus negatively affect the communities whose livelihoods depend on irrigation water. In an attempt to understand irrigation water governance problems, earlier studies focused on either FMS or GMS, but this did not present a holistic understanding of the problem. This study focused on both institutional arrangements in order to present a comprehensive and comparative understanding of their performances and to bridge the knowledge gap. This comparative approach was able to cover new ground and make a novel contribution to knowledge of irrigation water governance in the country and elsewhere. This new knowledge can inform future

institutional reforms seeking to enhance community-based irrigation water resource governance.

The overarching question this thesis sought to answer was: *To what extent are the current decentralised local government and governance structures and processes at the regional, district and sub-district levels supporting a community-based approach to irrigation water governance?* The sub-questions arising from this focal question that the study seeks to answer specifically over chapters 5 to 9 were:

1. To what extent has irrigation water resource governance been decentralised to the community level?
2. What are the institutional arrangements for irrigation water governance at the district and community levels and how well are these institutions working?
3. What are the impacts of the current local level decentralised structures and processes on community-based irrigation water resources governance?
4. To what extent have normative standards and by-laws promulgated as a guide for irrigation water governance been enforced by relevant stakeholders?
5. What capacities exist for irrigation water governance and how are these capacities supporting community-based irrigation water governance at the local level?
6. To what extent have decentralised processes promoted water user participation in community-based irrigation water governance?
7. How has the decentralisation initiative promoted stakeholders' interaction and collaboration and how are the stakeholders coordinated for irrigation water governance at the local level?

The results of a synthesis of the answers to these questions, which was directed at answering the overarching research question, were presented in chapter ten. Answers to

the overarching research question are also provided in section 11.2. Next, the implications of those overall findings for development of theory are examined in section 11.3. Policy implications of the overall findings are then examined in section 11.4. Final conclusion is provided in section 11.5. Limitations of the overall study are presented in section 11.6.

11.2 Answer to the Overarching Research Question

This section provides a summary of the answer to the overarching question: *To what extent are the current decentralised local government and governance structures and processes at the regional, district and sub-district levels supporting a community-based approach to irrigation water governance?* The answer to this overarching question is based on the four major themes resulting from a synthesis carried out in chapter ten.

The study observed that the decentralised structures at the regional, district and community levels have not been effective in establishing community-based irrigation water governance at the local level. None of the irrigation institutional arrangements for either FMS or GMS achieved effective community-based irrigation water resource governance. The intended outcomes of power sharing and participatory decision-making, control, and ownership were not well achieved. Thus, decentralisation has not enhanced the capacities of regional, district, and community level decentralised structures to support and promote effective community-based water governance. Decentralisation has also not enhanced interaction and collaboration among stakeholders, a necessary condition for effective community-based governance. The decentralisation process failed to recognise the pervasive background power of traditional local authority structures. The hierarchical structure of the traditional system frustrated many of the aims of inclusiveness, especially for women, young men, and

‘non-natives.’ However, the traditional chain of command could mobilise locals for work and compliance. Neither the good or bad aspects of traditional authority systems at the village level were substantially engaged by the policies that came from above. They were most often seen as a threat to the development of effective community-based irrigation water resource governance. The decentralisation policy and implementation strategies were designed superficially, without a critical examination of the ‘theories of change’ that can produce the expected outcomes in a custom-based local society.

11.3 Implications for Development of Community-Based Common Pool Resource Governance, Institutional, and Decentralisation Theories

Evidence from this study demonstrates that collective actions espoused by institutional and collective action theorists as a solution to common pool resource governance problems, have not been effective in solving irrigation water governance problems, due to the limiting contextual factors identified. Various scholars (Ostrom, 1990, 1992, 2007; Ostrom et al., 1994; Lam, 1998; Tang, 1992) have found that institutions developed collectively by the resource users themselves tend, under supportive circumstances, to be more effective in institutional enforcement and compliance than systems where the institutions were entirely determined by external authorities. However, this study shows that enforcement and compliance of the institutions were ineffective in all the case-study areas, including the FMS which developed their own institutions. CPR theory also assumed that participation in community-based interventions would be voluntary and less costly, however, demand for monetary and in-kind rewards as a condition made rules enforcement and compliance costly.

The theory of decentralisation should be revisited in order to further understand the dynamics of the social, cultural, economic, and biophysical factors at the local level,

and how it could be made more effective and beneficial. This study has demonstrated that complex and interlinked community attributes affected policy implementation. The policy, however, lacked a detailed and rigorous analysis of an underpinning ‘theory of change’ that was needed to drive the expected policy outcomes. In many ways, the Ghanaian decentralisation policy was seen as an end in itself, not as a means to other ends such as participation, power sharing, equity, ownership, control, human, organisational and social capital capacities at all levels, and stakeholder collaboration which were assumed but not clarified. Unless policy design and its implementation strategies can effectively deal with these complexities in order to activate the expected changes, local level water resource governance will continue to fail.

11.4 Implications of the Overall Findings for Policy

The implications of the case-study findings for future policy development are considered in this section. Two key policies implemented were the Irrigation Management Transfer (IMT) and Participatory Irrigation Management (PIM). The current water management transfer policy has not had the intended impact of establishing effective community-based irrigation water governance organisations at the local level. There is therefore the need for policy review, clear definitions of implementation strategies, outcomes, and pathways for achieving the outcomes, taking into consideration the complexities associated with the implementation of community governance identified in this study. The very concept of ‘community’ also needs to be more clearly defined and enforced, as a policy of broad inclusiveness does not seem to be popular among traditional local power holders. Traditional authorities should be encouraged to understand that central government resources being directed to local irrigation water governance should benefit all the people in the communities and should in some measure benefit the whole nation, not just their sectional interests.

Inclusiveness of marginalised groups, by broadening the economic and social base of Ghanaian irrigation agriculture, would be one such general benefit for the whole nation.

Additionally, Ghana implemented the World Bank and International Monetary Fund (IMF) sponsored Structural Adjustment Policy in the early 1980s and 1990s. The policy resulted in mass retrenchment of public servants, including those working in agriculture, an end to subsidies for farm inputs, reduction in credit to farmers, and introduction of user fees for social services. However, evidence from several studies (Naylor, 1999; Konadu-Agyemang, 2000) and this thesis, point to the fact that farmers and ICOUR have still not recovered from the negative impacts of the adjustment policy. This policy has reduced the available capacities as a result of reduction in state expenditure on public services such as access to basic agricultural services. Irrigation infrastructures were not maintained, under-utilised, and wasted due to lack of government support. The main policy implications of the research findings are discussed in the next section.

11.5 Policy Recommendations

To achieve community-based irrigation water governance outcomes a number of policy recommendations are proposed below. Each policy recommendation follows from the research findings. These policy recommendations should help to chart the pathways for effective local level irrigation water resource governance. These are grouped into four strategies.

1. strengthen regional and district level stakeholder collaboration for collective action;
2. integrate local level formal and informal institutional arrangements;
3. improve organisational, human and social capital capacities; and
4. facilitate attitude and behavioural change.

11.5.1 Strengthen Regional and District Level Stakeholder Collaboration for Collective Action

Weak stakeholders' interaction and collaboration at the regional, district, and community levels contributed to ineffective community-based irrigation water governance in the case-study area. To improve stakeholders' collaboration the following steps are recommended.

1. The Regional Coordinating Council (RCC) and the District Coordinating Unit (DCU) should assume regional and district level leadership roles and work actively to achieve better integration and collaboration of regional and district decentralised departments and agencies. The RCC and DCU should bring representatives of diverse stakeholders together to engage in defining irrigation water problems, identifying solutions, and obtaining and sustaining the necessary policies, programmes, rules and norms that can establish collaborative efforts for mutual gain. The stakeholders should operate in shared power arrangements in which they can pool information, resources, and activities around irrigation water problems and potential solutions. Forums should be created in a shared-power setting, in which the stakeholders have common understandings of the governance issues, decide what to do about them, and manage conflict and adjudicate disputes over policy implementation. These settings may enhance collaboration, the selection of executives, development of guidelines; and the adjudication of disputes and sanctioning of conduct. Both horizontal and vertical ties should be developed and strengthened between regional and district stakeholders and between regional, district and community level stakeholders. The process should be reviewed, feedback provided, and the lessons learned shared with all the stakeholders on a regular basis. The process should be institutionalised at the

regional and district levels and funded by the Ministry of MOFA, Ministry of Works, Housing and Water Resources, and Ministry of Local Government and Rural Development in order to ensure that the process persists.

2. Though face-to-face contacts are important they are often difficult to organise regularly. New information and communication technologies such as conference calls or other social media should be used to reduce the transaction costs involved in stakeholder interaction for collective action. This may enable multi-level, multi-actor, and multi-sector interaction and negotiation to take place easily. This notwithstanding, it is important to hold at least one performance review annually.
3. The Water Resources Commission (WRC), Ghana Irrigation Development Authority (GIDA) and the District Assemblies should embark on educational campaigns to raise awareness of the water and irrigation policies, expected outcomes, implementation strategies, and also to highlight the roles and responsibilities of stakeholders at all levels. This will not only enhance the institutionalisation of stakeholder participation, but also create a sense of collective ownership of the process. The long-term success of participatory processes may depend on institutionalised stakeholder participation. For effective stakeholder interaction, a district level irrigation management team (DIMIT) should be set up comprising representatives of all stakeholders in the irrigation district. The roles of the DIMIT should include monitoring, evaluation, and capacity building of the WUAs and lateral groups. A regional and district level evidence-based monitoring and evaluation systems should be developed to provide a feedback on output and outcome performance indicators of the stakeholders' interactions. The M&E system should provide opportunities for local stakeholders' inputs and feedback using state-of-the-art participatory

monitoring and evaluation methodologies. The M&E reports should inform irrigation policy implementation and also stimulate action research to further understand factors affecting local level irrigation water governance. Figure 11.1 shows a recommended governance structure that has the potential to stimulate effective interaction. The red arrows show the pathways of relationship between the stakeholders.

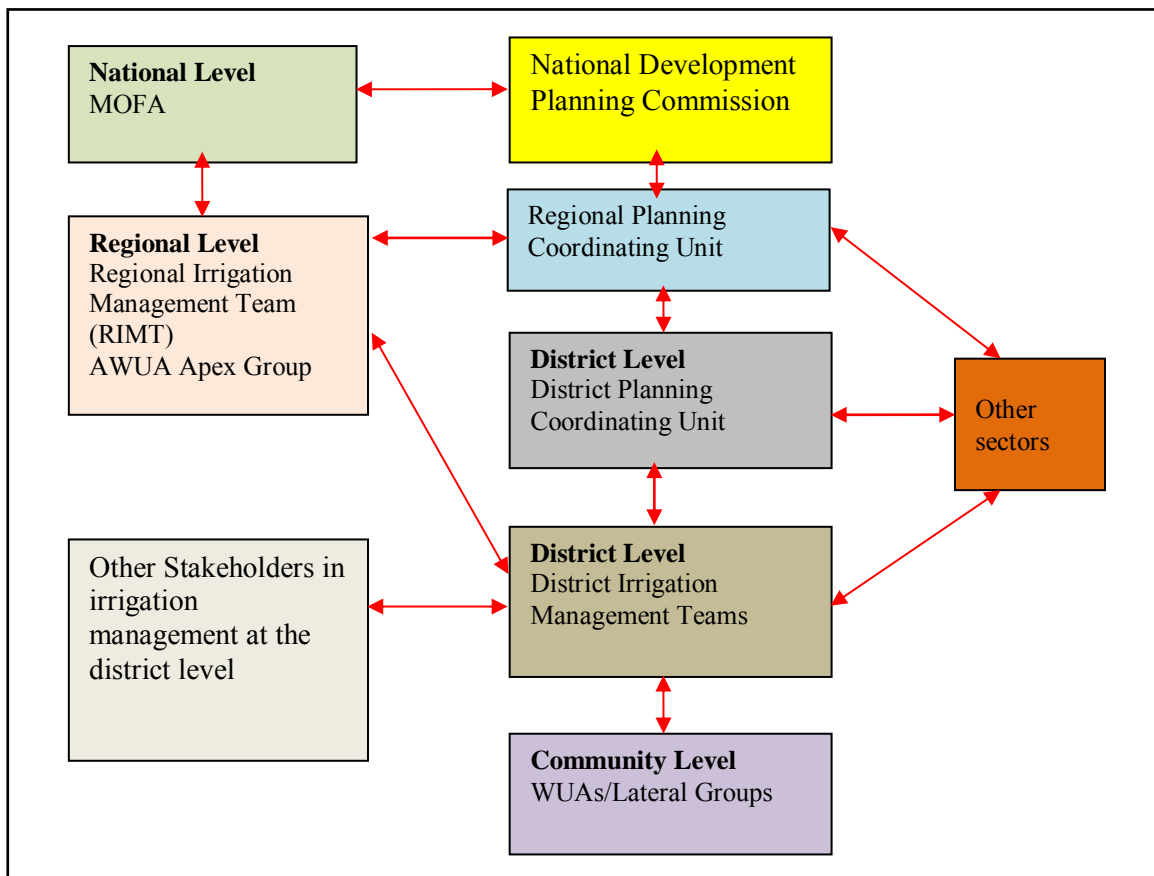


Figure 11-1 Proposed Irrigation Management Interaction Framework

Source: Author’s construct

Included in the proposed structure is the Regional Irrigation Management Team (RIMT), comprising regional Federation of Water Users Association (FWUAs) in both FMS and GMS, and District Irrigation Management Team (DIMIT). The RIMT should provide regular technical support to the DIMIT and FWUAs. The DIMIT and FWUA should in turn provide technical support to the WUAs and lateral groups in the

communities. This structure may be able to represent the interests of all stakeholders. It may also help to tackle issues cutting across economic, social, environmental, spatial categories. In this structure, there should be two-way vertical interaction between national, regional, district, and community level structures.

The following points provide additional conditions to enhance stakeholder' collaboration, cooperation, and partnership for community governance:

1. Collaborative planning is critical as an ongoing process of stakeholder interaction. It is important that communities identify their own priorities with inputs from district and regional stakeholders. Community priorities should become the reference point for district level stakeholder's plan of action.
2. Trust building is important for an enduring collaborative partnership in development. Building of a trusting relationship between the stakeholders should be a priority of any irrigation water governance strategy. To achieve this, it is important that no stakeholder assumes to have a monopoly of knowledge about the problems and everyone should be considered as part of the solution. The stakeholders should work on the principle of transparency and sharing of information. Hierarchies of power, resources and status, while inevitable, should be minimised by adopting an inclusive philosophy of the equal potential worth of each member's contribution and equal decision-making power based on the quality of each individual contribution rather than traditional status. The credit of collective achievement should be ascribed to stakeholder collaboration efforts, for without collective and collaborative action it would be difficult to sustain irrigation systems.

3. Lockwood et al. (2009) identified eight good governance principles for natural resources management. These eight governance principles are relevant for stakeholder collaboration and interaction in irrigation water local governance. These principles should be adopted by all the stakeholders as norms to guide the quality of interaction and collaboration. The application of these principles should be monitored and evaluated on a regular basis with feedback provided.

11.5.2 Integrate Local Level Formal and Informal Institutional Arrangements

There is a need for strong integration of informal and formal institutions for synergy in institutional design and enforcement, and to achieve common goal good governance. Integration of formal and informal institutions may face initial challenges, as traditional authorities and formal group leaders attempt to share power for a common goal. In the case of FMS, as land is under customary governance, there may be resistance to the allocation of land on an equitable basis to women, non-natives and young people. Efforts must be made to understand local land rights, power distribution, and possible conflicts. Education and dialogue may create awareness that formal and informal organisations need to collaborate to overcome the negative effects of fragmentation within the communities. Continuous education and negotiation can minimise these barriers. Sustained public education is required to adequately inform all the community stakeholders on the importance and purpose of the integration, that is, a furtherance of the common good. As Beierle (1998:5) noted, public education is a precursor to behavioural change, and therefore “plays an increasingly important role on issues in which the collective effects of individual decisions are crucial.” Awareness creation will provide information and knowledge for the necessary change.

Policy implementers need to ensure that the WUAs, lateral groups, and particularly the traditional authorities have sufficient information to compare the advantages and disadvantages of the two forms of institution in order to make informed decisions. The traditional authorities can play a catalytic role, due to their ability to enforce rules. Hence their consent for integration is important as solutions to the problems affecting irrigation water governance is multifaceted and requires different perspectives, but all parties must see the benefits in long term social well-being of sharing power and opportunities.

11.5.3 Improve Organisational, Human and Social Capital Capacities

The study identified limited organizational, human and social capital capacities as a major factor affecting all levels of irrigation water governance efforts. There is the need to build and strengthen the three forms of capacities identified in this study (human, organisational, and social capital) for governance at all levels. Resources available to stakeholders will affect their capacity to become involved. The strengthening of irrigation water governance capacity requires sustainable funding to build organisational, human and social capital capacities at all levels. At the district level, human capacities of agriculture extension officers should be built for extension services to provide the technical support needed by the irrigators. Also, at the district level, government departments and agencies' human and organisational capacities should be built for conflict resolution, facilitation skills, adaptation and leadership through training programmes, periodic reviews, and sharing of experiences and lessons learned.

Land is distributed in the government-managed schemes based on ability to pay, however, the poor faced restricted access to land, due to their inability to afford land and water levies. Policies guided by assumptions of homogeneity within communities

failed to see that these differences in social status could not ensure equitable access to land and equal participation in irrigation water governance decision. Widespread participation requires economic empowerment of the majority poor, to bridge the differences in income. Capacities of the farmers can be built through access to land and good commodity prices. One possible strategy is the establishment of micro-credit schemes in the districts to enable irrigators to access the credit necessary to successfully engage in irrigated agricultural production. However, a major constraint on the profitability of irrigated crops is low commodity prices due to excess supply as a result of lack of storage facilities. Loan repayments will be difficult if irrigators cannot make a profit. The RIMT and DIMT should dialogue with the Ministry of Trade, MOFA, Ministry of Local Government and Rural Development, NGOs, and other development partners to establish storage facilities at different irrigation farming zones to preserve perishable crops in order to control quantity supply to the market. Such strategically targeted public investments will tend to boost the returns on production and so perhaps alleviate poverty in a way that the generalised subsidies of the past, abolished on IMF advice, could not.

Moreover, governance failures are limiting improvement to small scale irrigated agricultural production, allowing rural poverty to persist. These failures included: (i) inadequate mechanisms to allow local demands and needs to be integrated within a framework of national water sector goals and strategies; (ii) the lack of mechanisms to generate district and regional resources to co-finance irrigation schemes; (iii) the overlapping roles at the district and regional levels; and (iv) the dominance of local elites in irrigation water development decision making. These issues need to be addressed through effective policy design and implementation.

11.5.4 Attitudinal and Behavioural Change Strategies

National and local level water sector policy objectives, as well as by-laws, should be informed by research that identifies the attitudinal and behavioural changes necessary at national, regional, and community levels to improve community-level irrigation water governance. Water sector policy makers, research institutions, and development practitioners should critically analyse the findings of this research and collaborate to design evidence-based policy to promote effective community irrigation water governance that takes into account the attitudinal and behavioural issues identified in this research. There is the need for an overall behavioural strategy to help change attitudes and behaviours of stakeholders at all levels to produce the intended governance outcomes.

Additionally, the life-cycle of projects undertaken by government agencies and development organisations needs to be explained to resource users. Communities need to understand from the design stage that projects entail both costs and benefits, and what these costs and benefits entail. They need to understand that the cost of development projects such as irrigation facilities go beyond the initial construction costs. Communities need to understand that they have roles and responsibilities to play in post-project costs. These include especially repair and maintenance of the infrastructure, as it is unrealistic to expect government or development organisations to continue major funding of repair and maintenance of infrastructure after the project has ended. It is, however, reasonable to expect a national government to give critical support to training and education to build local capacity to carry out these tasks.

11.6 Research Limitations

Research limitations can be divided into methodological limitations and limitations relating to general interpretation of the research findings. The methodological limitations have been discussed in section 4.12. Hence, this section focuses only on the limitations regarding data interpretation.

The interpretive paradigm followed in the analysis of the study findings involved the interpretation of the participants' feelings, responses and observations from the field. The fact that the researcher depended on these sources of information meant that the reality constructed was undoubtedly influenced by the participants' feelings, as well as the perceptions, experiences, and interests of the researcher. Thus, the researcher's biases influenced the data analysis as it was difficult for the researcher to be independent of both the participants' feelings and his own background and interests. Additionally, the conceptual framework used in this study defined the scope of analysis and interpretation of the data.

The use of only four cases, two each from FMS and GMS, has limited the findings to these study areas. However, the findings can be applied to similar contexts beyond the study area, as it is likely that similar issues occur elsewhere, although generalisation is moderated by the methodological and inferential limitations of the research. Nevertheless, the ability to generalise the lessons learned from this study into the application of a well-intentioned but poorly-applied policy, justifies the value of the study.

11.7 Final Conclusion

Undoubtedly, decentralisation had not made any significant impact on local level irrigation water governance in the UER of Ghana. The decentralised structures and

processes in both FMS and GMS were too weak to promote the intended community-based irrigation water resources governance. Institutional weaknesses make the devolution problematic. Ironically, the GMS had no governance capacity advantage over the FMS, in spite of government's human and financial support. Conversely the FMS rather had some capacity advantage over GMS in terms of community ownership, control, and participation. Thus, there were significant differences between the performance of the FMS and GMS in respect of achieving community-based governance. Decentralised community level structures and processes have made more contributions to the FMS than to the GMS in terms of community-based resource governance outcomes of participation, ownership, and control. Thus, FMS had made greater progress towards community-based governance than the GMS. This can be viewed as one way that decentralisation had contributed towards community-based governance. To promote effective community-based irrigation water resource governance programmes, it is desirable to ensure that governance capacities are built, since these capacities are necessary to enhance community participation, ownership, and control which in turn affects community-based irrigation water resource governance at the local level. It is also important to note that contextual issues at the lower level shaped policy implementation, more than did the 'top-down' efforts of policy implementers.

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APPENDICES

Appendix 1 Key Water Agencies and Legislations

Organisations	Laws	Responsibilities
Environmental Protection Agency (EPA)	Environmental Protection Agency Act, 1994 (Act 490)	The Environmental Protection Agency Act, 1994 (Act 490) turned the Environmental Protection Council into an Agency having; inter alia, regulatory and enforcement roles.
	Environmental Assessment Regulations 1999 (L.I. 1652)	Defines the procedures, under EPA Act 490, for acquiring Environmental Permits and conducting Environmental Impact Assessments. Areas of focus include agriculture, fishing and trapping, logging and forestry, drainage and irrigation, housing, industry, mining, crude oil and natural gas, quarries and sand pits, manufacturing, beverages, rubber and plastic products, leather and textile products, construction, power generation and transmission, waste treatment and disposal, water supply. The aim is to assess activities under these areas that are likely to have adverse effects on the environment and public health.
Forestry Commission (FC)	Forestry Commission Act 1999 (Act 571)	To coordinate and implement the policy and the management of forests reserves and protection of watersheds. This responsibility under the Ministry of Lands and Forestry. Repealing the Forestry Commission Act (Timber Manual, 1998).
Ghana Irrigation Development Authority (GIDA) (GIDA)	Supreme Military Council Decree 85: Irrigation Development Authority Decree 1977 (S.M.C.D. 85)	To formulate and execute plans and programmes for the development of irrigation, livestock improvement and fish culture. Also to plan use including the provision of housing and other social amenities in irrigation project areas.
	Irrigation Development Authority Regulations 1987 (L.I. 1350)	To establish and define the roles of project managements, land allocation committees, agricultural committees, farmers' associations, disciplinary committees, appeals committees, and internal auditors, for each project to ensure the implementation of GIDA's policies. Representation in the management of various technical departments and farmers' associations. The Project manager and the employees of the project are appointed by the GIDA.

Organisations	Laws	Responsibilities
Government of Ghana	Fourth Republican Constitution of the Republic of Ghana, 1992	The Constitution of Ghana legislature: parliament, political parties and the local government - the District Assembly, which sees to the enactment of laws and policies. The Judiciary consists of the Superior Courts of Judicature comprising (i) The Supreme Court; (ii) The Court of Appeal; and (iii) The High Court and Regional Tribunals, of the Judicial Council and the Attorney-General. (GoG, 1992). - Article 269 seeks to protect water resources by setting up a commission to co-ordinate government policies in relation to it.
Local Government/Governance	Local Government Act 1993 (Act 462)	Defines the actors in the decentralisation process: the Regional Co-ordinating Councils (RCC), the Metropolitan, Municipal and District Assemblies (MMDAs), and their sub-structures. The Act specifies their rights and duties such as coordination of decentralised departments, budgeting, planning, bye-laws, financial matters, rates, legal proceedings, penalties, oversight responsibilities.
	Legislative Instrument, Local Government (Establishment) Instrument 1991 (L.I. 1514)	For the establishment of Urban, Zonal and Town Councils and of Unit Committees. For details see (GoG, 1991).
	Local Government Law 1988 (PNDC Law 207)	The District Assembly (DA) as the key institution for the new local government decentralisation system.
	Local Government Service Act 2003 (Act 656)	The Local Government Service Act (Act 656) of 2003 established a Local Government Service, with a governing body whose object is to secure the effective administration and management of local government in the country. Functions of the Service are to provide technical assistance to District Assemblies (DAs) and Regional Coordinating Councils (RCCs) to enable them to effectively perform their functions in accordance with the Constitution and the Local Government Act, 1993 (Act 462). They are to conduct organisational and job analysis as well as management audits for the RCCs and the DAs in order to improve the overall management of the Service, and to assist the RCCs and the DAs in the performance of their functions.

Organisations	Laws	Responsibilities
Lands Commission of Ghana	Lands Commission Act 1994 (Act 483)	An Act of Parliament (Act 483) of 1994 established the Lands Commission to co-ordinate land related issues with other relevant public agencies and governmental bodies; manage public lands and any other lands; advise government, local authorities and traditional authorities on the policy for coordinated development of land in conformity with plans; formulate and submit to Government recommendations on national policy with respect to land use and capability; advise on, and assist in the execution of, a comprehensive programme for the registration of title to land, among others.
Minerals and Mining	Minerals and Mining Law 1986 (PNDC Law 153)	Specifying ownership, administration, procedures of obtaining mineral rights for reconnaissance, prospecting or mining, and other licences, mining leases, suspension of mineral rights, minerals prices, etc. Licence for diverting water for mining or other industrial purposes could be granted by the Secretary of the PNDC. - Every mineral on the territory of Ghana is the property of the State (GoG, 1986).
	Minerals And Mining (Amendment) Act 1994 (Act 475)	Adapting the Law of 1986, however, without any respect to water resources.
Procurement	Public Procurement Act 2003 (Act 663)	Principles referring to transparency and market access and to participation in international competition. This could affect the procedures and outcomes of the private sector participation (PSP) in the water sector.
Public Utilities and Regulatory Commission (PURC)	Public Utilities and Regulatory Commission Act 1997 (Act 538)	Established the Public Utilities and Regulatory Commission (PURC) as an independent regulatory body to determine and implement cost effective tariffs for potable water and electricity.
Volta River Authority (VRA)	Volta River Development Act 1961 (Act 46)	Founding the VRA, whose primary function is to supply electrical energy for industrial, commercial and domestic use in Ghana.
	Volta River Development Act Amendment Decree 1967 (N.L.C.D. 211)	Purpose not known

Organisations	Laws	Responsibilities
Water Resources Commission	Water Resources Commission Act 1996 (Act 552)	Act of Parliament (ACT 522 of 1996) established the Water Resources Commission (WRC), with the mandate to regulate and manage the country's water resources, and to coordinate the sector policies. On principle there is no private ownership of water in Ghana, but the President, or anyone so authorised by him, may grant rights for water use. Though the WRC Act vests the ownership of water resources in the State, it recognises all existing uses of water prior to the enactment of the WRC Act. However, all existing claims to water uses were supposed to be regularised by the Commission within twelve months after the coming into force of the Act. The WRC Act also provides for certain categories of water uses which are exempt from the requirement of permit. - The Act repealed Part I and II of the 'Rivers Ordinance Cap 226 (1903). Part III of the Ordinance is, however, still operative relating to the provisions on 'licensing for dredging, steam vessels and the power to issue regulations to protect and improve navigability and fishing.
	Water Use Regulations 2001 (L.I. 1692)	Issued by the WRC specifying the procedures to obtain water use permits (application, investigation, decision, objections, EIA requirements...) and modalities of administrative fees as well as raw water charges. Exemptions from the duty to obtain permits: water abstracted by manual means or by mechanical means where abstraction level does not exceed 5 litres/second, subsistence water use for land areas not exceeding 1 hectare, subsistence aquaculture water use not exceeding 1 hectare. – Adopted by Parliament in Dec. 2001 (WRC, 2003).

Source: Adapted from Fuest, Ampomah, Haffner and Tweneboah (2005)

Appendix 2: Information Sheet for Participants

Research Project: A Critical Analysis of Decentralisation and Community-Based Irrigation Water Governance in Ghana.

I wish to invite you to participate in my research on the topic above. The details of the study follow and I hope you will consider being involved. I am conducting this research project for my PhD at the University of New England. My supervisors are Dr. Julian Prior, Dr. Lisa Lobry de Bruyn and Dr. Graham Marshall of the University of New England. Dr Prior can be contacted by email at jprior@une.edu.au or by phone on +61267733610, Dr Lobry de Bruyn by email at llobryde@une.edu.au or by phone on +61 2 67733119 and Dr Marshall Graham by email at gmarshall@une.edu.au or by phone on +61267733250. I can be contacted by email at nanedo@une.edu.au or by phone +616773 5213. You can also contact Mr Sampson Tetteh (the Ghanaian contact) on +23320 8159 136.

Aim of the Study: To evaluate and assess the extent to which the current decentralised local government and governance structures and processes at the regional, district and sub-district levels are supporting community-based irrigation water resource governance in Ghana. I am also interested in evaluating the impacts of these structures and processes on irrigation water governance at the community level.

Participation is completely voluntary. You may withdraw from the interview at any time and there will be no disadvantage if you decide not to participate or withdraw at any time. If participants' quotations are used, participants will be quoted anonymously, and the participants will not be identifiable.

Time Requirements: A focus group interview will last approximately 90 minutes.

Interviews: There will be a series of open-ended questions that allow you to explore your views and practices related to your irrigation water resources supply, use, and management experiences. The interviews will be recorded with a digital recorder. The digital recordings will be kept on my personal computer and protected with a password at the researcher's office so that no one can have access to it. The transcription will be kept in the same manner for five years following the submission and then destroyed.

Research Process: It is anticipated that this research will be completed by the end of February 2012.

All personal identifying information and transcripts will only be viewed by the researcher, Nukunu Nanedo and his supervisors. An analysis of the research, however, will be provided to the University of New England, Australia. This project has been approved by the Human Research Committee of the University of New England (Approval No. HE11/184 No. ,Valid to 07/10/2012).

Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer and the Ghanaian contact person at the following addresses:

Sampson Tetteh Senior Hydrogeologist Ghana Rural Water Project World Vision Ghana PMB, Tamale Ghana Ph: +233 208 159 136 Email: sampson_tettey@wvi.org sampson_tettey@yahoo.co.uk	Research Services University of New England Armidale, NSW 2351. Telephone: +61 2 6773 3449 Facsimile +61 2 6773 3543 Email: ethics@une.edu.au
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Thank you for considering this request and I look forward to further contact with you.

Regards

Nukunu Nanedo

[nnanedo@une.edu.au](mailto:nanedo@une.edu.au)

Phone: +61 2 6773 5213

Appendix 3: Introduction Letter

School of Environmental and Rural Science

University of New England

Armidale NSW 2351, Australia.

jprior@une.edu.au

Tel: 02 67733610

September 23, 2011

The District Chief Executive

Dear Sir,

RE: PERMISSION TO UNDERTAKE RESEARCH IN YOUR DISTRICT

Nukunu Nanedo is a Doctoral Candidate at the University of New England, Australia. As part of his research project, Nukunu is undertaking an exploratory study on community-based irrigation and rural domestic water resources governance in Ghana. We are requesting your permission to carry out the research in your district.

The aim of the study is to evaluate and assess current water resource governance structures and processes (formal and informal), as well as identify ways of better supporting community-based approaches, in Ghana. Nukunu is also interested in evaluating the impacts at the community level of current governance structures and processes (formal and informal) in case studies selected from Northern and Upper Regions of Ghana in irrigation and rural domestic water resource supply, use and management.

Nukunu's supervisors are Dr Julian Prior, Dr Lisa Lobry de Bruyn and Dr Graham Marshall of University of New England. Dr Prior can be contacted by email at jprior@une.edu.au or by phone on 02 67733610, Dr Lobry de Bruyn by email at llobryde@une.edu.au or by phone on 02 67733119 and Dr Graham Marshall by email at gmarshall@une.edu.au or by phone on 02 6773 3250. Nukunu can be contacted by email at nanedo@une.edu.au or phone on +61 2 6773 5213 or +61 423 70 3133.

Participation in this research will enable Nukunu to evaluate and assess current water resource governance structures and processes, and identify ways of better supporting community-based approaches in your district.

Thank you for considering this request and we look forward to receiving a favourable response from you, and Nukunu can be contacted by email at nnanedo@une.edu.au or phone on +61 2 6773 5213 or +61 423 70 3133.

Regards

On behalf of Nukunu Nanedo



Ecosystem Management
School of Environmental and Rural Science
University of New England
Armidale NSW 2351, Australia.

Appendix 4: Consent Form For Participants

Research Project: An Exploratory Study of Community-Based Irrigation Water Resources Governance in Ghana

I,, have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction.

Yes/No

I agree to participate in this activity, realising that I may withdraw at any time. Yes/No

I agree that research data gathered for the study may be published using a pseudonym

Yes/No

I agree to the interview being audiotape recorded and transcribed.

Yes/No

I agree that quotations from my interview may be used anonymously in publications, and I understand that I will not be identified in any way.

Yes/No

.....

Participant

Date

Nukunu Nanedo

.....

Researcher

Date

Appendix 5: Interview Guides

TRADITIONAL AUTHORITIES INTERVIEW

Time at beginning of interview: Time at end of interview:

Date of Interview.....

A. District Name:

B. Name of Community:

INSTITUTIONAL ARRANGEMENTS AT THE COMMUNITY LEVEL

Focal Question: What are the rules determining water resources access, use and management?

Interview Question:

1. What are the roles and responsibilities of traditional authorities in water resource governance in district/community?
2. (a) What are the traditional rules put in place regarding irrigation water supply, use and management in the community?
(b) How were these rules formulated?
(c) At the moment, do you still have traditional rules regarding the water?
(c) Who was involved in developing these rules?

Rules enforcement and compliance

3. (a) Who ensures that everyone keeps the rules regarding the water in the community?
(b) Can you give me an example where there was a negative behaviour regarding the irrigation water in the community?
(b) What happened as a consequence of the negative behaviour?
(c) How do you reward positive behaviours in water in water use and management?
(d) What are the effects of compliance and non-compliance to the rules?
(e) Are there any rules for water resource governance that all organisations should comply with the community?
(f) How are the rules enforced?
(g) What will you consider as important to make all organisations work together well on water resource governance in the district?

Conflicts and Conflict Resolution Mechanisms

4. (a) Which kind of conflicts exist in this community regarding water supply and use?
(b) What are the main sources of conflict regarding the water?

- (c) What are the most common conflicts?
- (d) How often does this type of conflicts occur?
- (e) Can you tell me an instance when conflict arose between the community and these organisations in relation to water resource supply and management?
- (f) If there was an instance of conflict, what was the cause and how was the conflict resolved, if at all?
- (g) Were you able to resolve this conflicts and if so how?
- (h) What mechanisms do you use to resolve the conflicts if they arise?
- (i) How effective is the approaches you use to resolve conflicts?
- (j) Were there instances you were not able to resolve a conflict and what did you do?

COMMUNITY CAPACITY FOR WATER RESOURCES GOVERNANCE

Focal Question: To what extent do the communities have the capacity in irrigation water supply in relation to: (a) assess to network of influence, (b) water resource planning, implementation, monitoring and evaluation and (c) enforcing rules compliance?

5. How are you able to:

- (a) Mobilise financial resources for repair and maintain the water resource facilities?
- (b) Ensure community ownership of the water resource facilities?
- (c) Ensure compliance with rules?
- (d) Assess how well and badly the community is performing in water resources governance?
- (f) Network with organisations and communities that can support the community in its water resources governance?
- (g) What will you need to be able to perform your roles and responsibilities well?

EXTERNAL FACTORS (GOVERNMENT POLICIES AND LAWS)

Focal Questions: *What external actions (these could be both formal and informal) have influenced water supply, use management?*

1. Tell me how government has influenced rules and processes of water supply and management in the districts and communities you work?
2. (a) Do you feel you have been given adequate power to make decisions on water supply, use and management in the community?
(b) Why do you feel this way?

What is their relationship to the local government system?

STAKEHOLDERS' INTERACTION

Focal Question: What are the roles and responsibilities/functions of the various organisations regarding irrigation and rural domestic water resource governance?

3. (a) How will you describe your relationship with local government and other government agencies working on irrigation water in the community?
(b) Which organisations, groups and institutions do you work with concerning water?
4. Can you give an example when the organisations working on irrigation water management involved the traditional authorities?
5. What successes and difficulties do you have in working with the organisations and the District Assembly?
6. How is your relationship with the WUAs/lateral groups in the community?
7. How is your interaction with ICOUR/MOFA in relation to the reservoir?

GOVERNANCE PROCESSES AND PRINCIPLES

8. (a) Are there any rules for water resource governance that all organisations should comply with the community?
(b) How are the rules enforced?

Legitimacy

- (c) (a) How are the decisions or rules you make perceived by the WUAs/lateral groups/ICOUR/MOFA?
(b) To what extent are the rules of the traditional authorities obeyed regarding the reservoir?
(d) (a) Can you tell me how organisations working concerning water supply and management are serving the interest of the community?
(b) Which organisations will you prefer to work with and why?
(c) What do you think are the impacts of the WUAs/lateral groups/ICOUR?

Transparency

- (e) (a) Do you have examples of issues of trust regarding your working relationship with the WUAs/lateral groups/ICOUR/MOFA?
(b) Do the WUAs/lateral groups/ICOUR share information with you regarding the reservoir?
(c) Can you tell me your successes and difficulties in having access to information concerning resource supply, use and management in the district?

Accountability

- (f) (a) Do the WUAs/lateral groups/ICOUR/MOFA report to you about their activities concerning the water?

(b) How do you know the WUA/lateral groups/District Assembly and the organisations working on the water are performing well or badly?

Inclusiveness

(g) (a) What are your roles and responsibilities regarding the reservoir in the community?

(b) Can you give me an example where the WUAs/lateral groups/ICOUR/MOFA invited you to participate in the planning and decision concerning the reservoir?

(c) Are the views of traditional authorities represented in decision-making in the community and district as a whole?

(d) Do you think your views are considered by the WUAs/lateral groups/ICOUR/MOFA?

(e) How will you want to be involved in the management of the reservoir in the community?

(f) What will you consider as important to make all organisations work together well on water resource governance in the district?

Monitor, Evaluate and Report Governance Performance

(a) Can you give me an example where you assessed how the community performed in supply and management of water resources?

(b) How will you suggest that water governance could be improved?

WATER USERS COMMITTEES LEADERS INTERVIEW

Time at beginning of interview: Time at end of interview:

Date of Interview:

- A. District Name:
- B. Name of Community:
- C. Participant’s ID:
- D. Participant’s Gender:
- E. Participant’s Age:
- F. Participant’s level of Education:
- G. Years involved in irrigation farming
- H. Years stay in the community:
- I. Major crops under cultivation.....
- J. Number of Farmer Group Members..... [Male.....] [Female.....]
- K. Type of Water Resource: [Dam.....] [Stream.....]
- L. Development Organisations working with (List them)

Item	Name of Organisation	Development Activities
1		
2		

INSTITUTIONAL ARRANGEMENTS AT THE COMMUNITY LEVEL

Focal Question: What are the rules (the operational and collective choice rules) determining water resources access, use and management?

Interview Question:

- 1. (a) Who from the community are included in the Water Users Committee/Lateral group?
 - (b) Can you tell me the roles and responsibilities of Water Users Committee in organising irrigation water supply, use and management?
- 2. (a) What criteria do you use in selecting your leaders?
 - (b) What are the roles and responsibilities of the leaders?
 - (c) Who defines the roles and responsibilities of the leaders?

3. (a) What rules are put in place regarding irrigation water supply, use and management?
(b) Who were involved in developing these rules?
(c).Who ensures that everyone keeps to the rules?
4. Are there any traditional rules that are used to govern irrigation water resources?
5. What are the reasons for putting these rules in place?

Rules Enforcement and Compliance

6. (a) Which rules and regulations are working well and why?
(b) Can you tell me an example of where someone did not keep to the rules?
(c) What are the sanctions when people do not comply with the rules?
(d) Do you reward rules compliances and how?
(c) How effective are the sanctions?
(d) What suggestions can make the rules work?
(e) Are there rules needed to make irrigation water governance more effective?

Conflicts and Conflict Resolution Mechanisms

- 7 (a) Which kind of conflicts exist in this community regarding water supply and use?
(b) What are the main sources of conflict regarding the water?
(c) What are the most common conflicts?
(d) How often does this type of conflicts occur?
(e) Were you able to resolve this conflicts and if so how?
(f) What mechanisms do you use to resolve the conflicts if they arise?
(g) How effective is the approaches you use to resolve conflicts?
(h) Were there instances you were not able to resolve a conflict and what did you do?

Stakeholders' Interaction and Collaboration

- 8(a) Which organisations to you work with?
(b) How will you describe the strength of your relationship with them?
(c) What do you do in common with these organisations?
(d) In which ways are they helpful to you?

- (e) How often do you interact with them?
 - (f) How satisfy are you with your relationship with them?
- 9 (a) Do relate with other irrigation water users outside your village?
- (b) Have you established any continuous relationship with any NGO or government departments and agencies that work in irrigation water management?

Governance Principles

Capacity

10. (a) Which of your roles and responsibilities do you think you perform well and why?
- (b) Which of your roles and responsibilities are you not able to perform well and why?
- (c) What will assist you to perform your roles well?
- (d) What training have you received to perform your roles and when did you receive it?
- (e) What kind of support have you received from MOFA/ICOUR?
- (f) When was this training provided?

Legitimacy

11. (a) How do you elect your leaders?
- (b) As a leader, do you think you can make rules that will govern WUAs?
- (c) How are the decisions or rules you make perceived by the group members?
- (d) Are there some decisions you cannot take as a leaders?
- (e) Which organisations will you prefer to work with and why?

Transparency

12. (a) Tell me all the organisations you are currently working with.
- (b) Can you give examples of organisations in the community that provided you with information concerning their activities?
- (c) Which organisations are willing to work with you in the community concerning irrigation supply and management and which are not?
- (d) Do you have examples of issues of trust regarding your working relationship with the organisations and the community?
- (e) How do you disseminate information on irrigation water supply and management to to farmers?
- (f) To what extent can MOFA/ICOUR rely on you to take good decisions regarding water supply and use?

(g) How easy is it for MOFA/ICOUR to have access to your reports, decisions?

(h) How do you arrive at decisions in the WUA/lateral group?

Accountability

13. (a) Whom do you report to on your performances?

(b) How do you report on your performances?

(c) What do you report on?

(d) Is there anyone you are accountable to and yet you do not report to him and why?

(e) Does MOFA/ICOUR report to you on their performances?

Inclusiveness

14 (a) Have you ever invited ICOUR/MOFA etc to participate in your planning activities/meetings?

(b) To what extent are your views considered by MOFA/ICOUR?

(c) Have you being invited by MOFA/ICOUR to participate in their planning decisions concerning water in your community?

(d) To what extent do you include the WUAs and lateral groups in decision making?

(e) To what extend to do you include the traditional authorities in your decisions?

(f) To what extent do the traditional authorities influence your decisions?

(g) To what extent do you include women in decision making?

(h) How many women do you have in leadership?

Fairness

15. (a) Do you think every irrigator in the community including women, youths, non-natives are treated fairly in relation to (1) water allocation, (2) land allocation, (3) cost and benefits associated with irrigation water?

(b) What are the environmental issues that affect irrigation management in your community?

(c) How do you deal with environmental problems associated with irrigation?

(d) Do you think ICOUR is fair to all farmers in their decision regarding water supply and management?

Adaptability

16. (a) What are the challenges that affect your efforts in the management of irrigation water in the community?

- (b) What strategies have you put in place to deal with these challenges?
- (c) What opportunities exist in the community regarding irrigation water resources?
- (d) What plans do you have to take advantage of these opportunities?

Monitoring and Evaluation

17. (a) How do you know you are performing your roles well?
- (b) How do you get to know that the canals/lateral are in good condition?
 - (c) How do you ensure that the farmers are complying with the rules?
 - (e) What plans do you have in the community regarding the water?
 - (f) How do you know you are achieving your plans?
 - (g) What do you plan to achieve regarding irrigation water management in five years time?
 - (h) What plans have you put in place to achieve this plan?
 - (i) What are the benefits of the irrigation water to the community?

Vision for the Future

18. (a) In the next five years, how do you want to see irrigation water management in the community look like?
- (b) What suggestions do you have as to how to improve irrigation management in your community?

INDIVIDUAL IRRIGATORS INTERVIEW (WUA/LATERAL GROUP MEMBERS)

- A. Time at beginning of interview: Time at end of interview: ...
- B. Date of interview:
- C. District name:
- D. Name of community:
- E. Participant's ID:
- F. Participant's gender:
- G. Participant's age:
- H. Marital Status:
- I. Participant's level of education:
- J. Years involved in irrigation farming:
- K. Years stay in the community:
- L. Major crops under cultivation:
- M. Translator.....
- N. Interviewer.....

INSTITUTIONAL ARRANGEMENTS AT THE COMMUNITY LEVEL

Focal Question: What are the rules (the operational and collective choice rules) determining water resources access, use and management?

1. (a) What rules do you have regarding irrigation water supply, use, and management
- (b) Who design the rules?
- (c) How were you involved in developing the rules?
- (d) How were the farmers involved in developing the rules?
- (e) How were the farmers involved in developing the rules?
- (f) Who are your leaders in this group?
- (g) How were your leaders selected?
- (h) What criteria do you use to select your leaders?
- (i) Are there any traditional rules regarding the water?
- (j) How effective are the traditional rules regarding the water?
- (k) What are the benefits of the rules?

Rules Enforcement and Compliance

1. (a) What are the reasons for putting the rules in place?
- (b) Which of the rules are working well and what makes them work well?
- (c) Which of the rules are not working well and what makes them not to work well?
- (d) What do you think will make the rules work well?
- (e) What sanctions are given to the farmers who do not comply with the rules?
- (f) How effective are the sanctions?
- (g) Are your leaders fair in enforcing the rules?

Conflicts and Conflict Resolution Mechanisms

1. (a) Which kind of conflicts exist in this community regarding water supply and use?
- (b) What are the main sources of conflict regarding the water?
- (c) What are the most common conflicts?
- (d) How often does this type of conflicts occur?
- (e) Were you able to resolve this conflicts and if so how?
- (f) What mechanisms do you use to resolve the conflicts if they arise?
- (g) How effective is the approaches you use to resolve conflicts?
- (h) Were there instances you were not able to resolve a conflict and what did you do?

Stakeholders' Interaction and Collaboration

1. (a) How effective is your interaction with the WUA/lateral leaders?
- (b) Are you able to work together?

Governance Principles

Self-assessment

Capacity

2. (a) What are your roles and responsibilities as a member of the group?
- (b) Are you able to perform this role in the group?
- (c) What will make it possible for you to perform your roles well?
- (d) What training have you received regarding irrigation water management?
- (e) When did you receive training and what was it about?
- (f) Who provided this training?
- (g) What new trainings do you think you need and why?

Legitimacy

3. (a) How were your leaders elected?
(b) How well are the leaders serving your interest?
(c) How satisfied are you with how the leaders are managing the water in the community?
(d) Will you want the leaders changed or you will like them to continue serving you and why?

Accountability

4. (a) How do you know your leaders are performing well or not?
(b) Do your leaders report to you on their performance and do they do it?
(c) How well are the leaders managing your financial contributions towards repair and maintenance?

Fairness

5. (a) Do you think every irrigator in the community including women, non-natives, young irrigators is treated fairly in relation to (a) water allocation, (b) land allocation, (c) costs and benefits associated with the irrigation water?
(a) To what extent do you think the WUA/lateral leaders are fair in the way they make decisions and implement the rules?

Vision for the Future

6. a) In the next five years, how do you want to see irrigation water management in the community look like?
(b) What suggestions do you have as to how to improve irrigation management in your community?

FARMERS' MIXED FOCUS GROUP INTERVIEW GUIDE

District:					Group: Mixed Group
Community:					Moderator:
Note taker:					Date:
Translator:					Transcriber:
Participant ID	Age	Gender	Marital Status	Occupation	No. Years in irrigation
P1					
P2					

Decentralisation and Irrigation Water Management

1. Can you tell me about the policies regarding the governance of irrigation facilities in the community?
2. Are you aware of the government policy of transferring powers of decision making concerning the operation, management and maintenance of the irrigation water resources facilities to the district and communities?
3. How do you understand decentralisation so far as irrigation water management is concerned?
4. Who owns the irrigation infrastructure in the community?
5. Is the irrigation facilities fully transferred to the community?
6. Do you feel the ownership and control over management of the irrigation facility?
7. Do you feel you have the power to take decision concerning the operation, management and maintenance of irrigation facility in your community?
8. Can you as a community manage the water without the government support?
9. Do you have any legal document on the transfer of the reservoir to you?
10. What are the reasons for transferring facility management and ownership to the communities?
11. What the advantages and disadvantages for transferring the facilities to the communities?
12. How has the government policy of transfer of ownership, operation and maintenance responsibility affected how you are managing the water?
13. What are your roles and responsibilities in the management of the water?
14. What are your specific roles regarding the repair, maintenance and management of the dam?
15. How do you play these roles and responsibilities of yours?
16. Who makes decisions regarding the supply, the rules and maintenance of the dam?
17. How effective have you been in playing your roles and responsibilities?
18. Do you feel you have the capacity to be able to manage, repair and maintain the irrigation facility?
19. Do you have the capacity to monitor and evaluate compliance with rules and regulations that you have regarding the management of the dam?
20. What support do you receive from the District Assembly?
21. When was the last time you received training on irrigation water resources management?
22. How did you elect your leaders?
23. What is the tenure of office of these committee leaders?
24. Are women in the leadership?

25. What are the roles of women in the management of water?
26. Are your leaders accountable to you?
27. Are the WUA executives able to organize meetings the way they should?
28. Who makes the rules regarding the management of the water?
29. How do you decide on your user contribution?
30. How well are your leaders able to enforce the rules?
31. How is compliance with rules monitored and enforced?
32. What do you think are the effects of compliance to the rules on irrigation water supply use, and management?
33. Do you think your leaders have the power to enforce the rules?
34. Is the WUAs registered at the department of cooperatives?
35. Who is responsible for managing the money that you contribute?
36. At the moment how much do you have in your account?
37. Is the money you contribute enough to to repair and maintain the dam?

WOMEN'S FOCUS GROUP INTERVIEW GUIDE

District:					Group:
Community:					Moderator:
Note taker:					Date:
Translator:					Transcriber:
Participant ID	Age	Gender	Marital Status	Occupation	Years in irrigation farming
P1, P2, P3....					

1. Why is it necessary for WUA to be formed in this community?
2. What are the rules regarding irrigation water governance in this community?
3. Who made the rules?
4. Were women involved in making the rules?
5. How do these rules affect women?
6. Are women able to comply with the rules including financial contributions?
7. What roles do the WUAs play in irrigation water management?
8. What roles do women play in irrigation water management?
9. How do you elect your leaders?
10. Is women part of the WUA leadership?
11. What are the obstacles that prevent women from being in the leadership?
12. How do you feel for women not included in the leadership?
13. What would be the benefits of women inclusion in the WUA leaders?
14. Do women participate in meetings?
15. How do you arrive at a decision regarding contribution towards the repairs and maintenance of the dam?
16. Do women participate effectively in decision-making process concerning the irrigation water?
17. Do you think women are treated fair in terms of (1) access to land, (2) water allocation, (3) cost and benefits associated to water governance?
18. How easy is it for women to have access to land and water in the community?
19. What suggestion do you have to make women participate equally in decision-making?
20. What role do you (women) play in repair and maintenance of the dam?
21. Have women received any training from any institution or agency regarding the use and management of the water

REGIONAL AND DISTRICT IRRIGATION OFFICERS INTERVIEW

Time at beginning of interview: _____ Time at end of interview:

Date of Interview.....

- A. District Name:
- B. Name of Department/Agency:
- C. Participant’s ID:
- D. Participant’s Gender:
- E. Participant’s Age:
- F. Participant’s level of Education:
- G. Participants position:
- H. Number of years in the Organisation:
- I. Development Organisations supporting water resource governance in the district

Item	Name of Organisation
1	
2	
3	
4	

Management Structure

- 1. Can you tell me the category of staff you have for irrigation activities and their total number?
- 2. What are your roles and responsibilities in irrigation water resource management in the District here?

Decentralisation of Management responsibility

- 3. Can you tell me about the policies regarding the governance of irrigation facilities in the district?
- 4. Who owns the irrigation infrastructure in the district?
- 5. Are the irrigation facilities transferred to the Districts?
- 6. What are the reasons for transferring facility management and ownership to the communities?
- 7. After you have handed over, the facilities to the district do you still have any interaction with the communities and the WUAs regarding the management of these facilities?

8. At the moment, what are your roles and responsibilities regarding the irrigation facilities?
9. Tell me how decentralisation policy has influenced irrigation water management in the districts and communities?
10. What the advantages and disadvantages for transferring the facilities to the communities?

EXTERNAL FACTORS (GOVERNMENT POLICIES AND LAWS)

Focal Questions: *What external actions have influenced irrigation water management?*

11. (a) What is your interaction with government in relation to irrigation water resources governance?
12. (a) Do you feel the District Assembly has been given adequate power to make decisions on water supply, use and management in the district?
(c) Why do you feel this way?

STAKEHOLDERS' INTERACTION

Focal Question: What are the roles and responsibilities of the various organisations (formal legislated sub-district structures on the one hand, and informal civic water groups and communities on the other hand) regarding irrigation water resource governance?

Interview Questions:

Which organisations do you work with concerning the irrigation infrastructure?

13. Tell me how the organisations working in the communities involve the District Assembly in decision-making?
14. (a) What roles do traditional authorities and communities play in the governance of irrigation water resources in the district?
(b) What customary rules have influenced water governance processes in the communities the district support, if at all?
15. (a) Can you tell me an instance when conflict arose between you and these organisations in relation to water resource supply and management?
(b) If there was an instance of conflict, what was the cause?
(c) How was the conflict resolved, if at all?
16. What successes and difficulties do you have in working with the communities, other organisations and the District Assembly?
17. How are the activities of the stakeholders coordinated in the district?

GOVERNANCE PROCESSES AND PRINCIPLES

18. (a) What are the rules for water resource governance that all organisations working in the district should comply with?
(b) How are the rules enforced?
19. (a) What will you consider as important that will make all organisations work together well on water resource governance in the district?

Legitimacy

20. (a) How are the organisations working on water supply and management serving the interests of the district in water resource governance? Please explain.
(b) Which of the organisations will you not want to work with in water supply and management? Please explain why?

Transparency

21. (a) Which organisations working on water supply and management provide you with information concerning their activities in water and which organisations do not?
(b) Which organisations include you in their planning processes concerning water?
(c) Are there issues of trust regarding the organisations working in the district? Please explain why.
22. Can you tell me your successes and difficulties to have access to information concerning water resource supply, use and management in the district?
23. How is information disseminated across and among stakeholders in the district?

Accountability

24. (a) How is District Assembly able to know how well or badly the organisations are performing in the district?
(b) Whom do you report to about your performances?
(c) How often do you report about your performance?
(d) How do you relate to the District Assembly in terms of reporting and accountability?

Inclusiveness

25. (a) Can you give me an example where organisations or institutions working on water supply and management invited you to participate in the planning activities concerning water in the district?
(b) Can you give me an instance where you invited the development organisations including traditional authorities in your planning activities concerning water in the district?

Integration

26. (a) Can you show me a copy of a harmonised water plan in the district that guides your operation?
 - (b) How has this harmonised plan influenced your activities?
 - (c) How beneficial has this harmonised to your department/agency?
- (b) What roles do traditional authorities play in the governance of irrigation water resources in the district?
 - (c) Can you give me an example where customary rules had influenced water governance processes in the district?

Capacity

27. What are your experiences in irrigation water resources supply and management?
28. What organisational resources do you have to support you in local level water governance?
29. What human resources do you have to support you?
30. What resources do you lack as a department in terms of irrigation development
31. What will you need to be able to perform your roles and responsibilities well?
32. What skills and knowledge do you lack as department in terms of irrigation development?
33. What enables your department to perform its irrigation water resource governance roles well?

Adaptability

34. (a) What are your successes and difficulties in irrigation water supply and management in the district?
 - (b) What do you consider as threats to water resources supply and management in the District?
 - (c) How is District Assembly performing against the identified threats and difficulties?
 - (d) What strategies have you put in place to deal with the threats and challenges you face?
 - (e) What are the opportunities have you identified for water supply and management in the district?
 - (f) What lessons have you learned concerning water supply and management in district?

35. (a) How will you rank the performance of the organisations, institutions and groups against the governance principles in relation to water supply and?
(b) Why do you rank the organisations in the manner you did?

36. Tell me how the performance of the organisations in the governance principles affected the outcomes of water resources supply and management in the district.

Monitor, Evaluate and Report Governance Performance

37. Can you give me an example where you assessed how the district performed in the supply and management of water resources in the district and what did you assessed?

38. Which organisations were involved in the assessment of the district's performance of its water resource governance outcomes?

Concluding Question

39. How will you suggest that water governance could be improved?

ICOUR INTERVIEW GUIDE (Government Irrigation Company)

Region:

Participant ID:

Sub-Group:

Gender:

Age:

Interviewer:

Position

Transcriber:

Date of Interview:

Management Structure

1. Can you tell me about your management structure
2. Can you tell me the category of staff you have for irrigation activities and their total number?
3. What are your roles and responsibilities in the management of the Vea reservoir?
4. What roles do the lateral groups play in the management of the water?
5. What roles do the traditional authorities play in the management of the water?
6. What roles do the District Assemblies play in the management of the water?

Decentralisation of Management responsibility

7. Can you tell me about the policies regarding the governance of the Vea scheme?
8. Who owns the Vea irrigation infrastructure?
9. By policy, the communities and the water users are supposed to co-manage the scheme with ICOUR. To what extent is that policy working?
10. What do you consider as the advantages and disadvantages of that policy?
11. What success have you made regarding that policy?
12. What do you consider as weaknesses of that policy?
13. How has this policy influenced the management of the irrigation scheme?

Rules Enforcement and Compliance

14. Are there written rules and regulations in place concerning the management of the water?
15. What criteria do you use to determine water and land levies to be paid?
16. Do the farmers consider the levies affordable?

17. Is there any written water distribution schedule that every farmer has to be aware of?
18. Are farmers involved in making these distribution schedules?
19. Do you have a situation where you provide them less water than they expect?
20. Were the farmers involved in setting up these rules and regulations?
21. Which rules and regulations are working well and why?
22. Can you tell me an example of where someone did not keep to the rules?
23. What are the sanctions when people do not comply with the rules?
24. How effective are the sanctions?
25. Do you reward rules compliances and how?
26. Are there other rules needed to make irrigation water governance more effective?
27. Do you have a written operation and maintenance plan in place?
28. What types of maintenance are the farmers supposed to do?

Conflicts and Conflict Resolution Mechanisms

23. (a) Which kind of conflicts exist in this community regarding water supply and use?
 - (b) Does disputes occur between you (ICOUR) and the farmers regarding irrigation water use and management?
 - (c) How do you resolve these disputes?
 - (b) What are the main sources of conflict regarding the water?
 - (c) What are the most common conflicts?
 - (d) How often does this type of conflicts occur?
 - (e) Were you able to resolve this conflicts and if so how?
 - (f) What mechanisms do you use to resolve the conflicts if they arise?
 - (g) How effective is the approaches you use to resolve conflicts?
 - (h) Were there instances you were not able to resolve a conflict and what did you do?

Stakeholders' Interaction

24. What kind of interaction do you have with the water user's here in Ve'a?
25. What kind of interaction do you have with the traditional authorities?
26. What kind of interaction do you have with the District Assembly and regional agencies?

27. What kind of interaction do you have with the Federation of the Water Users (Apex group)?
28. What success have you made working with the Apex group and District Assembly and regional agencies?
29. What difficulties have you had working with these partner groups?

Legitimacy

30. Do you have the authority and power to make rules and operate on your own?
31. Where is your source of power and authority coming from?
32. What decisions can you make and what can't you make as ICOUR in Ve'a?
33. Which partner organisation or institution would you work with and why?

Inclusiveness

34. To what extent have you involved the lateral groups in the management of the water?
35. To what extent are farmers involved in your water scheduling plans?
36. To what extent do you involve the traditional authorities the various communities in the management of the water?
37. To what extent do District Assemblies and regional agencies involve you in their planning activities regarding water management in the communities?
38. To what extent are your views considered in the way the water users also take decisions and implement them?

Capacity

39. Which of your roles and responsibilities do you think you perform very well?
40. What will make it possible for you to be able to perform these roles and responsibilities better?
41. What type of support will you need from the District Assembly and other partner organisations to be able to achieve your goals?

Transparency

42. How do you disseminate information on irrigation water resource supply to the farmers?
43. What kind of information do you provide to the farmers?
44. To what extent are the farmers informed on your seasonal irrigation schedules?
45. To what extent do the community people or the lateral groups provide you with information regarding how they are managing the water resources?

46. Do the district decentralised departments and regional agencies provide you with information?
47. Do you also provide district decentralised departments and regional agencies provide you with information regarding your operation?
48. To what extent do you think the partner organisations can trust ICOUR to make decisions and rules regarding irrigation resource use and management?
49. Can the farmers trust you for reliable supply of water?
50. To what extent can ICOUR trust the community and laterals leaders to take decision and implement them regarding water resource management?C

Accountability

51. Whom do you report to and what do you report on?
52. Do you report to the water users in the communities?
53. Is there anyone or institution that you think you are accountable to and yet you don't report to?
54. To what extent have you considered environmental issues in water resource management?
55. What did you plan to achieve in the last five years?
56. What are your plans in the next five years?

Integration

57. To what extent are your water resource management plans integrated with the plans of water users in the community, the District, and regional agencies?

Adaptability

58. What are the external challenges or threats that affect your efforts in managing the water resources in Veá?
59. What plans have you kept in place to deal with these threats that you mentioned in the near future?
60. What are the opportunities that exist here regarding water resource management that you can take advantage of?
61. What strategies have you put in place to take advantage of these opportunities?

Monitoring and Evaluation

62. To what extent are the rules and regulations that you have set is monitored?
63. How will you describe the impact of the canals or laterals on irrigation activities in Veá?

64. How do you evaluate your own performance as ICOUR?
65. At the moment where do you think you need to improve?
66. Is there seasonal or annual inspection of irrigation?
67. Who are involved in monitoring and implementing these rules and regulations?
68. How effective is the monitoring and implementation of these rules and regulations?

Plans for the Future

69. How will irrigation water resource management in Veia be like in the next five years?

Rice Production –Nyariga, Ve a & Winkogo											
Irrigator ID	Sex	Land preparation	Seeds	Planting	Weeding/water pumping	Agrochemicals	Fertilizer	Harvesting/transport	Total Cost (X)	Gross Profit (Y)	Net Profit (Z) (X-Y)
NFL108	M	130/1.5acres	40	160	120	-	148	420	1018	990	-28
NFM120	M	35/1acre	140	50	80	-	74	230	609	270	-339
NFL111	M	130/1acre	45	60	50	-	113	72	470	360	-110
NFF140	F	50/1 acre	30	80	150	25	74	30	439	300	-139
NFF139	F	20/1.5acre	30	25	20	3	74	10	182	50	-132
VFL069	M	210/3acres	120	200	250	18	339	256	1,393	510	-883
VFM079	M	20/0.5acre	40	50	70	20	56.5	-	256.5	-	-256.5
VFL071	M	70/0.5acre	45	90	100	-	130.5	45	480.5	380	-100.5
VFM080	M	90/1acre	70	100	60	-	148	48	516	60	-456
VFF102	F	60/1acre	70	50	40	-	74	60	294	60	-234
WFM051	M	15/0.5acre	6.00	20	20	-	OM	25	86	150	64
WFF052	F	15/0.5acre	10	30	45	-	O.M	35	135	60	-75
WFM049	M	35/0.5acre	12	35	38	-	O.M	34	154	90	-64
WFF059	M	60/1acre	4	6	22	-	O.M	6	98	100	2
WFF061	F	20/0.5acre	6	12	20	-	O.M	14	72.00	120	48

Leafy Vegetables Production –Nyariga, Ve, Durongo, Winkogo											
Irrigator ID	Sex	Land preparation	Seeds	Planting	Weeding/water pumping	Agrochemicals	Fertilizer	Harvesting/transport	Total Cost (X)	Gross Profit (Y)	Net Profit (Z) (X-Y)
NFL108	M	110/2acres	150	175	75	45	74	20	649	3,300	2,651
NFM120	M	65/1 acre	70	40	35	-	56.5	47	313.5	500	186.5
NFL111	M	30/1 acre	25	18	15	3	74	10	175	400	225
VFL069	M	100/acre	5	14	42	9	74	30	274	150	-124
VFL071	M	90/3.5acres	163	60	144	42	173.5	130	802.5	3,500	2,697.5
VFM080	M	50/0.5acre	20	36	72	-	74	50	302	100	-202
VFF102	F	35/0.5acre	30	20	15	40	39	60	239	100	-139
DFM008	M	20/0.25acre	10	40	70	18	74	20	252	400	148
DFM010	M	20/0.25acres	70	15	20	20	70	8	223	200	-23
DFM029	F	50/1.5acres	45	20	30	25	45	35	250	300	50
DFM012	M	20/1acre	6	15	10	2.5	78	9	140.5	500	359.5
DFM027	F	6/0.25acre	4	12	13	12	10	13	70	94	24
WFM051	M	20/0.5acre	12	15	20	24	O.M	12	103	300	197
WFF052	F	35/0.5acre	12	15	25	10	O.M	30	127	400	273
WFM049	M	38/0.5acre	12	40	35	10	O.M	30	165	350	185
WFF059	M	25/0.5acre	3	14	35	6	O.M	10	93	170	77

Source: Field data on profitability

ID # Beginning with N = Nyariga, e.g. NFL108

ID # Beginning with V= Ve, e.g. VFL069

ID # Beginning with D = Durongo, e.g. DFM008

ID # Beginning with W = Winkogo, e.g. WFM051

O.M = Organic manure.

Appendix 7: ANOVA of the Profitability in Tomato, Rice and leafy vegetables

Anova: Single Factor					
SUMMARY					
Groups	Average	Variance			
TOM	-25.6333	488415.1595			
RICE	-180.2	57990.56429			
LV	433.9	853106.4			
ANOVA of the profitability in Tomato, Rice and leafy vegetables					
Source of Variation	SS	df	MS	F	P-value
Between Groups	3060903	2	1530451	3.280682	0.047438
Within Groups	19593170	42	466504		
Total	22654072	44			
Data on the profitability in Tomato, Rice and leafy vegetables					
Toato	Rice	Leafy Vegetables			
-526	-28	2,651			
-1,155	-339	186.5			
-172	-110	225			
113	-139	-124			
-460	-132	2,697.50			
569	-883	-202			
1619	-256.5	-139			
79	-100.5	148			
-433	-456	-23			
-324	-234	50			
1,190	64	359.5			
71.5	-75	24			
-383	-64	197			
-226	2	273			
-347	48	185			

Appendix 8: Sample WUA By-Laws

ARTICLE 1: AIMS AND OBJECTIVES

The aims and objectives of the Dorongo Water Users' Association are:

- a. To enhance farming activities in the dry season thereby increase incomes.
- b. To assist provide reliable water sources on sustainable basis for farming, watering of livestock, fishing and domestic uses.
- c. To create employment opportunities for the unemployed youth thereby halt the youth migration to southern Ghana.
- d. To improve the nutrition of the community.
- e. Ensure the active participation of the Dorongo community in the dam rehabilitation and management.

ARTICLE 2: MEMBERSHIP

Membership is open to all who are interested in farming and are prepared to abide by the rules and regulations of the association/Society.

Before one can be regarded as a member he or she must meet the following conditions:

- a. Pay a registration or entrance fee of ₵ 10,000.00.
- b. Pay the annual levy of ₵ 10,000.00 and ₵ 20,000.00 for small scale farmers and those farmers who use pumping machines respectively.
- c. Attend meetings regularly.

Dismissal

A member may be dismissed on the following grounds;

- a. Failure to attend three (3) consecutive meetings without reasonable excuse.
- b. Failure to pay levies dues and other contributions three (3) consecutive times.
- c. If found to be dishonest.

ARTICLE 3: DAM PROTECTION/MAINTENANCE

- a. Members shall take active part in the dam rehabilitation by providing labour, materials and money.

- b. Members shall plant trees and grass in the catchment area.
- c. Plant grass along the dam wall to check erosion
- d. Repair damages in good time to avoid serious damage to the irrigation facilities.
- e. Set up a committee to oversee the irrigation facility to detect faults and recommend.

ARTICLE 4: EXECUTIVE /MANAGEMENT COMMITTEE

- a. The association shall have a management committee or executive committee made up of the chairperson ,vice chairperson, secretary, treasurer ,assistant treasurer and other members.it shall have a maximum membership of nine(9).
- b. The tenure of office bearers is three (3) years at the end of which fresh elections would be conducted to elect new officers or re-elect the old ones.
- c. There shall be a minimum of three (3) females in the management or executive committee.

ARTICLE 5: ACCOUNTS/RECORD BOOKS

The association shall procure the following books for use.

- a. Minute books
- b. Receipt books
- c. Membership register
- d. Cash book
- e. Ledger book
- f. Files
- g. Payment voucher

ARTICLE 6: MEETINGS

The association shall hold the following meetings;

- a. Executive /Management Meetings
The executive committee shall hold monthly meetings to plan activities for discussion and approval by the general body or members.

It is responsible for organizing the members for fund raising, communal labour and water management.

It shall render financial statement to the members periodically during general meetings.

b. General Meetings

General meetings shall be held quarterly to raise funds, carry out activities for the development and maintenance of the entire irrigation facilities- dam. Review activities; approve recommendations b the executive committee.

c. Annual General Meetings

The association shall hold annual general meetings yearly for the Executives to render accounts for the year under review, conduct elections, plan for the following year.

d. Emergency Meetings

The association shall hold emergency meetings to attend to or address urgent issues.

e. Quorum

Quorum for General Meetings shall be forty (40) members.

Quorum for Executive or Management committee meetings shall be five (5) members.

ARTICLE 7: CUSTODY OF FUNDS

Funds for the association /society shall be kept in the bank. The chairperson, secretary and treasurer shall operate the account. Any two of the three (3) can sign for withdrawal from the account.

Contributions, levies, dues, registration fees and other funds of the association must be sent to the bank weekly.

The Association/Society may be invested in bank fixed deposits and treasury bills with the approval if the general body at a meeting.

ARTCILE 8: COMMITTEES

The association shall put in place the following committees:

- a. **Finance and Audit Committee** to examine financial transactions to ensure that WUA money is properly receipted and accounted for.
- b. **Water Management Committee** to ensure judicious and efficient use of water. The association has the authority to prevent any person from misusing the water. Activities that will pollute the water will be prevented by the Association.

ARTICLE 9: FUNDS

Funds of the association shall be derived from the following sources.

- a. Registration fee of ₪ 10,000.00 per person.
- b. Annual levies of ₪ 10,000.00 and ₪ 20,000.00 for ordinary farmers and those using pumping machines respectively.
- c. Other contributions fixed by members.
- d. Donations and grants.
- e. Loans
- f. Fines.
- g. Interest from investments.

ARTICLE 10: AMENDMENTS

The constitution or bye-laws can only be amended by the general meeting of members as and when necessary.

These bye-laws were amended on the 7th March 2002 by the general body.

Appendix 9: Synthesis Process

Chapter 5-9	Key findings	Patterns	Contradictions	Themes
5	<ul style="list-style-type: none"> • Moderated traditional authority roles • Formal structures influenced by traditional laws • Lack of effective participation by traditional authorities (TAs), women • Limited capacities • Power differentials • Ineffective local level structures • Ineffective leadership • Attitudes and behaviours 	<p>Social norms are in important Leadership</p> <p>Attitudes and behaviours</p> <p>Capacities</p>	<p>Local structures weakened through decentralisation</p>	<p>Power differentials</p> <p>Effect of social cultural norms</p> <p>Attitudes and behaviours</p> <p>Capacities</p>
6	<ul style="list-style-type: none"> • Adherence to social norms • Community attributes, leadership, social norms, affected rules enforcement and compliance. • Lack of accountability • Lack of capacity • Attitudes and behaviours • Participation, ownership and control affected institutional compliance 	<p>Community attributes-social norms.</p> <p>Available capacities</p> <p>Leadership</p> <p>Attitudes and behaviours</p>	<p>The paradox of weakened traditional rules.</p> <p>Inability of WUA and lateral leaders to enforce formal rules</p> <p>TAs source of strength to informal groups</p>	<p>Importance of capacity</p> <p>Social cultural norms</p> <p>Policy implementation</p>
7	<ul style="list-style-type: none"> • Limited capacities • Inadequate leadership capacities—regional, district and local • Ineffective policy implementation strategies • Weak formal institutional design • Uncoordinated resources 	<p>Capacities</p> <p>Leadership</p>	<p>Strength of TA in terms of respect, power, mobilisation, conflict resolution.</p> <p>Limited capacities through decentralisation.</p>	<p>Capacity at all levels</p>

Chapter 5-9	Key findings	Patterns	Contradictions	Themes
8	<ul style="list-style-type: none"> • Limited widespread participation • Social norms affected participation • Ineffective leadership to mobilise participation • Attitudes and behaviours affected participation • Ineffective policy implementation 	Social norms affected participation Attitudes and behaviours Effect of capacities on participation Policy implementation	Decentralisation engender participation Lack of ownership, control and participation.	Influence of Attitudes and behaviours Policy implementation and participation
9	<ul style="list-style-type: none"> • Limited stakeholder support • Policy implementation gaps • Lack of regional and district level leadership for coordination • Weak horizontal and vertical stakeholder relationships • Power differentials • Undefined roles and responsibilities • Limited capacities • Attitudes and behaviour 	Attitudes and behaviours Limited capacities Power differentials	Regional and district partners supporting local level groups	Vertical and horizontal stakeholder relationships