THEORY, PRACTICE AND OUTCOMES OF COMMUNITY MANAGEMENT OF COMMON PROPERTY RESOURCES THROUGH THE LENSES OF NJALA AND DOMASI IRRIGATION SCHEMES

M.A. (DEVELOPMENT STUDIES) THESIS

By

SANE PASHANE ZUKA

B.Ed (HUMANITIES)-UNIVERSITY OF MALAWI

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DECLARATION

I the undersigned hereby declare that this thesis/dissertation is my own original work which has not been submitted to any other institution for similar purposes. Where other people's work has been used acknowledgements have been made.

SANE PASHANE ZUKA

Full Legal Name

_____

Signature

_____

Date

CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval.

Signature: _____Date:_____

NAME: Blessings Chinsinga, PhD. (Associate Professor)

1st Supervisor

Signature: _____Date:_____

NAME: Happy Kayuni, MPA (Senior Lecturer)

2nd Supervisor

DEDICATION

To my mother, Alless; father, Foster; and wife, Brenda. I am proud of you.

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ABSTRACT

In line with the paradigmatic shift in the theory and practice of governance since 1980s, state management of irrigation schemes has been replaced by community management. It is driven by the popular understanding that community based natural resources management (CBNRM) presents the best alternative for governing local resources and achieving resource sustainability. The nature of irrigation schemes, however, subject resource users to competition and resource exploitation resulting in a situation Hardin calls “tragedy of the commons”. Present CBNRM regime, as guided by theories in social capital and institutionalism, argues that local communities are capable of equitably and sustainably managing their local resources. Using Domasi and Njala irrigation schemes, this study explores the challenges faced by irrigation farmers in effectively managing their irrigation schemes. The study employed both qualitative (interviews, participant observation and focus group discussions) and quantitative (survey) methods of data collection. The study findings reveal that irrigation management at the two sites faces a number of challenges such as resource access inequalities, corruption and conflicts. This demonstrates that the success of CBNRM largely depends on the existence of a democratic culture and not mere presence of social capital and locally crafted institutions. Thus, to remain credible theories backing CBNRM need to underscore the significance of creating a democratic society in the process of building collective action. In this process, rather than being left out, informal institutions should be allowed to evolve together with formal institutions.

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LIST OF ACRONYMS AND ABBREVIATIONS

CBNRM	Community Based Natural Resource Management
CCAP	Church of Central Africa Presbytery
CPRs	Common Property Resources
FGDs	Focus Group Discussions
GoM	Government of Malawi
IDRC	International Development Research Center
IWMI	International Water Management Institute
IMT	Irrigation Management Transfer
KII	Key Informants Interview
NGO	Non Governmental Organisations
ODI	Overseas Development Institute
O&M	Operation and Maintenance
SPSS	Statistical Package for Social Scientists
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
WIDER	World Institute for Development Economics Research
WUA	Water User's Association

CHAPTER ONE

INTRODUCTION

1.0 Background

Since the 1980s, the devolution of responsibility and control over natural resources from government to user groups has become a widespread policy in many developing countries (Meinzen-Dick, Raju and Gulati, 2000; Shaw, van Koppen, Merrey, de Lange and Samad, 2002; Ferguson and Mulwafu, 2004). Founded on the rationality of citizen participation and democracy as opposed to leviathan and technocrat approaches, the policies have not only challenged the morality of centralized approach of governance, but also questioned its very efficiency, effectiveness and sustainability. In general, devolution policies contest the state's incentives and capability to manage local natural resources efficiently, sustainably and equitably (Meinzen-Dick et al., 2000; Agrawal, 2001).

Backed by various evidence of unimpressive performance of state management of natural resources (Agrawal, 2001; Blaikie, 2006), state management is criticised for being unresponsive to local needs, increasing social inequality, destroying indigenous natural resource management knowledge and lacking flexibility about resource use (Lee, 2002). The participatory school of thought in particular recognises the limitations of the state in managing local resources and consequently advocates reducing the size of government (Meinzen-Dick et al., 2000; Restrepo, Vermillion, and Munoz, 2007).

Generally, preference for CBNRM over state management is premised on the assumption that local people are likely to prioritise their local environmental problems, allocate resources efficiently, lower transaction costs and improve resource monitoring as resource users respect decisions made and institutions crafted locally. In addition, CBNRM is supported as a means to achieving good governance at a local level (Kellert, Mehta, Ebbin and Lichtenfeld, 2000; Danida, 2007). Thus over the last two decades, state management of natural resources, many of them falling under common property resources (CPRs), has been replaced by community based natural resources management (CBNRM). Simply defined, CPRs are resources held by an identifiable community of interdependent users in which these users exclude outsiders while regulating use by members of the local community (Adhikari, 2001, Carpenter S.R, 1998).

This policy shift is, among other sectors, more prevalent in the agriculture sector and the irrigation sector in particular (IWMI, 2003a). With widespread realities of unimpressive performance of state-managed irrigation systems, most governments are transferring their management responsibility over irrigation systems to farmers organized in Water User Associations (WUAs) through a process commonly known as Irrigation Management Transfer (IMT) (Meinzen-Dick et al., 2000; IWMI, 2003a). The rationale behind IMT is the perception that increased ownership, decision-making authority and active participation of the irrigators in the operation and maintenance (Q&M) of the irrigation systems would create committed and responsible water users. This is envisaged to result in sustainable use of irrigation systems (Meinzen-Dick et al., 2000).

In Malawi, the National Irrigation Policy and Development Strategy reflects this goal by promoting full ownership of irrigation schemes by the beneficiaries through their

legally constituted local organizations that will oversee all matters related to operation and maintenance of these schemes" (GoM, 2000: 7). Likewise, the Irrigation Act, 2001 vests legal authority in a group of small scale farmers to own, use and maintain the schemes. Like in other countries, policy change in the irrigation sector in Malawi is largely a response to poor performance of state-managed irrigation as a result of government failure to meet operation and maintenance costs. Thus, a number of former government-owned smallholder irrigation schemes are currently de jure government owned, but de facto managed by irrigation farmers.

1.1 Problem Statement

Present policy reforms in the irrigation sector are not only against the 1960-90s Malawi's practice in which the state took a central role in irrigation management, but also contradicts earlier government assertions about the ability of local people to manage their CPRs. Equally important, the reforms are against earlier government position regarding the best trajectory of bringing about agrarian change and economic growth in Africa and Malawi in particular (Blaikie, 2006; Agrawal, 2001; Ngwira, 1995). Moreover, while there is widespread agreement that policy reforms in irrigation management are to a larger extent a response to the 1980s global economic downturn (Meinzen-Dick et al., 2000; Ferguson and Mulwafu, 2004; Restrepo et al., 2007), the adoption and popularity of CBNRM is academically supported and upheld by theoretical developments in the social sciences theories. These theories, in the example of social capital and new institutionalism argue that local communities can manage their CPRs in an efficient, equitable and sustainable way (Ostrom, 1990; Agrawal, 2001). Specifically, there are

growing theoretical claims that areas vested with high social capital and locally crafted institutions can ably institute collective action for managing the commons efficiently and equitably. Thus, present irrigation management arrangements assume that by employing local social capital and locally crafted institutions, irrigation farmers would efficiently take over roles and responsibilities formerly assigned to the state. This includes allocating plots water and water to farmers, coordinating irrigation activities, monitoring rule compliance and sanctioning rule violators.

However, while theoretical claims predict a successful community management of CPRs, empirical evidence from both local and international CBNRM projects have highlighted mixed outcomes with some being more optimistic (Ostrom, 1999; Katz, 2000) while others arguing that its outcomes remain disappointing (Ferguson and Mulwafu, 2004, 2007; Blaikie, 2006). To what extent then do the theoretical claims about the efficiency of community management of CPRs hold in practice? In other words, what is the congruence between theoretical claims supporting CBNRM and its actual outcomes? To employ the words of Blaikie (2006: 194), "if there were better theories, there would be better CBNRM outcomes".

This study therefore sets out to find out the challenges and opportunities of community management of smallholder irrigation schemes as guided by theories upholding CBNRM. Employing Domasi and Njala as case studies, the study's crucial questions to be addressed are; how are the issues of farmers' access to irrigation plots administered under the new management arrangement? What are opportunities and challenges of community management of irrigation schemes? What is the interaction between the set up formal and existing informal institutions, and how is this interaction

affecting irrigation management? Thus, the study intends to explore the adequacy of social capital and locally crafted institutions in guiding effective management of irrigation systems. .

1.2 Study Objective

The overall objective of this study is to assess the opportunities and challenges of community management of common property resources as guided by social capital and institutional theories using Domasi and Njala smallholder irrigation schemes in the Lake Chilwa wetland basin as case studies.

1.3 Specific Objectives

The specific objectives of the study are to:

- assess the extent to which formal institutions at Domasi and Njala irrigation schemes are providing a fair and equitable guide to households' access to irrigation plots and water
- investigate the opportunities associated with community management of smallholder irrigation schemes at Domasi and Njala irrigation schemes
- investigate challenges associated with community management of smallholder irrigation schemes at Domasi and Njala irrigation schemes, and how the challenges are being addressed by the farmers

- explore the interactions between informal and formal institutions at Domasi and Njala irrigation schemes, and how these interactions affect management of the irrigation schemes
- find out the attitudes of irrigation farmers towards community management of Domasi and Njala irrigation schemes

1.4 Study Assumptions

This study is guided by the assumption that community management of irrigation schemes at Domasi and Njala is not effective and not supported by irrigation farmers.

1.5 Study Significance

CBNRM has in recent times become an established policy goal for pursuing rural development, natural resource management and socio-economic progress (Kellert et al., 2000; Blaikie, 2006; Ostrom, 1990). Supported by social capital and new institutionalism literature, CBNRM aims to achieve sustainable resource governance at a local level, an area where state natural resource management has registered numerous failures. Towards this end, there is a speedy process, locally and internationally, towards instituting CBNRM in many sectors, including the irrigation sector. Nonetheless, CBNRM remains a heavily contested issue within the academia (Blaikie, 2006; Ferguson and Mulwafu, 2004, 2007). This study is significant because it assesses the extent to which the theoretical claims about the efficiency of community management of CPRs hold in practice. Specifically, the study contributes to the advancement of theoretical knowledge

in the field of CPRs management. It is also hoped that, just as the rise of CBNRM found solace in the emerging theories, this study will be helpful in shaping future scholarly debates relating to the efficacy of CBNRM in Malawi and elsewhere.

1.6 Outline of the study

The outline of this study is as follows: Chapter 1 introduces the study by highlighting the paradigmatic shift from state management of common property resources to CBNRM. It also explains the study problem statement, objectives, assumptions and significance; thus it sets the scene for the study. Chapter 2 presents and discusses literature and theoretical framework relevant to this study. In particular, the chapter discusses the study's important concepts such as CPRs and CBNRM, including discussing scholarly and practical views about the best way to manage CPRs. From this literature review, the chapter places the discussion of this study in the context of social capital concept and formal-informal institution interaction model. Chapter 3 presents the methodology employed in this study. Chapter 4 presents field findings from household interviews, focus group discussions and key-informants interviews. Specifically the chapter analyses parameters of the opportunities and challenges of community management of irrigation schemes by applying theoretical claims into practice. Lastly chapter 5 concludes the study by recapitulating the main findings and emerging themes of the study. Suggested further studies in the area of CBNRM follow thereafter.

1.7 Definition of Terms

Common Property Resources: resources where members of a clearly demarcated group have a legal right to exclude non-members of that group from using a resource (Ostrom, 2000).

Democratic culture: culture where a large proportion of people observe and respect democratic principles (Evans and Rose, 2007).

Formal institution: rules and procedures that are created, communicated, and enforced through formal channels widely accepted as official (Helmke and Levitsky, 2004).

Informal institutions: socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels (Helmke and Levitsky, 2004).

Institutions: a set of rules and regulations guiding decision about common resource use, distribution and control (North, 1990; Knowles, 2006).

Social capital: structure of community relations based on trust, reciprocity and common norms that facilitate coordination and cooperation for mutual or group benefit (Coleman, 1988; Putnam, 1993)

1.8 Conclusion

This chapter has provided a general background of the study and its particular focus. It has broadly presented the global paradigmatic shift from leviathan management regime to CBNRM in the management of natural resources, many of which fall under common property resources. It is within this paradigmatic shift that the chapter has presented the research problem. Specifically, the chapter has provided justification for carrying out this

study, its objectives, research significance and research assumptions. Finally, the chapter has concluded with an outline of the research thesis. The next chapter presents and discusses relevant literature to this study and the theoretical aspects of the study.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

This chapter defines the direction of the study by reviewing relevant literature. It begins by defining and describing the concepts that are central to this study such as Common Property Resources (CPRs) and Community Based Natural Resources Management (CBNRM). The chapter also discusses the evolution of natural resources management regimes in Africa in general, and Malawi in particular. Within this discussion is a discussion on international shift in the management of irrigation schemes from leviathan regime to community management regimes. This chapter also examines the main theories guiding this study. The examination of these theories is set to provide a framework for understanding and analysing the findings of the study.

2.1 Common Property Resources and their Management Regimes

CPRs are resources where members of a clearly marked group have a legal right to exclude non-members of that group from using a resource. It is related to, and often confused with, open resources. The former however refers to resources which have no limits on who is authorised to use a resource (Ostrom, 2000:336). CPRs share two economic attributes with private and public goods namely: non-excludability and rivalry.

The former explains a situation in which it is difficult or very costly to exclude someone from utilising the resource, while the later explains a situation where use of resources by one person subtracts from the welfare of other users. Most natural resources like trees, water and wildlife fall under these attributes as not only is exclusion problematic, but also one user utility subtracts from that of others. Many economists presume CPRs are affected by a lot of inefficiency; including rent dissipation, high transaction and enforcement costs, and low productivity (Ostrom, 2000; Adhikari, 2001). In line with this understanding, Garret Hardin (1968) argued that the commons get trapped in an inevitable process that ultimately results in tragic loss of the commons and, to arrest such losses, proposed external interventions.

Generally, three management regimes exist for CPRs namely: state management sometimes referred to as command and control; private or market-based management; and community-based management approaches. In state management, state institutions including ministries, departments or agencies of the bureaucracy, make and enforce decisions about resource use. Proponents of market-based regime on the other hand believe that the problem of over exploitation and degradation of CPRs can be resolved by creating and enforcing private property rights, which is considered the most efficient way to internalise the externalities that arise under CPRs regime. Under this regime, private individuals or companies with ownership rights make decisions about resource use within statutory limits set by state. In a community-based management regime, which forms the focus of this study, community institutions with de jure or de facto ownership or use rights determine resource access and usage (Agrawal, 2001; Ostrom, 2000).

2.2 Conceptualizing Community-Based Natural Resources Management

CBNRM is broad in scope and overlaps with a number of other related concepts including co-management, participatory, collaborative, joint and popular management (Meinzen-Dick et al, 2000; Balarin, 2001; Danida, 2007). The overall concept is however based on the principle that communities can manage their common property resources, in an efficient, equitable and sustainable way. Though sometimes used interchangeably, the various terms of CBNRM reflect the level of community management of local resources as ranging from those that simply try to increase users' involvement as a supplement to state management to those that involve full transfer of responsibility and control over resources to formally recognised user groups. Thus, CBNRM is about ways in which the state can share rights and responsibilities regarding natural resources management with the local community (Meinzen-Dick et al., 2000; Blaikie, 2006).

2.3 Objectives of Community-Based Natural Resources Management

The objectives of CBNRM are varied, mixed and sometimes conflicting (Blaikie, 2006). This arises from the fact that stakeholders to the CBNRM including the state, international financial institutions, private sector and local communities themselves have different interests. In fact, though championed to bring on board local communities in the management of resources, the transition has largely been top driven resulting in conflicting objectives, by design or default, between the stakeholders. Overall, four objectives of CBNRM can be identified in literature.

First, there is the widespread view that presents CBNRM as a means to decentralization and local empowerment. It is mainly supported by international organizations and financial institutions who perceive participation as a sure way to local empowerment. CBNRM is understood to provide the opportunity for moving decision making authority from the central government to the local people (Lee, 2002; Blaikie, 2006). To this end, CBNRM has involved radical institutional reform in line with the principles of democracy and decentralization.

Second, CBNRM is aimed at reducing government expenditure on resource management. In fact, there is widespread agreement among scholars that the main impetus towards CBNRM came from the fiscal crisis of the state (Meinzen-Dick et al., 2000; Blaikie, 2006; Restrepo et al., 2007). Global economic crisis especially in the early 1980s resulted in governments failing to meet the costs of monitoring resource use and maintaining resource facilities. While most governments acknowledge the significance of devolution in reducing government costs, there is less willingness to completely devolve their responsibility to local resource users (Ferguson and Mulwafu, 2004; Hugh, 1995). Obviously, this trend has implications on the extent to which local communities will take over resource management.

CBNRM is also aimed at instituting sustainable utilization of local resources, which rises from a growing realization that state management of natural resources has been unsuccessful. The launch of the first Earth Summit in Rio de Janairo, 1992 has strengthened this cause. It is basically resting on the view that good stewardship of local resources has to be appreciated and supported by the people that use the resources (Lee, 2002). Thus CBNRM is designed to achieve resource sustainability through social and

economic incentives to local users who have for long time been blamed for resource depletion and destruction. Rather than being new, CBNRM is therefore a modern attempt to revive the old established traditional cultural and institutional mechanisms for managing and conserving the natural environment (Kellert et al., 2000). In fact, albeit CBNRM was not widely in use before the 1980s, the practice has a long history, including collective water management of Egypt and Mesopotamia, community grazing lands of Andes and dry land Africa, water harvesting in Roman North Africa, and south-west North America (Pretty and Ward, 2001; Blaikie, 2006). In other words, CBNRM has reappeared to challenge the view that communities cannot effectively manage CPRs as theorised by Adams Smith's invisible hand theory and Hardin's tragedy of the commons (Lee, 2002). The earlier understanding was founded on the view that individuals are not interested in pursuing public goods and thus cannot effectively manage CPRs; while the later was premised on the assumptions that CPRs means open access resources; which would at the end lead to overexploitation and resource degradation (Blaikie, 2006). In fact, Hardin's tragedy of the commons theory has been heavily criticised for confusing CPRs with open resources regimes (Ostrom, 2000; Pretty and Ward, 2001; Agrawal, 2006).

There are widespread claims among the proponents of CBNRM that its main objective is poverty reduction of the local people by increasing their access to resources. This objective has gained ground with the present understanding that poverty does not only relate to lack of physical assets but also social and political capacity (Lee, 2002; World Bank, 2002). In other words, CBNRM is a strategy to improving the local people's wellbeing physically, socially and politically through improving their access to resources,

social interaction and good local governance respectively. Thus, in achieving poverty reduction CBNRM takes a holistic view by concurrently conserving natural resources and promoting good governance and decentralization in a single process.

There is however a growing scepticism about the real objectives of CBNRM (Blaikie, 2006; Ferguson and Ferguson, 2007). According to Musumali, Larsen and Kartenborn (2007), from the beginning CBNRM may have been a ploy to pacify communities into accepting the broader aim of maintaining protected areas from which they would be excluded. Along side this criticism is the understanding that CBNRM is an agenda for resource conservation and protection[1] that continues to employ old coercive application of modern scientific environmental knowledge at the expense of indigenous knowledge. Blaikie (2006) particularly argues that this is against the idea of community participation as it brings contradiction between utilization of formal science founded on positivism principles on one hand; and local knowledge embedded in particular environment and social histories on the other hand.

Blaikie also cautions that the interpretations of CBNRM cannot be treated as a neutral term which can be implemented uniformly. According to Agrawal (2001), a community may be understood in three different ways: community as a spatial unit referring to a grouping of people who physically live in a geographical space; as a distinct social structure referring to a social grouping with a common history and cultural heritage which is usually based on kinship; and as a set of shared norms referring to a grouping united by common beliefs systems and understandings. Economically, communities can also be considered as groupings of people who share interests and control over particular resources (Chambers, 1997). DeFilippis (2001) also cautions that,

[1] The main focus is on conservation of resources and not poverty reduction of the local people

more often than not, communities are wrongly perceived as actors, instead of being perceived as outcomes. In other words, the different conceptions of community mean that it is difficult to clearly define the benefits of CBNRM as well as its practice.

2.4 Experiences of Common Property Resources Management in Malawi

Historically, Malawi inherited and continued with strong state intervention into natural resources management as backed by the colonial government administrators thinking, which doubted the ability of Malawians to efficiently manage their resources. On the contrary, state management of natural resources in Malawi has produced scepticism, lack of trust and hostility between resource managers and local communities (Blaikie, 2006). Over the years, it has become clear that the state capacity to police and regulate resources use is very limited resulting in widespread resource depletion and degradation (GoM, 2002; Scholz and Chimatiro, 2004; Nsiku, undated). Thus the shift to formal[2] CBNRM in Malawi is largely driven by the understanding that the majority of the population are engaged in agriculture and heavily dependent on local natural resources; along with overpowering widespread political moves towards democratization and public participation. In line with this policy shift, the government of Malawi has pursued progressive policy legislation for the implementation of CBNRM including the National Forestry Policy, 1996 and Forestry Act, 1997 in the forestry sector; Fisheries Conservation and Management Act, 1997 and National Fisheries and Aquaculture Policy, 1999 in the fisheries sector; and the National Irrigation Policy and Development Strategy,

[2] The word formal hereto refers to the recent trends in government recognition of communities role in natural resources management together with institutions legally accepted by the government

2000 and Irrigation Act, 2001 in the irrigation sector. Currently the country boasts of over 3000 Village Natural Resources Committees by 2007[3] (UN, 2007).

Notwithstanding progress made in instituting legislation pertaining to CBNRM in Malawi, the adoption of CBNRM within the sectors has been fragmented and at times adopting conflicting approaches (Chibwana, Watson and Bruessow, 2001). For instance, the forests and fisheries sector have adopted co-management approaches, which aims at promoting the participation of rural communities in the management of forests and fish resources respectively. The irrigation sector on the other hand has adopted full a devolution approach in which all aspects of management of smallholder schemes within the resource system is left to irrigators. Again, while in forest and fisheries sectors local chiefs play the role of ex-officials in the management of resources; in the irrigation sector local chiefs are not supposed to take part in the management of the schemes. Equally important, CBNRM outcomes are varied and mixed. For instance, while CBNRM is argued to likely benefit government in the fisheries and forests sectors (Scholz and Chimatiro, 2004), recent studies reveal disappointing outcomes in the irrigation sector (Mulwafu and Ferguson, 2007).

2.5 Global Shifts to Community Management of Irrigation Schemes

Internationally, the emergence of community based irrigation management can be traced to the early 1980s widespread global adoption of irrigation management transfer (IMT) policy reforms, which aims at relocating responsibilities and authority from government agencies into hands of non governmental organizations such as water user

[3] Like many the trends in many CBOs, it is unlikely that all these are functional.

associations (Restrepo et al., 2007). During the period 1950s to 1960s, the irrigation sector received huge investments from governments and international agencies and management practices during this period were essentially top-down. Irrigators took the peripheral work of farming on their plots while most operation and maintenance work were in the hands of the irrigation agencies. These irrigation management arrangements have on the overall achieved little as measured against the government set goals. Global experiences have revealed that the state has been unable to meet the operation and maintenance (O&M) costs, and enforce rules and regulations to control misuse of water (Veldwisch, 2009; Vermillion, 1999; Shah et al., 2002). This situation was worsened by the early 1980s economic downturn which largely reduced government and international agencies budgetary support to the irrigation sector (Chirwa, 2002; IWMI, 2003b; Ferguson and Mulwafu, 2004; Restrepo et al., 2007). Thus, poor performance of the irrigation sector due to poor funding from the central government have been pivotal to policy shifts towards community management of irrigation schemes.

Generally, IMT has five main objectives namely: reduce recurring government expenditures for irrigation operation and maintenance; establish financially self-reliant water users and instil a sense of ownership and responsibility, improve the physical condition of irrigation infrastructure; establish transparent and accountable local structures for irrigation management; and improve the performance of irrigated agriculture sector in terms of productivity, financial and physical sustainability (Shah et al., 2002; Ferguson and Mulwafu, 2004).

Though IMT took a global face in the 1980s, it can be traced back to as far as the 1960s in Taiwan province of China, Bangladesh and United States of America; in the 1970s in Mali, New Zealand and Colombia; and in the 1980s in Philippines, Mexico, Tunisia, and Dominican Republic (Restrepo et al, 2007). It is however the late 1990s that have seen a number of countries initiating the process of IMT including, Morocco (1990), Australia (1994), Turkey (1994), Peru (1995), Zimbabwe (1997), and Malawi in late 1990s (Restrepo et al., 2007; Shah et al., 2002). Like other CBNRM policies, policy shifts towards IMT have found solace in the emerging paradigm that recognises the ability of local communities to manage CPRs efficiently, equitably and sustainably.

Internationally, empirical experiences with community management of irrigation schemes remains very varied and at times highly contested. Studies by Lam (1998) in Nepal; Cernea (1987) in San Lorenzo; and Uphoff (1998) report that community management of irrigation schemes resulted in better irrigation infrastructure maintenance, effective water delivery and increased productivity (Kahkonen, 1999). Other studies have on the other hand indicated that community management of irrigation schemes have rarely resulted in more equitable distribution of power and economic benefits and have not reduced farmers conflicts and sustainable use of the irrigation systems (Shah et al., 2002, IWMI, 2003a; Restrepo et al., 2007).

2.6 Theoretical Framework

The second section of this chapter discusses the concept of social capital and formal-informal institutional interaction model, which are employed in this study. Social capital explains the contribution of local networks, reciprocal relations, trust and shared norms in

solving collective action problems while institutional theory explains processes by which structures such as schemas, rules, norms and routines become established as authoritative guides for social behaviour. For many years scholarship on the commons was dominated by prisoners' dilemma and tragedy of the commons school of thought that, having predicted the inability of resource users to mange their commons, favoured state intervention (Hardin, 1968; Ostrom, 2000). However, widespread unsuccessful experiences with state management of CPRs led to development of alternative theories, which are generally a reaction to the tragedy of the commons (Adams, B., Dyson and Vira, 2002). Specifically, there is a shift from a belief in the tragedy of the commons thinking to understanding potentialities of communities in managing their local resources. Inter-alia there has also been a shift from taking informal institutions as exclusively destructive to taking them as constructive (Adams et al., 2002; Kozanayi and Nemarundwe (2002). Current schools of thought in the management of CPRs have therefore highlighted the importance of social capital and informal institutions in instituting successful management arrangement (Pretty and Ward, 2001; Katz, 2000; Ostrom, 2000). Thus, this study is guided by the concept of social capital and formal-informal interaction model. The following section is devoted to discussing these theories.

2.6.1 The Concept of Social Capital

Social capital is a recent concept in the social sciences. Its popularity in academia is connected to the writings of Bourdieu, 1986; Coleman, 1988 and Putman, 1993, though modern sense usage of social capital dates back to as early as 1920[4] (Knowles, 2006).

[4] Woolcock (1998) argues that social capital was used in its present sense by Hanifan (1920).

Notably, social capital is today applied in many disciplines especially political science, sociology, and economics; and each discipline take a particular view point. Economists for instance view social capital by focusing on individual actors with freedom of action to make rational self-interested calculations in a market. Sociologists' view of social capital relate to individual's actions as part of a collective, constrained social structure, motivated by non-rational feelings, traditions and values, occurring throughout the society. From the political science perspective, social capital is used to describe the underlying relationships that give rise to civil society (Bayat, 2005).

There are thus numerous and at times contradicting definitions of the term social capital (Bayat, 2005). Putnam and Coleman however provide most encompassing definitions of social capital. Putnam (1995: 67) defines social capital as "features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit". Putnam's definition includes family relationships, kinship networks, friendships, acquaintances, civic attachments and institutional ties. Coleman (1998: 96) on the other hand defines social capital by its function, arguing it "is not a single entity but a variety of different entities, with two elements in common: they all consist of social structures, and they facilitate certain actions of actors…within the structure". The difference between the two is that Coleman views social capital as embedded in the structure of relations between actors and not with the individuals. Broadly defined therefore social capital refers to community relations of networks and connectedness; shared sets of values, rules, norms and sanctions; and relations of trust, reciprocity and exchange that can be relied upon for achieving common good.

2.6.2 Levels and Types of Social Capital

Social capital is broadly divided into two levels namely macro and micro level. The macro level refers to the institutional context in which organizations operate, which include formal relationships and structures, such as the rules of law, legal frameworks, the political regime, the level of decentralization and the level of participation in the policy formulation process. The micro level refers to the horizontal organizations and social networks, which are also divided into two types namely cognitive and structural. Cognitive social capital refers to the less tangible aspects which include values, beliefs, attitudes, behavior and social norms. The values in cognitive social capital include trust, solidarity and reciprocity that are shared among members of a community and that create the conditions under which communities can work together for a common good. Structural social capital refers to the composition and practices of local level institutions, both formal and informal, that serve as instruments of community cooperation. It is built through horizontal organizations and networks that have collective and transparent decision making processes, accountable leaders, and practices of collective action and mutual responsibility (Krishna and Elizabeth, 1999). The link between the different types of social capital has been well analyzed in Figure 1 below, which has been adopted from Krishna A and Elizabeth S, (1999: 10).

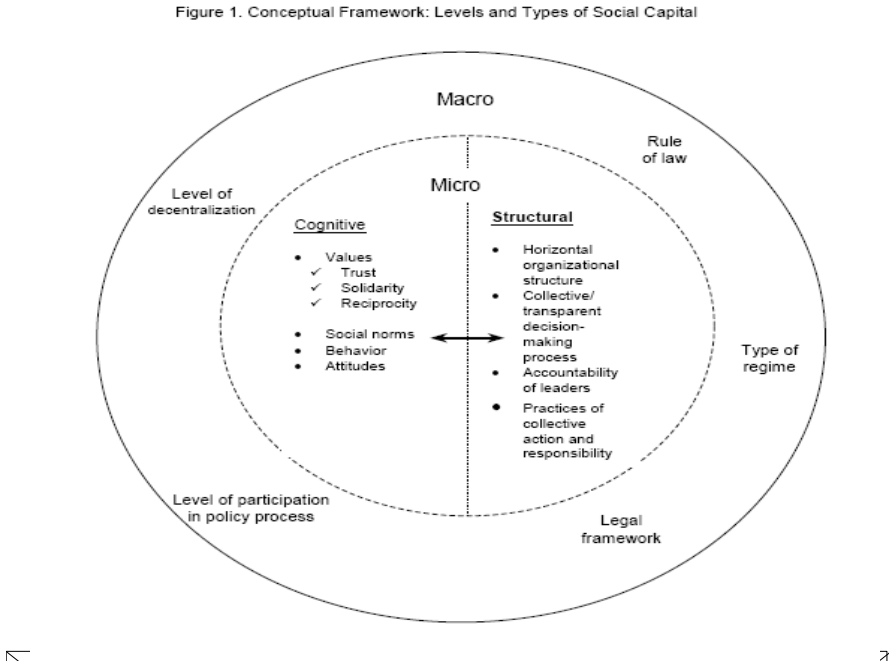

Figure 1.0: Levels and Types of Social Capital

The basic idea in the concept of social capital is that relationships among individuals give rise to something valuable, which can be drawn upon to improve individual and collective wellbeing (Katz (2000; Putnam, 1995). It is considered a type of social glue or lubricating agent in association with other resources that assists individuals secure benefits by being members of particular networks or social structures (Bayat, 2005). Among others, social capital increases the number of mutually beneficial trades, resolves collective action problems, improves the flow of information and reduces monitoring and transactions costs. Collective action is founded on the use of mutually agreed upon rules, norms and networks to place group interests above those of the individual. In other words, where individuals may be reluctant to co-operate or be socially engaged, social capital is relied upon to achieve group consensus and actions by ensuring compliance

with collectively desirable behaviour. In contrast to forced cooperation achieved by the state through policing, social capital generates voluntary cooperation (Gillinson, 2004).

The above benefits of social capital notwithstanding, a number of scholars have cautioned against perceiving social capital as only a positive public resource. Bayat, (2005) argues that social capital can result into negative outcomes such as operation of gangs and gangsters. Social capital may also potentially close off the market to anyone who is not part of the network (Defilippis, 2001). Again, Gillinson (2004), cautions against viewing cooperation, the very outcome of high social capital, as a neutral positive public good. Instead, he argues that cooperation is both good and bad by citing an example of how thieves and murderers cooperate to provide each other with alibis, which is bad for the society (see also Defilippis, 2001; Bayat, 2005). Likewise, Kilpatrick, Field and Falk (2001) argue that social capital may enforce the power structure and advantages and disadvantages of individuals within the communities. In other words, cooperation is good to members within the group, but not those outside the group.

Social capital is an appropriate concept for this study. Community management of irrigation schemes faces a number of challenges including rent dissipation and high transaction and enforcement costs as irrigation services are rival and non-excludable. Thus, without a fair and transparent water allocation system, the resource would be characterised by conflicts, inequalities and inefficiencies. Social capital can help water user groups cooperate in resource use and management. More relevant to this study is the idea that social capital allows individuals, groups and communities to resolve collective problems more easily. In fact, there is now an emerging consensus that social capital does pay in averting the abusive practices that lead to loss and degradation of common

property resources (Kahkonen, 1999; Pretty and Ward, 2001). For instance Katz (2000: 115) found out that the "existence of historically and ethnically based social capital can, in certain circumstances, substitute for well defined legal property rights in both private and common property resource tenure regime". He further argued that social capital provides the foundations for resource use rules, monitoring and enforcement mechanisms that are prerequisites for the success of community managed CPRs (see Fujita, Hamayi and Kikuchi, 2006). In Malawi, community management of irrigation schemes is based on the assumption that local communities can, using their local norms and values; solve problems experienced in the sector. Establishment of formal rules is also based on the understanding that local communities have common values systems for institutional performance (GoM, 2000). In other words, performance of formal institutions is supported by informal institutions. This brings in a second theory employed in this study.

2.7 Institutional Theory

The second theory guiding this study is the formal-informal institution interaction model as constructed by Helmke and Levitsky (2004). This model, within the institutional theory, explains the nature and outcomes of interaction between formal and informal institutions. Institutions are defined as rules of the game or humanly devised constraints that shape human interaction in society (Knowles, 2006; North, 1990). Institutional theory explains processes by which structures, including schema, rules, norms, and routines, become established as authoritative guidelines for social behaviour (Scott, 2004).

Institutional theory has very rich roots incorporating the insights of scholars ranging from Max and Weber, Cooley and Mead to Veblem and Common (Scott, 2004). New institutionalism however has three broad variants namely: normative/cultural, rational/economic choice and historical institutionalism, all of which profess to understand the sources, performance and consequences of institutions.

Normative institutionalism rests on the idea that the best way to understand both individual and collective behaviour is through the logic of appropriateness that individuals acquire through their participation in institutions. The understanding is that people functioning within institutions behave as they do because of normative standards set on them rather than their desire to maximise individual utilities (Peters, 2000). The second variant, rational choice focuses on the relationship between rules of the game and the preferences of the individual actors. The underlying argument of rational choice institutionalism is that institutions are arrangement of rules and incentives, and the members of the institutions behave in response to those basic components of institutional structure. However, unlike in the former variant, the preferences of occupants of these structures do not have their preferences modified by membership in the institution. On the contrary, individual preferences are pursued within the existing institutions. The last variant, historical institutionalism, recognises the importance of incentives, but predominantly emphasizes that the policies and structures made at the inception of the institution will have a persistent influence over its behaviour for the remainder of its existence (Peters, 2000). This school of thought emphasizes ways in which existing structures become self-perpetuating and mutually reinforcing. Path dependency is one aspect of this understanding.

The three variants can help understand practice in CBNRM as pursued and modified by institutional incentives, profit seeking goals and past institutional legacies. In fact, institutional analysis as outlined above have enormously contributed to the understanding of how different institutional arrangements affect both political and economic outcomes (Helmke and Levitsky, 2004; Peters, 2000; Meinzen-Dick et al., 2000). Nevertheless, there is a strong belief that many rules of the game that structure and guide people's life are informal institutions that are created, communicated and enforced outside of officially sanctioned channels (Helmke and Levitsky, 2004; Knowles, 2006). These scholars further argue that there is much assumption and focus that actors incentive, actions and expectations are shaped primarily, if not exclusively, by formal rules. On the contrary, with several examples of political life in post-war Italy, Brazil, Africa and Latin America, Helmke and Levitsky demonstrate that informal institutions play an important role in improving the performance of formal institutions, mediating effects of electoral rules, and shaping formal institutional outcomes. Thus, Helmke and Levitsky argue that consideration of informal rules is critical to explaining institutional outcomes and overemphasis on formal rules risks missing much of political drives. In CPRs management, this understanding is empirically supported by Meinzen-Dick et al., (2000), who note that collective action that take place outside formal organisations, either through customary institutions or spontaneous cooperation, often goes unrecognised, yet collective action does not necessarily require a formal organisation.

2.8 Formal-informal Institution Interaction Model

Helmke and Levitsky (2004) present one of the lucid frameworks for studying informal institutions constructed from a complex interaction between formal and informal institutions. In framing this framework, Helmke and Levitsky clearly distinguishes between informal and formal institutions; defining the former as socially shared rules, usually unwritten, that are created communicated, and enforced outside of officially sanctioned channels. The later are rules and procedures that are created, communicated, and enforced through channels widely accepted as official. These include courts, legislative, bureaucracies; and state-enforced rules such as constitutions, laws, regulations and organization rules or the official rules that govern organizations such as corporations, political parties and interests groups (Helmke and Levitsky, 2004; Knowles, 2006).

Generally, two dichotomous interpretations exist about the outcomes of interaction between formal and informal institutions. First interpretation view informal institution as functional or problem solving in that they provide solutions to problems of social interaction and coordination, which enhances the efficiency or performance of formal institutions. The second view treats informal institutions as dysfunctional or problem creating by ushering in clientelism, corruption, and patrimonialism which undermine the performance of formal democratic, market and state institutions (Helmke and Levitsky, 2004). Employing this dichotomous view, Helmke and Levitsky provide four typologies of informal institutions that highlight the complex interaction between formal and informal institutions. It is specifically based on two dimensions namely: convergence of institutional outcomes and effectiveness of relevant formal institutions. The former analyses the extent to which outcomes from employing either formal or informal

institutions converge or diverge. In other words, where following informal rules lead to a substantially different outcome, formal and informal institutions diverge; and where outcomes from the two institutions are not substantially different, formal and informal institutions converge. Effectiveness of formal institutions looks at the extent to which rules and procedures that exist on paper are enforced and complied with in practice. This includes constraining actors' choice as they believe that there is a high probability that authorities will sanction non-compliance. In other words, in a situation where formal rules and procedures are ineffective, actors believe the probability of enforcement and hence the expected cost of violation will be low (Helmke and Levitsky, 2004). These two dimensions produce fourfold typology of informal institutions namely: complementary, accommodating, substitutive, and competing.

Complementary informal institutions exist together with effective formal institutions in which actors expect that rules that exist on paper will be enforced. It combines effective formal rules and convergent outcomes. These institutions fill the gap by dealing with contingencies not dealt with in the formal rules or facilitate the pursuit of individual goals within the formal institutional framework and in so doing they enhance efficiency. They also serve as a foundation for formal institutions by creating or strengthening incentives to comply with formal rules that might otherwise exist merely on paper. Examples of these institutions include a set of shared beliefs and expectations among a group of people, and social obligation generated by membership in local associations (Helmke and Levitsky, 2004). Informal institutions also do not merely exist alongside formal ones, but play a key role in making the formal rules of the game. Convergent outcomes from complementary informal institutions mainly increase rule compliance and

minimised conflicts. In CPR management this relates to situations where rules and regulations of resource use are effective and informal institutions produce convergent outcomes, including rule compliance and reduced conflicts among resource users.

Accommodating informal institutions combine effective formal institutions and divergent outcomes. These institutions create incentives to behave in ways that alter the substantive effects of formal rules, but without directly violating them. They are created by actors who dislike outcomes generated by the formal rules but are unable to either change or violate the rules. These institutions may not be efficiency enhancing but they help to make institutions stable by dampening demands for change. Examples of accommodating institution include power sharing arrangements, and use of elite networks in acquiring certain resources (Helmke and Levitsky, 2004). In the context of CPRs management, accommodating institutions may relate to the peaceful coexistence and power sharing relations between formal and informal structure for resource use.

Competing informal institutions coexists with ineffective formal institutions in which formal rules and procedures are not systematically enforced leading to actors ignoring and violating them. These combine ineffective formal rules and divergent outcomes, producing competing informal institutions. Helmke and Levitsky (2004: 729) argue that these "institutions structure incentives in ways that are incompatible with the formal rules: to follow one rule, actors must violate another". Clientelism, patrimonial, clan politics, and corruption are some of the examples of competing institutions. These institutions usually exist under foreign-local legal pluralism such that imposed foreign legal systems embody very different principles and procedures (Merry, 1988). In the context of smallholder irrigation schemes subjected to IMT, WUA constitution may be

based on foreign principles and procedures such that following informal institutions violates the formal ones. For instance, to increase individual access to resources, one has to corrupt the system of resource distribution.

Substitutive informal institutions combine ineffective formal institutions and compatible outcomes. Like complementary institutions, substitutive informal institutions are employed by actors who seek outcomes compatible with formal rules and procedures. They however exist in environments where formal rules are not routinely enforced or rules lack authority. They thus achieve what formal institutions were designed, but failed, to achieve. Local conflict resolution that bypasses formal conflict resolution channels is one of the examples of substitutive informal institutions. Another example relates to informal means of raising revenue for the grouping that is formally organised.

Formal-informal institutional interaction model is very relevant in the study of community management of irrigation schemes that are experiencing power and responsibility transfer from government to irrigation farmers. In Malawi, IMT has been associated with establishment of formal rules and regulations that are formally recognised by the state[5] (Ferguson and Mulwafu, 2007). Thus, in the context of this study, formal institutions are a set of rules and regulations guiding decision about common resource use, distribution and control as outlined in the WUA constitution. Informal institutions on the other hand are resource governance rules, regulations and practices outside the constitution. Most of these informal institutions are deeply rooted in local tradition (see Kambewa, 2005). Therefore, as theorised in the Helmke and Levitsky typology of informal institutions, the success of the community management of irrigation schemes

[5] In Malawi, Water User Associations are legally recognized by government after producing and registering their constitution with the office of the Registrar General. Registration means that they are not only recognized by the formal state judicature, but can transact with formal credit institutions such as Banks.

depends on the complex interaction between formal and informal institutions. The other rationale for integrating social capital concept and formal-informal institutional interaction model is that there is a strong relationship between social capital and informal institutions (see Knowles, 2001). In other words, dependence on social capital within a formal institutional management framework inevitably brings formal institutions into interaction with informal institutions.

2.9 Conclusion

This chapter has presented the general direction of the study through a review of relevant literature. Specifically, the chapter has discussed in detail the major concepts guiding this study namely: CPRs and CBNRM. The discussion has particularly pointed out that management of CPRs faces one major challenge i.e. building users collective consensus regarding resource use. Critical agreement throughout the discussion is the recognition that performance of leviathan management of CPRs has been unimpressive. The chapter has also discussed different theories that have guided management of CPRs. Finally, rising from this discussion, the chapter has discussed the concept of social capital and formal-informal institution interaction model, which have guided interpretation of the study findings. The central message coming from these theories is that areas vested with high social capital can better manage their CPRs and that there is complex interaction between formal and informal institutions resulting in complex outcomes. The next chapter presents and discusses the major findings of this study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction

This chapter gives the analytical framework of the study. It firstly presents the conceptualisation of important terms in the study and units of measurement. It also outlines methods and tools used to collect data. Sampling techniques, sample sizes and methods of data analysis follow thereafter.

3.1 Conceptualisation and Measurement

This study is guided by the social capital concept and the formal-informal institutional interaction model. Social capital refers to structure of community relations and interaction based on trust, reciprocity and common norms that facilitate coordination and cooperation for mutual or group benefit. At the centre of the concept of social capital is the idea that existence of social capital as measured by norms of trust, reciprocity and associations enable the community to effectively manage common property resources for their common benefit. The analysis of this study therefore begins with assessing the nature and degree of social capital existence in the study areas as measured by the nature of relations, levels of trust, reciprocity, associations, and common norms and values among the farmers.

This is followed by an assessment of the contribution of social capital to management of the irrigation scheme as measured by ability of irrigators to organise collective work for cleaning canals, coordinate irrigation activities and institute collective water use monitoring. The physical condition of the resource and farmers' own assessment about the benefits of irrigation farming provide a measure of the success of the regime. This analysis is appropriate in that it allows adequate assessment of the contribution of social capital to local resource management and governance.

The second theory guiding this study is the formal-informal institutions interaction model. The distinction between formal and informal institutions is adopted from Helmke and Levitsky (2004: 727), who define formal institutions as "rules and procedures that are created, communicated, and enforced through channels widely accepted as official, while informal institutions are socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels". In this study, formal rules relate to rules contained in the WUA constitution while informal rules are those not provided for in the constitutions. Thus the institutional analysis in this study involves examining the nature of interaction between formal and informal institutions in the management of the irrigation schemes. This is followed by an assessment of the effect of this institutional interaction on the management of the irrigation schemes. This analysis is important in assessing the role of informal institutions in community management of irrigation schemes and the asserted contribution of informal institutions in CBNRM of CPRs.

3.2 Study Area

This research was conducted at Domasi and Njala smallholder irrigation schemes in the Lake Chilwa Catchment and Wetland basin, which is the largest wetland in Malawi and one of the internationally recognised RAMSAR site in Africa. It is also one of areas with highest population densities in Africa (Binauli and Chipeta, 1999). The choice of the study areas was based on two reasons. First, both Domasi and Njala present good examples of CPRs under community management. Second, the size differentials of Domasi and Njala allow comparative analysis required for assessing CBNRM initiatives (Agrawal, 2001; Ostrom, 2000).

Domasi and Njala small scale irrigation schemes are part of the six gravity-fed irrigation schemes in Lake Chilwa wetland basin that were formally under government management and are now managed by the farmers. The other four are Likangala, Chiliko, Khanda and Tsegula. The farmer management of irrigation scheme referred to in here is de facto as formal transfer marked by ceremonies as planned have not taken place despite the fact that schemes have been under farmers management since the late 1990s.

Domasi Irrigation Scheme is located in Machinga district in traditional authority Mposa[6] and has a land size of 500ha. It was constructed in 1972 and like other government small-scale irrigations scheme constructed in that period, its aim was to utilize idle land and teach local farmers modern intensive commercial farming as guided by the modernisation school of thought (Veldwisch, Bolding and Wester, 2009). Most of the construction work at Domasi was done by the state in which tractors and prisoners from Domasi prison were used. After construction, the local people were just required to

[6] Domasi is located in Machinga district but because it is very close to the border with Zomba district, it is cultivated by farmers from both districts.

register for plots and for a long time were given loans and inputs. The government also employed agriculture advisors to guide farmers on modern methods of farming. Domasi adopted Water Users' Association constitution 2003 after being accepted by the Registrar General[7], thus making Domasi irrigation schemes legally under community management.

Njala Irrigation Scheme is located in Zomba district in traditional authority Kuntumanji. It is one of the early irrigation schemes constructed by the Taiwanese in the mid-1960s and is 45ha. At first, Njala was directly under the Taiwanese farmers' management and most of irrigation work was done by the Chinese using tractors. Upon transfer of the capital from Zomba to Lilongwe in 1975, the scheme was incorporated into Likangala Irrigation Scheme Complex; which brought the management of Khanda, Tsegula, Chiliko, Njala and Likangala itself under a single management. This was done to reduce staff supervising the schemes as the complex could then be supervised by a Scheme Manager based at Likangala with the help of extension workers based in other smaller schemes. Unlike Domasi, Njala has not formulated its own constitution; neither has it registered with the Registrar General. It uses Likangala Irrigation Scheme constitution to guide its activities. The inclusion of Njala, which has not achieved independent status legally, is important in understanding formal-informal institutional interaction under different institutional arrangements.

3.3 Methods and tools of Data Collection

This study collected both qualitative and quantitative data. Qualitative data was collected through key informants interview (KII), focus group discussion (FGD) and in-

[7] It is a requirement of the government of Malawi that all constitutions in these schemes be accepted by the registrar general's office before coming into force.

depth interview with selected irrigation farmers. Interview and FGD guides were used as data collection instruments. Information collected through qualitative methodologies included farmers' views, feelings and perceptions on community management of irrigation schemes including issues of household access to irrigation plots, cooperation, conflicts and collective action. This method is conducive to studying issues of this nature as they require in depth analysis. At Domasi eight FGDs (4 for each sex) were conducted while at Njala four FGDs (2 for each sex) were conducted. The differences in the number of FGDs reflect the differences in the physical size of the two irrigation schemes. Each FGD comprised of 12 members who were purposely selected taking into account local social and power relations. This was done in consultation with the irrigation farmers. An effort was made to exclude WUA executive members and local chiefs in the FGDs in order to allow members discuss issues freely. Key informants interviewed included WUA executive members, traditional chiefs, leaders of local NGOs and faith leaders.

Participant observation method was also employed and involved participation in WUA meetings, which were largely aimed at disciplining farmers who had not cleaned minor canals or were absent during cleaning of main canals[8]. The physical condition of the irrigation infrastructure, including canals and roads, was also observed and digital camera used to take pictures. WUA documents at Domasi and Njala were also studied to verify findings primary sources. Documents studied included the Irrigation Act, 2001; Irrigation National Irrigation Policy and Development Strategy; WUA constitutions and WUA executive minutes.

[8] Minors canals are cleaned by individual farmers in their plots, while main canals are cleaned collectively by farmers within a particular block.

Quantitative data was collected through household questionnaire using closed and semi-structured questionnaires. Information collected through this method included household socio-economic characteristics and nature and extent of social capital existing at the two sites. Social capital variables generated from social capital literature included social and economic homogeneity, relations of trust and reciprocity and common norms and values among irrigation farmers. Social homogeneity refers to whether irrigators are from the same village, ethnic group, kinship caste and religion; while economic homogeneity refers to whether irrigators are from the same economic category as measured by income or landholding size (Kahkonen, 1999). Homogeneity influences collective action by increasing the number of social ties and norms that irrigators can draw upon in building cooperation (Meinzen-Dick et al., 2000; Pretty and Ward, 2000). Heterogeneity on the other hand breeds potential factionalism in a community as manifested in group conflicts. To measure social homogeneity, irrigator's religious and educational characteristics have been employed while economic homogeneity has employed irrigators land size expressed in terms of number of plots (see IWMI, 2003b). Density of cooperative networks have been measured by density of religious affiliations (see Meinzen-Dick et al., 2000) while irrigators' norms and values have been measured by the degree of farmers' value of collective work (see Pretty and Ward, 2001).

3.4 Study Sampling Techniques

Domasi irrigation scheme is patronized by twenty villages and from these villages eight villages were purposively selected to achieve geographical representation. Dwelling units were then selected from the chosen villages using simple random sampling. The

social homogeneity of the society and even distribution of dwelling units made this technique the most feasible. One elder person from each household was then interviewed. There was a deliberate effort to achieve gender representation by alternating the sex of the household head interviewed. At Njala, plots were randomly selected and then owners of those plots followed up for interviews. This was the most feasible approach considering that, unlike at Domasi where farmers live in same villages, irrigation farmers at Njala live in different villages and mix with households practicing informal irrigation[9]. Some of the households also own plots at Tsegula irrigation scheme[10].

The total sample size for household questionnaire at Domasi was 106 out of 1560 irrigation farmers, of which 51 were females and 55 were males. At Njala the sample size was 50 out of 240 farmers, of which were 23 females and 27 were males. The following statistical formula adapted from Israel (2009) was employed in calculating sample sizes.

$$n = \frac{N}{1 + N(e)^2}$$

where n = sample size,

N = Population

e = level of precision

The confidence level was set at 95% level and P at .5. This formula is used where the total populations are known and is appropriate in this study as the total numbers of irrigation farmers at both sites are known.

Giving Domasi = 318.37 and Njala = 150

[9] Very close to Njala, there is a lot of rice cultivation that is directly under traditional chiefs.

[10] Njala irrigation scheme is very close to Tsegula Rice Irrigation Scheme. The distance between the two schemes is not more than 3 km and farmers live in the same villages

Since the study targeted household heads engaged in irrigation farming, 318.37 and 150 farmers at Domasi and Njala was divided by three to find the study sample size. This was based on analysis of a questionnaire pre-tested at Tsegula Irrigation Scheme, which revealed that on average, three persons in a household own a field. This gives a sample size of 106 for Domasi and 50 for Njala.

3.5 Methods of Data Analysis

The study employed both quantitative and qualitative methods of data analysis. Quantitative analysis has been used in analyzing household survey data in which descriptive statistics such as frequencies, cross tabulations, means, graphs and percentages values have been calculated by using SPSS computer package. These statistics have been used to answer questions on household mode of access to irrigation plots, density of social capital at the two irrigation schemes as well as percentage of farmers in support of community irrigation management. A qualitative assessment has employed content and institutional analysis; which has allowed identification of emerging themes from FGDs and in-depth interviews especially with regard to farmers' cooperation, organisation of collective work and causes of conflicts among farmers. Institutional analysis has involved exploring a group of people that formulated the constitutions, their underlying motives and objectives; including the extent to which individual and group interests were compromised. Institutional analysis was also employed in analysing institutional performance as measured by the extent to which institutional arrangements and objectives defined management practice and outcomes.

3.6 Limitation of the Study

CBNRM is a recent phenomenon in Malawi and in irrigation sector in particular. There is thus paucity of academic literature on this subject, specifically literature that engages with the theories upholding the regime. There is some literature on the forestry and fisheries sector, but most of them are limited to merely assessing performance of CBNRM without invoking the theories. Since the main aim of this study was to find out the extent to which theoretical claims of CBNRM hold in practice, the study depended so much on literature from international experience such as India, Nepal, USA, Botswana and China. While this literature is useful to this study, local studies could have greatly contributed to the understanding of the critical issues explaining theory and practice of CBNRM in Malawi. This is one the limitation of this study. Again, the de jure and de facto status in community management of irrigation schemes in Malawi presented a challenge in data collection. This is so as despite the fact that communities are managing the schemes on their own, farmers are still waiting for a formal hand over of schemes to farmers. To avoid confusion, the concept of community management of irrigation schemes had to be therefore clearly explained to farmers. This was not only time consuming but needed frequent crosschecking of farmers responses to make sure that the concept was maintained throughout the interview. Notwithstanding these limitations, the researcher is certain that adequate effort and care was taken at both literature review and data collection to arrive at valid study insights.

CHAPTER FOUR

STUDY FINDINGS AND DISCUSSION

4.0 Introduction

This chapter gives and analyses the field findings from Domasi and Njala smallholder irrigation schemes where the study was conducted. The chapter begins with a presentation of the farmers socio-economic conditions in the two areas. It then presents the extent and nature of social capital as measured by its indicators. This information is important in contextualizing the discussion and analyzing the field findings. The study findings focus on the extent to which the theoretical claims about the efficiency of community management of common property resources hold in practice. Specifically, the first section presents findings on the extent to which set up institutions are providing an equitable guide to farmers' access to irrigation plots at Domasi and Njala irrigation schemes; the second section presents opportunities and challenges associated with community management of small scale irrigation schemes at the two irrigation schemes as guided by social capital concept; the third section highlights interactions between the informal institutions and formal institutions at Domasi and Njala and the effects of these institutional interactions on the performance of the irrigation schemes. Finally, the chapter presents attitudes of the local communities towards community management of the irrigation schemes.

4.1 Irrigation Farmers' Socio-economic Characteristics at Domasi and Njala

This section presents a summary of the socio-economic characteristics of farmers at Domasi and Njala irrigation schemes derived from 106 and 50 respondents, respectively, as explained in the methodology.

Table 1.0 Respondents Socio-economic Characteristics at Domasi and Njala

Farmers Characteristics	**Domasi n = 106**	**Njala n = 50**
Average age	36.29	33.82
Average household size	4.0	3.92
% of farmers who have not completed Primary School Education	83%	72%
Average number of irrigation plots	3.7	3.14
% of farmers economically depending on irrigation only	52.8%	82%
% of farmers practicing irrigation and upland farming	40.6%	16%
% of farmers with children above 18 years of age	63.2%	46%
% of married farmers	83.0%	90%

Source: Fieldwork, 2008

Table 1.0 indicates that the majority of respondents have not gone far with their education, which has negative effect on the extent to which they can adopt irrigation technologies (see Meinzen-Dick et al., 2000). Again, a large proportion of the farmers are married (83% at Domasi and 90% at Njala), which means that there is high population growth momentum at the two sites. High population growth is one of the challenges in terms of accessing plots. This condition is worsened by high dependence on irrigation farming (52% and 82% at Domasi and Njala respectively). More households dependence on irrigation farming at Njala reflect of shortage of agriculture land largely because Njala is closer to Zomba Urban and thus faces competition of land use.

4.2 Nature and Extent of Social Capital at Domasi and Njala Irrigation Schemes

This section presents the nature and extent of social capital existing at Domasi and Njala irrigation schemes as measured by social networks, connections, trust, relations of reciprocity and common norms and values.

4.2.1 Density of Social Capital as measured by Religious Affiliation

The presence of local organisations in an area is one of the indicators of social capital as these provide a forum for farmers' interaction. In rural settings where the civil society is not well developed, religious affiliations and number of temples can be employed as a measure of local organisation (Meinzen-Dick et al., 2000: 17)[11]. Religious affiliation is preferred in this study as studies carried out in India revealed that social capital generated by religion seems to have a positive influence on local organisation for natural resource management than that created by other cooperatives (Meinzen-Dick et al., 2000).

[11] Meinzen-Dick (2000) employed number of temples as a measure of the level of associations.

Table 2.0 Social Capital as measured by Religious Affiliation

Religious Affiliation	Domasi % of farmers affiliated n =106	Njala % of farmers affiliated n = 50
Moslem	36.8	26.0
Catholics	12.3	8.0
CCAP	17.9	8.0
Church of Christ	18.9	28.0
Other	14.0*	30.0*
Total	**100.0**	**100.0**

Source: Fieldwork, 2008

* This % includes small denominations which could not be effectively separately

Table 2.0 above reveal that Domasi and Njala religious affiliation provides a means for community association as all farmers are affiliated to a religious grouping. This may help in sharing information and innovations; establishing farmers trust amongst themselves; and mobilising resources. In general, religious affiliation at Domasi and Njala provides the necessary social capital for natural resource management as FGDs conducted at both sites reveal that people believe that a true Christian and Moslem should be obedient and cooperative. Thus religious affiliation is a social capital necessary for motivating farmers' compliance to irrigation scheme rules and collective work.

However, diversity may also bring factionalism amongst the farmers, such as Moslem competing with Christians for resources. Nonetheless, FGDs conducted at the two sites reveal that there is peaceful co-existence amongst people of different religious affiliations. This might possibly reflect that, though affiliated to different faith groups, the communities are predominantly composed of same tribes, Yao and Lomwe.

4.2.2 Social Capital as measured by Relations of Trust and Norms

Relations of trust, reciprocity and common norms are other major features of social capital that are of great importance in community management of irrigation schemes (Bayat, 2005). Trust enhances irrigation system performance by counteracting irrigators' incentive to ignore the operational rules and free-ride, while common norms give individuals confidence to invest in collective work for mutual benefit knowing that others will behave the same way (Pretty and Ward, 2001). To determine the degree of trust, farmers were asked if they feel most people in their area are trustworthy and if they value collective work.

Table 3.0 Farmers Trust in the Local Populace and Value for Collective Work

	Domasi n= 106		**Njala n= 50**	
	Frequency	**Percent**	**Frequency**	**Percent**
Farmers having trust in the local populace	77	72.6	28	56
Farmers who value collective work	68	64.2	47	94

Source: Fieldwork, 2008

Table 3.0 above reveals that the local populace at Domasi trust each other more than those at Njala; as revealed by 72.6% respondents at Domasi reporting having trust in the local people as compared to 56% at Njala. Low community trust at Njala can be explained by the effect of urban culture on the area considering the fact that the area has of late experienced increased immigration from Zomba urban area (see Ferguson and Mulwafu, 2007). Thus, Domasi has considerable social capital than Njala as measured by

relations of trust. This situation is however different when value for collective work is considered. Table 3.0 above reveals that farmers at Njala value collective work more than those at Domasi (94% as compared to 64.2%). Physical observation of the main canals and roads within the scheme also indicate that those at Njala are well cared. Low value for collective work at Domasi can be explained by the large number of resource users which encourage free riding (1560 at Domasi compared to 240 at Njala).

Low trust among the local community at Njala thus challenges the extent to which resource users can collectively mobilise resources for irrigation management and establish sustainable resource use (see Meinzen-Dick et al., 2000). Again, low value for collective work at Domasi is a threat to community management of irrigation schemes as it encourages free riding, which heavily undermines the needed community cooperation for resource management.

4.2.3 Social Capital as measured by Reciprocity and Exchanges

Reciprocity, expressed in continuous exchange of help among a group of people, is an indication of collective responsibilities involving ideas of caring for, and sharing with each other. In order to determine reciprocity levels, farmers were asked to mention their most important sources of help and if they help one another in irrigation work.

Table 4.0 Farmers Sources of Help at Domasi and Njala (%)

Source of Help	**Domasi n = 106**	**Njala n = 50**
Relatives	32.1	90
Neighbours	37.7	10
Political leaders	3.8	0
WUA executive leaders	18.9	0
No-one	6.6	0
Local NGOs	0.9	0
Total	**100**	**100**

Source: Fieldwork, 2008

Table 4.0 above reveals that the most important sources of help for farmers at Domasi are neighbours (37.7%), relatives (32.1%) and WUA executive (18.9). Other farmers reported getting their help from political leaders (3.8%) and NGOs (0.9). At Njala 90% of the farmers interviewed indicated that they get their help from relatives and only 10% mentioned neighbours. High dependence on relatives than neighbours at Njala can be explained by the effect of immigration into the area, which introduces urban culture as earlier explained. Again, the small size of the Njala irrigation scheme (45 ha) means that it attracts less political attention than Domasi (500 ha) hence political leaders not very much interested with issues affecting irrigation farmers.

FGDs with farmers at both Domasi and Njala also revealed that farmers do not help each other with farming activities in the scheme. While this reveals lack of reciprocity relationships, it should be treated with caution as this might, reflect past history of state controlled irrigation farming, which did not promote moral economy. State driven

irrigation in Malawi and other African countries was largely aimed at modernising local farming largely guided by moral economy, which was considered inefficient (see Ngwira, 1994; Veldwisch et al., 2009). It was, however, reported at Njala that farmers do help the chief in cultivating his plots. Key informant interviews revealed that this practice in the scheme was an extension of the old customary practice in the Lake Chilwa wetland cultivation where the local people pay a tribute to the chiefs as a token of thanks for the land given to them (see Kambewa, 2005). While this practice has the potential of enforcing local cooperation, it may increase unequal resource distribution in favour of few elites. In general, lack of reciprocity exchanges directly related to irrigation activities means that, though present, social capital is not being employed in resource use and management as will be explained later in this paper.

4.2.4 Social Capital as measured by Social and Economic Homogeneity

Community homogeneity socially and economically is one of the indicators of social capital as this promotes cooperation and communication (see Pretty and Ward, 2001). To measure social homogeneity, number of religious denominations and level of education were employed. From table 2.0, both Domasi and Njala are socially diverse as measured by farmers' diversity in religious affiliations. Thus, apart from instilling a sense of responsibility into farmers as earlier explained, religious groupings present one of the association for information sharing and communication. For instance, at Njala, a Pastor of one of Christ of Christ Church reported that he is mostly involved in transmitting information to, and disciplining farmers. High diversity, on the other hand, should theoretically result into increased conflicts as the presence of diversity in a local area

creates considerable factionalism that divides rather than unites the group (see Meinzen-Dick et al., 2000: 17). However, FGDs and key informants interviews at both sites revealed that farmers are not divided on religious lines.

Table 5.0 Homogeneity of Farmers as measured by Educational Qualification

	Domasi n = 106		**Njala n = 50**	
Educational level	**Frequency**	**Percent**	**Frequency**	**Percent**
None	18	17	4	8
PSLC not completed	70	66	32	64
PSLC completed	6	5.7	9	18
JC not completed	4	3.8	6	3
JC completed	3	2.8	1	2
MSCE not completed	3	2.8	1	2
MSCE completed	1	0.9	0	0
Diploma/Degree	1	0.9	0	0
Total	**106**	**100**	**50**	**100**

Source: Fieldwork, 2008

The table 5.0 above reveals that in terms of education both sites are homogeneous (83% of farmers at Domasi and 72% at Njala have not completed their primary school education). Thus, 17% and 28% of farmers at Domasi and Njala respectively had completed their primary school education. As earlier explained, a slightly higher percentage of farmers completing their primary school education at Njala than Domasi reflect the effect of urban culture on the area. For instance, one of the irrigation farmers interviewed at Njala reported that she has a husband who works in Zomba urban and comes homes every week end. Again, out migration of JC and MSCE holders at Njala into Zomba urban might explain low percentages of this group.

Table 6.0 Farmers' Diversity at as measured by Number of Plots owned

Number of plots	Domasi n = 120		Njala N = 50	
	Frequency	**Percent**	**Frequency**	**Percent**
1-4	77	72.6	42	84
5-8	26	24.5	8	16
8+	3	2.8	0	0
Total	**106**	**100**	**50**	**100**

Source: Fieldwork, 2008

Table 6.0 shows that both societies at Domasi and Njala are economically diverse as measured against the number of plots owned[12]. The table also reveals that a larger proportion of farmers at Domasi have larger plots at Domasi than at Njala (27.3% as compared to 16%). The differences in plots distribution between the two sites can be explained by problems of resource distribution associated with bigger resource units (see Agrawal, 2001). Thus, economic diversity trends at the two sites poses a threat to resource management largely because it potentially produces resentment among the losers, as will be explained later.

4.3 Factors Affecting Household Access to Irrigation Plots at Domasi and Njala

At both Domasi and Njala, WUA constitution is supposed to guide household access to irrigation plots and irrigation water. The constitutions of the two schemes stipulate that individuals accessing plots must be a Malawian, of good manners, sober-minded, hardworking, an established farmer in the areas and not less than 18 years of age.

[12] IWMI, 2003(a) considers differences in land size to be a good measure of economic differences between farmers. Since all plots are equal number of plots can be used to define relative size of land owned by each farmers

The procedure for becoming a WUA member at both sites begins with making a written membership application to WUA executive, which scrutinizes the applicant to see if s/he qualifies for membership. After the applicant is certified, he/she is given a form to sign and pay a membership of MK200.00 (this is subject to revision from time to time), and if plots are available is allocated a plot. Both constitutions also provide for property right transfer to children and relatives in the case of death, old age, emigration and upon willingness of the plot holder. In all these situations, a formal application has to be made to the WUA executive, which assesses the applicant to find out if s/he meets the requirement of WUA membership. For a child below 18 years of age, the constitution stipulates that an older person related or living with the child has to use the plot until the child comes of age. The constitution, however, empowers the executive to reject plot transfer application to a person who fails to meet the above requirements.

4.3.1 Farmers' Modes of Accessing Irrigation Plots and Access Equity Issues

An investigation on household access to irrigation plots was mainly centered on three areas namely: modes of household access to irrigation plots, number of plots accessed and the farmers' own views about equity issues in accessing irrigation plots. To answer these questions, farmers were asked about how they accessed the plot(s) they are cultivating, the number of plots they cultivate and whether they feel there is equal access to irrigation plots, and if not the reasons behind the inequality.

Table 7.0 Households' Modes of Access to Irrigation Plots at Domasi and Njala (%)

Mode of access	**Domasi n= 106**	**Njala n= 50**
Given by WUA	42.4	48
Inherited from parents	28.3	16
Renting	8.5	0
Given by government long time ago	20.8	36
Total	**100.0**	**100**

Source: Fieldwork, 2008

Both constitutions at Domasi and Njala provide two modes through which households can access plots namely: application to the WUA executive and through plot ownership transfer. From Table 7.0, 42.4% of the respondents at Domasi and 48% at Njala accessed their irrigation plots by applying to the WUA executive. Another 28.3% and 16% of respondents at Domasi and Njala respectively inherited their plots from parents and relatives. Thus, more farmers have inherited their plots from parents and relatives at Domasi than at Njala, which may mean that households own more plots at Domasi. With increasing population and no increase in irrigation land size, inheritance is likely going to become an established mode of accessing plots. In fact, key informants interviews indicated that plot transfer through inheritance was crafted into the WUA constitution in order to ensure plot holders' children have access to irrigation plots. Thus, WUA at Domasi and Njala have adopted existing customary norms of resource governance such as inheritance rights (see Kambewa, 2005)[13]. This effort demonstrate an inherent effort by elites who have better access to irrigation plots and power to influence

[13] Kambewa (2005), *Access to and monopoly over wetlands in Malawi* focussed on customary access practices in informal irrigation in Lake Chirwa Wetland Area.

institutional engineering to safeguard their plot ownership within their family[14]. For instance, 20.8% and 36% of the respondents at Domasi and Njala respectively reported that they own plots given to them by government before management transfer and have just formalized their plot ownership with WUA despite calls for plot re-distribution. Again, at Domasi, 8.5% of the respondents reported renting plots against WUA constitution that bars renting. This percent is likely to be high considering FGDs revelations that renting is so informal and occurring mostly among blood relations and rental fee vary depending on the nature of relationship. Thus, individual social capital in terms of relations of trust is an asset to accessing irrigation plots at Domasi.

In the present context, therefore, it is unlikely that community management of irrigation schemes can change the pattern of plot distribution. This is despite the communities having adequate social capital as measured by relation of trust, local networks, same norms and values. The findings from the two sites demonstrate that power to influence institutional engineering largely influences the pattern of resource distribution. As illustrated earlier in table 6.0, plot distribution patterns at Domasi and Njala show that although number of plot ownership is concentrated between 1 and 4, 24.5% and 16% of the respondents own between 5 and 8 plots. Again, at Domasi, 2.8% of the respondents reported owning more than 8 plots. Thus, unequal access to irrigation plots is evident at both sites. The following section analyses reasons for the differences.

[14] 70% of the respondents in the household survey indicate that Constitution was formulated by a few individuals. See also Ferguson and Mulwafu, 2004

4.3.2 Households' Equality of Access to Irrigation Plots at Domasi and Njala

At both Domasi and Njala, farmers feel there is no equality in accessing irrigation plots as evidenced by differences in the number of plots ownership. Of the farmers interviewed at Domasi and Njala, 82.1% and 52% respectively reported that there is no equality to plots and the following were the factors given for the inequality.

Table 8.0 Factors Explaining Household Unequal Access to Irrigation Plots (%)

Factor	**Domasi n= 106**	**Njala n= 50**
Wealth Status	4.7	0
Gender	2.8	3.8
Shortage of land	2.8	57.7
Relationship to chief	19.8	3.8
Relationship to WUA executive members	8.5	19.2
Early distribution pattern	61.3	15.4
Total	**100.0**	**100.0**

Source: Fieldwork, 2008

Table 8.0 above shows that 61.3% and 15.4% of the respondents at Domasi and Njala respectively feel unequal access to irrigation plots is due to early plots distribution patterns. This is especially true at Domasi where there was at first no restriction on the number of plots a farmer can hold as there was less response from the local people in terms of registering for the plots. Most local people felt government was aiming at turning them into tenants. Since very few people showed interest to register as farmers in the scheme, the willing farmers were allowed to own as many plots as they could. This continued plot distribution pattern shows that, as earlier explained, the current management has not addressed access inequalities. This is also supported by farmers'

feelings that access to irrigation plots is affected by relationship to local chiefs and WUA leaders. At Domasi, for instance, 19.8% reported that relationship to local chiefs affects farmer's access to irrigation plots, which reveals that local chiefs have more influence on the management of the scheme. Relationship to WUA executive leaders affects access to irrigation more at Njala than at Domasi (19.2% to 8.5%), which can be explained by the fact that Domasi is bigger and covers a number of local chiefs' jurisdiction while Njala is smaller and covers one chief's jurisdiction. Another factor affecting access to irrigation plot at Njala is shortage of land, (reported by 57% of the respondents), which underscores more the small size of land resource available to farmers than the causes of inequalities.

From these findings, two main factors emerge as critical to explaining present irrigation plots access inequalities at the two sites namely: firstly failure of the current management to address the past issues of inequalities; and secondly the failure of present institutions to establish a clear and corrupt free guidance to irrigation plots distribution.

4.3.3 IMT Failure to address Farmers' Plots Ownership Inequalities

As explained from above, when the schemes were created, the farmers were allowed to own as many plots as they could. Over the years, household demand for irrigation land in the schemes increased largely as a response to growing population and consequently decreasing per capita holdings. The early distribution pattern can also be explained by the fact that it was implemented within the modernisation paradigm which favoured the capable elites (see Ferguson and Mulwafu, 2004). Implemented within the broad paradigm of good governance and poverty reduction, IMT was supposed to reverse this trend. However, IMT at the two sites; which involved rule formulation, leadership

training and developing the schemes vision; failed to achieve this largely because of low farmers' participation in the IMT process as highlighted by the table below.

Table 9.0 Level of farmers' Participation in IMT Process at Domasi and Njala (%)

Level of participation	**Domasi n= 106**	**Njala n= 50**
Very low	9.4	6.0
Low	18.9	44.0
Average	34.7	30.0
High	37.7	20
Total	100.0	100.0

Source: Fieldwork, 2008

Table 9.0 above shows that the process was less participatory as over 62.3 % and 80% of the irrigation farmers at Domasi and Njala respectively indicated that it was average. FGDs discussion with farmers also indicated that farmers were only told of the policy change and thus farmers participated at the lowest level of participation (Passive participation) as presented by Pimbert and Pretty (1995).

> *Tinangoudzidwa za kusintha, koma zonse anapanga ndi atsogoleri athu*
>
> We were just told about policy change, but everything was done by our Leaders.

Farmers also indicated during FGDs that rules for irrigation management were formulated by few people. Table 10.0 below highlights the group of people involved in making rule for the schemes.

Table 10.0 Group of Irrigation Farmers who Formulated Rules

	Domasi n= 106	**Njala n= 50**
Interim WUA Executive	67.9	96.0
All farmers	31.1	4.0
Government	0.9	0.0
Total	**100.0**	**100.0**

Source: Fieldwork

From table 10.0 above, 67.9% and 96% of the farmers at Domasi and Njala respectively reported that rules were formulated by the interim WUA executive. According to Peter (Hugh, 1995), farmers' participation in the IMT process is crucial to the success of community management as it builds productive capital (better maintained irrigation infrastructure) and social capital. This means that the process of IMT at the two sites did not orient and prepare the existing social capital to be employed in the management of the schemes. Again, Samakande, Senzanje and Mjimba (2000) argue that participation in creating and modifying irrigation operational rules helps to build the needed social capital for collective action. This is what was lacking at the two sites.

4.3.4 Institutions Failure to establish Fair Plot and Water Distribution

Institutions set up at Domasi and Njala has failed to establish a fair distribution of plots and water. Farmers in FGDs and key-informants interviews indicated plot distribution at both sites is at both sites is not guided by the constitutions put in place. Instead, farmers indicated that access to irrigation plots and water is highly influenced by social and power relations that exist between WUA executive members and chiefs on one

hand and farmers on the other hand. The social relation refers to the individual farmer's relationship with the chiefs while the political relates to his/her relationship with the individuals in the WUA executive[15]. Both Key informant interviews and household survey at both sites reveal that relationship to the chiefs and WUA executive highly increases individual's chances of acquiring a plot as indicated above. It should also be noted that there is a weak boundary between social and political leaders referred to herein above. This is so as there is either a strong blood relation between influential WUA executive members and the local chiefs or the local chiefs themselves are WUA executive members. At Njala for instance, the vice president is the group village head while at Domasi the president of WUA is related to one of the most influential chiefs in the area. It is therefore unlikely that inequalities to irrigation plots can be addressed within these social and power relations settings, especially where access to plots is controlled by a group which has more plots. Carpenter (1998) argues that appropriation of resources by users already blessed with resources could leave others worse off, something social capital is believed to address. The scenario at Domasi and Njala however paints a doubtful picture on the extent to which social capital can be relied upon in achieving equitable distribution of CPRs. This is so as rather than being a uniting factor, social and power relations are perpetuating the inequalities. Specifically, relationship to chiefs and WUA executive members continue to benefit households with social and political ties to this group. At Domasi for example, two relatives to WUA executive member received plots earlier than those who applied before their application.

[15] WUA constitution at Domasi and Njala, as well as the 2001 Irrigation Act and 2000 National Irrigation and Development Strategy, do not provide chiefs any special role in the running of the schemes. Thus while it is true that chiefs are political leaders, in the case of irrigation management they are respected just because of their social standing in the society.

4.4 Opportunities and Challenges of Community Management of Irrigation Schemes at Domasi and Njala

There are some advantages associated with community management of irrigation scheme at Domasi and Njala. Among others, 8% and 6.6% of the respondents interviewed at Domasi and Njala respectively reported the regime is promoting ownership of the scheme among the local community and helps to make speedy decision concerning the scheme. These advantages however need to be taken with caution as they were mainly advanced by WUA executive leaders which might indicate a minority view of a group of farmers who benefit from the present social and power arrangements as explained earlier. For instance, FGDs with farmers revealed that community management is costly in terms of increased plot fee and time spent in UWA meetings.

Apart from these costs to farmers, community management of irrigation schemes at Domasi and Njala is meeting more challenges. The following challenges were mentioned by 92% and 93.4% of the farmers interviewed at Domasi and Njala respectively:

- irrigation water shortage
- water allocation problems resulting into unequal access to irrigation water
- lack of transparency and accountability of the WUA executive committee and
- lack of farming inputs resulting into declining crop output and
- problems of sustaining collective action in running operation and maintenance activities

FGDs and key-informants interviews reported that the main causes of water shortage are shortage of rains and increasing competition for water use with other farmers upstream. Farmers on the other hand indicated that unequal access to the irrigation water

is mainly caused by corrupt practices in water distribution by the irrigation committee. For instance, farmers indicated that water distribution schedules are at times distorted in order to supply water to preferred individuals. In this case, while unequal access to irrigation water is largely caused by factors within the irrigation system, shortage of water is caused by shortage of rains and other factors outside the system.

4.4.1 Ability of Farmers to Manage Water Problems Arising from Outside Causes

Social capital and local institutions are, under the current management, tools to addressing challenges rising in managing the schemes. At Domasi and Njala, the responsibility of distributing water to farmers rests in the water and irrigation committee, which carries out its duties as guided by the irrigation scheme constitution. The executive committee also ensures that adequate water is available for the scheme, which largely involves ensuring that the schemes secure water licenses from the government. This gives the schemes the required legal entitlement to water. Theoretically, the existence of social capital and local institutions is supposed to result into fair water allocation to irrigation farmers and combined monitoring of water abusers.

However, findings from this study reveal that this alone is not enough. Water is a mobile resource and entitlement is effective only when it has reached the boundaries of the resource system. Currently there is a lot of informal irrigation farming activities upstream where farmers claim traditional rights to water resulting in less water reaching the two schemes. This problem is serious at Njala irrigation scheme where farmers complain of receiving very little water because communities upstream have not only intensified informal irrigation farming but uses water without due consideration to water

requirements downstream. This is worsened by the fact that river water is one of the goods regarded as free or public goods hence free to all (see Carpenter, 1998). Despite WUAs paying water use license fees, the surrounding community lacks the concept of water being a market good hence not bound to respect water entitlements made with government. Therefore, without government enforcement to ensure that the required amount of water is reserved for the schemes downstream, the amount of water accessed by the schemes will largely be determined by social understanding between the irrigators and the communities upstream, something which is lacking at present. Farmers at the two sites complained that the problem is difficult to address as there are no structures to initiate and sustain discussions over good water use between the two communities. In-depth interview with some chiefs at Njala also revealed that farmers upstream feel that irrigators at Njala are only concerned about their own issues. Therefore, the findings from the two sites highlight that similarity of interests among the local populace is a major condition under which social capital can better guide management of common property resources (see also Meinzen-Dick at al., 2000; Agrawal, 2001). In the case of Njala, despite the irrigators and the farmers upstream sharing a number of social and political ties, it is difficult to reach a common understanding because they have different interests in the use of water. This re-echoes the tragedy of the commons in a new fashion.

Equally important, farmers at Njala irrigation scheme complain of silting up of the scheme reservoir dam, largely not because of the irrigation farmers' activities, but due to deforestation and increased farming upstream. According to focus group discussion with the farmers, the only permanent remedy to the problem is shared understanding between the irrigators and communities upstream to jointly control soil erosion. While it is true

that for a long time these communities have worked together to solve problems, and do work together on some issues at present, the present management arrangement of the WUAs does not provide the necessary link for wider geographical cooperation. This is so as chiefs whose authorities cover a wider area are theoretically out of the management structure. This finding therefore suggests that any effort at institutional engineering for common property resources management should not only take on board existing structures of resource management, but also consider their jurisdiction in relation to sustainable resource management.

Institutional engineering associated with IMT in Malawi has been limited to a geographical area covering the resource. In the case of Domasi and Njala, this approach has resulted in the formulation of WUA constitutions that have generally focussed on issues within the schemes. Water use practices outside the schemes, though greatly affecting the scheme, cannot legally be addressed through WUA constitutions. Interviews with both leadership at Domasi and Njala reveal that they have difficulties persuading the surrounding communities to follow sustainable water use practices.

4.4.2 Ability of Farmers to Manage Water Problems within the Scheme

As already explained earlier, unequal access to irrigation water is one of the problems facing community management of irrigation scheme at Domasi and Njala. FGDs with farmers revealed that the main cause of unequal access to water is corrupt practices by the WUA executive committee and the irrigation sub-committee. A critical analysis of the causes of unequal access to irrigation water at the two sites reveal two causes namely: location of the irrigation plot and selective water distribution rotation.

4.4.3 Location of the Irrigation Plot

Naturally, water problems in irrigation systems are more experienced at the tail-end as water is firstly used by head-end irrigators. Explicitly, this divides farmers into tail-end and head-end users and viewed this way, variations in access to irrigation water is determined by plot location. However, while it is true that location of a plot determines water access within the irrigation system, water access issues at Domasi and Njala irrigation schemes are implicitly buried in the existing social and power relations. This is so as existing social and power relations have an influence on the location of a plot one receives. During focus group discussions with farmers and interviews with key informants, it was revealed that Water User Association executive committee allocates head-end plots to their relatives and those of the local chiefs; as evidenced by the following statement:

> *Amakondera pogawa mapuloti. Amene ali ndi abale awo mu management amalandira mapuloti omwe ali kufupi ndi madzi.*
>
> There is favoritism in plot allocation. Plots closer to water are usually given to individuals who are related to WUA executive members and local chiefs.

4.4.4 Selective Water Distribution Rotation

Like the location of plots, farmers' water access differentials are also a result of institutional failure to distribution water fairly to farmers and maintain fair water distribution rotations. The success of rotational water allocation arrangement depends on compliance of the individuals entrusted with the duty of regulating water rotation to the agreed upon schedules. In the case of Domasi and Njala, the committee of irrigation and water is entrusted with this task. Focus group discussions and key informants interviews

conducted at Domasi reveal that the irrigation committee is able to follow the water distribution schedule when water is abundant. Farmers, however, reported that in times of water shortage WUA executive members and local chiefs change the water distribution schedule so that they access more water. In other words, farmers indicated that WUA executive and local chiefs are able to influence the irrigation committee to change water distribution schedules to their favour. Thus, social and power relations play an important role in determining access to water and works to the advantage of farmers related to the chiefs and WUA executive members. The conversation at Njala below, between one of the WUA executive members who escorted me in field observation and his friend, explains the nature of this practice.

> *Munda wanga wauma, kodi mkulu madzi bwanji?Popeza puloti lako lili kufupi ndi ine, nditsegula lero madzulo upezeko pango'no.*
>
> My plot is dry; can you not help me with water? I will open water to our block this evening so that you access water.

These findings reveal that institutional failure in creating and enforcing a fair water allocation system at Domasi and Njala is grounded in existing social and power relations. Like in the external factors affecting water allocation, the asymmetrical effects of social and power relations on farmer access to irrigation water is worsened by the fact that both farmers and WUA leadership consider water as a free public good. This is also evident in the WUA constitutions at both sites, which stipulate that farmers are to pay plot fee for accessing and utilising the land and not for accessing water. There is no water-use fee in the constitutions and as such no legal basis to take water as a market good simply by paying the plot fee. Thus, there are no legal claims on the part of farmers on one hand and obligations on part of WUA leadership on the other hand; that by paying equal plot fee,

farmers should have equal access to irrigation water. In this case, while moral economy is the only guiding principle to fair water allocation, it is heavily affected by the existing social and power relations that give a certain group of farmers an upper hand over the other. The findings at Domasi and Njala strongly confirm what Shackleton et al., (2002) advanced that more powerful community actors in southern Africa tend to manipulate CBNRM outcomes to their interests. He further argued that without checks and balances local elites control all the benefits and decision making.

4.4.5 Farmers' Compliance to, and Monitoring of the Water Allocation

In this study, compliance to water allocation system refers to farmer's observance of the water allocation schedules while monitoring refers to the combined community effort at enforcing compliance. Earlier discussion on the extent of social capital at Domasi and Njala has revealed that the two sites have considerable social capital. This should theoretically support a fair water allocation system as well as high farmers' compliance to water distribution rules. However, as evidenced by focus group discussions with farmers at Domasi and Njala, there is high illegal water diversion within the scheme. For instance, 96.7% and 60% of all respondents at Domasi and Njala respectively mentioned water distribution and diversion as a major source of conflicts among irrigation farmers.

FGD discussions with farmers at Domasi and Njala reveal that farmers are less interested in monitoring fellow farmers' compliance with rules regarding water usage because they benefit differently from the scheme. Farmers indicated in FGDs that the opportunity cost of being engaged in monitoring resource use is high for households not related to WUA executive and local chiefs as they benefit less. In other words,

favouritism in allocating water and plot to farmers is slowly producing resentment among some farmers resulting in reduced farmers' cooperation. Contrary to the theoretical claims therefore that where social capital exists monitoring of resource use is communally organised, at the two sites monitoring water usage has become solely a responsibility of the WUA executive committees. Except for the change in the actors, this trend is not different from the failed leviathan approach. For instance, during the whole fieldwork, WUA executive committee members were found busy attending to cases of farmers' illegal water diversion and failure to clean minor canals.

Again, frequent cases brought before WUA executive has serious side effects that is potentially threatening community management of irrigation schemes at Domasi and Njala. FGDs with farmers at Domasi and Njala revealed that meetings called by WUA executive to discipline farmers are costly to the association in two ways namely: opportunity costs of attending meetings and misallocation of WUA finances on meetings. Farmers complained that their plot fee is not benefiting them as expected as a lot of money is spent on WUA executive meetings to monitor farmers' compliance, discipline uncooperative farmers and settle water distribution related conflicts[16]. In fact, some of the farmers at Domasi indicated that frequent meetings organised by WUA executive is a deliberate move to spend their WUA finances.

From the presentation above, the problems of abuse of finances is shared among many farmers. Critical analysis of the discussions with farmers reveal that farmers at both Domasi and Njala are not well empowered to claim their rights and correct abuse by those in authority. For instance, despite the presence of elaborate constitutions at both

[16] WUA executive members are provided with food each time they attend a meeting. This usually includes soft drinks, biscuits, scones and lunch in times of all day long meetings.

sites, the majority of farmers are not aware of their rights. They are aware of their major duties and responsibility (cleaning canals, paying plot and membership fee) and sanctions but not their rights. This situation can be explained by the earlier findings that the process of IMT in Malawi was dominated by a few local elites. Again, this situation might be worsened by the fact that 83% and 72% of farmers at both Domasi and Njala respectively have not completed their primary education and of these 18% and 8% respectively have had no formal education. Furthermore, those who know how to read do not have easy access to the constitution as there is only one copy which is kept in the president's office for safety. In this situation, resource users' institutional knowledge depends largely on the extent to which they participated in the process of rule formulation. However, very few farmers participated in this process (see table 11.0 showing groups of people who participated in rule formulation).

4.4.6 Transparency and Accountability in Water User Association

At both Domasi and Njala farmers reported that lack of transparency and accountability, evidenced by lack of regular elections, undemocratic procedures for electing leaders and lack of regular financial reports and auditing, is one of the problems facing the community management of the scheme.

With regard to WUA Executive Committee elections, both constitutions at Domasi and Njala stipulate that elections are supposed to be held every three years. The constitutions further state that every legitimate member of the association has a right to stand for any post except of the posts of chairperson, secretary and treasurer, which are reserved for people who know how to read and write. However, FGDs with farmers and

key informants interview revealed that at both sites elections are not regularly conducted as the last one was held in 1999. Worse still, farmers doubted the probability of holding the elections soon. Farmers reported that WUA executive leaders and local chiefs silence all those who call for elections. This is against the belief that institutional engineering in countries implementing IMT including Malawi will create democratic structures. The findings from Domasi and Njala reveal that the existence of democratic structures and institutions has not translated into democratic practicum. Instead, undemocratic practices have generated growing dissatisfaction amongst farmers as evidenced by the following farmers' sentiments from Domasi:

> *Mavuto alipo koma kuti masankho sakuchitika. Mmene anachitikira 1999 sanachitikenso. Amene ali ndi mphavu zoitanira msonkhano wa masankho akupindula nawo.*
>
> Problems are there but elections are never held. Those who have the power to call for elections are silent because they are benefiting from the present WUA leaders.

Findings from Domasi point to the fact that instead of promoting democracy, unconstitutional relations between WUA executive members and chiefs are turning out to be a barrier to instituting a democratic culture. The networks are creating parallel management channels that contravene WUA constitutional requirements.

FGDs with farmers at Domasi and Njala also revealed that the procedure for electing WUA leadership is marked by undemocratic tendencies. According to WUA constitutions at both sites, election of WUA management committees takes place at a general assembly attended by all farmers. The constitutions also stipulate the requirements for election into leadership, which include good behaviour; be able to read and write for the positions of president, secretary and treasurer; be trustworthy and be a

committed farmer. While the constitutions is silent on the exact procedure for electing leaders, both WUA executive committee and farmers explained that the first step in electing leaders involves individual farmers declaration of interest to stand for election for the top positions of president, secretary and treasurer. The names of interested individuals, together with a list of farmers supporting their intent are then forwarded to outgoing WUA executive who scrutinise their names with the help of local chiefs to see if they qualify. After this exercise, outgoing WUA executive releases the names of those who have been accepted to compete for the top positions. All other positions are also supposed to be elected during the general meeting. This procedure seems to be democratic on face value.

However, focus group discussions and key informants interview reveal that chiefs and influential people have a lot of influence on the choice of leaders. Local farmers are hardly given the opportunity to contest as they are, not only demoralised by local chiefs and those already in power, but that they are also finding it difficult to persuade other farmers to support them. FGDs revealed that local farmers also fear to be associated with persons not approved by the local chiefs and those in power for fear of being labelled as acting against the local chiefs and those in power. In this case, those people who contest for top positions might therefore not be individuals favoured by the farmers. For instance, FGDs at Domasi revealed that during the elections held in 1999, individuals who contested on position of president were just dictated to the farmers. It is unlikely that this trend will be reversed soon, considering the low levels of education existing at the two sites. According to Evans and Rose (2007) in Malawi education strongly predicts mass endorsement of democratic procedures and rejection of non-democratic ones. Low levels

of education at the two sites therefore mean that the community has not only less value for democratic culture, but also lacks the much needed capability to enforce democratic community irrigation management institutions.

Lack of accountability and transparency is also evident in the way WUA finances are managed. This is despite the fact that WUA constitutions at both Domasi and Njala provide means of ensuring financial accountability namely: presentation of annual financial report at a general assembly including the right of farmers to access the report; and yearly financial audit by qualified auditors. The constitutions at the two sites therefore present the needed conditions for achieving financial accountability. However, FGDs with farmers and key-informants interviews revealed that there is little financial accountability at the two sites largely because of the following two reasons.

Firstly, while the constitution provides for farmers' right to access association records, this is practically hampered by the fact that 83% and 72% of farmers at Domasi and Njala respectively have either none or very little education to understand the association's transactions. This group of people cannot read; or if they do, cannot understand financial transactions. This leaves out a large group of people from participating in financial management needed for building trust in leadership. For instance, though mismanagement of WUA funds was mentioned in all FGDs, the claims could not be substantiated.

Secondly, while the constitution provides that WUA funds be audited by a well qualified expert, something that is not done. WUA executives at Domasi and Njala could not show audited financial reports nor show financial reports. The practical challenge of achieving this is that the auditors have to be identified by the WUA executive and thus

the whole purpose of achieving transparency and accountability highly compromised. Notwithstanding the fact that this study has not uncovered any practice, the probability of the executive influencing the choice of auditors to hide financial abuse is very high. This scenario obviously points to the challenges of achieving successful community management of common property resources, including irrigation schemes understudy, in an area characterised by divided social and political relations founded on asymmetrical benefits from the resource use.

4.4.7 Lack of Farming Inputs

From FGDs with farmers as well as WUA executive at both sites, lack of farming inputs is one of the serious problems that irrigators experience. Lack of access to fertiliser was mentioned by all respondents in household survey and came out in all the FGD conducted. This scenario is expected as farmers in government managed irrigation schemes were used to be given government loans in form of fertilisers, rice seedlings and chemicals. The change to community management means that farmers were to find means of accessing these loans on their own. WUA constitutions at both sites stipulate that farmers can get loans from financial institutions to meet their needs. Theoretically, community management of irrigation schemes is also based on the idea that irrigators can pool their resources together to fund collective work and offer individual loans to farmers. This can be achieved if the networks are not only diverse, but also horizontal (linking those of similar status) and vertical (linking those of different status and external organizations). (see Kilpatrick et al., 2001). Farmers need also to have trust that they will

benefit equitably from the resources pooled together. This is what is lacking at Domasi and Njala as evidenced by farmers'[17] fear of being cheated in cooperative rice sales.

Findings from Domasi and Njala also indicate that it is not easy for irrigators to access loans from financial institutions. WUA executive at Domasi for instance reported that they have tried in vain to negotiate for loans for farmers from formal financial institutions. WUA executive explained that at one time their attempt to bring in informal financial mechanisms was more disastrous as external buyers who got rice from farmers amounting to over one million and promised to bring fertiliser and other inputs could not be traced thereafter for payment. The findings from Domasi therefore indicate that, while local social capital is significant in community management of irrigation schemes and that present scholarship has devoted a lot of space to it, it is not adequate in achieving resource mobilisation that falls outside the local relations. In other words, vertical relations and bridging social capital is lacking, both of which are very important in accessing resources outside the resource systems. Existence of vertical relations will depend on the availability of knowledgeable individuals to initiate the relations. According to Meinzen-Dick et al., (2000) the presence of college graduates and influential people in the area offer networks links to irrigation partners and market opportunities. Assessed against this, Domasi and Njala schemes are unlikely to mobilize external resources as the educational levels of farmers are very low. Of the 120 farmers interviewed at Domasi, 2 farmers hold a Malawi School Certificate of Education and only 1 hold a Diploma. At Njala, of 50 farmers interviewed none is holding Junior Certificate.

[17] Most farmers indicated that they are not willing to sell their rice together because they are likely to be cheated. Some indicated that they have ever been cheated and are not willing to enter into that arrangement.

4.4.8 Collective Action in Running Operation and Maintenance Activities

The physical condition of main canals at both sites reveals that farmers are cleaning them at intervals. However, there are currently a number of problems relating to cooperation of farmers in cleaning minor canals along their plots especially at Domasi. The physical conditions of minor canals which take water to irrigation plots reveal that they are not regularly cleaned. Figure 2a and 2b below show two canals, one with just a small part cleared of its bushes and the other with all the bushes. Farmers indicated during FGDs that failure to clean minor canals is one of the major causes of farmers' conflicts as water is not able to flow properly to tail end plots.

2a

2b

Figure 2.0: Minor Canals Serving Irrigation Plots at Domasi

3a

3b

Figure 3.0: Conditions of Roads at Domasi Irrigation Scheme

Figures 2.0 and 3.0 show that there are problems of farmers' cooperation to clean minor canals and maintain roads serving the scheme. Farmers at Domasi for instance indicated it is the duty of WUA executive to maintain roads and canals and argued that WUA has to use casual labourers paid from their plot fee. Generally, CBNRM is premised on the benefits of social capital in instituting voluntary collective action and cooperation among resource users (Ostrom, 2000; Gillison, 2004). In the case of Domasi and Njala, despite the existence of social capital and formal institutions, FGDs with farmers revealed that farmers are only forced to cooperate due to fear of sanctions. In other words, there is coerced cooperation rather than voluntary cooperation [18], which has a number of costs including information and corruption costs (see Gillinson, 2004). Since coerced cooperation is based on policing by the central authority, which itself is at an informational disadvantage, information costs in terms of finding out who is not cooperating is high. There is also a potential danger of corruption in terms of who should be punished as it is not easy to identify those who do not cooperate. In addition to this, there other indirect costs such as time spent in meeting farmers and organizing meetings for disciplining uncooperative members. It is therefore obvious that all these costs are negatively affecting management of the schemes at the two sites.

Lack of voluntary collective action in an area already vested with considerable social capital such as Domasi and Njala can be explained by a number of factors. FGDs with farmers and key-informants interviews at the two sites revealed that collective action is negatively affected by undemocratic and corrupt practices taking place within WUA executive. Farmers reported that good plots, water allocation in times of water shortage

[18] Coerced cooperation demands supervision by a central authority. Voluntary cooperation on the other hand is based on good will and voluntary participation (Gillinson, 2004)

and good rice prices is offered to those related to WAU leadership and local chiefs. In other words, farmers feel they are not benefiting equally from the scheme and thus do not see the need to work for the benefit of other people. This finding indicates that, while social capital is a necessary ingredient for collective action and cooperation, its success largely depends on the ability of the communities to establish a democratic culture, which has the potential of cultivating spirit of ownership and oneness among resource users. According to Gillinson (2004: 6) ownership enhances commitment of participants and changes resource users mind from it's "government duty to it's our duty mindset".

4.5 Typologies and Effects of Formal-informal Institutional Interaction at Domasi and Njala Irrigation schemes

As earlier explained, both Domasi and Njala have written constitutions that are supposed to guide management and operations of the scheme. However, informal institutions are also employed. Thus, there is interaction between formal and informal institutions, which has given rise to two typologies of informal institutions namely:

- Complementary informal institutions with functional outcomes
- Accommodating informal institutions with dysfunctional outcomes

4.5.1 Complementary Informal Institutions

At both Domasi and Njala, there is frequent involvement of the chiefs, who are formally not recognised in the WUA constitution, in issues relating to decision making, coordination of irrigation activities and enforcement of formal rules. WUA executive

members from the two sites indicated that chiefs help them to enforce rules and make decisions concerning irrigation management. FGDs with farmers and interviews with key informants also revealed that religious leaders are involved in maintaining farmers' discipline and solving conflicts. For instance, sheiks at Domasi and pastors at Njala reported that they have the responsibility to counsel and discipline their members who break scheme rules. In this way, formal-informal institutions at the two sites produce convergent outcomes in that they help to achieve what formal institutions are aiming at (cooperation and compliance) but could not achieve on their own.

The above formal-informal relationship introduces the traditional versus modernity dichotomous debate in rural management. There is a school of thought that views traditional authority in irrigation management as incompatible with universal democratic principles such as fairness, accountability and equality (Ferguson and Mulwafu, 2004; Mamdani, 1996). Another school of thought perceives involvement of traditional leadership as having practical benefits such as acting as community mobilising agents, bridging power vacuum and enforcing modern institutions (Bergstrand, 2003). As explained above, at Domasi and Njala, interaction between WUA executive on one hand, and local chiefs and religious leaders on the other hand, helps in enforcing WUA executive decisions and mobilising farmers for collective work.

4.5.2 Accommodating Informal Institutions

Formal-informal institutional interaction at both Domasi and Njala has also created accommodating informal institutions as evidenced by power-sharing and reciprocal relations between WUA executive and local chiefs that are not provided for in the

constitutions. In-depth interviews WUA executive and local chiefs, for instance, revealed that local chiefs are not only consulted on scheme management issues, but also enjoy privileges accorded to WUA executives. This is against the constitutional stipulations of the two schemes, which bars local chiefs from taking part in the management of the schemes and enjoying benefits attaching to this responsibility. However, most chiefs perceive this constitutional requirement as underrating their local authority, which is a likely cause for conflict between the two groups (see also Ferguson and Mulwafu, 2004). In fact WUA executive members at Domasi indicated that local chiefs were at the beginning very hostile and their involvement has motivated them to positively contribute to the management of the schemes by among others making sure that people obey and follow the associations' rules. WUA executive at Domasi even reported that they cannot discipline farmers without consulting local chiefs. In other words, WUA executive has not only recognised the political jurisdiction of local chiefs, but also reported that chiefs help them to manage the irrigation scheme as they discipline farmers in their villages. The influence of the local chiefs on the management of irrigation schemes at the two sites is also enhanced by the fact that, unlike WUA leadership, traditional authorities form part of the district development framework as they are members of the district development planning system. Therefore, without the support of local chiefs, WUA executive cannot effectively appeal to the local people.

The findings of community management of irrigation schemes at Domasi and Njala strongly confirm the fears of leaving out local chiefs in decentralisation. For instance, Shackleton et al (2002) found out that exclusion of traditional leaders from conservation committees in Namibia was counterproductive resulting in conflict and delays until the

chiefs were incorporated into committees. This was also true in Mozambique (see Bergstrand, 2003). However, while the relationship between WUA executive and local chiefs at Domasi and Njala irrigation schemes can be seen to be constructive by enhancing stability of the management regime, it is characterised by a lot of reciprocity and exchange of favours that go against the principles of a democratic organisation. A good example of these favours is a case in which WUA executive at Domasi restricted access to a good market to WUA executive members and local chiefs[19]. Farmers indicated that they were not happy with the arrangement. In fact, undemocratic and corrupt practices at the two sites is building resentment among farmers and thus destroy the very hub of trust that community management of CPRs depends on.

4.6 Attitudes of Irrigation Farmers towards Community Management of Irrigation Schemes at Domasi and Njala

In order to find out farmers' attitude towards community management of irrigation schemes, farmers were asked to give their preference between the old government management and the new community management regimes. They were also asked to explain the reasons for choosing a particular management regime. Figure 1.0 below present farmer's choices.

[19] FGDs with farmers at Domasi

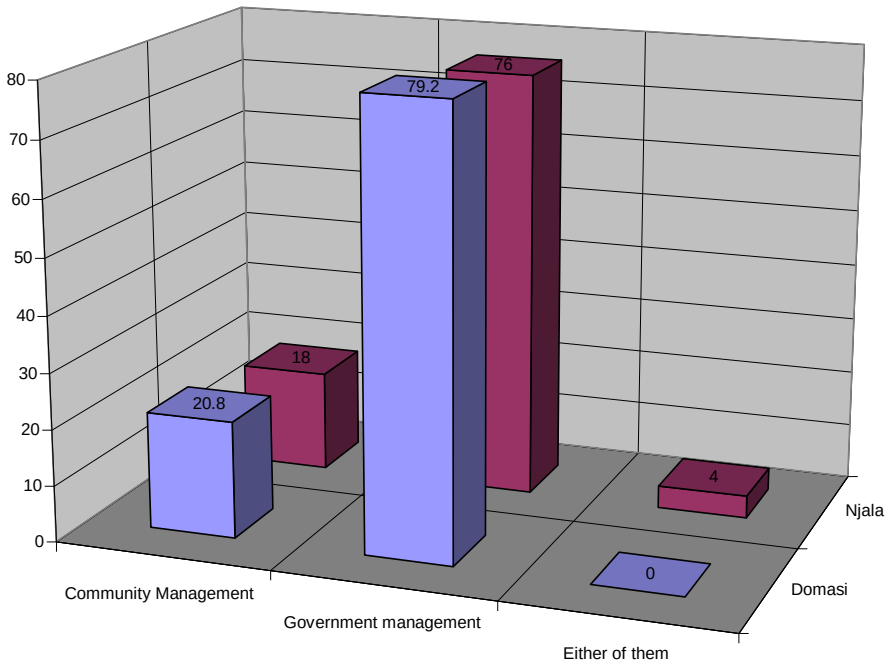

Figure 4.0: Farmers Preferences of Management Regime

From figure 4.0 above, 79.2% and 76% of the farmers at Domasi and Njala respectively prefer the old government management. During focus group interviews, the farmers lamented that government withdrawal has subjected them to a number of challenges, which include: lack of fertiliser loans, scarcity of market for their produce and increase in plot fee. Farmers also reported that increased cost of maintenance has resulted into deteriorating physical condition of the schemes infrastructures. Thus, the findings at Domasi and Njala challenges the extent to which resource users can collectively mobilise resources required for managing CPRs and access the needed markets. At both sites, farmers want government to re-take over management of the schemes. Obviously, farmers' negative feelings towards the present management have an impact on building a spirit of resource ownership and responsibility towards resource

management. In fact, farmers' sentiments at Domasi and Njala reinforce the view that CBNRM, despite being so favoured by international financial institutions, is so unpopular with target communities themselves (see Blaikie, 2001). The empirical evidence from the two sites studied question the theoretical predictions about the benefits of community management of CPRs, and irrigation schemes in particular. Instead, the study findings reveal that CBNRM is currently facing a lot of challenges.

4.7 Conclusion

This chapter has presented the major findings of the study. Firstly, the chapter has highlighted the extent of social capital at Domasi and Njala and discussed the farmers' modes of accessing plots. Secondly, the chapter has highlighted the major challenges farmers experience in the management of the schemes and the role of social capital in addressing the challenges. The major findings of the study are that social capital, though present at the two sites, is not effectively employed to address the challenges farmers are facing. This is particularly so as institutional arrangements have created reciprocal relations that benefits the few local elites resulting in resentment among many farmers. Finally, the chapter has presented farmers' views about the community management regime, which has revealed their deep disappointment. The next chapter concludes the study and points out significant areas for further study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND IMPLICATIONS

5.0 Introduction

This chapter summarises the major issues discussed in this study. Based on the theoretical knowledge from literature review and from empirical evidence from the two sites, the chapter also presents major recommendations of the study.

5.1 Conclusion

Policies of devolving management of irrigation schemes from the state to farmers represent a significant shift in the approach to the management of CPRs in Malawi. It is largely driven by the unimpressive experiences of state management of natural resources and the global moves towards greater public participation and democratization. In the academic area, it is supported by the emerging scholarship that recognises the ability of communities to successfully manage their CPRs. However, while theoretical claims predict a successful community management of CPRs, empirical evidence locally and internationally have highlighted mixed outcomes with some being more optimistic (Ostrom, 1999; Katz, 2000; Agrawal, 2001); and others very pessimistic (Ferguson and Mulwafu, 2007; Blaikie, 2006). This study explores the extent to which the theoretical claims about the efficiency of community management of CPRs hold in practice.

Study findings from Domasi and Njala irrigation schemes, utilising both qualitative and quantitative methods of data collection and analysis, reveal that community management of irrigation schemes under the new regime faces a number of challenges which include: shortage of irrigation water, unequal plot and water distribution, corrupt management systems, lack of access to farming inputs, and failure of irrigators to sustain collective action for running operation and maintenance activities. Literature review has shown that these problems can be escaped by employing community social capital and locally crafted institutions (Ostrom, 2000; Pretty and Ward, 2001; Agrawal, 2001).

The study findings indicate that the contribution of social capital and locally crafted institutions to community management of irrigation schemes largely depends on existence of conditions that can make social capital and local institutions not merely present but usable. Empirical evidence from the two sites have highlighted that existence of a democratic culture is one such major condition. In other words, areas with adequate social capital and locally crafted institutions and under democratic regime are more likely to register successful CBNRM. Undemocratic practices at Domasi and Njala have produced farmers' resentment, eroded the spirit of collective action and made local social capital unusable. The effect of democracy on the success of CBNRM is also supported by CBNRM projects in USA, Nepal and Kenya. Kellert et al., (2000) found out that CBNRM is more successful in USA than in Nepal and Kenya and concluded that there are more management problems in the latter. Probably one of the reasons that do explain these differences is that democracy is more established in America than it is in Nepal and Kenya.

Like in many other places, the process of IMT at Domasi and Njala was characterised by creation of formal structures based on democratic principles. This was based on the understanding that this will help to institute democratic institutions and culture. The underlying assumption was that formal structures and institutions set up in the irrigation schemes will guide in the management of the scheme. This understanding did not only undermine the contribution of informal institutions, but also removed social capital from management practice. In other words, the understanding was that formal institutions would exist parallel to informal institutions and that each would operate in its own spaces. Again, the assumption was that formal institutions and not social capital would guide the management of the scheme. This was not only a misplaced understanding, but also against the philosophy of CBNRM. In the case of Domasi and Njala, the process of establishing formal institutional framework created potential conflict between the informal institutions under local chiefs and formal institutions under WUA executive. A complex interaction and reciprocal relationships has developed between the two groups which has, being largely based on undemocratic practices, rendered the use of existing local social capital irrelevant and formal institutions ineffective.

Specifically, the major findings of the study are:

- Farmers' access to irrigation plots and water is greatly influenced by local social networks which benefit local chiefs and WUA executive leaders. This has created factionalism within the community and increased perceived corruption[20].

[20] Blaikie (2006: 1954) also reports that new local institutions in the community management of forests in Malawi are prone to corruption.

- WUA executive members' corrupt practices has generated general farmers' dissatisfaction resulting in lack of trust in the WUA executive.
- Collective action amongst farmers is not sustainable as it is mainly based on coerced motivation; and farmers' motivation is eroded by WUA executive corrupt practices. Untrustworthy institutions has generated scepticism and distrust and as farmers realise that respecting the rules is less rewarding, they are less motivated to cooperate.
- There is no observance of democratic principles in running the schemes despite WUA being founded on the principles of democracy. This is mainly so as there are no checks and balances created to protect farmers' interests, and local informal institutions have not been given the opportunity to evolve into democratic ones
- Overall, there is low farmers' motivation to manage the schemes on their own, particularly because farmers are alienated from enjoying full stipulated rights in WUA constitutions.

The major challenge of CBNRM, therefore, lies in instituting democratic management institutions and culture so as to generate trust needed for collective action. (see Lavallee, E., Razafindrakoto, M., and Roubaud, F., (2008). The presence of trust in a society is significant as it increases efficiency, reduces costs, builds community confidence in leadership and makes possible contract negotiation and enforcement (Hamayi, 1997; Chinsinga, 2003). For instance, farmers at Domasi and Njala reported failing to sell their rice in bulk to companies because farmers were afraid that their leaders would cheat them. The findings of this study do confirm fears raised by a number

of scholars about CBNRM (see Blaikie, 2006; Carpenter, 1998), and farmers management of irrigation schemes in particular (Meinzen-Dick et al., 2000; Restrepo et al., 2007). These scholars argue that CBNRM remains very unpopular amongst the target group because local communities have not enjoyed the anticipated benefits.

Despite these challenges, there are a few irrigation farmers especially among the leaders who see community management of irrigation schemes as instilling a sense of resource ownership and helping to speed up decision making. This is however, a local elite view and need to be taken with a lot of caution.

5.2 Implications and Further Areas of Study

CBNRM is still in its infancy, both at a policy and practical level. Present challenges associated with the regime are expected taking into account the effect of long time state intervention into natural resources management. Insights from this study revealed that local elites, who have power and influence, largely operate in line with the principles of state management of natural resources. In other words, there is a small undemocratic state managing resources at the local level. This makes analysis of social sciences theories upholding CBNRM difficult. There is currently need for comparative studies that assesses areas with democratic culture and those without or with less.

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7.0 APPENDICES: DATA COLLECTION INSTRUMENTS

Household Interview Verbal Consent Agreement

Dear respondent,

My name is Sane Pashane Zuka. I am a postgraduate student of the University of Malawi, Chancellor College. I am on an academic study in line with the requirements of my studies. My topic of study focuses on Community Management of Domasi and Njala Smallholder Irrigation Schemes. This is a household interview survey questionnaire designed to assess opportunities and challenges of community management of smallholder irrigation schemes at Domasi and Njala. The study focuses on the extent to which local farmers are able to effectively manage the schemes. The ultimate objective of the study is to find out problems of irrigation management.

The success of this study and recommendations depends on your participation in responding to this questionnaire. I therefore kindheartedly request your participation and cooperation in responding to this questionnaire.

Please be assured that any information you provide will be kept confidential and be used purely for the purpose of the study.

Thank you.

SANE PASHANE ZUKA

HOUSEHOLD QUESTIONNAIRE TO IRRIGATION FARMERS

Part I: Socio-Economic Characteristics of Household

1. Sex: Male = 1 Female = 2
2. Age: 15-24 = 1 20-24 = 2 25-29 = 3
   30-34 = 4 35-39 = 5 40-44 = 6
   45-49 = 7 50+ = 8
3. Religion: Moslem = 1 Catholic = 2 CCAP = 3
   Pentecostals = 4 Other Specify _____
4. Marital status: Married = 1 Widowed = 2 Divorced = 3
   Single = 4 Polygamist = 5 Separated = 6
5. Size of household: 1-3 = 1 4-6 = 2 7-9 = 3
6. Ability to read and write: Can read and write = 1 Cannot read and write = 2
7. Highest education qualification of head of household
   None = 1 PSLC not completed = 2
   PSLC completed = 3 JC not completed = 4
   JC completed = 5 MSCE not completed = 6
   MSCE completed = 7 Diploma / Degree = 8
   Other State _____ = 9
8. Main economic activity of the head of household
   Rain fed farming = 1 Irrigation farming = 2
   Business = 3 Wage employment = 4
   Self employment = 6 Fishing = 7
9. Do you own land of your own (not irrigation land): Yes = 1 No = 2
10. If yes, what is the size of the land you own:
    Less than 0.5 ha = 1 0.5 to 1.0 ha = 2
    1.0 to 1.5 ha = 3 More than 1.5 ha = 4
11. Is your land enough for cultivation: Yes = 1 No = 2
12. What crops do you cultivate on your own land:
    Maize = 1 Rice = 2 Vegetables = 3 Cassava = 4
    Other state_____= 5
13. Do you hold any leadership position in this community: Yes = 1 No = 2
14. If yes, what kind of leadership position do you hold
    Traditional leaders = 1 Political formal = 2 Religious = 3
    Social Cultural leaders = 4 Devt Committees = 5
    Other specify _____

Part II: Farmer's access to irrigation plots

15. How long have you lived in this area
    One year = 1 Two years = 2 More than three years = 3
16. How long have you been practicing irrigation farming
    First time = 1 More than once = 2
    Since the scheme started = 5 Other state _____ = 6
17. How many plots of irrigation land do you usually access per growing period
    1 =1 1 = 2 3 = 3 4 = 4 4+= 5

18. Do you have adequate labour to engage in irrigation and rain-fed farming
    Yes = 1 No = 2
19. How did you access the plots you have now
    Given to me three years ago by the Irrigation Management Committee = 1
    Given to me this year by Irrigation Management Committee = 2
    Inherited from my mother = 3 Inherited from my uncle = 4
    Inherited from my father = 5 Renting from a friend = 6
    Other state _____ = 7
20. Do you feel all local people have equal access to irrigation plots
    Yes = 1 No = 2
21. If your response is no, what do you think is the reason for the inequality?
    Wealth Status = 1 Gender = 2 Political influence = 3
    Relationship to chief = 4 Relationship to IMC members = 5
    Other _____ = 6
22. Are the plots at Domasi scheme equal in terms of soil fertility and closeness to irrigation water resource : Yes = 1 No = 2
23. If no, are you happy with the type of irrigation plot(s) you have been given
    Yes = 1 No = 2
24. If not happy, why are you not happy with the plot you have
    Less fertile = 1 Away from water sources = 2 Gets flooded = 3
    Other _____= 4 Other _____ = 5
25. What crops do you grow under irrigation
    Maize = 1 Rice = 2 Vegetables = 3 Cassava = 4
    Other specify _____ = 5
26. What are the criteria for the number of irrigation plots allocated to a household during redistribution?
    Size of household = 1 Years of irrigation farming = 2
    Alternative means of earning a living available to a household = 3
    Availability of labour in the household to do irrigation farming = 4
    Other specify _____ = 5
27. In your opinion, is land distribution fair?: Yes = 1 No = 2
    I don't know = 3 At times = 4
28. Under whose title is your land registered?
    My self = 1 My spouse = 2
    All the family members = 3 My self and my spouse = 4
    Other specify _____= 5
29. Do you have children who is/are at the age of claiming land under their own?:
    Yes = 1 No = 2

Part III: Irrigation Services and Facilities

1. What are the main problems you meet in irrigation farming
    Shortage of labour = 1 Problem of inputs = 2
    Lack of market for produce = 3 High transport costs for produce = 4
    Lack of credits = 5 Other specify _____= 6
2. Have you ever taken credit for irrigation purpose?: Yes = 1 No = 2
3. If yes, what was the source: Informal sector = 1 Formal sector = 2 Bank = 3

4. If no, why not?
   High interests rates = 1 Didn't meet the collateral criteria = 2
   Have sufficient money = 3 Don't know where to get = 4
   Others, specify _____ = 5
5. Where do you sell your produce
   Local buyers = 1 ADMARC = 2 Zomba town = 3
   Other specify = _____ = 4
6. What problems do you meet in selling your produce
   Low prices = 1 Lack of market for the produce = 2
   High transport cots = 3 Other specify _____ = 4
7. What services are provided by the Irrigation Management Committee?
   Common market = 1 Inputs credits = 2
   Other specify _____= 3
8. In your opinion, is the Irrigation Management Committee helping you with the needed services?: Yes = 1 No = 2

Part IV

Management and Maintenance of irrigation plots

1. Do you have rules governing the irrigation scheme: Yes = 1 No = 2
2. If yes who came up with the rules
   Irrigation Management Committee = 1 All farmers = 2
   The chief = 3 Political leaders = 4
   Government = 5 Other _____ =6
3. If no why don't you have the rules
   I don't know = 1 Not followed = 2
   Not thought about it = 3 Other state_____ = 4
4. If yes , are the rules followed: Yes = 1 No = 2
5. If yes, what makes you follow the rules
   Rules benefit me = 1 We are forced to follow the rules = 2
   Social obligation = 3 It is our way of life = 4
6. If not followed what makes the farmers not to follow the rules
   Every farmers does what is good to him = 1 Rules are not enforced = 2
   Farmers are not united = 3 Other _____ = 5
7. What happens to farmers who do not follow the scheme rules
   Evicted from plots = 1 Disciplined by the committee = 2
   Disciplined by the chief = 3 Disciplined by relatives = 4
   Other state _____ = 6
8. Are there times when the scheme need maintenance: Yes = 1 No = 2
9. What kind of maintenance does it require
   Maintaining water canals = 1 Maintaining plot boundaries = 2
   Other state = _____ = 3 _____ = 4
10. Have you ever participated in maintenance of the irrigation scheme?
    Yes=1 No=2
11. If yes, was it a collective community work or your own plot maintenance
    On my own plot = 1 On the reservoir dam = 2
    On the canals = 3 Other specify _____ = 4

12. What are some of the activities that the community do together
    Development activities = 1 Cultural activities = 2
    Other specify _____ = 3
13. What is/are the main cause/s of structure damage in your scheme? List down in order of importance.
    _____
    _____
14. Is water for irrigation enough during dry season: Yes = 1 No = 2
15. If no, why not?
    There are a lot of plots and water is not enough = 1
    Some farmers are using water without considering other farmers = 2
    Wasteful use of water = 3
    Other state _____ = 4
16. Do you feel you share equal water with every user in the scheme?
    Yes =1 No =2
17. If no, what do you feel is the reason for the inequality?
    Class in society =1 Gender = 2
    Political Power =3 Crop Type =5
    Others/Specify _____ = 6
18. If there is inequality, which groups of people do you feel get more?
    Committee members = 1 Community leaders = 2
    Males = 3 Political leaders = 4
    Wealthy individuals =5 Other specify_____ = 6
19. If there is inequality, which groups of people get less?
    Poor people = 1 Females = 2
    Widows = 3 Other _____ = 4
20. If there is inequality, do you get more or less?: More= 1 Less =2
21. If no, what measures do you take in response?
    Become reluctant to participate in maintenance =1
    Try to over use water in my turn = 2
    Talk to my friends in order to bring about equality =3
    Other / specify _____ =4
22. Does the scheme have rates for watering your fields?: Yes = 1 No = 2
23. If yes, how is the rate for the different crops decided established
    _____
    _____
24. If yes to Q 22, do you always stop watering when the rate is met
    Yes = 1 No = 2
25. If no to Q 22, why don't you stop at the given rate?
    No-one to monitor = 1 Everybody does the same = 2
    In order to maximize returns from the irrigation land = 3
26. Have there been any defaulters of water distribution in the scheme?
    Yes = 1 No = 2
27. Does the community have a system of rule for controlling water distribution default?: Yes = 1 No = 2

28. If yes, what does the rule say?

_____

_____

29. If yes to Q 27, do you believe the rule is enforced in the way formulated?

Yes = 1 No = 2

30. If no, what are the weaknesses? Please, list down in order of importance

_____

_____

31. Do you pay any water use fees in this scheme? Yes = 1 No = 2

32. If yes, what is the fee used for?

Maintenance =1 Sent to govt =2

Both = 3 Don't know = 4

Other /specify _____ = 5

33. Have you ever had a conflict related to irrigation farming with anybody or with committee?: Yes =1 No = 2

34. If yes to Q 33 , how often do you experience conflicts

Most often = 1 Often = 2 Not very often = 3 Rarely = 4

35. If yes to Q 33, please mention all cases and their causes you remember.

Case	Cause
1. _____	1. _____
2. _____	2. _____

36. What do you think is/are the main cause/s of conflict in your scheme?

Land redistribution = 2 Water allocation = 2 Water distribution = 3

Water fee non payment = 4 Storage sharing = 5

Others/Specify _____=6

37. Who usually mediate/ judges conflict among the farmers

Irrigation management committee = 1 Chief = 2

Local political leaders = 3 Relatives = 4

All of the above = 5 Other specify = 6

38. In your opinion, are the mediators fair in solving the conflicts

Yes = 1 No = 2 I don't know = 3 At times = 4

39. Do you think there is favoritism in judging cases

Yes = 1 No = 2 I don't know = 3 At times = 4

40. If yes to Q 39 above, who do you think are usually favoured

Politicians = 1 Chief/ village relatives = 2

Relatives to the IMC = 3 Wealthy individuals = 4

Men = 5 Women = 6

Other specify_____ = 7

41. In your opinion, is community managed irrigation scheme better than government managed?: Yes = 1 No = 2 I don't know = 3 At times = 4

42. Would you say you have trust in WUA leadership

Yes = 1 No = 2 I don't know = 3 At times = 4

43. If yes to Q 41 above, why do you say community managed irrigation scheme is better than government controlled (Give at least three reasons)

_____

_____

44. If no to Q 42 above, why do you prefer government managed irrigation scheme than community managed (Give at least three reasons)

_____

_____

45. What is your judgement concerning the status of the irrigation scheme since the community took over from the government?

Production has declined = 1	Cooperation has declined = 2
Cooperation has increased = 3	Production has increased = 4
No impact = 5	Bought more problems = 6

FOCUS GROUP DISCUSSIONS GUIDE

1. Farmers access to irrigation plots

- Do we know who is responsible for allocating plots to households
- What do think are the criteria used for allocating plots to households
- Are these criteria followed
- Do you think that everyone in this community has equal access to irrigation plots and water resource? Is this also true for the poorest members of the community?
- If no, who do you think are the people that have more access to irrigation plots

Problems the scheme is facing

What do you think are the main problems Domasi scheme is facing? Explain the cause and a way to solve the problem

2. Collective action, solidarity, conflict resolution, and sustainability of efforts

People from the same village/neighbourhood often get together to address a particular issue that the community faces, to fix a problem or to improve the quality of life.

- Are there times when your community come to together to discuss issues relating to irrigation farming?
- What is the general turn up of the people to such meetings
- What are the main issues discussed during such meetings if any

If there is less collective action,

- Why do you think the farmers are not able to work together?
- In your opinion, would you say the problem is with our local leaders or with the general public?
- Do you think the community is united to work together in irrigation issues and have trust in the leadership?
- Does the community has rules for managing the scheme?
- If yes, are the rules fair?
- Are the rules followed? If not, why?

In irrigation farming, plots are close together and farmers share water

- Are there established rates for watering our crops?
- Are these rates followed and if not why are they not followed?
- From your experience is there cooperation between farmers in sharing water for irrigation?
- Do you think there is consideration to access to water resource in allocating plots and if there is that consideration, is equality to water resource followed?

3. Community leadership and decision-making

Every community has leaders who guides and makes decision on behalf of the people

- Which group of people are usually chosen as WUA leaders
- Do you have trust in the leaders
- Are rules made by these leaders followed, if not why are they not followed

KEY INFORMANTS INTERVIEW GUIDE

1. What criteria is followed to locate irrigation plots to households
2. Are there any special consideration to a particular group of people such as female headed households in plot allocation
3. In your opinion, would you say plot allocation to farmers is fair at Domasi irrigation scheme
4. Have you ever heard of conflicts relating to access to irrigation plots
5. Community management of irrigation scheme demands that the community work together to do certain work. From your experience, can you say that there is community cooperation in running the scheme?
6. Are meetings conducted frequently to discuss issues pertaining to the scheme, and how would you describe the turn up of the farmers to such meetings.
7. In any organization there are challenges and this may be true with your Domasi and Njala Irrigation Schemes. What do you feel are the main challenges facing Domasi and Njala Irrigation schemes?
8. In your opinion, can you say that the community is running the scheme well? Do you have trust in the people chosen to run the scheme? Do you think the WUA executive is effective in dealing with the challenges?

Interview Guide for Water User Association Executive Committee

1. Membership in WUA, (Gender issues), tenure of office, and mandate of WUAs.
2. Management of the scheme, including knowledge of constitutions, who formulated the constitutions and problems the schemes is facing.
3. Issues of indiscipline cases: what type, who settles
4. Working relationship with local chiefs, including role of local chiefs in the management of the schemes, conflicts with the chiefs.
5. Plot allocation and water distribution, including issues of criteria for allocation, equality to access, problems faced in allocation, incidences of farmers conflicts
6. Finances: sources, security of association funds, accountability and transparency
7. Leadership capability and skills: training of WUA leadership, farmers' trust in leadership.
8. Collective action: Level of collective action among farmers; situations and conditions under which farmers refuse to work together; solutions taken.