

WHAT POLICY SAYS AND PRACTICE DOES

Gender, Household and Community in
Rural Water Provision in Tanzania

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Thesis

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List of Abbreviations

CWSM	Community Water Service Mapping
DC	District Council
DPs	Distribution Points
DWD	District Water Department
DWE	District Water Engineer
FAO	Food and Agriculture Organisation of the United Nations
FGD	Focus Group Discussion
IGAs	Income Generating Activities
LGAs	Local Government Authorities
MoW	Ministry of Water
NAWAPO	National Water Policy
NWSDS	National Water Sector Development Strategy
O&M	Operation and Maintenance
PO	Private operator
RWSSP	Rural Water Supply and Sanitation Project
URT	United Republic of Tanzania
VEO	Village Executive Officer
VWC	Village Water Committee
WPM	Water Point Mapping
WSEGs	Women's Social and Economic Groups

Chapter 1

General Introduction

This chapter presents a general overview of the study. It begins with presenting background information on the topic of rural domestic water supply in developing countries and more specifically in Tanzania. Against this background, I discuss my motivation for embarking on this study. Subsequently, the research problem and the research questions are presented. This is followed by a discussion of the key concepts and the theoretical framework. The chapter ends with an outline of the thesis.

1.1 Rural domestic water supply: challenges and policies

Domestic water is among the most important services for the health and productivity of rural populations. However, rural areas in developing countries face persisting challenges in the accessibility, sustainability, appropriateness and reliability of domestic water services (Regmi and Fawcett, 1999; Carter *et al.*, 1999; Harvey and Reed, 2004, 2007; Bakalian and Wakeman, 2009; Montgomery *et al.*, 2009; Moriarty *et al.*, 2013). This compromises their livelihoods and well-being, and ultimately affects their development.

In Tanzania, since Independence in 1961 there have been efforts by the government, donors and non-governmental organisations (NGOs) to improve domestic water services in the rural areas. In 1971, 'water for all by 1991' was a top priority on the development agenda (Boesen, 1986; Therkildsen, 1988; Maganga *et al.*, 2002). From 1971 to 1991 domestic water services were free of charge provided by the central government (Therkildsen, 1988; Cleaver and Toner, 2006; Jiménez and Pérez-Foguet, 2010a, 2010b). Nevertheless, the free-water-for-all approach did not meet the intended target of providing every rural dweller with adequate potable water within easy reach by 1991 (Maganga *et al.*, 2002). Thereafter, the governance approaches in the rural water sector changed to align them with international and national political and economic reforms, which escalated from 1970s onwards (Budds and McGranahan, 2003; Furlong, 2010). The increasingly influential neo-liberal approach of the international lending agencies placed major emphasis on 'water as an economic good' instead of 'water as a social good', which entailed a shift from state-based to market-based service delivery. At the same time, in the framework of national policy reforms and changing preferences for governance models in the international discourse there was a devolution from centralised to more decentralised water management (Harvey and Reed, 2004; Harris, 2009; Joshi and Zwarteveen, 2012). Decentralised rural water services in Tanzania imply that users are responsible to contribute to the capital investment, manage the water schemes, and ensure full cost-recovery for the Operation and Maintenance (henceforth O&M) of their water scheme. Following the global and local reforms, in July 2002 Tanzania announced the new water policy (URT, 2008a). In the new policy the central government was no longer the sole provider of the rural water services (URT, 2002; Jiménez and Pérez-Foguet, 2010a, 2010b). With the 'hands off, eyes on' approach the role of the central government now focused on policy and guideline formulation, coordination, monitoring, regulating and liaising with the donors of rural water supply programs and projects. The responsibility for delivering domestic water services in the rural areas shifted to the Local Government Authorities (henceforth LGAs) through national and regional programs and projects.

Over the past four decades, Tanzania has invested a lot of resources to ensure improved and sustainable water supply for rural people. The most recent initiative is the Rural Water Supply and Sanitation Program, which started in 2002/03 as pilot phase called Rural Water Supply and Sanitation Project (henceforth RWSSP-I¹) (Giné and Pérez-Foguet, 2008; De Palencia and Pérez-Foguet, 2011). The main objective of RWSSP-I was to ensure access to improved and sustained water and sanitation services in rural communities (URT, 2006). The project resulted from the public services and sectoral reforms that have been implemented in Tanzania since the early 1990s (URT, 2011a). These reforms aim at enabling the LGAs to respond effectively to local priorities and to increase sustainability of service delivery, rural water provision being one of these services (Mwambe and Braathen, 2007). During the pilot phase in 2002-2003 of RWSSP-I the project was implemented in the three districts of Kilosa, Mpwapwa and Rufiji, after which the project was expanded to eleven districts: Handeni/Kilindi, Igunga, Iramba, Kiteto, Kondoa, Kongwa, Manyoni, Morogoro Rural/Mvomero and Singida Rural. It was expected that through reliable rural water supplies and by reducing water-fetching distances, people would gain time for productive activities (URT, 2008b). Based on the decentralisation principle, RWSSP-I emphasized: (a) a demand-responsive approach whereby communities choose service levels and appropriate technologies according to their needs and ability to pay; (b) upfront contribution of capital costs and full financing of O&M costs by communities, and (c) implementation and management by communities with assistance of local governments, NGOs and the private sector (URT, 2008a, 2008b).

Despite the major initiatives and investments in the sector only about 57 percent of the rural population has access to potable water services and over 40 percent of all rural water supply schemes are not functioning properly (URT, 2009; Giné and Pérez-Foguet, 2008; Taylor, 2009a). Additionally, many rural water schemes experience persisting non-functionality due to hardware problems, sources being dry, and poor management (Taylor, 2009a; Jiménez and Pérez-Foguet, 2011a). However, empirical studies that document whether and how the implementation of rural water projects at the village level has been adapted to the local context, in terms of location, time, gender integration and other socio-economic and demographic diversities, are still scant (Cleaver *et al.*, 2005; Harvey and Reed, 2007; Giné and Pérez-Foguet, 2008; Taylor, 2009a; Brown 2010). Besides, dilemmas that impede the development of the rural water sector in Tanzania have not yet been fully resolved and the lack of sustainability is still a major challenge in the sector (Therkildsen, 1988; Giné and Pérez-Foguet, 2008; Taylor, 2009b). This study fills these gaps and addresses these problems by examining the policy-

¹ In Rural Water Supply and Sanitation Project “I” was added to distinguish it from the ongoing second phase program (2010-2015).

practices nexus as manifested in the contexts of households and communities. The latter are the primary contexts and gendered arenas that have a principal role in organising the access to water, provision and uses, and the implementation of village management structures to ensure the sustainability of the water facilities.

1.2 Motivation for the study

My motivation to do this study stems from my confrontation with the problematic water services in most parts of the rural localities in the Dodoma region. Being an academic staff member at the Institute of Rural Development Planning (IRDP) - Dodoma in Tanzania, at various occasions I participated in fieldwork in the rural districts of Dodoma. Because I was involved in organising field practicals for students, in order to select field stations I had to collect district-level data on the overall situation regarding proximity to and availability of social services such as in the domains of health and domestic water. Availability and reliability of public domestic water proved to be the challenging factors in the selection of field sites. Given the fact that people were living in those villages, I realised that there were lessons to be learnt on how they were organising and managing domestic water services at the household and community levels. The region's location in a semi-arid area makes the situation even more problematic during the dry season. The persistent problems with water service in the villages I visited, while being aware of the importance of domestic water for households and for practitioners and actors in rural development, became a pertinent research gap to me. This corresponded well with the IRDP focus on research and training in rural development planning and management. Thus, when I was selected by the IRDP management to do a PhD through the Netherlands Initiative for Capacity Development in Higher Education (NICHE/TZA/002) project, I took the opportunity to pursue my research idea. The result is this thesis.

1.3 Research problem and questions

Most studies on the governance and sustainability of the rural water supply in African countries, including Tanzania, overlook the micro level and tend to focus on macro to meso levels in terms of projects or programs and institutions and local communities as key stakeholder in management (Carter *et al.*, 1999; Harvey and Reed, 2004, 2007; Giné and Pérez-Foguet, 2008; Montgomery *et al.*, 2009; Bakalian and Wakeman, 2009). Furthermore, the subject of sustainability is hardly linked with the qualities of appropriateness and accessibility (Therkildsen, 1988; OBI, 2007; Giné and Pérez-Foguet, 2008; Taylor, 2009a, 2009b). The focus on macro and meso levels is rooted in the community-based management approach which is common in sub-Saharan Africa where the majority of water systems are owned, operated and managed by communities rather than by individuals or households

(Harvey and Reed, 2004). However, these systems serve users at the household level, which underscores the need to look at the interconnectedness between household and community. The provision, use and management of domestic water involve the household as well as the community. Moreover, both are gendered arenas that influence the roles of men and women actors in private and public domains. Therefore, this study intends to address household-community interfaces in rural domestic water provision and uses a gender perspective.

This study examines the policy-practices nexus by investigating how households and communities together organise the provision, use and management of domestic water services. The overall question addressed in this study is: *How do gender, household and community influence the appropriateness, accessibility and sustainability of domestic water service-schemes in rural Tanzania and are women's gender needs taken into account in domestic water services?* To answer this question the following research questions were formulated:

1. To what extent and how are gender roles and needs integrated in rural domestic water schemes and to what extent do these schemes address women's gender needs and reaffirm or change the social construction of gender?
2. What is the actual situation of the criteria of appropriateness and accessibility to the village domestic water service?
3. How do gender roles and responsibilities in the provision, use and management of the domestic water service and the criteria of appropriateness and accessibility to the water service influence sustainability of the public water facilities in rural areas?

1.4 Definitions and discussion of key concepts

In this section the key concepts used in this study are defined and clarified. The key concepts include gender, household and community (management) and are discussed in connection with the attributes of accessibility, appropriateness and sustainability that are crucial in rural water services.

1.4.1 Gender

Gender is conceptualised and applied differently by different scholars and disciplines. Sometimes the term is used interchangeably with 'sex' or 'women', thus it is important to explain the meaning of gender in my study. Gender refers to socially defined roles and characteristics of men and women acquired through socialization, on the basis of which masculine and feminine attributes and identities are distinguished and socially and culturally appropriate relations between men and women in private and public domains are determined (Meena,

1992; Parpart *et al.*, 2000; Vlassoff and Moreno, 2002). “Gender is historically contingent and constructed, simultaneously embedded in material relations, social institutions and cultural meanings” (Lamphere *et al.*, 1997: 4). This implies that, the meaning of and what constitutes gender changes over time and varies across regions and within and between societies and cultures.

In policies and in the academic literature on rural water supply, gender integration is presented as a policy principle for enhancing both men’s and women’s involvement in the decision-making processes and management of water schemes. It is among the major institutional reforms in the rural water sector aiming at reinforcing community participation (Van Wijk-Sijbesma, 1985, 1998). The essence of gender integration is the underlying conceptual rationale that men and women have different gender roles and needs at the household and community levels (Moser, 1989). This means that men and women experience the (un)availability and (in)accessibility of water differently (Van Wijk *et al.*, 1996; Van Wijk-Sijbesma, 1998; Khosla *et al.*, 2004; Sever, 2005). Tanzania’s current water policy promotes gender participation and recognises women as principal actors in the provision of rural water supply services (URT, 2002: 32). Unravelling how gender integration is empirically realised and its implications for men’s and women’s roles and needs regarding domestic water services at the household and community levels requires gender analysis, which I discuss in detail in Section 1.5.2. Gender as applied in this study consist of socially constructed practices that are revealed in the division of labour, roles, responsibilities and resources between men and women in the household and in the community, which I see as gendered arenas where the attitudes, perceptions, and behavioural patterns related to men’s and women’s roles and responsibilities can be observed (cf. Agarwal, 1994; 1997; Parpart *et al.*, 2000; Rao and Kelleher, 2005).

1.4.2 Household

The household produces and organises cash, labour and time as the main resources that facilitate provision of domestic water services. Within households resources are generated, organised, managed, and used for economic activities as well as for the welfare and well-being (care) of their members (FAO, 2004; Niehof, 2004a, 2004b, 2011). The latter description implies that households have agency, which is subject to change as the household members experience changes. According to Niehof (2004b: 246), the household is not a static unit and has permeable boundaries as its members have social networks that extend beyond the own household. Households interface with other institutions in the society and beyond their immediate settings. Niehof further describes that social norms and cultural values are given concrete form within the household. Additionally, households respond to political, social and economic changes (Pennartz and Niehof, 1999).

These views are most relevant for my research in which intra-household arrangements on the provision and uses of domestic water are seen as extending beyond the household and regulating the involvement of male and female household members in the public decision-making spaces. In the same vein, several scholars have emphasized that the household is not an isolated unit but is embedded in the wider societal institutions through which intra- and extra-household bargaining are interrelated (Kabeer, 1994; Agarwal, 1997; Spaargaren, 2000). Household analysis is one of the means to gain further understanding of the gendered roles in the provision, use and management of domestic water (cf. Cleaver and Elson, 1995). The household is the logical starting point because it is the arena in which male and female members are involved in the production and consumption of collective services, including domestic water (Kabeer, 1994). For these reasons, the household is the primary unit of analysis for this study, as discussed in detail in Chapter 2.

1.4.3 Accessibility, sustainability and appropriateness

Accessibility to, appropriateness and sustainability of rural water supply are crucial for the efficacy of domestic water services delivery. In this study, *accessibility* covers affordability (price per unit), availability (time and seasonality) and proximity (distance to the water facility), and is seen as linked to women's practical gender needs in their responsibility for household water needs and other reproductive as well as productive roles (Moser, 1993; Regmi and Fawcett, 1999).

Appropriateness, which is mostly determined by users, is another vital condition for the efficacy of rural water schemes (Regmi and Fawcett, 1999; Bhandari and Grant, 2009). In my study, appropriateness covers suitability in terms of the quality and sensory attributes of the water as well as the technical and managerial attributes of the water sources in a specific local environment (cf. Elmendorf and Isely, 1983; Van Wijk-Sijbesma, 1998). Additionally, appropriateness implies assessing the compatibility of the water services and quality with the gendered social and cultural context and the livelihood activities of rural households (Regmi and Fawcett, 1999; Wajcman, 2000; FAO, 2004; Groot-Marcus *et al.*, 2006; Bhandari and Grant, 2009; Amin, 2010; Joshi *et al.*, 2011). Women's responsibility for their household's domestic water makes them more knowledgeable about and sensitive to water quality attributes and bad facilities. The Chapters 4 and 6 deal with the subject of the appropriateness of the domestic water services from the users' point of view.

In this study, *sustainability* refers to functionality of the facilities, i.e. their ability to yield water regularly and the continuity of the services after installation. This research links sustainability to the roles of users as actors at the household level and to the village structures for management and O&M of the water scheme.

Besides, women's involvement and voice in local decision making and management form part of their strategic gender needs (Moser, 1993; Regmi and Fawcett, 1999; Bhandari and Grant, 2009). Not meeting these needs undermines the sustainability of water schemes (Cleaver, 1998a, 1998b; Hemson, 2002; Singh, 2008; Gleitsmann *et al.*, 2007). Despite men's and women's shared interest in reliable water services and women's practical gender needs regarding domestic water supply, in most of rural Africa women are hardly involved in local water decision-making and management (Hemson, 2002; Chipeta, 2009). The concepts of strategic and practical gender needs and their application are explained in Section 1.5.2 of this Chapter and in Chapters 4 and 5. Local financing of O&M is another requirement to achieve sustainable rural water services (Hemson, 2002; Harvey, 2007; Jiménez and Pérez-Foguet 2010a). Hence, the financial component is an aspect of sustainability as well.

1.5 Theoretical framework

The theoretical basis for this research is grounded on a sociological approach to investigating the policy-practises nexus of the public-domestic water services in rural settings. In this section, I shall outline the theoretical framework of the study. According to Parpart *et al.*, (2000), a theoretical framework is a system of ideas or conceptual structures that help a researcher to 'see' the social world, understand it and explain it. This implies that the theoretical framework plays a vital role for providing lens and direction in examining research questions as well as for placing the research findings in a wider scientific context (Parpart *et al.*, 2000; Creswell, 2003; O'Leary, 2004). As described in Section 1.1, the decentralised rural water provision in Tanzania involves multiple actors and levels from the national level to the household. Therefore the orientation of this study entails a theoretical approach that recognises the interplay between multiple levels and actors, and can place these actors in their appropriate context in which they organise provision, use and management of the domestic water services. Based on this point of departure, I decided to link ecological modernisation theory in studying domestic consumption (Spaargaren, 2000), gender analysis (Moser, 1989, 1993; Kabeer, 1994), and the community management model of rural water supply (Harvey and Reed, 2004). Combining these theoretical perspectives with the key concepts discussed in this chapter, achieves the following. First, it provides a framework for systematically unpacking the practices and processes relating to rural domestic water services and the implications of gender integration and community management as key components that underpin our research questions and the demand-responsive approach. Second, it creates room for analysis at multiple levels, including the household, water facilities and institutions in the user community. Both are important for several reasons. Gender and community involvement cut across the

key focus and sustainability principles of the Tanzania's water policy. Besides, the demand-responsive approach relies on users' participation in establishing, owning, managing and ensuring full cost-recovery for the O&M of their water schemes (URT, 2002; Jiménez and Pérez-Foguet 2010a).

1.5.1 The theory of ecological modernisation and domestic consumption

The theory of ecological modernisation focuses on the sociological analysis of the long-term transformation of Western society as the object of study (Spaargaren and Van Vliet, 2000). In their model for studying ecological modernisation of domestic consumption Spaargaren and Van Vliet (2000) take the actors in the household context as a starting point to analyse the organisation of domestic practices and activities around production and consumption of good and services. The authors link the households (as actors) and their daily activities to the institutions that are involved in the development of the goods and services by assessing how these goods and services fit the actors' lifestyle and their internal domestic organisation. Spaargaren and Van Vliet (2000) argue that the assessment of the extent to which goods and services fit in the household context should proceed by distinguishing four slots, namely the modes of use, access, provision and production. These slots present a model for the parameters that will determine whether households will engage in innovative consumer practices. The model of Spaargaren and Van Vliet is relevant for this study because it combines an actor-oriented approach in studying service users as actors and places them in the household, community and institutional contexts. However, it is silent on the gender dimension. Scholars of household and gender studies have pointed at the centrality and inseparability of gender and the domestic production of the services within the household and even at the community (cf. Kabeer, 1994; Niehof, 2004b, 2011). Implicit in the model is the distinction between the public contexts of institutions and communities and the private context of the household. Also in this regard gender is an important aspect, since "women have often been associated with the private sphere; men with the public one" (Parpart *et al.*, 2000: 208). The major strength of the theory of ecological modernisation is putting at the centre of attention the institutions that are most important in bringing about the shift to more sustainable production and consumption cycles (Spaargaren and Van Vliet, 2000). In my research production and consumption are linked to the division of labour in the provision, use and management of the domestic water within and beyond the household, because what happens in the household is shaped by the community and vice versa.

Ecological modernisation theory connects users' practices and intra-household organisation to that of the wider community consisting of the institutions that develop and technically control systems of public service provision, thus analysing domestic consumption in a macro-micro framework (Spaargaren, 2000). According

to Long (2001: 24), an actor-oriented approach centres on placing individuals in the “specific arenas in which they manage their everyday affairs”, analysing the processes that are relevant to these arenas, and examining the links between the local actors and that of the larger-scale actors. This description is applicable to how I see the users of domestic water services: as social actors and active participants in the interventions pertaining to the provision of rural water services. They should not be perceived as passive recipients. “Arenas are spaces in which contests over issues, claims, resources, values, meanings and representations take place” (Long, 2001: 242). In this study, the arenas include the household and the community, in the light of their gendered attributes (Agarwal, 1994, 1997). Literature in the field of the sociology of consumption and households refers to the household as ‘the arena of everyday life’ (Niehof and Price, 2001; 19; Butijn *et al.*, 2013).

1.5.2 Gender analysis

Gender is an analytical variable and a very important cross-cutting theme in examining the domestic water provision at village level. In rural areas of Tanzania, the household provision of domestic water is a gendered issue, as is its management at the community level. As explained above, the national water policy acknowledges the importance of integrating men as well as women in the management of public water services. Particularly because of women’s reproductive roles as mothers, food providers and caregivers, reliable access to sufficient and safe domestic water forms part of women’s practical gender needs (Moser, 1989, 1993; Amin, 2010). To ensure this access, women need to have a voice and influence in the public decision-making spaces in which domestic water systems are shaped and their implementation decided upon. To have such voice and influence is part of women’s strategic gender needs. Moser defined practical gender needs as “the needs that arise from the concrete conditions women experience and are a response to immediate necessities that women identify within a specific context.” Strategic gender needs are defined as “the needs that originate from women’s ideological subordination to men”, which vary depending on the particular cultural and socio-political context within which they are formulated (Moser, 1989: 1803). To investigate whether women’s practical and strategic gender needs are met in the context of rural domestic water supply it is necessary to do gender analysis. Gender analysis aims at understanding and documenting the differences in gender roles, activities, needs, and opportunities in a given context (World Bank, undated).

I employed gender analysis to understand gender roles and needs regarding domestic water services among men and women within and beyond the household. At the household level, I concentrated on gender and the division of labour pertaining to the provision and use of domestic water that is domestic

production of the water service. At community level, I looked at the underlying factors governing men's and women's involvement in the community management of and decision making on the public water service. In this way, the linkages between practical and strategic gender needs in terms of gender norms and values and those between the formal sphere of policies and institutions and the informal sphere of actual practices can become visible. Apart from the gender roles framework of Kabeer (1994) and Moser's (1989, 1993) concepts of women's practical and strategic gender needs, I adopted Rao and Kelleher's 'what are we trying to change' model (2005: 59-61) in order to assess the influence of informal structures on women's involvement in the public decision-making spaces and management of the domestic water services. Kabeer's framework constitutes a matrix of questions that focuses attention on gender divisions in the production of goods, services and human resources as well as in access to and control over resources and benefits (Kabeer, 1994: 271). The Rao and Kelleher (2005) model places efforts to change gender inequality in the context of social systems and institutions, both at personal and societal levels and in formal and informal relations, and is, therefore, suitable for assessing the interactions between formal and informal structures.

In the management of the rural water much attention is paid to having women members in the Village Water Committee (henceforth VWC), but women's membership does not guarantee that they will contribute to and have influence on decision-making. Whether women in public water management can exercise their agency also depends on the gender structures in formal policies, legal frameworks, and in socio-cultural norms and traditions (Rao and Kelleher, 2005). Women's involvement in the governance of public water schemes challenges socio-cultural norms and structures that frame management as a public, male domain and domestic water use as a private, female domain (Hemson, 2002; House, 2003; Cleaver *et al.*, 2005). In this thesis gender is more specifically addressed in the Chapters 4 and 5.

1.5.3 Community management model

The community management model, also known as 'Village Level Operation and Maintenance' (VLOM), is by far the most common partnership approach adopted in sub-Saharan Africa (Harvey and Reed, 2004). This also applies to Tanzania. The essence of the model stems from the decentralisation of the rural water sector, which is about "the transfer of authority and responsibility for public functions from the central government to subordinate [...] government organizations or the private sector" (Litvack and Seddon, 1999: 2). Community-led or participatory management of local water supply appeals to both the proponents and opponents of neo-liberal approaches in social services delivery (Furlong, 2010). Recent studies

criticise the panacea design of the community management approach and linked it to questionable sustainability of the rural water supply (Moriarty *et al.*, 2013; Smits *et al.*, 2013). According to Harvey and Reed (2004), the model implies different roles of multiple actors from the national down to the community level. Surprisingly, the village and household are not shown in the model, although the authors mention them in other parts of the book, especially in clarifying the meaning of community for the village and ownership of the water supplies for the household. The omission of the village and household in the model is of particular interest because the two are primary-micro units that represent the local managing structures and users. In Chapter 7 of this thesis there is a detailed discussion on the actors from different levels and their roles as stipulated in the 2002 national water policy and their actual roles. It also has to be noted that community management and community participation do not mean the same thing (cf. Harvey and Reed, 2007). As clarified by Harvey and Reed (2007), community management primarily results from community participation in selecting the management system the user community wants to adopt for managing their water scheme.

1.5.4 Users' perspective

The users' perspective concept is a variant of the actor perspective, because it is built on the assumption that people shape and re-shape their own situation and interact actively with their environment, using their skills, knowledge and experience (Niehof and Price, 2001). In a review of different disciplinary applications of the concept of users' perspective the author notes that in the studies reviewed the common point of emphasis was "to start with the user of products and services in the context of actual uses and to end with that user" (Hardon-Baars 1997: 24). Therefore, the concept of the users' perspective goes further than the focus of most participatory approaches on *who* participates in *what* and *how*. In this research, the concept of users' perspective has a pivotal role in examining the policy-practices nexus, because of its potential for the analysis of how the rural water programmes are designed, implemented and continued to operate in line with the users' perspectives. This also allows for addressing the changes in the users' perspectives due to individual or collective factors (like demographic change). This is important because the features and preferences of the users in relation to the organisation of rural water projects are mostly assessed only once, namely at the start of the project. Chapter 6 describes the various perspectives of the users involved, how these are articulated by the users and addressed by the providers before and after the implementation of the water schemes in the villages. Again gender plays a crucial role in the users' perspectives on domestic water because of the gendered nature of provision and use of domestic water.

1.5.5 Conceptual model

Figure 1.1 summarises the theoretical framework of the study. The household and community levels affect *appropriateness*, *accessibility* and *sustainability* because these are the contexts in which users organise provision, use and management of their household water services. In addition, the two arenas shape *who* is involved and *how* in the village management structures and decision making. Apart from that, appropriateness, accessibility and sustainability of the domestic water services are affected by socio-economic, cultural, institutional and policy variables. The policy context covers the national and the international frameworks as reflected in the country's national water policy and development strategy.

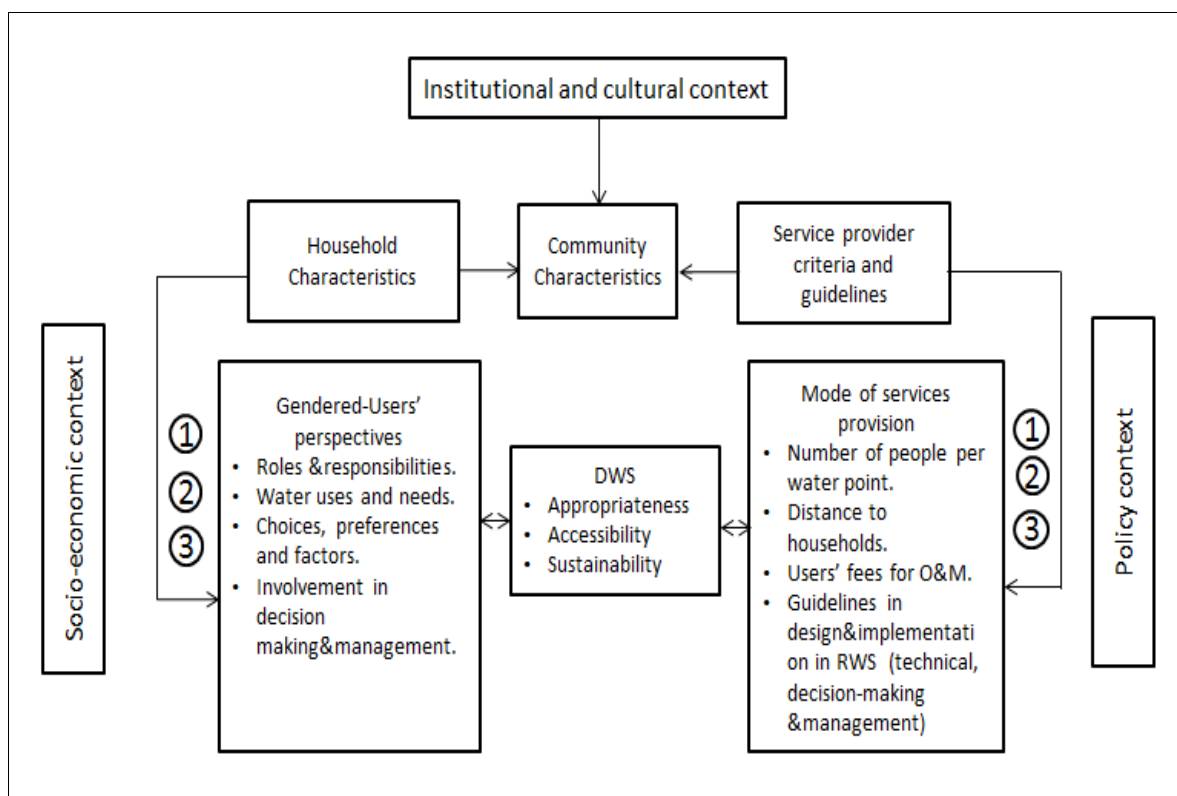


Figure 1.1 Conceptual model of the study

Note: the numbers in Figure 1.1 refer to the research questions (see page 5), DWS means Domestic Water Services, O&M stands for Operation and Maintenance, and RWS corresponds to Rural Water Services.

1.6 Outline of the thesis

The book consists of eight chapters, including this introductory chapter. Chapter 2 presents a profile of the study area, the justification for its selection, the methodological approaches used in the research and the study design. The chapter closes with how I addressed ethical issues. There is a specific methodology section in

each of the empirical chapter (Chapters 3-7) because these chapters are either published or in the process of being published in international peer-reviewed journals.

Chapter 3 discusses the potential of community water service mapping in assessing domestic water services at the village level. The chapter shows how the research combined the tool of participatory sketch mapping with the FGD and a transect walk to visualise the existing situation of the domestic water provision at the village level.

Chapter 4 provides details on the interfaces between gender roles in water provision and use at household and community level and their relationship with women's practical and strategic gender needs. Through the lens of the combined gender analysis framework, the chapter examines the nexus between the household and the community as gendered arenas to understand domestic water provision and uses.

Chapter 5 examines how the village-level interplay of formal and informal structures shapes women's participation in the local decision-making spaces for water services management. The chapter discusses the obstacles facing the women and how women leaders pursue their leadership roles in the governance and management of the domestic water services.

Chapter 6 describes how the users' perspectives are articulated by the users and addressed by the providers in the overall organisation of the domestic water services before and after implementation of the water schemes in the villages.

Chapter 7 addresses the question of whether community management at the district and village levels in water services delivery affects the sustainability of rural water facilities at village level, in terms of their technical and managerial aspects. Additionally the chapter discusses the role capacity building of users and providers plays in the current community management arrangements in relation to the sustainability of rural water facilities.

In the final chapter, Chapter 8, the research questions are revisited and the main conclusions are presented and synthesized. The chapter concludes with a discussion on policy implications and outlines areas for further research.

Chapter 2

Research Area and Study Design

This chapter provides a description of the study area and methodological approaches used in this research. The chapter starts with the description of the study area, presenting the relevant features of the country, the districts and the villages studied. In the second part of the chapter, the study design adopted in this study is discussed. This is followed by an account of the fieldwork process and the implementation of the research phases. The data collection methods are described in order to enable assessing the validity and reliability of the data I have collected. The chapter ends with ethical considerations.

2.1 Tanzania: the study area and rural water supply

The United Republic of Tanzania is located in Eastern Africa between the longitudes 29° and 41° east and the latitudes 1° and 12° south (URT, 2013a). The country covers a total area of 945,000 square kilometres, of which about 6.4 percent is inland water (URT, 2011b). Tanzania borders Kenya and Uganda in the north; Rwanda and Burundi in the west, the Democratic Republic of Congo, Zambia and Malawi in the west, Mozambique in the south and the Indian Ocean to the east. According to the 2012 national census, the current population of Tanzania is about 44.9 million with an annual growth rate of 2.7 percent (URT, 2013b). The country has 30 regions, of which the regions of Njombe, Katavi, Simiyu and Geita are newly established. Twenty-five regions are in the mainland and five in Zanzibar. Dodoma is the official capital city and seat of the National Assembly. Dar Es Salaam is the major commercial city that hosts numerous government ministries, diplomatic missions and major national and international agencies as well as institutions.

This study was conducted in the rural districts of Kondoa and Mpwapwa in Dodoma region that is part of Central Tanzania (see Figure 2.1). The other districts in the region are Kongwa, Bahi, Chamwino and Dodoma urban. The region borders on Arusha region to the north, Morogoro to the east, Singida to the west and Iringa to the south. In 2012, Dodoma had a population of 2.08 million, an annual growth rate of 2.1 percent and an average household size of 4.6 (URT, 2013b). Much of the region is flat terrain rising gradually from some 830 metres in the Bahi swamps to 2000 metres above sea level in the highlands north of Kondoa (URT, 2007). Generally, Dodoma region has savannah climatic characteristics with long dry seasons, from late April to early December. Having semi-arid climatic condition, Dodoma region relies mostly on the ground water sources (Kaliba *et al.*, 2003). Rainfall varies based on the agro-ecological zone of the area, with an average of 300mm as minimum to 1200mm as maximum. The rainfall is low and unpredictable in terms of frequency and amount, particularly in January (URT, 2007). Temperatures range from 18°C to 31°C.

Major economic activities include small-scale farming and animal husbandry, often in combination. The main food crops grown in the region are sorghum, maize, millet, cassava and sweet potato, while cash crops include sunflower, sesame, groundnuts, pigeon peas and grapes. Paddy is grown in some wetland areas such as Bahi. Vegetables and fruits are grown in a few areas, such as Mlali in Kongwa, nearby Matomondo river and close to Gulwe in Mpwapwa. Livestock is the second major contributor to the region's economy. Cattle, goat, sheep and local chicken are sold even beyond the region's boundaries. In addition, beekeeping, fishing and mining are a source of livelihood to some households, but at a much smaller scale than farming and livestock keeping.

The districts of Kondoa and Mpwapwa are among the first rural districts to implement the RWSSP-I. The pilot project was implemented in the districts of Kilosa, Mpwapwa and Rufiji between 2002 and 2003. In 2003, the implementation of RWSSP-I was extended to 14 districts².

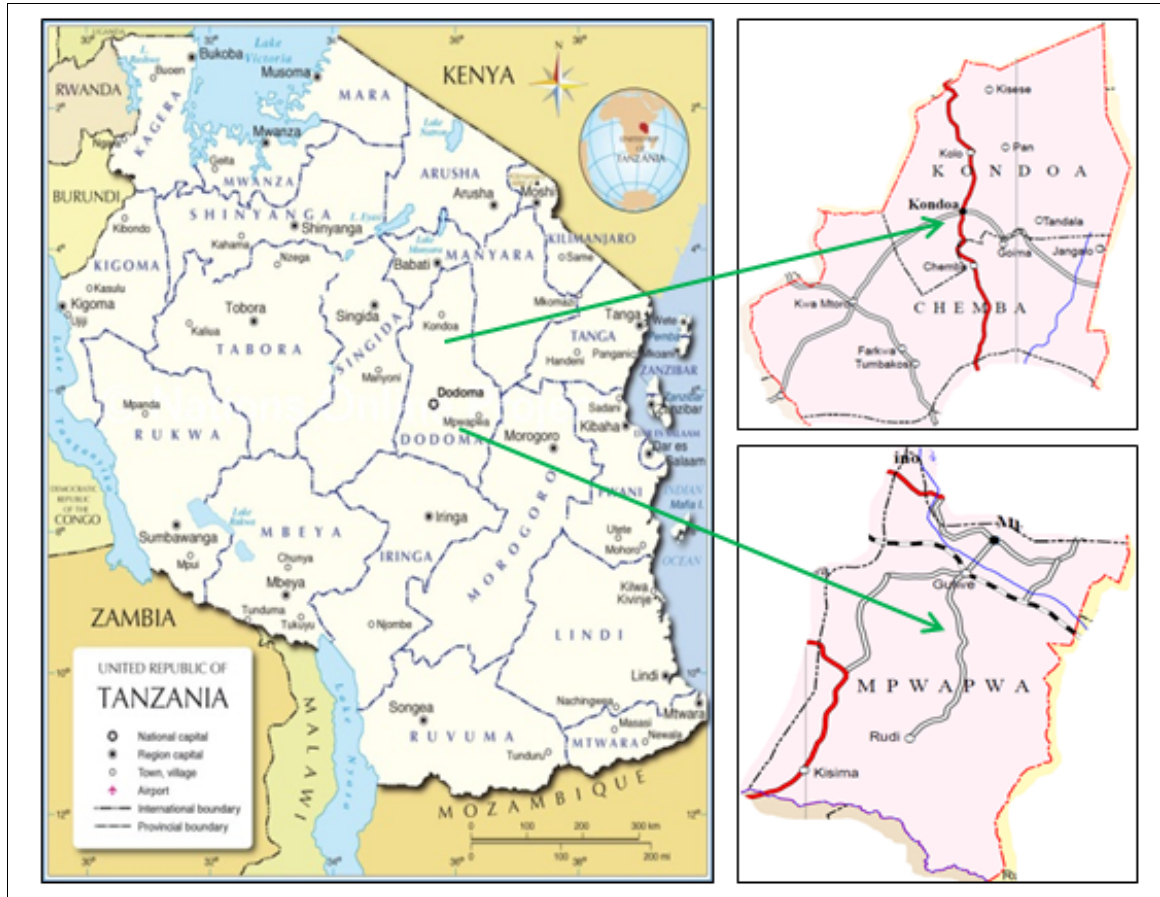


Figure 2.1 Maps of Tanzania and the districts of Kondoa and Mpwapwa (Source: Nations Online, 2011)

The main objective of RWSSP-I was to ensure access to improved and sustained water and sanitation services in rural communities. The project resulted from the public services and sectoral reforms that have been implemented in Tanzania since the early 1990s (URT, 2011c). One of the reforms comprises restructuring the LGAs in order to respond more effectively and efficiently to identified local priorities of services delivery in a sustainable manner (Mwambe and Braathen, 2007). Water supply and sanitation are among the basic social services in rural areas provided by LGAs, supported by national and international development partners. The next two sections present detailed features of the districts of Kondoa and Mpwapwa.

² Other eleven districts were added, namely Handeni/Kilindi, Igunga, Iramba, Kiteto, Kondoa, Kongwa, Manyoni, Morogoro Rural/Mvomero and Singida Rural.

2.2 Kondoa district

Kondoa³ district is located in the northern part of Dodoma region, about 160 kilometres from Dodoma Municipality, the regional headquarters, and covers a total area of 13,210 square kilometres. It shares borders with the districts of Babati in the north, Kiteto and Simanjiro in the east, Hanang and Singida in the west, Manyoni in the southwest, Chamwino and Bahi in the south. Based on the 2012 national census, the district population is 505,415; males 244,103 and females 251,312 with a population growth rate of 1.6 percent and an average household size of 4.8 (URT, 2013b; Kondoa District Council, 2011). The district has the semi-arid climate characteristics of the central plateaus of Tanzania. Its climatic condition is determined by agro-ecological zones, with temperature ranging from 16°C to 29°C and rainfall from 500 to 1000mm. About 85 percent of the annual rain falls from December to March. The remaining months are dry, with very little rain in April to November.

The population is predominantly rural. There are different ethnic groups, including the Rangi, Gogo, Sandawe, Barbaig, Bulunge, Nguu, Zigua, Fiome, Goroa and Maasai. The main sources of income are farming and animal husbandry. Few people depend on beekeeping, small-scale sunflower oil processing, casual labour, small-scale trade, wage employment and artisanal activities. The main food crops are maize, cassava, beans, bulrush millet, sweet potato, finger millet and sorghum. Major cash crops are sunflower, sesame, pigeon peas, groundnuts and sometimes onions. Bananas, vegetables and cassava are cultivated in a few areas in the district, such as in Sambwa and Mnenia.

Administratively, Kondoa district has seven divisions, 42 wards and 193 villages. Additionally there is Kondoa township authority that has six wards and 23 villages and *mitaa*⁴. A big part of the district is accessible by road throughout the year although some areas have trouble during the rainy season because none of the roads are tarmac roads. The district has paved and unpaved trunk and regional roads (TANROADS, 2013). The length of all the roads in the districts amount to 1500 km, of which 356 km are trunk and regional roads, and 1154 km are district and village feeder roads (Halmashauri ya Wilaya ya Kondoa, 2011; Kondoa District Council, 2012).

The Kondoa District Council collaborates with different development partners and programmes in domestic water supply. The Water Sector Development Programme (WSDP) financed by the World Bank is the main stakeholder in

³ At the time of fieldwork for this research, plans were underway to split the districts into two districts of Kondoa and Chemba.

⁴ *Mtaa* Swahili translation for street is the lowest administrative level in urban areas, equivalent to subvillage or *kitongoji* in Swahili for rural areas.

water supply projects. Others include the Belgian Fund for Food Security (BFFS)⁵, Tanzania Social Action Fund (TASAF), Tanzania National Parks Authority (TANAPA) and the Centro Mondialite Sviluppo Reciprocal-Tanzania (CMSR-Tanzania). Only about one third (34%) of the district population has access to potable water from protected sources within 400m from their households. According to the District Water Engineer's office, the main water sources include boreholes (115), shallow wells (106), gravity schemes (26), rainwater harvesting schemes (11), charcoal dams (12) and two dams (District Water Engineer' Office 2012). The district has some unimproved water sources such as hand-dug wells, riverbed-sand wells and temporary springs. The unimproved sources are not well documented in the district profiles but were used for domestic purposes such as laundry, washing dishes and cleaning, and for productive activities such as livestock watering and bricks making.

In Kondoa district, the study was conducted in five villages: Potea, Kidoka, Kelema Maziwani, Chase-Chinyika and Sambwa. Each village has a water supply project for public domestic water services. In each village, except Kelema Maziwani and Chase-Chinyika, distribution points (henceforth DPs) for domestic water are found in almost each subvillage. Cattle troughs for watering livestock are situated in at least one subvillage in each village.

2.3 Mpwapwa district

Mpwapwa district is located in the southwestern part of Dodoma region, about 120 kilometres from the regional headquarters. It covers a total area of 7,379 km². Borders are shared with the districts of Kongwa in the north, Kilosa to the east, Chamwino to the west and Kilolo to the south. According to the 2012 census, the district has a population of 305,056; 147,306 males and 157,750 females, with an average household size of 4.6 people (URT, 2013b) and an annual growth rate of 2.1 percent (Mpwapwa District Council, 2010). The district has a dry savannah climate, with exceptions in mountainous areas like Kiboriani, Wotta, Lufu, Mbuga and Mang'aliza where there is more rainfall. Climatic conditions in Mpwapwa are determined by agro-ecological zones, with temperature ranging from 15°C to 30°C and rainfall from 600 to 1200mm. The rainy season extends from December to April, the remaining months experience dry season.

Mpwapwa has different ethnic groups, the Gogo being the dominant one. Others are the Hehe, Kaguru and Bena. Recently, few Sukuma were migrating to the area for farming and livestock keeping activities. In addition, pastoral ethnic groups like the Maasai and Mang'ati migrate to the district, especially to the southern plains close to the Mtera dam and Ruaha River (Mpwapwa District

⁵ BFFS was known as Belgian Survival Fund (BSF) since 1983 when it was established up to January 2010 when its name was changed to BSSF <http://www.ifad.org/bffs/>

Council, 2010). The main sources of income are farming and animal husbandry. Few people depend on casual labour, small-scale business, wage employment and artisanal activities. Small-scale fishing is among the sources of livelihood in few villages such as Seluka and Chipogoro that are located nearby Mtera reservoir and Great Ruaha (Mwalyosi, 1986). Major food crops in the district are maize, sorghum, bulrush millet, cassava, rice, and Irish and sweet potato. Cash crops include the following: groundnuts, sesame, sunflower, beans, and cashew nuts. Fruits and vegetables are produced in few areas in the district, for example, most of banana and onions comes from Wotta.

Mpwapwa district has four divisions, 30 wards and 93 villages. All the roads in the district are earth roads and are largely accessible throughout the year, except in the rainy season when some roads become impassable, like in Chipogoro village. The length of all roads in the district is 1,098 km, of which 177 km are trunk and regional roads, 231 km district roads and 690 km feeder roads (Mpwapwa District Council, 2011). Construction of Dodoma-Iringa trunk road was ongoing at the time of the research. The central railway line crosses the district and has stations in the villages of Gulwe, Msagali and Godegode. Heavy rains and flooding often wash away railway infrastructures and the bridge that connects Gulwe to other villages and the district headquarters. Gulwe is located within the Kinyasungwi River and flood plain that is often besieged by floods (PMO-RALG, 2012).

Water service is mainly provided by the District Council in collaboration with different organisations, such as CMSR-Tanzania, WaterAid-Tanzania, Maji na Maendeleo Dodoma (MAMADO), and the Anglican, Roman Catholic and Evangelical Lutheran churches. About half of the population (55%) has access to water services. The main sources of water include boreholes (33), shallow wells (145), gravity schemes (32), rainwater harvesting schemes (43), and one charcoal dam (Mpwapwa District Council 2010; District Water Engineer's Office, 2012). Unimproved water sources are mainly hand-dug wells and riverbed-sand wells. The district profiles and reports do not document the latter sources but they are among dependable sources of water especially in remote villages, such as Seluka.

In Mpwapwa district, the study was conducted in four villages: Lupeta, Mbori, Berege and Seluka. Each village has a water supply project for public domestic water services, but since 2008 Seluka's project is not functional. In each village, DPs for domestic uses are found in either some or each subvillage and cattle troughs for watering livestock are in at least one subvillage for village use.

The condition of water service in terms of number and status of water points differs within and between villages.

Table 2.1 Study villages, number and status of waterpoints

Village name	Population	N households	Name & number of subvillages	Total number of DPs	Non-functional DPs
Berege	7664	1467	Chisale A	1	-
			Chisale B	2	-
			Mangwe	1	1
			Makweme	1	1
			Selezi	No waterpoint	
			Chimaza	No waterpoint	
			Mahubuhubu	No waterpoint	
			Vinolo	No waterpoint	
Seluka	2894	771	Miengweni	2	Completely collapsed infrastructure
			Nyabu	1	
			Shuleni	2	
			Ofisini	1	
			Mbuyuni	1	
Mbori	4470	1002	Kaloleni A	1	
			Kaloleni B	No waterpoint	
			Ikulu	No waterpoint	
			Msunjulile	1	
			Mabwe Mazelu	No waterpoint	
Lupeta	4493	945	Lupeta	4	
			Chibwechangula	2	
			Changómbe	3	
			Mdawini	2	2
Potea	2999	438	Kijaji	3	1
			Chamkanga	1	
			Bolisa	3	1
			Lunda	2	
Kelema Maziwani	3188	716	Kitaki	1	1
			Bwawani	1	
			Mikoroshini	1	
			Chimi	1	
			Amiti	No waterpoint	
			Chokobai	No waterpoint	
			Darajani	No waterpoint	
Kidoka	3274	784	Kimambo	1	
			Mkalama	2	
			Mkombozi	2	
			Shule	2	1
Sambwa	3647	673	Sambwakati juu	3	1
			Sambwakati chini	2	
			Ntojo	2	
			Mnadani	2	1
Chase-Chinyika	4846	1219	Chase-Shuleni	1	1
			Chinyika	2	
			Naante	No waterpoint	
			Zezengwalo	No waterpoint	
			Hubu	No waterpoint	
			Gwandi	No waterpoint	
			Dalai	No waterpoint	
			Ziawa	No waterpoint	

Source: Compiled based on the information from the Village Executive Officers, 2011/2012

Translating Table 2.1, into the 2002 country's water policy on 250 users' per waterpoint, it is striking that every village had inadequate number of waterpoints with waterpoint-population ratios ranging from 1:374 to 1:2555. Thus, the overall picture calls for pragmatic expansion of the existing water service and paying attention to the number of the DPs as well as population distribution.

2.4 Research design

The research design forms a framework that connects the research questions and data to be collected with the entire research process (De Vaus, 2001; Yin, 2003; Bryman, 2004). The research design is a procedural plan that guides a researcher on how to conduct the study (Kumar, 2005: 84). Its main function is to ensure that the evidence obtained enables the researcher to answer the research questions as unambiguously as possible (De Vaus, 2001: 9). From the large body of social science research literature one could say that the research design functions as a compass in providing directions for the researcher.

Studying the policy-practises nexus of public water services in the rural areas from a sociological angle entailed a research approach that takes into account multiple actors, levels, processes and their dynamics. As outlined in Chapter 1, the decentralised rural water provision is guided by the national policy, managed by the community and used by households. Therefore, examining implications and practicability of rural water services from macro policies by meso providers at micro-level, i.e. rural households and their complexities, needs to link macro, meso and micro interactions. This necessitated a reflection on the research paradigm that underpins the methodology, which resulted in employing a mixed-methods strategy, a temporal perspective and multiple units of analysis (De Vaus, 2001; Yin, 2003; Bryman, 2004; Axinn and Pearce, 2006). Given the type of research questions (see Chapter 1), their philosophical stance is inclined towards a constructivist ontological orientation and an interpretative epistemological perspective (cf. Grix, 2002).

2.4.1 Mixed methods

Combining quantitative and qualitative methods allows a researcher to capture phenomena in their context by collecting data through multiple structured and semi-structured tools (Scrimshaw, 1990; Rao and Woolcock, 2003; Adato, 2008). Because of their complementarities, mixed methods enable triangulation and the use of multiple units of analysis. Mixed methods create an interwoven picture on the research topic at multiple levels and from numerous sources. Sometimes multiple sources at the same level are used. For example, in each village information was collected from the villagers and leaders. Besides, the study used

mixed methods to understand rural water services in general and their specific bearing on intra-household water provision and use in which gender relations play an important role as well. Primary data were collected through a household survey, in-depth interviews with key informants, case studies, Focus Group Discussions (henceforth FGDs), community water service mapping and observation. (Non-participant) observation was used throughout the fieldwork to comprehend practices on water provision and use at the DPs, cattle troughs and around dwellings, and to take pictures of the village water infrastructures. Secondary data were collected through reviewing and analysing reports and documents relevant to this research from the village, district council and the national reports, policy and strategy from the Ministry of Water.

2.4.2 The temporal perspective

Understanding how and in what ways gender, household and community domestic water provision and management were integrated in the ongoing rural water services require process information from multiple administrative levels and actors. Obtaining this information necessitates conducting repeated visits and using retrospective questions, historical sources, and structured and unstructured instruments of data collections. Thus, while this study does not strictly follow a longitudinal design (cf. De Vaus, 2001; Bryman, 2004; Kumar, 2005), systematic attention for the temporal dimension enabled identifying causal factors and unravelling changes in the practices and processes involved in rural domestic water provision. Since the study had multiple phases, previous experience could guide the implementation of the next round in terms of the type and structure of the questions (Axinn and Pearce, 2006: 177-8). Sometimes, not all previous respondents could be contacted in subsequent visits, but as Kumar (2005) clarified, in studies with a longitudinal orientation, data collected should be from the same population, not necessarily from the same respondents. During the fieldwork, study villages and district were visited two to seven times, starting in the orientation phase to the phase of in-depth qualitative data collection.

2.4.3 Units of analysis

De Vaus (2001: 18) refers to the unit of analysis as the 'thing' about which we collect information and from which we draw conclusions. The type of research questions, type and sources of data required, influence the researcher's choice of the unit of analysis (Yin, 2009). The unit of analysis can be an individual, group of individuals, an institution, or a place in terms of communities and geographical area (De Vaus, 2001; Axinn and Pearce, 2006; Yin, 2009). According to De Vaus (2001: 18), thinking beyond the individual as a unit of analysis broadens the range of questions we can ask and that of the sources of data available. From an

ontological and epistemological perspective (cf. Grix, 2002), unpacking the policy-practices nexus of public domestic water provision in a rural context requires multiple units of analysis. Therefore, in this research the household is the main unit of analysis, Kondoa and Mpwapwa districts are higher-level units of analysis, and the villages of Kidoka and Seluka were taken as case studies. The literature affirms that each unit of analysis calls for a slightly different data collection strategy in order to maximize the advantages of both, quantitative and qualitative data collection methods (De Vaus, 2001; Yin, 2009).

For this study, the *household* is the 'main' unit of analysis because it is the arena within which people provide and manage resources for their daily needs, including water (Rudie, 1995; Niehof, 2004, 2011). Rudie's (1995: 228) definition of the household as a "family-based co-residential unit that takes care of resource management and the primary needs of its members", is best applicable for this research. Although the 2002 policy does not explicitly indicate household as users of the rural water services, in this study the household is seen as the main user of the service and its members play major roles in the provision and use of domestic water (see Chapters 4 and 7). In most rural areas of Tanzania, domestic water provision is a gendered issue at household level and gender plays a role in water management at community level, as articulated in Chapters 4 and 5. "Households are the fields of interaction in which deep seated features of a gender system are reproduced through social practices", says Rudie (1995: 228). This applies to water provision as well. Women and girls are responsible to ensure availability of domestic water within their households while men and boys are responsible for the productive uses of the domestic water (cf. Chapter 4). Domestic water uses at the household level include consumption, personal and domestic hygiene as well as small-scale income generating activities such as livestock keeping, bricks making, brewing, and food vending.

The *village* forms another unit of analysis because in rural Tanzania, the village is the second lowest administrative level that operates as a medium through which higher-level government policies, laws and regulations are transmitted to the community (Venugopal and Yilmaz, 2010: 216). The 'subsidiarity principle' in Agenda 21 of 1992 and decentralised rural water governance require the community at the lowest appropriate level to manage their schemes (URT, 2002, 2008a; Cleaver and Toner, 2006). Households in the same village form a community under the same village leadership. In practice, the village through its structures such as the Village Council and VWC, administers water service delivery for its community on a daily basis. The latter description accords the existing structure of the LGAs (Venugopal and Yilmaz, 2010). Generally, each village has its formal institutions pertinent to the domestic water service such as the Village Assembly, the Village Council, the VWC and a private operator in the villages that opted for one. Therefore, the village is a focal point in analysing the

interfaces of gender, household and community and their linkages to the domestic water services. In this study nine villages (four in Mpwapwa and five in Kondoa) were purposively selected on the basis of their location in the district, presence of public water project, type of water source and management arrangements (see Table 2.2).

Table 2.2 Study villages and their selection criteria

District	Village name	Village selection criteria		
		Distance from the district head-quarters & location	Type of water source	Management approach
Mpwapwa	Berege	31 km heading to the southern part of the district	Borehole with diesel pump	Private operator & active VWC
	Seluka	90 km southern part of the district	Borehole with diesel pump	Unstable VWC
	Mbori	20 km around central part of the district	Shallow well & river Matomondo	In transition: private operator & active VWC
	Lupeta	12 km at the central part of the district	Gravity scheme	Active VWC
Kondoa	Potea	46 km at northern part	Borehole with diesel pump	Active VWC
	Kelema maziwani	30 km at northern part	Borehole with electrical pump & river Kelema	Active VWC
	Kidoka	65 km at southern part	Borehole with diesel pump	Private operator & active VWC
	Sambwa	55 km at northern part	Gravity scheme	Unstable VWC
	Chase-Chinyika	120 km at southern part	Borehole with diesel pump	In transition: private operator & active VWC

The District Council is the immediate overseer of the social services in the district (Mwambe and Braathen, 2007). Thus, in this study the district is a 'higher-level' unit of analysis that cuts across meso and macro levels. At meso level, the district liaises with the Ministry of Water and the Prime Minister's Office, Regional Administrations, LGAs and other institutions working on and affected by rural water supply. Also at the meso level, the district provides water services and technical support to all villages within its jurisdiction. At macro level, the district and the national levels form the layers at which especially the political processes that affect water service provision and management at household and community level respectively are initiated and the economic parameters formulated. The national water policy and strategy (URT, 2002, 2008a) forms the macro-level framework in which policies are formulated and decisions made that affect the management and sustainability of the infrastructures at the local level.

2.5 The fieldwork processes

The fieldwork was conducted in the districts of Kondoa and Mpwapwa from October 2011 to early September 2012, in three overlapping phases. These are described below.

2.5.1 Preparation and exploratory phase

This phase started with administrative logistics to obtain research permits from the regional and district authorities. Two research assistants were recruited during this phase. They were district council planning officers with a master's degree and extensive experience in social services projects in the study area. Throughout the research process, the research assistants were contact persons at district level and linked the researcher to district officials and village leaders. I also had discussions with them on practical points, such as the planning of trips to the villages.

Thereafter, exploratory research was carried out at district and village level. I reviewed secondary information pertaining to domestic water services from the district profiles, water sector reports, budget and planning documents from the departments of water, planning, and community development. The documents reviewed were from the year 2000 onwards depending on their availability. Semi-structured and unstructured interviews with the District Water Engineers (henceforth DWEs), District Planning Officers and representatives of District Community Development Officers enabled me to obtain and discuss information on the following: the conditions of the water services in the villages, the coordination and technical support, the water fund account, and management approaches in the villages, including the gender aspects of this. Other points discussed were the collaboration between the water department and the legal unit in assisting the villages on the legal terms of hiring private operators, challenges facing the water department in supporting the villages, and the prevailing gender and management approaches. Analysis of the information obtained through the District Council enabled me to get a general understanding of the districts and villages in relation to the research context.

Subsequently, I used the information of the district officials and the reconnaissance visits to the intended study villages to confirm selection of the villages. By visiting the study village rapport could be built with the village leaders, members of the VWC and private operators if present. I had semi-structured and unstructured interviews that acquainted me with the general picture of water service and the social, economic and demographic features of the study village. I also discussed practical things like good timing for the household survey interviews and market or auction days. I always made phone calls to the research assistants, village leaders and district officials before visiting their offices to ensure their availability and that of the information I had requested.

2.5.2 Household survey phase

In the second phase, the household survey was conducted. In the villages with more than four subvillages, data were collected from four subvillages only. The questionnaire used in the survey contained open and closed questions. I designed the questionnaire in English and then translated it to Swahili, the national language in Tanzania. To ensure that the original meaning of questions was maintained, the translated version was checked by three reviewers, among them one with linguistic expertise. See Appendix 1 for the questionnaire.

Prior to the survey, six enumerators were recruited. Three of them were fresh bachelor degree graduates who had previously been involved in research and monitoring activities in the study area. The other two had over ten years' experience with gender and rural extension issues, had worked in numerous rural development projects, and had a postgraduate diploma. One enumerator only had an ordinary diploma but had over fifteen years' experience in technical, training and mobilisation activities at the water department. Before the survey, the enumerators were trained to have a common understanding of the questionnaire, field practicalities, and ethical issues especially the importance of the respondents' consent. The questionnaire was pretested in the village of Lupeta to check how its design, phrasing and content would work out in practice. After that, the questionnaire was corrected to improve the clarity and flow of the questions. During the survey, the village office endorsed the subvillage's chairperson or another villager when the chairperson was unavailable, to accompany the enumerators.

2.5.3 In-depth qualitative study

To prepare for the in-depth qualitative data collection, I did a preliminary analysis of the survey data and revisited field notes taken in the previous phases. The in-depth qualitative study in the three purposively selected villages was done to elicit detailed information and the users' insider perspective. Kidoka in Kondoa district was included because of its experience with the community water management by the VWC and the private operator. Chase-Chinyika in Kondoa and Seluka in Mpwapwa district were included, respectively because of remote location and collapsed water scheme. Qualitative data were collected through in-depth interviews with key informants, village case studies, FGDs participatory sketch mapping, observation and photographing water infrastructures. This third phase added detailed data and 'thick' descriptions (cf. Jick, 1979) on village water services. These descriptions were about practices and processes related to user fee mechanisms, handling of revenues from user fees, overall management of the schemes, patriarchy and gender in the management of water services and overall challenges of the water services. Table 2.3 summarises the fieldwork activities.

Table 2.3 Summary of the fieldwork activities

Phases	Duration	Main activities
Preparation & exploratory study	October – November 2011	<ul style="list-style-type: none"> • Preliminary data collection at the district council: water, planning and community development departments • Discussions with key informants at the district and village • Collecting secondary data • Reconnaissance visits and observation
Household survey	November 2011 - February 2012	<ul style="list-style-type: none"> • Household survey • Collecting secondary data • Field observation • Capturing photographs
In-depth qualitative study	March 2011 - Sept, 2012	<ul style="list-style-type: none"> • Interview with the key informants • Conducting FGDs • Documenting villages and women case studies • Capturing photographs • Participatory sketch mapping • Attending budget meetings at the district councils

2.6 Methods of data collection

Primary and secondary data collection was done in all fieldwork phases. Mixed methods were applied to enable triangulation and, thereby, maximise their complementary advantage, for enhancing the validity and reliability of the results (Scrimshaw, 1990; Rao and Woolcock, 2003; Small, 2011). Data collection for primary data was done through the household survey, FGDs, interviews with key informants, village and women case studies, participatory sketch mapping, and field observation. Secondary data was collected through analysis of information from relevant documents at the village, district and national levels.

2.6.1 Household survey

The survey was conducted among 221 randomly selected households in the study area by using village registers as a sampling frame. Where the village registers were incomplete such as in Kidoka, I used a list on village households' information as an alternative. I used simple random sampling to select the households because all households in a village depend on the same public water facilities for domestic water services. Although the planned sample size was 30 households per village, in each village, a number of 22 to 25 households were interviewed. According to Grinnell (2001), a sample size of one-tenth of the total population (with a minimum of 30) is normally sufficient to provide a reasonable control over sampling error. Whereas the saturation point principle is mostly used in qualitative studies (Kumar, 2005: 165-166), I applied it in the survey following the realisation that after carrying out the survey in about 15 households there was hardly any new information with regard to the water services experience. More households were added because household characteristics and intra-household relationships differ from one household to another and these shape water needs and the gendered division of labour regarding provision and use of domestic water (Kabeer, 1994; Dungumaro, 2007; Gleitsmann *et al.*, 2007; Kanyoka *et al.*, 2008; Arouna and Dabbert, 2010). Besides, the intra-household relationships regulate the participation of the household members in activities and processes pertaining to community roles such as public management of the water services (cf. Moser, 1989; Kabeer, 1994; Agarwal, 1994, 1997).

In all households (except three houses), the wife of the head of household or another adult woman was interviewed, because domestic water is a gendered subject, and it is mainly women's responsibility to ensure its availability. The household survey provided useful quantitative data on household characteristics and sanitation facilities, expenditure on water, responsibilities and processes to access water services, the household's involvement in the water project, the respondent's perceptions on the appropriateness of the water services in the village, and the experience with non-functionality of the water facilities.

2.6.2 Focus Group Discussion

In this study, I opted for focus group discussions in small groups because the small group facilitates interaction among the participants, and between them and the researcher. There is room for responding to questions and for building upon what participants say (Morgan, 1998; Axinn and Pearce, 2006). FGDs were an appropriate tool for triangulation of the information collected through other methods. Morgan (1996: 130) defines focus groups as "a research technique that collects data through group interaction on a topic determined by the researcher." Using Morgan's definition and my checklists, I conducted seven FGDs, four in

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Kidoka and three in Seluka. In total, 47 participants (24 men and 23 women) were involved in the FGDs. Apart from the VWC focus groups that had four and five participants, the other groups had six to nine members. In all FGDs' sessions, I took notes and audiotaped the discussions with the participants' consent. Appendix 2 shows the checklist for men and women FGDs. Table 2.4 presents a summary of the demographic characteristics of the FGDs participants and the topics discussed.

Table 2.4 Profiles of Focus Groups participants and main topics discussed

Composition	Characteristics of the participants		Topics discussed
	Kidoka village	Seluka village	
Men	<ul style="list-style-type: none"> • 6 participants • Age: 40-67 years • Education: Primary (5) & Ordinary Diploma (1) • Farming cash crops (4) • Small shop and other business (2) • All are married with children, and 3 of them are grandfathers • Mixed ethnic groups 	<ul style="list-style-type: none"> • 8 participants • Age: 30-71 years • Education: Primary (7) & Ordinary Diploma (1) • Subsistence farming (4) & for cash crops (2) • Small scale business (2) • All are married with children, & 4 are already grandfathers • Mixed ethnic groups 	<ul style="list-style-type: none"> • Access to water services • Payment mechanism • Overall management approach & handling of water revenues • Appropriateness of water services • Main challenges of the water service • Patriarchal culture
Women	<ul style="list-style-type: none"> • 7 participants • Age: 40-58 years • Education: Primary (5) & had no formal education (2) • Small scale farming • All are married with children; and 4 are grandmothers • Rangi and Gogo 	<ul style="list-style-type: none"> • 8 participants • Age ranges 35-55 years • Education: Primary (6) & adult education (2) • Small-scale farming • All are married with children; and 3 grandmothers • Mainly Gogo 	<ul style="list-style-type: none"> • Access to water services • Payment mechanism • Overall management approach & handling of water revenues • Appropriateness of water services • Main challenges of the water service • Patriarchal culture
VWC members	<ul style="list-style-type: none"> • 4 participants; 2 men & 2 women • One was the treasurer of the VWC • Age: men in mid 50s & women in mid 30s • Education: Primary • All were subsistence farmers • All are married with children 	<ul style="list-style-type: none"> • 5 participants; 3 men & 2 women • Age: men in mid 50s, & women in early 30s • Education: Primary • All were subsistence farmers • All are married with children 	<ul style="list-style-type: none"> • Membership in VWC • Responsibilities of the VWC • Decision making in VWC • Patriarchy system • Payment and management of water funds • Challenges for VWC members
Mapping participants- Kidoka village	<ul style="list-style-type: none"> • 9 participants: men (6) and women (3) • Age: 39-67 years • Education: Primary (6), secondary (2) & Ordinary Diploma (1) • All are farmers and engaged in small-scale business in the village. • Native villagers (6) • Migrated to the village (3) 		<ul style="list-style-type: none"> • Land uses and cover • Public social services in the village • Domestic water services and demographic characteristics • Location & condition of DPs. • Seasonality • Overview of the water facilities

2.6.3 Key informants interview

Interviews with the key informants were done in all phases and at all levels. During the exploratory phase their main purpose was to gather preliminary information, while in the survey and qualitative data collection phases the interviews served explanatory purposes. Key informants interviewed included officials at the Rural Water Supply Division - Ministry of Water, the District Water Engineers and technicians, Planning and Community development officers, village chairpersons and executive officers, members of the social service committee in the village councils, VWC members, private operators, and identified villagers who had lived in the village for a long time. Topics covered included socio-economic and demographic trends, gender and management of public water facilities, and the status of water services in the study area. Others were payment and management of water funds, women and leadership, motivation to and challenges in leadership, and major challenges in the provision of water services. All the interviews with the key informants used semi-structured and unstructured interviews tools. See Appendix 3 and 4 for questions that guided the interviews with the villager leaders and members of the water committee.

Table 2.5 Type and number of the key informants

Type of the key informants	Number
Officials from the Ministry of Water - Rural Water Supply Division	2
Kondoa & Mpwapwa District Councils	
• Water engineers	2
• Water technicians	2
• Planning officers	4
• Community Development officers	4
Study villages	
• Village Chairpersons	9
• Village Executive officers	9
• Members of the Village Council/Social Services Committee	27
• Members of the Village Water Committee	16
• Pump/Tank attendant	5
• Private operator	3
• Villagers	30
Total	113

2.6.4 Case studies

Case studies are applicable to guide an empirical inquiry that seeks to investigate the *how* and *why* of phenomena within their real-life context. The meaning of a case study differs from one field to another and there are multiple and varying interpretations of what constitutes a case study (De Vaus, 2001; Grünbaum, 2007; Mol, 2008; Diefenbach, 2009; Yin, 2009). In this study, I applied the case study method to villages and women to understand the specific contexts and dynamics of practices and processes related to the management of the public water schemes. Village case studies (Kidoka in Chapter 3 and Chase-Chinyika and Seluka in Chapter 7) were employed to highlight context-specific examples and detailed information on how local features and the interaction between different actors and levels shape the overall situation of the village's domestic water service. I documented three women cases (Chapter 5) to shed light on how women get access to the formal leadership positions and perform in these positions.

I recognise that conclusions from the case studies are specific and not well amenable to generalisation (Grünbaum, 2007; Mol, 2008; Diefenbach, 2009). However, their specific conclusions yield insights that can serve as starting points for conceptual and policy development. The latter is especially important for fine-tuning the large-scale and blanket approaches that have been implemented in the decentralisation of the rural water services.

2.6.5 Community water service mapping

In this study, community water service mapping (henceforth CWSM) was applied because it involves users from the households to gather and map information on the water accessibility based on their local experience. I used the mapping approach to visualise the dynamics of water service coverage in the village and reflect the findings against the national standards. Understanding how management intersects with the provision of domestic water required a technique that can elicit the users' perspective on the spatial aspect, which is not easily captured through other methods of data collection (Cleaver and Elson, 1995; Rocheleau, 1995; Glockner *et al.*, 2004; Welle, 2010). Additionally, the method enabled me to capture the effects of seasonality on village domestic water services.

CWSM was carried out by combining FGDs, participatory sketch mapping and geocoded transect walk. Checklist that guided mapping exercise is shown in Appendix 5. By weaving together these three techniques, the information from the service users' perspectives could be validated. For example, the sketch map that resulted from the discussions among the participants in the FGD could be validated by the transect walk. Having mapping participants from the household, CWSM enabled me to get accurate, relevant and valid information. Drawing from the principles of interactive mapping as formulated by Amsden and

VanWynsberghe (2005), CWSM produced a map that visualizes the existing reality of the water service. That was vital to check the information on water accessibility obtained by other methods and showed that, contrary to what it is generally assumed, access to water is sometimes limited during the rainy season. Chapter 3 presents a detailed account of the application of CWSM in this study.

2.6.6 Non-participant observation

Like interviews with key informants, I used observation throughout the fieldwork. I observed household toilet and/or bathroom facilities as well as visited water infrastructures to see their general condition. I also observed practices related to water fetching, such as who fetches water, means of transporting water, and domestic arrangements related to water uses. With the consent of the people concerned, I took photographs to document some of the observed situations and events. While conducting FGDs, attending meetings, and during the mapping exercise, I observed patterns of interaction among men and women and the effects of age on turns in speaking and topic of discussion. Apart from taking photographs, I recorded locally provided clarifications on the observed practices in the field notebooks. Clarification from the local people is of great importance to avoid misinterpretation. As an outsider I could wrongly interpret the local practices, which O'Leary (2004: 47) describes as "a trap of judging the reality of others in relation to *my* own reality".

2.6.7 Secondary data

Secondary data were also collected in all phases, by reviewing and analysing reports and documents relevant to this research from the village, district to the ministry level. Secondary data included socio-economic and demographic data, data on the status of water service in the villages and districts, and the profiles of villages and districts. Additionally, minutes of the VWC meetings and the Village Assembly, and the model for the contract between private operator and village were reviewed subject to their availability. To understand the roles assigned to the actors at different levels and macro-meso-micro interactions, I did a detailed review of the rural water supply section in the 2002 National Water Policy and in the 2008 National Water Sector Development Strategy.

2.7 Data analysis

Data from the household survey were coded and entered into the Statistical Package for the Social Sciences (SPSS version 19). Then summary frequencies were run to check completeness and accuracy of the data. Cross-tabulations, bivariate correlation and Chi-square analysis were performed to understand the relation-

ships between the variables and test their statistical significance. Percentages were used to explain proportions and Likert scale to measure perceptions of the service users on the appropriateness of water service. Figures on water service and demographic characteristic from the districts and villages were summarised and grouped in relevant themes.

Qualitative data recorded in the field notebooks and voice clips from the FGDs and interviews with the key informants were manually analysed based on the context and content analysis. Village and women case studies were processed by identifying and categorising topics, patterns, and their relationships (cf. O' Leary 2004), to explain the meaning of situations and concepts such as condition of water services and patriarchal culture. Discussion with the mapping participants and reflection of the information in the sketched map in the light of the demographic characteristics of Kidoka underpinned the analysis of the mapping data.

2.8 Validity and reliability

Validity refers to the ability of an instrument to measure what it is designed to measure (Kumar, 2005). To enhance validity, the researcher has to make an effort to capture the essence of subjective information by using the appropriate tools in order to generate answers to the research questions (Creswell, 2003). Reliability is also referred to as replicability, in the sense of "the extent to which scientific observations can be repeated and obtain the same results" (Scrimshaw, 1990: 89). This implies that the tool used in data collection should be able to produce consistent results when administered under the same or similar conditions and to the same population (Kumar, 2005). For reasons of validity and reliability, I refined the questionnaire based on the observations from the pretesting exercise. Apart from that, I crosschecked household data with the villages' records. Checklists guided the collection of secondary data and the FGDs to ensure that the same questions were consistently asked in the whole study area. Neither qualitative nor quantitative approaches can independently achieve validity and reliability, which is why in this research a mixed-methods strategy was adopted. A combination of qualitative and quantitative approaches strengthens the reliability and validity of the research findings (Niehof, 1999). As Scrimshaw (1990: 89), said: "Qualitative methods are acknowledged to be more accurate in terms of validity, while quantitative methods are considered to be better in terms of reliability or replicability."

2.9 Ethical considerations

Getting permission from the administrative authorities and informed consent from the individuals in the study area is vital for conducting research. Before starting

the fieldwork, I applied for the research permits to the Regional Administrative Secretary, who issued a permit and introduced me to the District Administrative Secretary, who introduced me to the District Executive Director (DED). The DED is the head of the District Council administration and an accounting officer. The DED then issued letters to introduce me to the village executive officers of the study village. During the preliminary visits to the villages, I introduced the research topic and research team to the village leadership. All respondents were asked for their informed consent to participate in the research after explained to them what was the research about and how was the information (including photographs) obtained from them was going to be used. For the photographs of the water infrastructure, I requested permission from the village leadership of the respective village. Having a local person to accompany the enumerators increased the respondents' confidence in the legitimacy of the fieldwork and their willingness to provide information. To maintain the confidentiality of the respondents, I have used pseudonyms instead of the real names in the women cases that I documented.

Chapter 3

Community Water Service Mapping and Domestic Water Services⁶

This chapter presents the potentials of the community water service mapping in assessing village domestic water services. Data were collected through sketch mapping, geocoded transect walk, focus group discussion and cross-checked by interviews. Results show that participatory sketch mapping combined with discussions and transect walk supports collection and validation of relevant, accurate and representative information on water service coverage at village level. Community water service mapping depicted the intersections between seasonality and accessibility to water services, and revealed yet unreported intra-village variations. The approach used in this study has added value for updating the status of water services and assessing their adequacy at the village level, in the light of population change and development of new settlements.

⁶ Based on this chapter the following article will be submitted: Mandara, C.G., van Lammeren, R. and Niehof, A. Assessing water service coverage by Community Water Service Mapping: A case of Kidoka village in Tanzania.

3.1 Introduction

Domestic water is an indispensable input and resource for a household's livelihood activities, health and sanitation needs (FAO, 2004). In Tanzania the proportion of the rural population with access to potable water services has been gradually increasing from about 46% to 57% during the 1990s to 2010 (URT, 2002, 2009a, 2010a, 2011a; MoWLD *et al.*, 2002). However, about 40% of the rural water schemes are not functioning properly due to hardware problems, sources being dry and poor management (Giné and Pérez-Foguet, 2008; Taylor, 2009a, 2009b). Non-functional water schemes disrupt water access indicators guided by the 2002 national water policy. That policy defines water as accessible when one water point serves 250 persons within a distance of 400 meters and users spend no more than 30 minutes for a round trip (URT, 2002, 2008a, 2010c, 2012). A water collection round trip is defined as going to the source, waiting in line to collect water and coming back to the house. Moreover, studies indicate under-reporting of non-functionality and over-reporting of service coverage in terms of accessibility (URT, 2010b; Welle, 2010). This leads into inaccurate information which interferes the sector's management for many years (MoWLD *et al.*, 2002; URT, 2010b; Jiménez and Pérez-Foguet, 2010a, 2010b, 2011b).

To address the problems on information anomalies in the water sector, water point mapping (henceforth WPM) was introduced (URT, 2010b, 2011d; Jiménez and Pérez-Foguet, 2011b). The WPM approach was designed by WaterAid to measure access indicators for improved water points in a specific area (Stoupy and Sudgen, 2003). WPM supports visualisation of the relationship between physical and socio-economic factors related to access to water and reveals patterns that would otherwise be difficult to see (MacDonald *et al.*, 2009). In Tanzania since the early 2000s, WPM has been used by international and local organisations working with water and development sectors such as WaterAid, Stichting Nederlandse Vrijwilligers (SNV) and the resident Ministry of Water (Welle, 2005, 2010; SNV-Dar Es Salaam-TZ, 2010; URT, 2010a). WPM has been applied in other African countries including Ethiopia, Ghana, Nigeria, Malawi, Uganda and Kenya (cf. MacDonald *et al.*, 2009; Welle, 2005, 2007, 2010). Most of the WPM applications in Tanzania have been done beyond village level, on an ad hoc basis, and are neither well consolidated at the national level nor regularly updated (Jiménez and Pérez-Foguet, 2010a, 2010b; URT, 2010a). Previous studies on WPM (Jiménez and Pérez-Foguet, 2008, 2010a, 2011a, 2011b) do not explicitly show how villages and households participate. Therefore, the outputs from WPM are likely to miss processes at the micro level i.e. villages and households; because its applications lack inputs from the actors who are service managers and users. The word 'users' is occasionally used as a synonym to mapping participants. Examining applications of WPM reveals a mismatch between its application and its

appropriateness in meeting local needs, due to questionable validity of the information in terms of relevance, correctness and representativeness.

Additionally, villages depend on the District Water Department (henceforth DWD) for technical expertise when their water infrastructures break down. To get the required assistance, members of the VWC inform the Village Executive Officer who then notifies the District Water Engineer (URT, 2010a). In these procedures mapping-aided information is rarely used because it's hardly available at the district and village levels. If it is, it is fragmented, outdated, poorly accessible, or not in standardized formats, which hinders timely and appropriate interventions.

Besides, the DWD uses population size from census and national surveys such as household budget surveys and the Health and Demographic Survey to plan for village water projects. These figures tend to be outdated because Tanzania conducts a census once every ten years and the surveys are scheduled in different periods. To actualize population's information, the DWD makes projections. Such projections estimate population size rather than its composition and spatial distribution, which are much affected by internal migration. These weaknesses, compromise achieving the national standards which depend on population size and distribution to determine accessibility to water service.

Due to previously mentioned reasons users have been largely overlooked in various practices conducted to rectify information irregularities in the rural water sector. This calls for an approach to fill the gap, which we call Community Water Service Mapping (CWSM) addresses the following questions: (1) what is the added value of the CWSM approach to assess water services coverage at village level? and (2) how do methods and processes involved in the CWSM enhance the relevance, accuracy and representativeness of micro-level information? CWSM is applied because it involves users from the households to gather information on the water accessibility from their local experience. Consequently, CWSM is needed for the internal village use while WPM is applicable for planning at the district and national levels. Therefore it could support the integration of the macro, meso, and micro levels of domestic water services delivery and use.

3.2 Community mapping in domestic water services: a theoretical framework

Community mapping (Amsden and VanWynsberghe, 2005) produces maps which communicate information that is shared, relevant and important to the community's needs based on open, interactive, transparent and inclusive processes (Parker, 2006; Corbett and Rambaldi, 2009). Community maps are made through the participation of community members who live in and do know the area. In this way they may co-create and locate, by visualising as a map, micro-level, up-to-date information (Glockner *et al.*, 2004; Corbett and Rambaldi, 2009). Such

representation of the micro-level understanding on their locality enhances the power and capacity of the local community (Amsden and VanWynsberghe, 2005). Community mapping has been applied in various fields and different types of research, at different scales (cf. Craig *et al.*, 2002; Amsden and VanWynsberghe, 2005; Vajjhala, 2005; Parker, 2006; Corbett and Rambaldi, 2009; McCall and Dunn, 2012). This approach has been advancing parallel to critical cartography and participatory Geographical Information Systems, and, recently, qualitative GIS (Elwood, 2006; Parker, 2006; Corbett and Rambaldi, 2009; Elwood and Cope, 2009; Wilson, 2009). However, there is scant academic literature showing the application of community mapping in rural public domestic water services.

CWSM in this study views villages as heterogeneous and dynamic entities in terms of population composition, size and spatial distribution. Besides, the methodology is attributed the capacity to elicit users' perspectives on the spatial aspect, which are not easily captured through other methods of data collection such as a household survey (Cleaver and Elson, 1995; Glockner *et al.*, 2004; Amsden and VanWynsberghe, 2005). CWSM enables the integration of the micro-level spatial and non-spatial data to support water service analysis (Cleaver and Elson, 1995; Vajjhala, 2005; SNV-Dar Es Salaam-TZ, 2010; Welle, 2010). In our study, CWSM merges and integrates three methods: FGD, participatory sketch mapping, and geo-coded transect walk. Triangulation by combining these methods enhances information validity in terms of relevance, accuracy and representativeness.

CWSM draws on three dimensions of information validation (Figure 3.1). The first dimension is that of the relevance of the information, since CWSM connects the source of information with the micro-level features on which data is being collected. The second is about the accuracy of the gathered information through spatial illustration. The third dimension focuses on the representativeness of the information, because the information in the sketch map comes from community members who represent the households that are the service users.

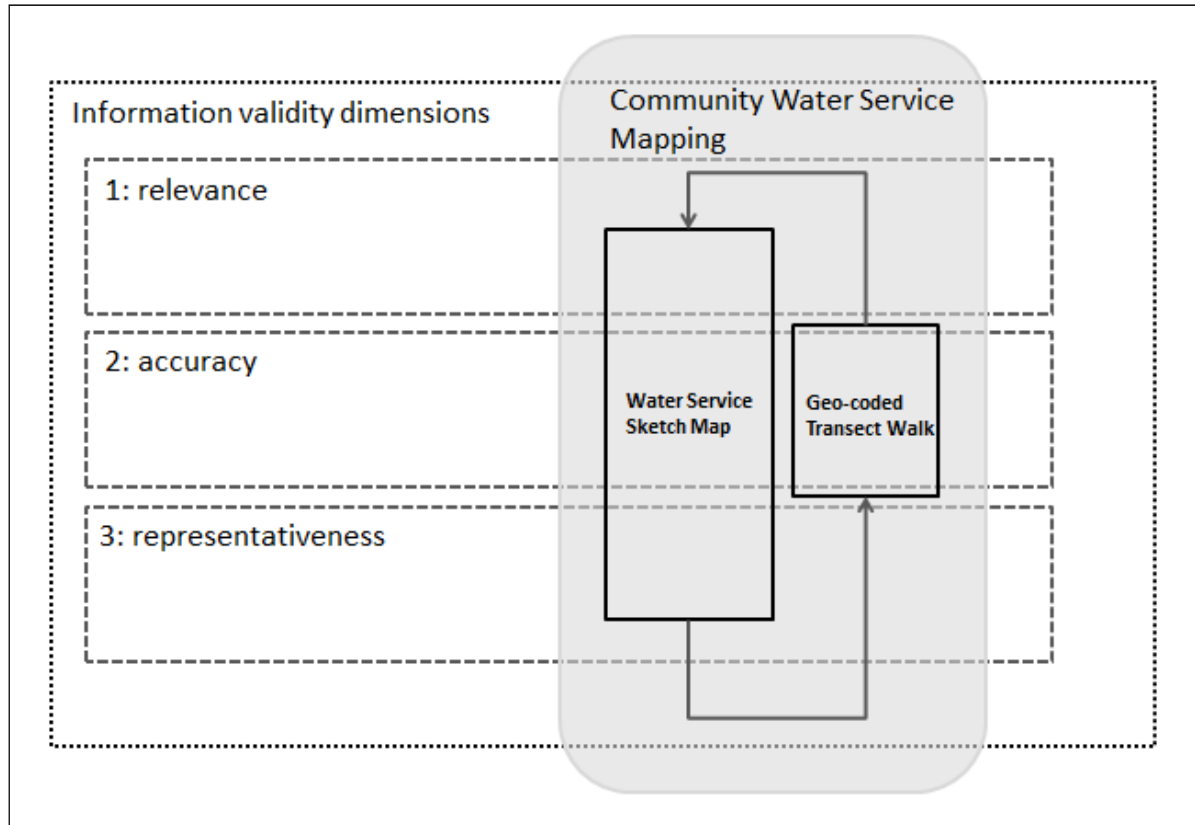


Figure 3.1 Community Water Service Mapping related to information validity dimensions (Inspired by Vajjhala, 2005).

Regarding the validity dimensions, the added value of CWSM is realized by the following:

- i. Investigating the appropriateness of water service delivery and existing infrastructures *from the perspective of the users*;
- ii. Documenting the actual functioning of the services and infrastructures and their shortcomings as experienced by the users while taking into account seasonal variation;
- iii. Eliciting demographic trends that according to the users have consequences for services delivery in terms of adequacy of the infrastructures; and
- iv. As much as possible involving representatives of different groups of users and varied experience of users in the process.

CWSM partly overlaps with WPM. Therefore, based on the application of the CWSM in this study and the synthesized literature on WPM we have made a systematic comparison on both approaches by highlighting their key features, including mapping procedures, outputs and feasibility, as shown in Table 3.1.

Table 3.1 Comparison between Water Point Mapping and Community Water Service Mapping

Key features	Water Point Mapping (WPM)	Community Water Service Mapping (CWSM)
Mapping procedure		
1. Use of a handheld Global Positioning System (GPS)	To record location of the water infrastructures	During transect walk to record location of the water infrastructures
2. Community participation	Not explicitly shown and no discussion with community members is indicated	Roles of the participants are explicit in sketch mapping, transect walk and discussion
3. Mapping exercise	Spearheaded by experts	Spearheaded by the mapping participants
4. Walking during data collection	Mainly done to collect locational and other socio-economic data	Transect walk is carried out to: (a) Validate content of the sketch map; (b) Observe physical condition of water infrastructure & users-water point interactions; (c) Clarify observations
5. Possibility to integrate qualitative data & local knowledge	Little room for qualitative data & local knowledge	Much room for rich & contextual qualitative data & local knowledge through: focus group discussion, oral histories & sketch mapping
6. Characteristics of the mapping participants	Not well documented	Are diverse, indicated and documented
Outputs		
7. Key symbols in the map	Software has in-built predefined cartographic symbology	Participants –define cartographic symbols
8. Output validation	Technical, at meso and/or macro level	Technical, less complex and is done by the participants at micro level
9. Representativeness of the content.	Misses appropriate representation of the local situation	Allows representative content which is relevant to local people
10. Map(s) output	Map is created & local people have limited or no influence on the output	Map is created upon completion of the exercise & local people have major influence on the output
11. Accessibility to use the map (s) produced in decision-making	Mostly used at the district and national level	Can be used at the village and ward level
Feasibility		
12. Complexities to integrate the approach in water sector management	Requires financial & technical resources with detailed infrastructural & managerial procedures	The exercise is done at the local level & by using locally available and relatively affordable materials
13. Institutionalising the approach to different actors and levels	Low pace and fragmented due to limitations & multiple tiers from the village to the national	The pace can be fast-tracked to have continuous coverage from the village to the district level
14. Time required for the whole exercise	Time consuming mostly in terms of technical matters including availability of the existing maps prior to WPM exercise	Time consuming due to processes & people involvement as in most participatory data collection approaches

Despite its practicality and potential, CWSM, as other participatory approaches, faces challenges related to the participation of actors and its implications for the inputs and outputs (McCall, 2004; Amsden and VanWynsberghe, 2005; Chambers, 2006; McCall and Dunn, 2012). More specifically, these challenges deal with information ownership and uses, legitimacy of the empowerment, power relations, and trust between the mapping participants. The latter refers to local participants and facilitators (most of the times these are outsiders), which raises issues of institutional and interpersonal trust (Abbot *et al.*, 1998; Rambaldi, 2004; Chambers, 2006; Corbett and Rambaldi, 2009; McCall and Dunn, 2012). Other challenges include unintended and unanticipated consequences, such as heightening tensions and uncertainty in the community (Corbett and Rambaldi, 2009; McCall and Dunn, 2012), which could become a source of conflict between and within communities (Abbot *et al.*, 1998). Besides, the exercise is time consuming, but the output is worth the time invested in it (Amsden and VanWynsberghe, 2005; Chambers, 2006; Corbett and Rambaldi, 2009).

To mitigate the challenges pertaining to the methodology, we paid repeated visits to the village to do the following: familiarisation, collecting demographic data through household survey, building trust and networking with villagers and leaders. These visits enabled us to clarify the intention of our research to the community and leaders and inform them on the uses of the results, for them to make informed decision to participate or not. In addition, we informed the mapping participants that we were there to learn from them because as villagers they are the knowledgeable insiders. Details on the mapping process and selection of the participants are explained in the methodology section. These survey data were not used in this part of the research.

3.3 Study area and methodology

Field research was conducted in Kidoka village, in Kondoa district in Dodoma region in November 2011 through September 2012. The village is located on the Kondoa-Dodoma main road, 65 kilometres from the Kondoa District Council headquarters.

Kidoka was selected because it is a good representative of the villages' water service development and of the management shift from the VWC *per se* to VWC in collaboration with a private operator. Data collection was done by combining FGD, participatory sketch mapping, and geocoded transect walk. According to Mohamed and Ventura (2000), the geocoded transect walk entails a walk with a hand-held GPS receiver to collect positional data and write all observations related to mapped items in a field notebook. Through the focus group discussion, mapping participants produced a sketch map with village resources and water services on two flip charts that were joined together (about 65x1000 centimetres

each). A digital camera was used during the transect walk to make photographs, to document the physical condition of the water points and other water infrastructures. To double-check our findings and to get leaders' insights on our study we interviewed the following village leaders: village's chairperson, council members and executive officer. Nine villagers, six men and three women, participated in the mapping exercises.

The mapping participants were selected based on the following criteria: availability and willingness to participate, involvement in village leadership and experience in local politics, duration of living in the village, gender, age and involvement in water services management. By using the earlier mentioned criteria, a tendency of "community homogenisation" was avoided Craig *et al.*, (2002), the essential parameters of participation of types of participants and their roles in the mapping exercise were included (cf. McCall, 2004; McCall and Dunn, 2012). The composition of the focus group was not meant to represent the village as a whole, the criteria applied to compose it aimed at benefiting from the diversity of knowledge and perspectives among the participants. Its size had to be kept to the limits amenable for the focus group discussion (cf. Morgan, 1996). Regarding duration of living in the village, six participants were natives and three had migrated to the village at the end of 1990s. The participants had different ages, ranging from 39 to 67. In terms of education, six participants had primary education, two had secondary education and one had post-secondary education. All nine participants were farmers and were engaged in small-scale business in the village. One of the three women had been a leader in the women's wing of the current ruling party. The other two women were not involved in any political activity. Three of the six men had been involved in village leadership at different capacities during the 1980s and 1990s.

The mapping exercise was carried out in an interactive setting, a classroom at Kidoka primary school. The setting of the classroom supported discussions among participants and between them and the facilitator, in our case the researcher. The size of the flip charts was sufficiently large to allow interaction while mapping. Because the CWSM exercise was done when the survey was completed, the facilitators were already familiar with the village. After having completed the sketch map, three mapping participants accompanied the researcher for the transect walk, to record the location of the water distribution points and other on-site attribute data through observation. These participants clarified users-waterpoint interaction to ensure the correct interpretation of the researcher's observations. During the mapping and geocoded transect walk, a checklist was used to understand the appropriateness, accessibility and functionality of domestic water service from the users' perspective.

3.4 Results and discussion

3.4.1 Kidoka village and context of domestic water service

In September 2011, the village had 784 households and a population of about 3274 in its four subvillages Mkalama (910 persons), Mkombozi (911), Shule (684) and Kimambo (769). Kidoka has mixture of tribes, mainly the Rangi and Gogo others are Maasai, Sukuma, Barbaig and Bulunge. During the fieldwork, the village leaders reported on the migration of Sukuma and Barbaig pastoralists to the village. The main sources of income are farming and animal husbandry. The current water project was established in 2007, through the Water Sector Development Programme that supports the implementation of the Rural Water Supply and Sanitation Programmes. To establish the project, villagers contributed money and physical labour to meet the criterion of a 5 percent village's initial contribution to the capital investment (Giné and Pérez-Foguet, 2008). To plan for this water project, the DWD used the population from the 2002 Census.

Water infrastructures in Kidoka comprise one diesel-pump borehole, seven domestic distribution points, one cattle trough, eight water meters and one pump house. The number of domestic distribution points varies per subvillage; there are two in Mkalama, two in Mkombozi, three in Shule and one in Kimambo. In Shule subvillage, the waterpoint at the village dispensary is not functioning. With regards to functional water points, the average number of users per waterpoint is 467. This implies a shortage of water points because the existing ratio exceeds the national standard (one water point per 250 people) by 217 people.

The water project is managed by the eight members (four men and four women) of the VWC and operated by a private operator. The equal number of men and women in the VWC conforms to the requirement of the 2002 water policy. The VWC members are elected through the village assembly. Each sub-village has two representatives in the VWC, a man and a woman. From the FGDs and interviews with the leaders, the following qualification criteria to become a member of the VWC transpired: being an adult (aged 18 and above), able to read and write, trustworthy, and willing to volunteer. The last two criteria are essential because VWC's members handle money and are not compensated for their time. The VWC meets once a month and it convenes an extra meeting when there is an emergency such as a breakdown. The current members of the VWC were elected in April 2011 and had not been provided with any training. They manage the water services through sharing their experience with the village leaders and other villagers who are willing to contribute their knowledge upon request.

According to the secondary data on village water management and focus group discussions, the private operator is contracted for one year through a tender conducted in the village. The village receives technical support on contracting the

private operator from the district council mainly the DWD and the District Legal Officer. The private operator is responsible for the 'minor' operation costs (minor repairs), paying monthly allowances to the pump attendant and the security guard, and daily allowances to water sellers. Repairs are considered minor when the costs do not exceed TSH 100,000/= (about US\$ 63.98)⁷. The daily allowance is for seven water sellers, six at the domestic distribution points and one at the cattle trough. Each water seller is paid TSH 2,000/= (about US\$ 1.28) per day.

The users' fee is paid per bucket of 20 litres, at TSH 20/= (US \$ 0.013) and TSH 30/= (about US\$ 0.019) per head of cattle and TSH 10/= (about US\$ 0.006) per head of goat and sheep. As reported by the Village Executive Officer and the VWC treasurer, the private operator is required to pay the village every month with specifications based on seasonality. During the dry season, mainly from July to November, the operator pays the village TSH 800,000/= (about US\$ 511.84) and during the rainy season, from December to June, the operator pays TSH 100,000/= (about US\$ 63.98). The amount of water revenues the operator pays to the village during the dry season exceeds that of the rainy season by TSH 700,000/= (about US\$ 447.86). This is because during the dry season the villagers use more water and people from neighbouring villages with unreliable sources come to Kidoka to get water for domestic uses and livestock. Seasonal fluctuations in the availability of water in rural water schemes are known in other African countries as well, as documented in various studies (Uzomah and Scholz, 2002; Katsi *et al.*, 2007; Arouna and Dabbert, 2010; Aper and Agbehi, 2011). Looking at the terms of payment of the water service provider's contract, we see intersections between the water service, seasonality and the legal context. However, the legal context is not the focus of our research.

3.4.2 Community mapping process and participants' roles

The CWSM participants provided inputs in the mapping activity on village boundaries, land uses and land cover, public social services, and the location and condition of water distribution points. Before drawing the sketch map, the participants discussed the location of the village in relation to the main road and the compass direction. During that discussion, the participants requested two old village maps to use as references. At first, they requested for the oldest map available in the village which was used when Kidoka was an Ujamaa⁸ village in 1970s. It shows the layout of different land parcels and their uses during the

⁷ Based on exchange rate of 1 US Dollar equal to 1,563/= Tanzania Shillings on August 2012. The exchange rate was taken from Indicative Foreign Exchange Market Rates in the Central Bank of Tanzania in <http://www.bot-tz.org/Default.asp>.

⁸ The Ujamaa concept was introduced in 1960s in Tanzania by its first president the late Julius Nyerere as the core focus of social and economic policies for rural development based on collective agriculture and the villagization approach

Ujamaa era. The second map was made during the village registration exercise in the 1980s by the Ministry of Land, Housing and Settlement Development. This map mainly shows boundaries that demarcate Kidoka and neighbouring villages. The maps referred to are shown in Figure 3.2. While referring to the old maps, discussions on historical issues continued among the participants and they affirmed that the old maps helped to place their village in the right location and identify its boundaries with the neighbouring villages. The following fragment of the discussions during and after mapping exercise illustrates this:

“These two old maps have helped us to find a starting point to draw the sketch map and to place our village in the right location. In fact, the old maps have enabled us to use relatively less time for the mapping exercise because we did not have to figure out so much about the site and boundaries of our village by ourselves.” (Mapping participants in Kidoka village, 8 August 2012)

The previous quotation affirms the findings of Corbett and Rambaldi (2009), on the ability of the community mapping processes to illustrate close relationships between local people and their area, which Parker (2006) refers to as inclusion.

In a study carried out in Canada by Johnson (1992) as cited in Corbett and Rambaldi (2009), it is pointed out that local knowledge about the land in participatory mapping is communicated in form of stories. Using the two old maps, the participants started to draw a sketch map by beginning with the main road, public institutions at the village centre, and the boundaries between the study area and other villages. When asked why they started with those areas, the participants explained that they always use the main road to travel and to go to the public institutions, such as the village office, primary school, and dispensary. This demonstrates the connection between the mapping participants and important public spaces in their environment. Our findings concur with a study on community mapping in Canada that discovered that “maps are able to capture emotional and other abstract connections experienced by the mapmaker” (Amsden and VanWynsberghe, 2005: 361).

During the mapping exercise, the following patterns were observed: division of roles related to map drawing based on age and sex, interactions among men and women, age variation among group members and turns in speaking per subject matter under discussion. Older men and women from 55 to 67 years dominated the discussion on village boundaries and changing land uses, linking it to the history of the village since its establishment in the 1960s. Two relatively younger men (39 and 45 years) had been chosen by their fellow participants to lead the drawing exercise because they could draw faster than the others. One of the two men had participated in the mapping exercise during the preparation of the 2009 village development plan. There were no major differences between men and women participants in terms of their contribution, although an age pattern could

be observed in the discussions on the settlement and its expansion when labelling residential areas. Participants in their early 50s and older who were natives of Kidoka village could say more on the expansion of settlements in the Majengo, Songambe, Mbagostaa and Ndachi neighbourhoods that were previously farmlands. The use of the old maps in our study has enthused retrospective dialogues and enhanced the correctness of the sketch map. This corroborates the findings of Corbett and Rambaldi (2009) that local and supplementary sources of spatial and non-spatial information have the potential to improve the accuracy of the final map output. The two old maps in Figure 3.2 are not very clear because the original hard copies are not very legible.

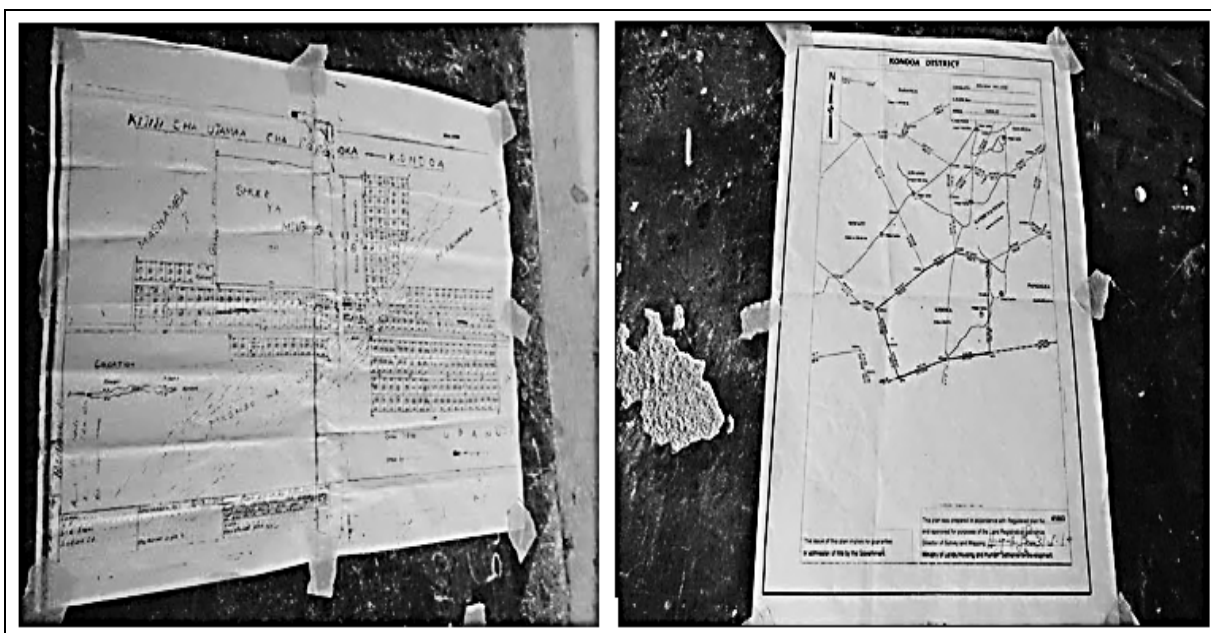


Figure 3.2 Old maps of Kidoka village used as point of reference during the mapping exercise.

The map on the left-hand side was used in Ujamaa village management and that on the right-hand side was used during the village and land registration exercises

3.4.3 Geocoded transect walk and inspection of water infrastructures' condition

After the sketch mapping, we carried out a geocoded transect walk by using the handheld Global Positioning System (GPS) receiver "Garmin 12". Throughout the geocoded transect walk most water infrastructures observed had some defects, such as leakage in a water tank, broken water meters (all 9), cracked and missing water meters' tops (6 out of 9), broken taps (2 out of 8), and an incomplete pump house. Figure 3.3, shows a set of photographs displaying water infrastructures

with defects. The sustainability of the water service in the study area is at jeopardy if immediate and essential measures to repair the infrastructures are not taken.

From the FGD and the interviews with the village leaders, we discovered that leakage of the water tank and non-functionality of water meters occurred since 2007, just a few months after project inception. Nevertheless, since then the tank and meters have not been repaired. The situation has not been given due attention, because the breakdowns have not (yet) caused acute unavailability of water services in the village. In the discussions while mapping, it transpired that type and prominence of broken-down water infrastructures influence promptness to do repairs. The village chairperson commented: *"The water pump is a very important machine for water availability in the village. Its importance to the availability of water service in this village is almost like that of the heart to human life"* (Village chairperson, 7 August, 2012). We confirmed from the mapping participants that women play instrumental role in the VWC and 'push' timely repairing of the water pump whenever it collapses. One participant clarified:

"Truly the women in the water committee are a very big 'push', because when the water pump is broken women members insist that it should be fixed on the same day or very quickly because the broken pump implies no water in the village. Absence of water affects women more because a woman always 'plays with water'. Women will be required to walk longer distances to fetch water from our neighbouring village called Haneti, which is very far by foot" (Chairperson of the VWC, 8 August 2012).

The above quotation reaffirms that women's roles in provision and collection of domestic water subject them to more difficult experience than men whenever water pumps cease to function (Mandara *et al.*, 2013). The leakage of the water tank inhibits its use to its full capacity, which compels the pump attendant to pump water twice or thrice a day. This is inconvenient to the attendant, especially during the farming season. The broken water meters in all eight distribution points pose a challenge to the monitoring of water funds, because neither the VWC nor the operator can keep track of the exact amount of water pumped and the revenues from selling water. Other studies have found that unmetered water supplies lead to heavy losses of revenues to water utilities (Mashauri and Katko, 1993; Chitonge, 2010). Likewise, presence and use of working meters support the estimation of the daily amount of water and generated revenue in the village. When broken-down parts of water taps are unattended for a long time, it may lead to a major failure of the water point and ultimately it interferes with the sustainability of the whole project. Hoko and Hertle, (2006) demonstrated the role of rehabilitation in the sustainability of water infrastructures in Zimbabwe. The loose window in the pump house (see picture in Figure 3.3) jeopardises security of the pump and its frames. From a technical and managerial perspective, neglected, broken and loose infrastructures may deteriorate and become costly to replace.

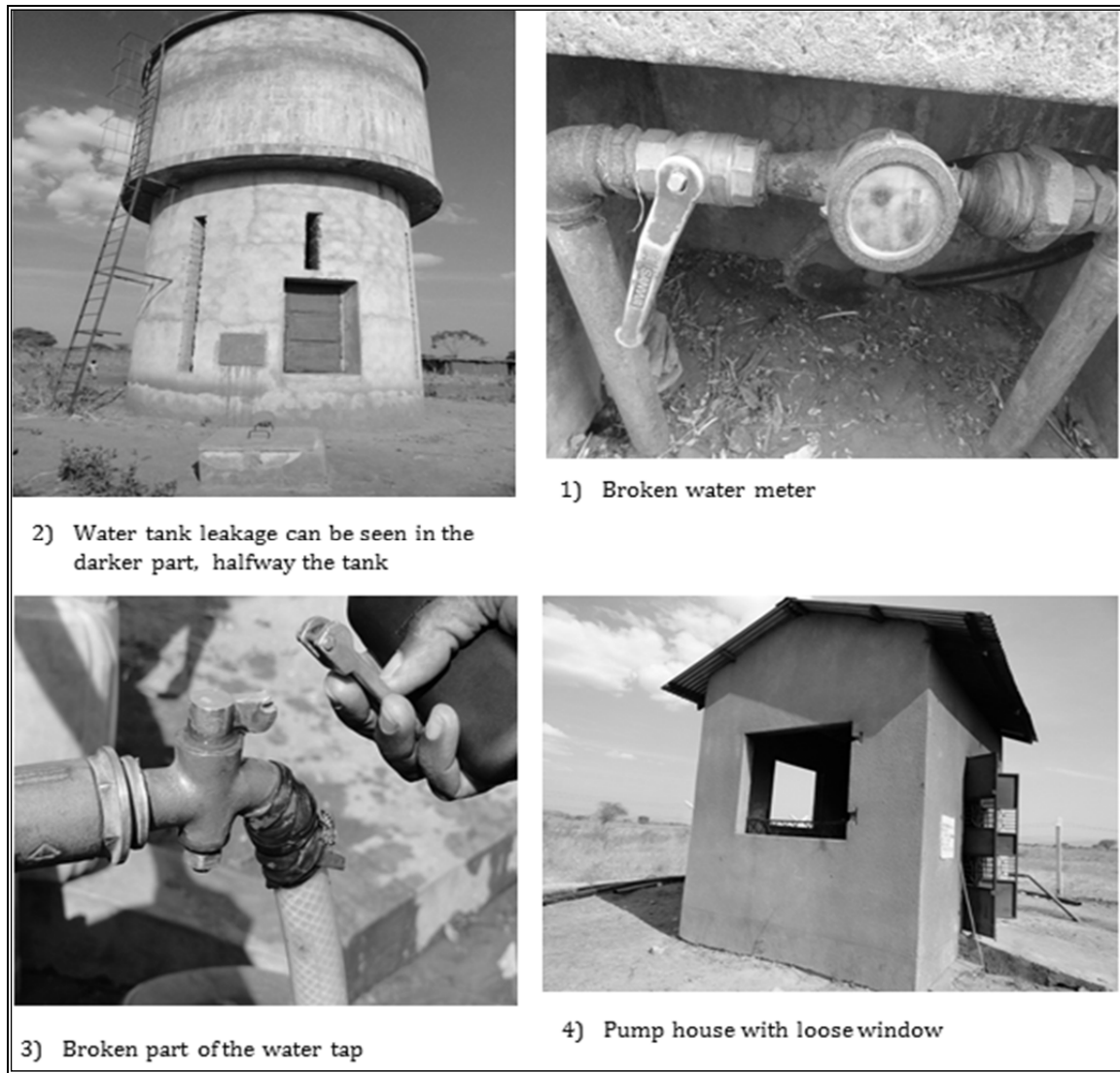


Figure 3.3 Photographs showing water infrastructures with defects in Kidoka village.

Note* All photographs were taken by the first author during data collection in the village in 2011/2012.

3.4.4 Seasonal water services accessibility

A wide range of literature has reported on the relationship between seasonality and the availability of domestic water in the rural areas of developing countries (Rached and Rathgeber, 1996; Thomas, 1998). It is habitually assumed that during rainy seasons the distance to water points in rural areas decreases because rainwater can be harvested by those with iron sheets roofing, gutters and other appropriate gears. Moreover, temporary sources such as seasonal rivers develop and ponds are sometimes formed (Katsi *et al.*, 2007; Arouna and Dabbert, 2010; Aper and Agbehi, 2011). In our study we observed that rain water, especially from ponds, was not used for all types of domestic water uses. For details on the latter

see Mandara *et al.* (2013b). Most households continue to collect drinking and cooking water from the public water points. In fact, during the rainy season to some villagers time and distance to the nearest water point increased from 1.5 to 6.4 kilometres because the private operator closes five out of the seven functional distribution points for domestic water. The operator closes the identified water points to reduce administration costs under the assumption that rainwater becomes an alternative source of water. When five water points are closed, water users in different subvillages are affected in different ways depending on the number of water points and the location of the ones that continue to be operational. For example, in the subvillages of Mkalama and Mkombozi, one distribution point is closed and one continues to provide services. Shule and Kimambo remain without water services in their subvillages because all water points at Shule are closed down and the only water point in Kimambo is closed as well. This implies that during rainy season the whole village depends on only two distribution points for drinking and cooking water uses: 'Stendi' or 'Kwa Mama Ndee' in Mkalama sub-village and 'Msikitini' in Mkombozi sub-village (indicated by arrows in the sketch map in Figure 3.4). Referring to Section 5.1 the whole village population of about 3274, depend on two water points (ratio of 1 : 1637) during the rainy season, which by far exceeds the water policy standard. The mapping participants reported that villagers from Mkombozi subvillage, especially those living at Songambebe neighbourhood, have to walk up to about 6.4 kilometres to fetch drinking and cooking water at the 'Msikitini' distribution point. In Kimambo subvillage, villagers from Mbagostaa neighbourhood have to go to Mkombozi subvillage, which is about 4.8 kilometres away. These distances substantially exceed the 400 metres that is the national water policy standard. Moreover, closing the two functional distribution points during rainy season at Shule subvillage where there is village dispensary, causes unnecessary inconvenience to dispensary workers and patients, particularly to women for whom the dispensary also functions as a place to give birth.

In Figure 3.4, the four encircled areas are relatively new settlements: Majengo in the northwest, Songambebe the northeast, Mbagostaa in the southeast and Ndachi in the southern part of the village. The land on which these settlements are built was farmland in 2007 when the water project was implemented. The village leaders disclosed that the settlements are increasingly expanding towards the neighbourhoods mentioned earlier. Households in those areas experience water shortages since there are no domestic water points. Furthermore, the villagers residing in the newly developing settlements have to walk from 45 to 90 minutes to get water services from the nearest distribution points, while the national standard for a round trip is 30 minutes (MoWLD *et al.*, 2002; URT, 2010c; 2012). This implies that after implementing village water projects one needs to consider population changes in monitoring and evaluation because population

variables change over time. To achieve a basic service level in rural areas, the water policy requires year-round supply of 25 litres of potable water per capita per day from a protected water point serving 250 people within 400 meters and spending 30 minutes for a round trip (URT, 2002; 2010c; 2012). Evaluating extent to which these criteria are achieved or not requires timely, valid and up-to-date information on the village's population size and its spatial distribution. The Village Executive Officer confirmed that the trend of settlements development continues due to migration of pastoralists from other areas.

"There is an increase of migrants in our village especially from pastoralist societies like Sukuma, Barbaig and Maasai. This happens to the extent that the village population records of February this year are expected not to be correct anymore because some of the migrants do not report to the village office upon their arrival. Most of them are settled far away from the village centre, especially in the neighbourhoods of Mbagostaa and Songambe" (Village Executive Officer, 8 August 2011).

During the feedback session after the mapping exercise, the participants and village leaders expressed that from their experience as villagers they knew about a need for additional water points in the emerging settlements. Then the mapping participants said that after producing the sketch map it became clearer which the exact neighbourhoods are that need additional water points. They further mentioned that, their experience from sketch mapping could become a starting point for the discussion on additional water points with the District Council. The participants' views are expressed as follows:

"Our participation in the mapping exercise and the map we have produced has enabled us to know the exact areas that need immediate attention, especially Mbagostaa and Songambe, as there is no any water point in their neighbourhood. The experience can also contribute to the discussion on the expansion of water services in the village" (Mapping participants, 8 August 2012).

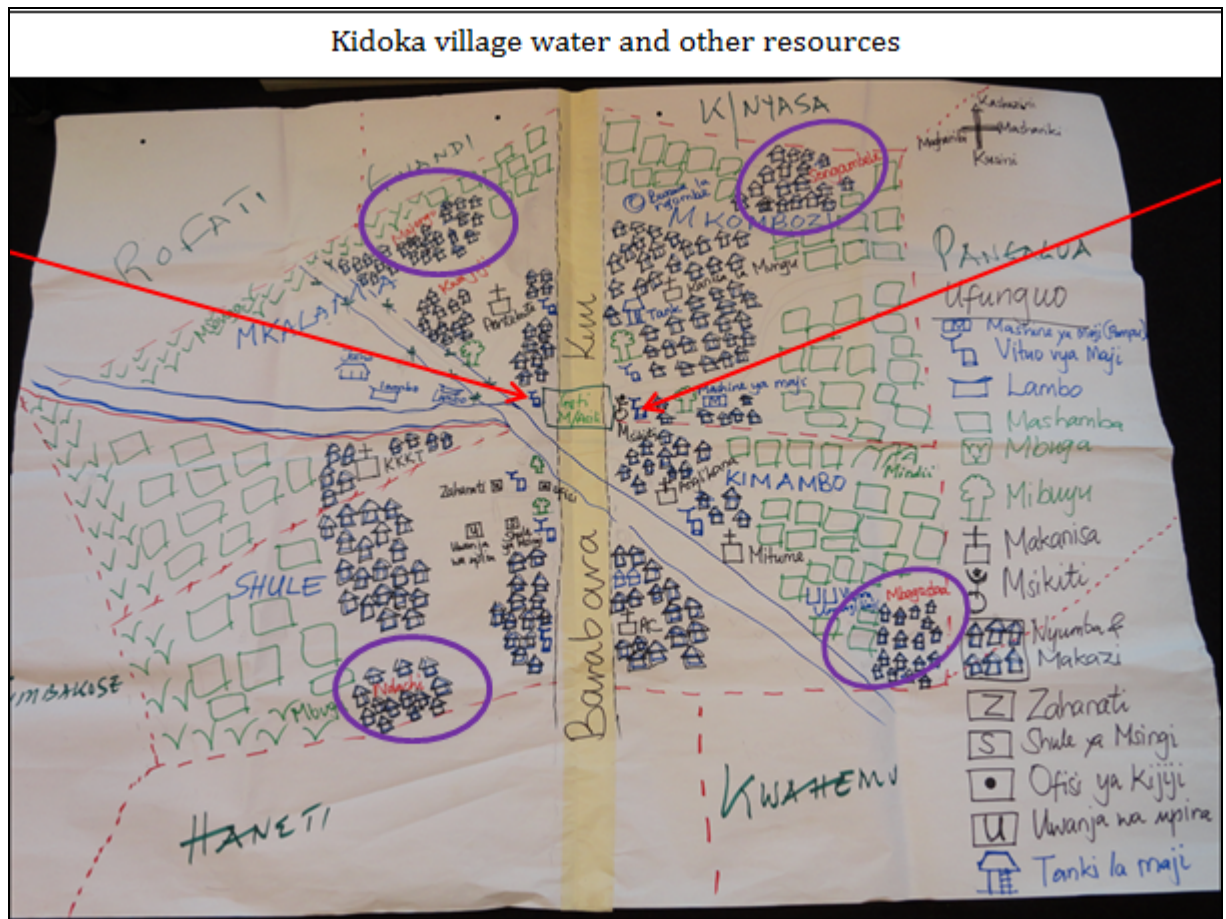


Figure 3.4 Kidoka village map showing village resources and dynamics in accessibility to domestic water service (arrows point at water points during the rainy season; circles show recent residential areas).

3.5 Conclusions

CWSM has shown an added value in assessing village domestic water coverage. The letter “S” of service in CWSM connotes the role of service users in data collection and map production. This makes CWSM a valuable methodological tool to enhance validity and reliability of the village’s domestic water service information.

CWSM conducted in an interactive setting with the participants from local households, elicits users’ knowledge and perspectives on spatial and non-spatial aspects of domestic water services in their locality. Combining participatory sketch mapping with the geocoded transect walk has the potential to observe, understand and document the actual situation of the village’s water infrastructures. For instance, the information on broken infrastructure would not be fully captured during the survey, especially when the infrastructures are not near the surveyed households. The processes revolving around these techniques and their triangulation play an important role in validating the information on actual village

water services coverage and the status of the infrastructures. In this way, CWSM supports the assessment of the existing situation on the accessibility to village domestic water services as experienced by the service users in relation to the policy guidelines.

CWSM has shown the intersections between seasonality and the dynamics of the accessibility of water services, as well as intra-village variation among the subvillages in Kidoka village. The mapping exercise in our study was done once; insights on seasonal variability were obtained by additional questioning. Yet, the application of the CWSM approach enabled to reveal changes on the population's spatial distribution from the pattern that existed when the water project started. The situation depicted in the sketch map links spatial and demographic features at village level. This information could allow the relevant higher administrative levels from the district council onwards to prearrange possibilities for expanding installed water service to reflect changes in the population size and distribution. Then it is possible to strategize and prioritise interventions to the neighbourhoods with limited water access.

Our results imply that application of the CWSM methodology yields relevant, accurate, representative and up-to-date information that is important for the monitoring and evaluation components of the rural water sector. Therefore, we suggest starting with CWSM in villages with domestic water projects, especially in the districts where WPM has not yet been done. Because even within villages with improved water services there are differences in patterns and dynamics of the accessibility among sub-villages and neighbourhoods. We propose to do this annually. The appropriate time could be at the end of the dry season, because during that time water use and breakdowns increase and the villagers will have time to participate because it is not a peak time for farming activities.

CWSM can be integrated in the preparation of the annual village development plan. At the district level it can be incorporated in the annually scheduled district development plans exercise. CWSM can be added to the water sector performance monitoring tools as a technique that uncovers micro-level users' perspectives and the spatial-temporal dynamics of domestic water services. CWSM is appropriate and relatively affordable. It has less technical, financial, managerial, infrastructural and other procedural complexities than WPM for which these are a persistent problem (Jiménez and Pérez-Foguet, 2008; 2009, 2010a, 2010b, Welle, 2010; URT, 2011b). CWSM as applied in our study can be placed in the category of ethno (carto)graphic methodologies (Wilson, 2009), sharing the theoretical and operational underpinnings of the ethnographic and cartographic research strategies.

In institutionalising CWSM, there is a need to be alert to the risks of up-scaling caused by the multiplicity of local context features, limitations from its interactive nature, and its chances to become politicised. Therefore, when CWSM is

introduced, the facilitators need to adhere to good practices and ethics pertaining to mapping and participatory processes (cf. McCall, 2004; Chambers, 2006; Corbett and Rambaldi, 2009). Application and up-scaling of CWSM requires an answer to the question of the harmonisation of CWSM with other monitoring and data collection tools that are fragmented and come with different formats. An equally relevant issue is that of the relationship between the external facilitator (outsider) of the mapping process and the participants (insiders) in safeguarding the authenticity and local ownership of the results. Local power relations and the dynamics of the different positions of the actors involved in CWSM processes (mapping participants, researchers, development practitioners and politicians) can cause the results to be contested. These challenges require a thorough and transparent preparation of the CWSM that is sensitive to socio-cultural differentiation among the users and can avert it from being politicised.

Chapter 4

Gender, Households and Domestic Water Services⁹

This chapter highlights the interface between gender roles in water provision and use at household and community level; and its relationship with women's practical and strategic gender needs. The findings show that women gain more knowledge on the appropriateness of water for consumptive and productive uses while pursuing their reproductive roles in the provision and use of domestic water. However, social-cultural context limit women's participation during designing and planning of water services at community level. Ultimately, women's preferences and perceptions on the appropriateness of the domestic water are not integrated in the water projects. This chapter contributes to the analyses on the interdependence between women's domestic water needs, their involvement in community management and the bigger picture of gender roles in the society.

⁹ An abridged version of this chapter is published as Mandara, C.G., Niehof, A., van der Horst, H (2013) Does women's representation in local water management lead to better meeting women's domestic water needs? *International Journal of Social Sciences and Humanity Studies*, 5 (1), 43-62.

4.1 Introduction

Generally, rural water supply started as a technical and male-domain sector, in which the differences between the roles of men and especially the roles of women were overlooked (Van Wijk-Sijbesma, 1985, 1998; Harvey and Reed, 2004; Singh, 2008). The non-participatory approaches resulted in failures of many water projects due to institutional and managerial problems during the 1970s and 1980s (Therkildsen, 1988; Van Wijk-Sijbesma, 1985; 1998). To address these failures there were global initiatives, such as the resolutions of the two international decades¹⁰ and Principle 3 of the 1992 Dublin Principles, which mandated women's involvement in local water committees (Van Wijk-Sijbesma, 1985, 1998; ICWE, 1992). During the 1970s and 1980s, the sector experienced major paradigmatic shifts in which the emphasis was on gender mainstreaming and integration and on addressing the implications of water and sanitation interventions on men and women (Zwarteveen *et al.*, 2012). The initiatives focused on the appropriate linkages between gender and sustainable management of rural water supply (Van Wijk-Sijbesma, 1985; 1998; Harvey and Reed, 2004; Singh, 2008). In addition to that gender awareness in domestic water became pertinent in accord to 'meeting people's needs' theme in the sector (Udas, 2012). Despite women's multiple roles (Kabeer, 1994; Moser, 1989, 1993) and responsibilities in domestic water provision and use, they did not have a voice in the decision-making on and management of rural water supplies (Van Wijk-Sijbesma, 1985, 1998). Through daily household responsibilities, women acquire robust local knowledge on the quality and appropriateness of water for consumptive and productive uses from their interaction with the sources, the environment and their roles.

Following from a concern with women's lack of voice in rural water supply management, women have been integrated into local structures managing water services in Tanzania. Lack of voice can be subsumed under women's strategic gender needs, which are needs that originate from women's ideological subordination to men. They vary depending on the particular cultural and socio-political context within which they are formulated (Moser, 1989: 1803). Practical gender needs are the needs that arise from the concrete conditions women experience and are a response to immediate necessities that women identify within a specific context (Moser, 1989: 1803). The integration of both women and men in community water management is considered vital because their gender roles and needs are different, dynamic and vary with time and across geographical locations (Van Wijk-Sijbesma, 1985; 1998; Khosla *et al.*, 2004; Sever, 2005). Changes that occur at community level may also affect gender roles and needs in the household.

¹⁰ International Drinking Water Supply and Sanitation Decade (IDWSSD, 1981-1990) and United Nations Decade for Women (1976-1985)

Similarly, changes in domestic practices may have repercussions for women's representation in the community.

Literature on gender and the intra-household organisation of reproductive and productive roles indicates a gendered division of labour in provision and uses of domestic water (Moser, 1989; Van Wijk-Sijbesma, 1985; 1998; Kabeer, 1994; Wakeman *et al.*, 1996; Van Koppen, 2001; Faisal and Kabir, 2005; Gleitsmann *et al.*, 2007). The division of labour is influenced by household characteristics, intra- and extra-household relationships, and is embedded in social-cultural structures (Kabeer, 1994; Thompson *et al.*, 2001; Faisal and Kabir, 2005; Gleitsmann *et al.*, 2007; TGNP, 2009; Amin, 2010). Domestic water management consists of many activities in which men and women have different responsibilities and revolves round questions like: Who fetches water? For what uses? From which source? When a user fee is required, who is paying for it? Who decides on water uses in the house? The answers to these questions are found in arrangements that are based on domestic routines, negotiations and to a certain extent cooperation in the provision and use of domestic water (Agarwal, 1994; Kabeer, 1994). Recognizing the hegemonic nature of routines and the difficulty of changing this through negotiation, women in northern Burkina Faso refused to marry anymore into villages with severe water scarcity, because the burden of water provision would not be shared and this would lead to quarrelling between the spouses¹¹. Most studies indeed indicate that it is women who are primarily involved in provision and uses of domestic water at the household level. "They [women] decide which water sources to use for various purposes, how much water to use, and how to transport and draw the water (Van Wijk-Sijbesma, 1998: 41)."

Studies investigating gender and local water management tend to highlight changes in the management of water resources and services at the community level. These studies emanate from a policy emphasis on women's strategic gender need for participation in local water management structures. This reflects an implicit recognition of the practical gender needs of women, for whom accessible domestic water is vital for carrying out their reproductive roles and domestic duties. However, little is known about how women's representation in local water management, whether this indeed addresses their strategic gender needs and in fact translates into meeting their practical gender needs. Having women in the VWC is one thing, but what they can achieve in a given socio-cultural context is another (Cleaver, 1998a; 1998b; Hemson, 2002; Rao and Kelleher, 2005). Understanding this is crucial for gender-sensitive rural water supply policy and planning.

Even though there is ample research on the household and the community regarding the gendered nature of water use and management, the interface

¹¹ Personal communication C. Butijn, Wageningen University.

between the two arenas in this respect is not well documented. On the one hand, the different responsibilities of men and women in the household also affect their involvement in decision-making and management of public water facilities (Regmi and Fawcett, 1999; Gleitsmann *et al.*, 2007; Bhandari and Grant, 2009). On the other hand, it can be hypothesized that different gender roles and responsibilities in the community will affect gendered involvement and responsibilities of water arrangements in the domestic arena. This chapter focuses on the interface between gender roles in water provision and use at household and community level and its relationship with women's practical and strategic gender roles.

4.2 Household, gender and domestic water: Interwoven complexities

The household is the arena within which people provide and manage resources for their daily needs, including water (Rudie, 1995; Niehof, 2004a, 2011). For the “empirical significance of household relationships in the daily management of resource entitlements, and as the routine context of people's lives”, Kabeer (1994: 114) coined the term ‘facticity’. Included in this facticity is the gendered nature of these household relationships, of the household division of labour, and of the distribution of power and benefits (Evans, 1991; Kabeer, 1991; Agarwal, 1997). Thus, household, gender and water are, as the title of this section indicates, interwoven complexities.

In conceptualising the household, the balance between seeing it as a unit of production or consumption continually shifts, depending on context and through time. In seeing the household as geared towards providing for the daily needs and well-being of its members (Wilk, 1989; Rudie, 1995; Kabeer, 1991; Niehof, 2004a, b) its productive functions are emphasized. With the emergence and growth of consumer society in large parts of the world, the household became framed as a unit of consumption with household members increasingly deriving their identity from consumption (Sassatelli, 2007). In most policies on public services, including water services, the household is implicitly or explicitly, considered a unified unit of consumption (Evans, 1991). In our study, we see the household as the arena of everyday life in which resources for the provision and utilisation of domestic water are generated and managed (FAO, 2004; Niehof, 2004b, 2011) and highlight the household's productive role in enabling and enhancing domestic water consumption.

Water is indispensable for household livelihood activities and for safeguarding the health and hygiene of household members (FAO, 2004). In this study, water provision at household level comprises paying user fees, and fetching, transporting, storage and in-house management of water. Domestic water uses include reproductive ones such as water for drinking, cooking, bathing,

laundry, sanitary purposes and cleaning dishes and house premises, and productive uses such as livestock watering, brick making, food vending, brewing and vegetable gardening.

The gendered nature of household production plays a large role in the persistence of gender differences. As Rudie observed, the gender system in households may be resistant to change, “households are the fields of interaction in which deep-seated features of a gender system are reproduced through social practices” (Rudie, 1995: 228). This also applies to water provision. This gendered understanding of responsibilities for water is shaped by social practices within the household, but also by outside developments, such as the representation of women in local institutions for water management.

Where, as in the study area and in many other parts of the world, women are responsible for the reproductive activities of cooking, cleaning and care, they are the primary domestic water users. Water for various domestic uses is mainly fetched, transported, stored and managed by women. These and other domestic responsibilities leave women little time to participate in community management (cf. Moser, 1993, on women’s triple role), which hampers addressing their strategic gender needs and meeting their practical gender needs.

Women also make decisions on the appropriateness and allocation of water for specific needs. Such decisions should not be understood according to psychological or economic notions of individual decision-making. They are embedded in culture, including in trans-generational knowledge and women’s judgement of the convenience and social appropriateness of technologies (Elmendorf and Isely, 1983; Van Wijk-Sijbesma, 1985; 1998 Cleaver, 1998a; Faisal and Kabir, 2005; Gleitsmann *et al.*, 2007; Sijbesma *et al.*, 2012).

The gender lens is essential for understanding the provision, use and in-house arrangements of domestic water (Wakeman *et al.*, 1996; Seager, 2010). Gender analysis has been employed in research and development planning to assess the role of gender and changes of the gender relations in institutions (Feldstein, 1989; March *et al.*, 1999). In this study, we combined the gender roles framework of Kabeer (1994) and Moser’s (1989, 1993) concepts of women’s practical and strategic gender needs. Kabeer’s framework constitutes a matrix of questions that focuses attention on gender divisions in production of goods, services and human resources as well as in access to and control over resources and benefits (Kabeer, 1994: 271). This approach enabled us (i) to examine gendered patterns and their implications in ‘who does what and how’ in terms of obligations and efforts in the provision and uses of domestic water, (ii) to capture the local context of the gendered household-community interfaces in schemes for domestic water provision; and (iii) to address private-public spheres relations and their social-cultural construction (see also Feldstein *et al.*, 1989; March *et al.*, 1999; Udas, 2012). Despite their relevance, gender analysis frameworks can have the following

weaknesses: their application depends on objectivity of the user(s), they can confuse the issue when their application is politically motivated, and they are time consuming to apply. In applying a combined framework, we hope to have minimised these weaknesses.

Capturing the interface between the two arenas of water provision and use of the community and the household, both considered gendered arenas, requires an understanding of the household's social-economic characteristics and their linkage to the water services. Through the lens of the combined gender analysis framework and by using qualitative and quantitative methods, this chapter presents micro level evidence on gender, household and domestic water.

4.3 Methodology

Data were collected from nine villages, in the districts of Kondoa and Mpwapwa. The villages were purposively selected based on: distance to the district headquarters, presence of a public water project, type of water source, and management arrangements. The water sources in the study area included improved and unimproved ones. Although each village had a water project, Seluka village was depending on traditional hand-dug wells and riverbed-sand wells for all water uses because its borehole had broken down. The other eight villages had functioning improved water sources. Five villages had boreholes, two had gravity schemes and one village had a shallow well. In the villages with the improved sources, unimproved sources such as riverbed-sand wells were used for laundry and cleaning dishes and house premises, and for the productive purposes of livestock watering and brick making.

Data collection methods included a household survey, FGDs, key informants interviews, observation, and in-depth interviews with some villagers and case studies. In the survey, questionnaire was administered in 221 randomly selected households. In almost all cases (218), the respondents were women. This is justified by women's pivotal role in domestic water management. To avoid a 'women's only' bias we collected men's views through qualitative data collection methods. The qualitative data yielded contextual details on gender roles in the provision of domestic water and on household arrangements in using water and coping with shortages.

To operationalize women's gender roles and needs, household domestic water management, and their interplay with the rural water schemes, we focused on the household division of labour, the accessibility of water in terms of distance to the water source, time spent on water provision, affordability of the user fee, household characteristics as well as appropriateness of the source in relation to water use. Users' perceptions of appropriateness were indicated by using a three-point scale from 'very appropriate', through 'appropriate' to 'not appropriate'. The

other variables were addressed through the following questions: Who fetches water, for what uses, from which source and when? Who is paying for the user fee? Who decides on water uses in the house? Moreover, finally, it was asked how these practices are reflected and integrated in the planning of the rural water schemes.

4.4 Results and discussion

4.4.1 Household characteristics

About 188 of the households in the sample were male-headed and 33 were female-headed. There were a few *de facto* female household heads whose husbands were migrant workers. Household size ranged from two to ten, with a mean household size of 5.9. On average, the households had two to five children below the age of 18. The majority of the respondents were between 20 and 50 years old. The mean age was 37. Regarding education, 158 (72%) of the household heads had primary education, 47 (21%) had no formal education, four (2%) had adult education, and 12 (5%) had secondary education or higher. For 90 percent of the households farming was the major source of income, for the others it was livestock keeping, small-scale business, wage employment or handicraft.

Regarding duration of stay in the village, 61 percent of the respondents had been living in their villages since birth, 30 percent for more than ten years and the remaining for five to ten years. Most respondents owned the house they lived, only four respondents were renting it. Only 42 houses could qualify as modern according to the classification of the National Bureau of Statistics (URT, 2009a), i.e. were made from concrete with a cemented floor and a corrugated iron sheet's roof. Many households (189) had toilets, built outside and separated from the main house. About 133 households had a bathroom, for the others the toilet functioned as bathroom as well. When there is a bathroom, it is also a separate structure and has a concrete or an earth floor.

4.4.2 Household division of labour in provision and uses of domestic water

Provision of domestic water requires cash, labour and time. Contributions of these resources tend to be divided along gender lines, and the division differs according to cultural context (Van Wijk-Sijbesma, 1985, 1998; Van Koppen, 2001). As stated above, provision of domestic water in our context related to paying user fees, and fetching, transporting, storage and in-house management of water. The performance of these activities depends on the social-cultural construction of men's and women's roles and needs within the household.

Paying user fees

Our results show multiple arrangements for paying the user fee depending on the headship of the household. Of the 149 households that were paying user fees, 128 were male-headed and 21 were female-headed. Not paying user fees occurred because: (i) Sambwa village had a gravity scheme from which water was provided free of charge, (ii) Seluka village had a broken-down borehole, and (iii) in Mbori most of the villagers were not willing to pay the user fee and used a river as an alternative source. In the male-headed households, paying the user fee was a joint responsibility of the household head and his wife. Among the 128 male-headed households, the responsibility to pay the user fee was shared as follows: 94 (74%) household head 26 (20%) wife and 8 (6%) both. In the female-headed households, only the head was paying the user fee, this implies that female heads of household bear more burden than their counterparts. It has to be noted that formally only the head of the household is held responsible for paying the user fee. We looked into the noncompliance to pay the user fee in Mbori village. Respondents and representative of the village council emphasized the salty water from the shallow well, insufficient number of DPs – two DPs for 4470 villagers, and the inadequate flow of water at the DPs. This shows that local realities, alternatives, and users requirements ought to be fitted in when planning and designing new water projects. Avoidable failures that emanate from assumptions that awareness creation and other promotion activities automatically lead to exclusive use of and payment for the improved water supply can thus be circumvented (Van Wijk-Sijbesma, 1998; Harvey and Reed, 2004). It is important to note that in Sambwa village reactive financing was applied whenever there was major breakdown of the water infrastructure (cf. Harvey, 2007). Nevertheless, their approach was unique by ensuring that the livestock keeper who migrated to Sambwa contributed first (and much) on the following grounds: the migrants came to the village and found water system installed, they use more water than basic domestic uses and they are better off.

Fetching and transporting

The survey established that although all household members fetch water for domestic uses, it is predominantly done by women and girls. These observations corroborate findings from other African and Asian societies where drawing domestic water is a female domain (Van Wijk-Sijbesma, 1985; 1998 Moriarty *et al.*, 2004; Hadjer *et al.*, 2005; Faisal and Kabir, 2005; Gleitsmann *et al.*, 2007; Udas, 2012). However, in our study the gender pattern differs between fetching water for reproductive and productive uses, as presented in Figure 4.1.

Figure 4.1 shows that women and girls predominate in fetching water for reproductive uses at the home, while boys and men fetch most of the water for productive uses, mainly livestock watering and brick making. The latter activities

were commonly carried out at the water source or close to it, entailing less of a collection effort. Women and girls featured in productive activities that were carried out in or around the house, such as brewing, food vending, and vegetable gardening. Mokgope and Butterworth (2001) also found that women's productive activities are usually confined to the homestead. Such arrangements enable women to participate in productive and reproductive roles concurrently (Moser, 1989; 1993).

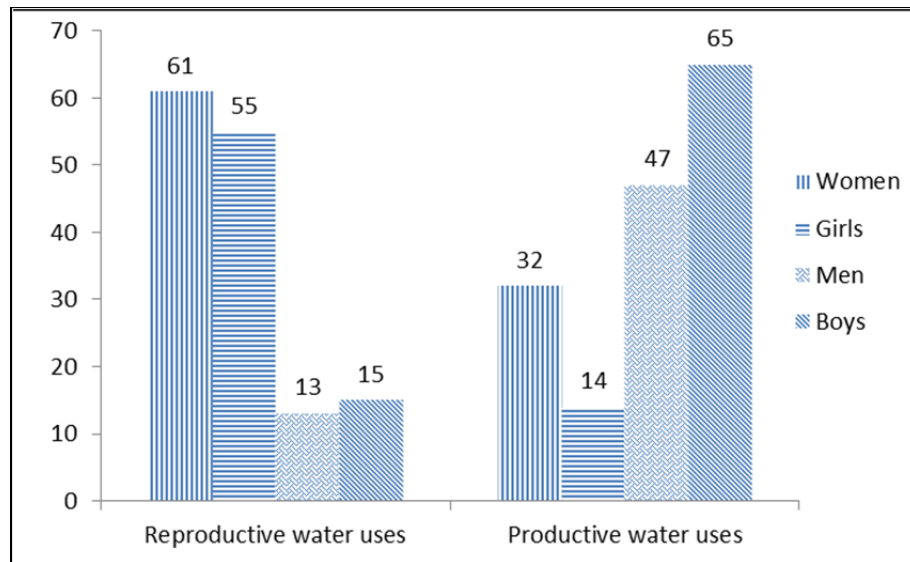


Figure 4.1 Proportions of the household members fetching water for reproductive and productive uses

Gender, water fetching and modes of transporting water

As 143 (65%) respondents indicated, women and girls usually carry water containers from the source to their home on the head, 58 (26%) said they also used a bicycle. The rest were using other means, mainly bicycles and an oxen or donkey cart. The latter were afforded and used by a few households, particularly by men. This implies that for women and girls, water collection entailed a much greater effort than men, also considering that for 132 (60%) households the distance to the source was more than 400 meters and time expenditure was on average of 2:20 hours for a round trip. Our results on the effort of water collection in terms of time and distance are similar to those of Kaliba *et al.* (2003). They are above the national standards of 400 meters and 30 minutes for household accessibility to water services (URT, 2002, 2008a, 2009a).

We found a shift in the mode of water transporting among some Maasai and Gogo men from livestock keeping households around Songambe neighbourhood, Mkombozi sub-village, in Kidoka village. Songambe is about 6.4 kilometres away from the nearest DP. While survey data did not establish any significant relationship between the frequency of fetching water, distance to the nearest DP

and occupation of the household head, FGD information revealed that some of the households whose major source of income is livestock keeping, fetch water only once to thrice a week. They use a donkey or oxen cart, or a tractor when they own or can afford to hire one. Figure 4.2 pictures men transporting water, which signifies a change from the traditional gender division of labour. As Cleaver (1998a) noted, the gender division of labour is not static but changes over time, but is negotiable and shaped by changes in the livelihood system.



Figure 4.2 Men carrying water by using tractor and donkey driven cart

In-house arrangements in reusing water and coping with shortage

We found a gendered pattern related to the in-house arrangements on reusing domestic water and in coping with water shortage. Domestic water was a major input that determined timing and prioritisation of domestic chores such as laundry, cleaning dishes and house premises. Women in the FGDs revealed that domestic chores were organised by maximising on the possibility to reuse water remained from one use to the other. For example, they reused laundry water to clean the house premises and to settle dust in the houses with earth floors.

Another practice found in four villages of Berege, Lupeta, Kidoka and Chase-Chinyika was that women wear different coloured *kitenge*¹² and *kanga*¹³ during the rainy and dry season. The following citation summarises women's responses of in the earlier mentioned villages: "We normally wear dark colours *vitenge* and *kanga* during driest months of the year especially October-November and wear those with white and other light shades in the rainy season." The major reason was shortage of water during the dry season to adequately wash and rinse

¹² *Kitenge* (*vitenge* in plural) is cotton piece of cloth that is decorated with a variety of colours and patterns; it is often worn by women around chest or waist, used as a headscarf, a baby-sling and has other uses related to personal care and as linen for house's interior decoration.

¹³ *Kanga* has very similar uses as the *kitenge* but is smaller and made of lighter material.

light colour fabrics and availability of rain water to do the same during the rainy season. The survey data also showed that about 60 percent of the respondents increased the amount of water for laundry during the rainy season. Several studies in Africa found an association between quantity of water, type of use and season, with an increase in the rainy season and a decrease in the dry season (Nyong and Kanaroglou, 2001; Hadjer *et al.*, 2005; Gleitsmann *et al.*, 2007; Arouna and Dabbert, 2010).

Water for reproductive uses and for female productive uses such as brewing and food vending was commonly stored in the main house or kitchen in plastic buckets, jerrycans or other big containers. To prevent water from in-house contamination women ensured that the storage containers were covered.

Household characteristics and water uses

Household characteristics are among key factors in the delivery of public water services. We found that household size, headship and occupation of the household head determine the amount and type of water use. The survey revealed a strong correlation between household size and amount of water used on daily basis ($r=0.553$; $p=0.01$), as did other studies (Arouna and Dabbert, 2010). Household headship was significantly associated with type of water uses ($p=0.00$). Male-headed households were using 60 percent of the water for domestic purposes and 39 percent for the productive uses of bricks making and livestock watering. In female-headed households, these percentages were 68 and 15, but these households used 17 percent of the water for food vending, brewing and gardening. Occupation of the household head also had a significant influence ($p=0.00$) on type of water use.

4.4.3 Appropriateness of the water service to the household water uses

Water source and use tend to be linked (Van Wijk- Sijbesma, 1985; 1998; Rosen and Vincent, 1999; Thompson *et al.*, 2001; Mokgope and Butterworth, 2001; Moriarty *et al.*, 2004; Amin, 2010; IFPRI, 2010). The perceived water quality determines in what ways water is used for reproductive and productive purposes. The literature on gender and development confirms that women are more knowledgeable and have more explicit preferences than men on the relationship between water source and water use (Elmendorf and Isely, 1983; Van Wijk- Sijbesma, 1985; 1998; Cleaver, 1998a; Hadjer *et al.*, 2005; Sijbesma *et al.*, 2012). When available, women will draw water for consumption from improved sources due to perceived sensitivity of that use and the quality required for it. As Elmendorf and Isely already noted in 1983 (196-7): "Decisions about drinking water are often based on sensory or macroscopic perceptions on colour, taste, or smell, rather than microscopic qualities of technical purity." Water for cleaning purposes is drawn from unimproved sources

when the improved sources is either unavailable or less accessible due to non-functionality, distant location, long queues, or a user fee requirement.

To assess the appropriateness of the service to the users we distinguished two categories of appropriateness: (i) technical and managerial attributes of the water source, (ii) quality and sensory attributes. The first category comprises costs (user fee), distance to the source, water availability at the source, and reliability and quantity of water. The second is about taste, smell and colour (cf. Elmendorf and Isely, 1983). As shown in Table 4.1, the survey established that users have different perceptions about the different aspects of the appropriateness of the water service in the study area.

Table 4.1 Users' perception on the appropriateness of domestic water service (n= 221)

Attributes	Level of appropriateness			Total
	Very appropriate	Appropriate	Not appropriate	
Costs (user fee)	17 (8%)	79 (36%)	55 (25%)	149 (67%)
Distance to the source	28 (13%)	112 (51%)	81 (36%)	221 (100%)
Water quantity and reliability at the source	16 (7%)	105 (47%)	100 (45%)	221(100%)
Water availability at the source	18 (8%)	97 (44%)	106 (48%)	221 (100%)
Taste	38 (17%)	114 (52%)	69 (31%)	221 (100%)
Smell	45 (20%)	152 (69%)	24 (11%)	221 (100%)
Colour	40 (18%)	143 (65%)	38 (17%)	221 (100%)

In Table 4.1, the total of the responses in the user fee category is not 221 as not all households were paying a user fee because of the reasons mentioned in Section 4.4.2. Water availability, quantity and reliability were perceived not appropriate by more than 40 percent of the respondents. When we asked for clarification, it transpired that some of the DPs had no water and at others, the quantity of the water was less than expected. The results on the quality and preference attributes show that more than 50 percent of the respondents judged the water appropriate. However, about 69 respondents regarded the taste not appropriate because they preferred 'soft' water for laundry and bathing, and 'soft and cold' water for cooking especially for beans and tea. Because of its hardness, salty water requires more soap for laundry than soft water, which implies more costs to the household members. In addition, to have clean laundry from salty water one needs to rinse clothes many times and ultimately their bright colours

will fade. Other studies in African semi-arid areas corroborate our findings (Nyong and Kanaroglou, 2001; Gleitsmann *et al.*, 2007). According to Nyong and Kanaroglou (2001), local people's water quality perceptions are based on their indigenous knowledge and should be taken seriously during the implementation of water projects.

During the fieldwork in Potea village in Kondoa district, we found women drawing water from unimproved sources, mainly hand-dug wells. They said that they were using the water for uses such as bathing, laundry, and cleaning dishes and the house premises. These uses fall under women's practical gender needs (Moser, 1989; Amin, 2010). The major reasons given why they were using these sources were distant location of the improved sources and the long queues there, convenience, and saving time for other domestic chores. Figure 4.3 shows a woman drawing water from a hand-dug well.



Figure 4.3 A woman drawing water from a hand-dug well at Potea village

Unimproved water sources are unprotected. They may be contaminated and can ultimately threaten women's and their household's health. The providers rely on water policy frameworks in which the major criteria to position domestic water points are 250 people and a distance of less than 400 metres from the users' homesteads (URT, 2002, 2008a; Giné and Pérez-Foguet, 2008). Village leaders in the study area told us that decisions on the location of the borehole during the initial technical surveys involved key informants, often elderly men. Positioning the DPs at public social institutions like the dispensary, school and sometimes mosque was a first priority. Subsequently, input from the village assembly was sought for the positioning of other DPs. However, most households do not attend the village assembly. The survey showed that only 69 (31%) households of the households, represented by mainly male household heads, participated in the discussions on the location of the water points. The presence of women members in the VWC had

only a slight influence on the location of the DPs, because the women VWC members are required to give their opinion in the formal decision-making context of the village assembly. Their domestic duties often prevent them from attending and when they attend, cultural notions about proper female behaviour in public spheres inhibit them from speaking up. Studies in rural Africa and South Asia have likewise established limited participation of women in the designing and planning of public water services (Regmi and Fawcett, 1999; Hemson, 2002; Gleitsmann *et al.*, 2007; Bhandari and Grant, 2009; Sijbesma *et al.*, 2012).

Apart from improved sources, the villages of Mbori and Kelema Maziwani each have a river that villagers used as an alternative source of water. In Kelema Maziwani village, the user fee for a 20-litres bucket of water from the improved source was TSH 25 (about \$US 0.02) and the price of water from the Kelema river was TSH 150 (about \$US 0.10) per bucket of the same size. This suggests that sometimes users are willing to pay extra to get the service that suits their quality preferences. Women were buying water from the river for drinking and laundry purposes. When probing for clarification from the women users and from youth who were selling the river water, the following was said: “Water from the river is ‘cold’ and has a ‘sweet’ taste; it quenches the thirst quicker than water from improved sources.” In addition, women said that they preferred water from the river “because it is very good for laundry as it brightens white clothes and does not cause discolouration to the *vitenge* and *kanga*.” Similarly, Cleaver (1998a: 350) found in her research that “women have strong preferences for particular types of water for different purposes. The soft water of the sandy riverbeds is favoured for washing best white clothes and for drinking because of its taste.” This shows that availability of local alternatives shapes the choices and preferences of the users. In the discussions with village council representatives, it was said that it would have been of great help if the engineer and technicians could have drilled at least one water point at the riverbed. This suggests that water engineers and related professionals need to investigate local knowledge and ‘standards’ on water quality during the designing phase and that they should integrate these when technically viable.

4.4.4 Women’s representation and role in the village water committees

All nine villages had a VWC with male and female members. Among them, four had a private operator who was sub-contracted by the village to supply water services under supervision of the VWC. Table 4.2 shows that all villages, except Potea, had equal numbers of male and female members, as required by the national guidelines (URT, 2002, 2008a). The VWC of Potea village had five males and three females because one woman who was elected had to quit the post because of her husband’s objections. Major roles of the VWC were to ensure

smooth delivery of services and an adequate water flow to all DPs and cattle troughs. In the villages without a private operator (PO), the VWC members prepare the water-selling roster and take turns to sell water at the DPs, submitting user fee collections to the VWC treasurer. In the villages with a PO, the VWC has to supervise the PO and make sure that the PO timely pays the village the amount agreed per month. The members of the VWC are required to meet once a month and convene extra meetings in case of an emergency such as damaged infrastructure. Apart from Seluka and Sambwa villages, the VWCs in the study area were meeting regularly to discuss the water services.

Some female VWC members mentioned that sometimes they could raise an important point but found it difficult to influence the final decision on the matter by deliberation, especially when the woman raising the point is younger than other VWC members. This reveals the influence of the social-cultural context on decision-making processes in the management of rural water schemes. Cleaver and Hamada (2010) already drew attention to how structures influence voice in terms of hierarchies among women and the constraining norms of proper behaviour for especially younger women, and how this affects women's participation in the formal water governance.

Table 4.2 Composition and management approach of the village water committees

Village Name	Management Approach	VWC Composition	
		Male	Female
Berege	VWC and Private operator	8	8
Seluka	VWC	5	5
Mbori	VWC and Private operator	5	5
Lupeta	VWC	4	4
Potea	VWC	5	3
Kelema Maziwani	VWC	7	7
Kidoka	VWC and Private operator	4	4
Sambwa	VWC	6	6
Chase-Chinyika	VWC and Private operator	6	6

From the interviews with the Village Executive Officers and VWC representatives, it also became apparent that most of the points on the agendas of VWC meetings were related to technical and managerial aspects, such as repair of a broken-down DP, status of the water infrastructures and management of the water fund account and cash kept by the VWC treasurer. Given the points that dominate the VWC agendas and discussion, it follows that women's practical gender needs emanating from their domestic responsibilities, were hardly discussed. In terms of meeting women's strategic gender needs, however, it has to be noted that the affirmative

action of having women in the management of public water facilities provides chances for women as well. The latter is corroborated by the studies on gender in irrigation, sanitation and drinking water policies (Udas, 2012; Sijbesma *et al.*, 2012). In our study, these women gained more exposure to external sources of knowledge and information through interaction with researchers and other visitors visiting the villages for education and developmental work and through training on management aspects, however short. They were also better informed about various opportunities in and outside the village for improving their lives through the discussions during the monthly VWC meetings.

4.5 Conclusion: Interfaces and women's gender roles and needs

By looking at the household-community interfaces, important lessons can be drawn for achieving gender integration in the formal structures of managing rural water services. Women's domestic duties and reproductive and productive roles define their practical gender needs regarding water. Additionally, female household members bear the brunt of the burden of water collection. Kabeer (1994) noted that women family members who are involved in water collection are a human resource; they produce care for other family members although their service is viewed as non-economic, 'natural', effortless and is mostly overlooked by men and development planners. Therefore, a policy intervention such as women's representation in the VWC is important for addressing their strategic gender needs and could be the starting point for addressing their practical gender needs in terms of the resources and costs incurred to get water from the DP to the house. Spending much time on fetching water inhibits women's participation in community management, which – in turn – prevents their practical gender needs from being met.

The cases presented in this chapter demonstrate that placing gender in the formal management structures by having women in the VWCs addresses women strategic gender needs to a certain extent, but does not automatically meet women's practical gender needs. Our results have shown that women's agency in their management role as VWC members is entrenched in social-cultural structures. Besides, the main points discussed during the VWC meetings are not inclined to women's household experiences. This implies that the policy aims and actual practices related to women's representation in the VWC are at odds. Moser's (1989) description of women's practical gender needs formulates '*how, why, by whom*' and '*in what context*' questions to place women's gender needs in the concrete conditions women experience in order to respond to immediate perceived necessities identified by women themselves. Linking this to our results, it can be concluded that addressing women's domestic water needs requires a two-way feedback between decision-making at the community level and practices related to

water provision and use at household level. Women's domestic water needs should neither be viewed as a 'women's only problem' nor treated in isolation from their strategic gender needs. It is important to systematically analyse the interdependence between women's domestic water needs, their involvement in community management, and the bigger picture of gender roles in the society (cf. Alsop, 1993; Kabeer, 1994; Rao and Kelleher, 2005).

The regulations about women's representation in VWCs reflect the recognition of women's key role in household water provision and use. Unfortunately, these women, especially the younger ones, are hardly able to influence VWC decision-making. Theoretically, women have a voice in terms of equal representation, but in practice, it is difficult for them to use their voices in the community arena like in the village assembly, because it is considered inappropriate for a woman to be talkative in public spheres. A related issue is the lack of women's voice in the technical sphere. While women relate to water as managers, providers and users to carry out their reproductive roles, water professionals rarely integrate women's knowledge, preferences and perceptions on the appropriateness of the domestic water in the designing and planning phases of water projects.

Nevertheless, we support the affirmative action of women's representation in the management of public water facilities because it expands their exposure to external sources of knowledge, information and increases their awareness on various opportunities in and outside the village. These benefits, either directly or indirectly, give women the chance to become more informed, confident and widen their horizons for different leadership positions.

Our findings may be contested on the ground that households and villages vary and so do their requirements and perceptions of the appropriate domestic water services. However, our conclusions raise three questions for further research: (i) how are interventions organised to deal with the local context in which women VWC members have to function; (ii) how willing are policy makers and village leaders to challenge the prevailing socio-cultural gender order; and (iii) how do the formal and informal interfaces interact with gender and the management of public water facilities in the rural settings.

Chapter 5

Women and Rural Water Management¹⁴

This chapter discusses how informal structures intersect with women's participation in formally created decision-making spaces for managing domestic water at the village level. The results reveal the layered and contextual nature of the influence of the informal context of women's access to and performance in the formal decision-making spaces. Overall, there is low community involvement in local governance structures and that of women is even less and mostly in the village assemblies. In the VWCs, women's representation is regulated by a quota system but women rarely occupy leadership positions. The relatively large number of women in the social welfare committee reflects the traditional division of labour and women's practical gender needs. Even when husbands are supportive, patriarchal culture, scepticism and negative stereotypical assumptions on women leadership frustrate the government's effort of enlarging women's representation in the local decision-making spaces. Three entry points for change were identified: successful women leaders as role models; women's passive participation in village meetings that could develop into active participation; and women's membership of social and economic groups which strengthens their skills and bargaining position.

¹⁴ Based on this chapter the following article will be submitted: Mandara, C.G., Niehof, A. and van der Horst, H. Women in rural water management in Tanzania: Token representatives or paving the way to power?

5.1 Introduction

Gender mainstreaming in rural water supply is among the major institutional reforms under decentralised rural water service. The approach emerged during the 1970s and 1980s and aimed at addressing the implications of the rural water interventions for men and women (Van Wijk-Sijbesma, 1998). To promote it, involvement of both men and women through community participation was reinforced. In most developing countries, including Tanzania the emphasis on community participation followed the failure of many water projects as a result of institutional and managerial problems (Therkildsen, 1988; Van Wijk-Sijbesma, 1998). It was expected that water projects would fare better if communities had ownership and would be empowered. Furthermore, the notion reigned that local specificities, including gender relations, could thus be more suitably addressed (Narayan, 1995; Van Wijk-Sijbesma, 1998; Harvey and Reed, 2004; Harris, 2009; Furlong, 2010).

These gender initiatives in the sector emanated from the understanding that men and women have different needs and roles regarding water. Being the prime managers and users of domestic water at the household level (Elmendorf and Isely, 1983; Van Wijk-Sijbesma, 1998; Mandara *et al.*, 2013a), women should be able to influence water management and decision making at community level. Until then, however, this was not the case (Narayan, 1995; Harvey and Reed, 2004; Singh, 2008; Seager, 2010). Factors prohibiting women to effectively engage in the management of rural water services have been widely documented in academic and policy literature. Among others, women's demanding domestic workload and the social-cultural barriers they face stand out as major constraints (Hemson 2002; Singh 2008; Bhandari and Grant, 2009; Cleaver and Hamada, 2010; Todes *et al.*, 2010; Udas, 2012; Mandara *et al.*, 2013a). These constraints reflect norms and traditions that shape societal cosmologies, form masculine and feminine identities, govern the division of labour and reinforce social hierarchy (Agarwal, 1994; Rao and Kelleher, 2005; Singh, 2008; Cleaver and Hamada, 2010). To redress the situation, mechanism like a quota system, changes of rules, and training were devised (Kabeer, 2005; Rao and Kelleher, 2005; Harris, 2009; Hicks, 2011).

In the literature the optimism prevails that women's participation in decision making and management makes water services more gender-responsive (Fisher, 2006; Water and Sanitation Program, 2010). Women's representation in village water management became mandatory in the 1980s, when the development community realised women's critical role in reaching the targets of water for all under the 1981-90 International Drinking Water Supply and Sanitation Decade (Van Wijk-Sijbesma, 1998). In the global South, women's representation in the local management structures became a requirement of development agencies (Harvey and Reed, 2004; Harris, 2009; Furlong, 2010). Thus, women's entry into these local

decision-making spaces was 'invited' and 'mandated' by policies, rather than being based on women's own active choice. Still, little is known about how women's representation in village water management structures is achieved and translated into participation. Local social-cultural settings with their specific gender relations and roles were not much taken into account in effecting women's representation in local decision-making bodies (Kabeer, 1994; Rao and Kelleher, 2005; Singh, 2008; Udas, 2012). It was assumed that individuals would enact free choice and advance their interests once a level playing field was formally established. However, such a level playing field cannot be taken for granted, because "gender is historically contingent and constructed, simultaneously embedded in social institutions and cultural meanings" (Lamphere *et al.*, 1997: 4).

The National Water Policy (henceforth NAWAPO) in Tanzania acknowledges the key roles and practical interest of women in rural water provision (URT, 2002:32). A quota system was adopted to ensure women's representation in the formal water management structures at the village level, particularly in the Village Council and Water Committees. The VWC is responsible for managing village water projects on behalf of the village and reports to the Village Council. Although the general policy prescribes women's representation in these structures, it has to be effectuated in areas with diverse customs, norms, traditions and beliefs relating to gender (Guijt and Shah, 1998; Hemson, 2002; Singh, 2008). In many countries, having women in local water management bodies challenges the pervasive socio-cultural notion that such bodies are a public, male domain and use of domestic water is a private, female domain (Hemson, 2002; Singh, 2008; Bhandari and Grant, 2009; Udas, 2012). Because "women have often been associated with the private sphere and men with the public one" (Parpart *et al.*, 2000: 208), incorporation of women in public decision-making spaces does not ensure that their influence will match that of men.

The above background exposes a missing link between the policy mechanism of the quota system and the factors that restrict women's participation at the village level. This begs the question whether women's representation in these structures will truly bring about positive change for women. The fact that women are represented does not mean they are accepted as decision makers and that they have voice, influence and decision-making power in the same way as men. Quota for women can also be 'exploited' politically and do not guarantee women's needs are met. Just as it cannot be said that male representatives are necessarily blind to the concerns of women, it can also not be assumed that women's representation will lead to better outcomes for women in general. Furthermore, women may not always act on behalf of the interests of women when they occupy official positions (cf. Meena, 2003; Kabeer, 2005; Todes *et al.*, 2010).

Against the backdrop of this discussion, the chapter addresses two key questions. First, how does the village-level interplay of formal and informal

structures shape women's participation in the local decision-making spaces for water services management? Second, how do the obstacles facing these women affect the responsiveness to women's stakes in domestic water services?

5.2 Conceptual framework

The framework combines several concepts. Following the work of Moser, a distinction is made between women's practical and strategic gender needs. Practical gender needs are those that arise from the concrete conditions women experience and are a response to immediate necessities that women identify within a specific context. Strategic gender needs originate from women's ideological subordination to men and they vary depending on the particular cultural and socio-political context within which they are formulated (Moser, 1989: 1803). Domestic water is a practical gender need for women because of their reproductive roles at household level. Women's representation and participation in the local decision-making spaces relate to their strategic gender needs for influence in domestic water services governance. To analyse the formal and informal structures influencing women's involvement and performance in the local decision-making spaces and management of the domestic water services, we adopted Rao and Kelleher's 'what are we trying to change' model (2005: 59-61). The model underscores the need for changing the rules of the game in the inequitable social systems and institutions, both at personal and social levels and in the formal and informal relations. Combining the concepts of practical and strategic gender needs with the analysis of the interfaces between the quota system and the informal institutions that determine women's performance in the local decision-making spaces, forms the basis of our conceptual framework as shown in Figure 5.1.

Water development policies intersect with other formal arrangements as well as with informal structures (cf. Nicol, 2000). Overlooking this fact, leads to complications and failures. The formal structures provide women with opportunities to participate in decision-making, but it is the informal structures that govern women's actual access and performance (Kabeer, 2005). Since at village level the informal arrangements tend to prevail over the formal ones Sokile *et al.*, (2005), this study investigates how women exert influence in the formally created decision-making spaces in the village and how the informal context shapes these women's involvement in public management.

We draw on Agarwal's typology of participation (2001, 2010) to examine men's and women's participation in the village decision-making spaces and management, distinguishing gender relations and arenas. Gender relations are the socially constructed practices that manifest themselves in the division of labour, roles, responsibilities and resources between men and women and that are based on attitudes, perceptions and behavioural patterns (cf. Agarwal, 1994, 1997; Parpart

et al., 2000; Rao and Kelleher, 2005). Gender arenas in this study include the household and community (Agarwal, 1994, 1997), because the household is the domestic setting in which water is needed, used and managed, and it is the community that governs water schemes through village institutions such as the VWC and village council.

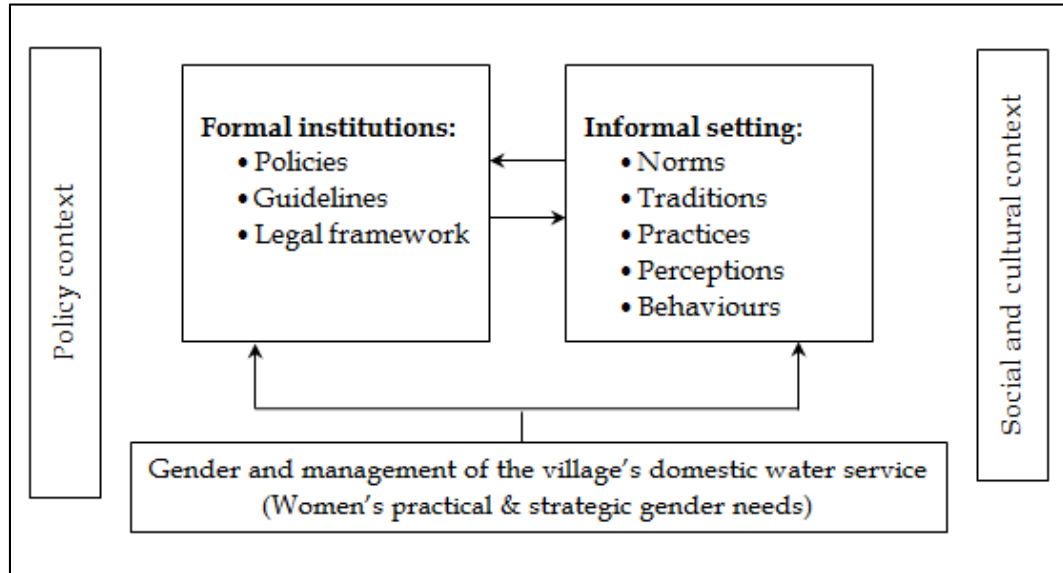


Figure 5.1 A conceptual framework for understanding women's involvement in management of village water service and its formal- informal intersections

Figure 5.1 displays the formal and informal structures related to women's involvement in village-level domestic water management are connected through the linkages between the policy frameworks that create the 'invited' decision-making spaces and the social-cultural environment that dictates access and performance in those spaces. That interconnectedness implies that changes in the formal structures to have a bearing on the informal structures and vice versa.

5.3 Study area and methodology

The empirical research was carried out in 2011-2012, in nine villages in the rural districts of Kondoa and Mpwapwa, Dodoma region, central Tanzania. The villages were selected based on presence of a public water project, type of water source, management arrangements and distance to the district headquarters. Each village had a functional water project, except Seluka that mainly depended on traditional hand-dug wells and riverbed-sand wells for all water uses because the borehole had broken down (for details see Mandara *et al.*, 2013b). In the other villages, villagers could access improved water sources for consumption while sometimes unimproved sources were used for cleaning and productive water uses. The three

types of improved water sources were: boreholes (in six villages), gravity schemes (in two villages), and a shallow well with hand pump in one village.

Data collection combined quantitative and qualitative methods, to enhance the validity and reliability of the results (Small, 2011). The methods employed include a household survey, FGDs, key informant interviews, observation and case studies. Survey interviews were done in 221 randomly selected households, with primarily (218) women respondents. Both men and women featured in the FGDs and the key informant interviews. To put the phenomenon under study in its real-life context (cf. De Vaus, 2001), the cases of three women were documented. These women were selected for the following reasons. They had substantial leadership experience and commanded authority. They had experienced community-family interference and had been confronted with negative community perceptions on women being leaders. We examined practices and processes pertaining to management of domestic water services in the village institutions and decision-making spaces and looked into women groups because of the opportunities these offer for women to strengthen their bargaining position.

5.4 Results

5.4.1 Domestic water management approach

All nine villages had a VWC with male and female members. Four villages had a private operator who was sub-contracted by the village to operate the borehole and deliver water services under supervision of the VWC. In other villages the option was considered. In Potea, the village council was considering to have a PO to increase its water revenues as a solution to the problems with the collection of the user fees. Seluka village had put out a PO tender, but since the major part of the water infrastructure was not functional, no one applied. Mbori village was working to change the terms of the contract with the PO to derive more benefits from it.

The VWC is responsible for the overall management of water projects, selling water (in the villages without a PO) at the distribution points based on the water-selling roster prepared by the VWC, collecting user fees and submitting these to the VWC treasurer, and ensuring a smooth delivery of services and an adequate water flow to all distribution points and cattle troughs. In the villages with a PO, the VWC has to supervise the PO and confirm that the PO timely deposits the agreed monthly amount in the village water fund account. The VWCs are required to meet once a month (but not always do so) and convene extra meetings in case of an emergency, such as damaged infrastructures.

Women's representation in the village water committees

In all villages except Potea, the proportion of women in the VWC was 50 percent. Potea's VWC had five male and three female members because one woman who was elected as a member had to quit the post following her husband's disapproval. The Potea village leaders reported that the husband required his wife to be at home to fulfil her domestic responsibilities and insisted that as a practicing Muslim, it would not be acceptable for a married woman to be involved in public duties without her husband's permission. A recent study in the same village found a similar pattern of women withdrawing from village committees because of their husbands' refusals (Masanyiwa *et al.*, 2014). Such an experience can discourage other women to contest for and accept leadership positions.

The three main positions in the VWC are chairperson, treasurer and member. Chairpersons and treasurers were mainly men; only one woman was a treasurer. Women were mostly just members. The reasons for this, as reported by men and women, include low level of education and lack of awareness among women, husbands' disapproval, and women's demanding domestic chores.

Gender, age and qualification criteria for village water committee members

In all villages the qualification criteria for VWC membership were being a resident in the village, aged 18 years and above, and ability to read and write. Trustworthiness and being literate is important because managing water project involves handling money, preparation and presentation of progress and financial reports. Other criteria such as willingness to volunteer, patience and being committed are also vital, as the work is demanding and not compensated.

Women key informants brought up the subject of trust and were implying that some of the unmarried youth are not trustworthy. The following was reported during women's FGD in Seluka:

"We prefer married youngsters to unmarried ones in the VWC because some unmarried youth can easily disappear with our money and since they do not have their own homestead we will have no one to hold accountable. But if he or she is married you can hold the spouse accountable and therefore one's spouse is our guarantee. If we elect unmarried youth and this person disappears with our money, the parent will tell us that we freely elected the youth as an independent adult and then they will not help us finding the person. For the married youth we can always ask the spouse to give us our money and when he/she refuses we can take an asset that will cover our lost money" (Women FGD in Seluka village, Sept. 2012).

The aforementioned qualification criteria apply equally to men and women, but in the villages of Potea and Kelema Maziwani, marital status and age were specific criteria for women. In Potea, a married woman or widow of advanced age was preferred as a VWC member. In Kelema Maziwani married women were preferred

over single ones. In these villages the justification behind married women was their being settled in the village. Besides, in Kelema Maziwani, an elderly widow was favoured on the ground that it was unlikely for her to remarry, hence there would be no spouse interference. Normally, an elderly widow becomes head of the household and final decision maker. Although the age criterion allows any adult aged 18 and above, there were few young adults (males and females) of ages 18-35 in the VWCs. For young men the opportunity costs of community leadership, which is demanding and unpaid work, are too high. For young women, community perceptions on the socially appropriate behaviour of a 'good woman' discredit young women who are vocal, especially in public places and in the presence of elders.

All POs in the villages of Kidoka, Chase-Chinyika, Berege and Mbori were men, who hired married women, old men and sometimes single ladies to sell water at the distribution points. We found that POs applied the following criteria for hiring the water sellers: basic knowledge of arithmetic and experience of running a small business, parent's approval for young ladies and husband's approval for married women, as well as trustworthiness. Other water facilities' attendants, mainly security guards and pump or tank attendants were men. These attendants were hired by the village office and their allowances were paid by the village in the villages with VWC only and otherwise by the POs. The village office was the main employer for the security guard and pump or tank attendant.

5.4.2 Village assemblies

The village assembly is the major village's decision-making space. It is made up of all adults in the village who are over 18 years and elects the village chairperson, village council, and committees such as the VWC (Shivji and Peter, 2003; Venugopal and Yilmaz, 2010). The village council consists of 15-25 members, including all subvillages' chairpersons, village chairperson and other elected members of whom at least one-fourth should be women (Venugopal and Yilmaz, 2010). The village council operates through three standing committees - for planning and finance, social welfare, and defence and security, respectively. These are responsible for handling the daily affairs of the village (Sokile *et al.*, 2005).

Village assembly and domestic water services

Domestic water is a major item of discussion during the village assembly meetings. The points of discussion include the financial report on the revenue and expenditure from user fee collection, amount of the user fee, cleaning (around pump house, water tank, and intake for the gravity schemes), performance of the VWC, and the status of the water project and its infrastructures. The survey data showed a significant correlation ($p=0.000$) between being informed about the

village assembly and attending it. The information on an up-coming meeting is disseminated at least two weeks before the meeting, mainly through the subvillages' chairpersons, written announcements papers in public places such as the school or the dispensary notice board, in the village centre close to the bus stop, in shops, and in the village office. However, in year 2011 about 60 percent of the respondents did not attend a village assembly meeting. Of the 40 percent who attended, 22 percent were male household heads, 8 percent wives of the household head, 7 percent other adult men or women in the household and 3 percent were female household heads. This implies that majority of the female-headed households do not participate in the village assembly. Upon our inquiry, the village leaders confirmed that assembly meetings attendance is poor in most of the villages. The following comments of six village leaders were noted (name of the village added):

"Women attendance to village meetings is problematic; men attend and participate more in the village assembly compared to women" Potea

"Attendance in village assembly is poor" Kelema Maziwani

"Men attendance in the village meetings is more than that of women" Kidoka

"Villagers' attendance in the meetings, especially women is very poor" Sambwa

"Citizens' have very low motivation and awareness towards development contributions; even their attendance in the village meetings is poor" Seluka

"There is insufficient attendance in the meetings in this village" Lupeta

Other factors reported as causes of poor attendance were: (i) demanding domestic chores workload and patriarchy system particularly to women (ii) inadequate report on water revenue and expenditure, (iii) disappointment about the water project, and (iv) untimely information and irregular meeting schedule.

Speaking up in meetings

In Agarwal's typology of participation (2001, 2010), speaking up in the meeting is a more active and higher level of participation than just attending meetings. Results from the survey revealed that only few women speak up in public meetings such as the village assembly, subvillage meetings and other village development meetings. The respondents reported that more men speak in public meetings than women. About one in ten women spoke in the last public meeting they attended in 2011. The village records showed that at most about 400 villagers attended the village assembly in 2011. Based on the average number of villagers who attend public meetings, the proportion of women estimated to speak up ranges from 0.4 to 4.4 percent. The explanation for these low percentages is that in these villages speaking up by women in a public place is seen as 'socially unacceptable' behaviour. In an interview a village leaders told us that women who are overly vocal in meetings endanger the chances of their unmarried female family members

to get married, because the family could be labelled as having ‘noisy’ and ‘bad’ women. Hemson (2002) and Hicks (2010) found the same phenomenon in South Africa.

5.4.3 Activity-specific participation

Contributing to the initial capital and involvement in maintenance related activities are forms of activity-specific participation. These are not new practices in Tanzania. Since the precolonial era they have been part of the approach to rural development, under names such as *self-help* and *popular participation*. According to Jennings (2003: 166): “Mission societies had used it as a means for the construction of schools and dispensaries, as well as in famine relief strategies, in the nineteenth century [...] the colonial administration had similarly promoted the concept [...] as a low-cost means to achieve local-level social development.”

We have focused on the contribution to initial capital, repairing, cleaning around water infrastructures, and reporting breakdowns. This selection is in line with the decentralisation of the rural water service which requires villagers’ five percent contribution to the capital investment either by cash or physical labour as a qualification indicator (Harvey and Reed, 2004); and villagers to manage water schemes and cover all the costs for operation and maintenance (URT, 2002). Additionally, it highlights the actual roles and responsibilities of the villagers (Mandara *et al.*, 2013b) and community management as a component of community participation (Harvey and Reed, 2004).

Contributing to initial capital

About 42 percent of the households in the study had contributed to the initial capital in cash. The remaining households contributed physical labour, by digging trenches, collecting sand and stones, as well as fetching water for the building activities. A recent study on users’ participation in rural water services in Dodoma noted the same trend on cash contribution (Masanyiwa *et al.*, 2014). District officials commented on the limited contribution to the initial capital. One of them said: “*There is low morale in the communities and reluctance to contribute to the initial capital, and it is more difficult in the villages with gravity schemes.*” A Sambwa village leader said: “*It was hard to convince villagers to contribute to the initial capital because some of the village council members resist any monetary contribution on the ground that gravity scheme is naturally made and a free gift from God.*” Among the households who had paid cash, 80 were male-headed and 13 were female-headed (see Figure 5.2).

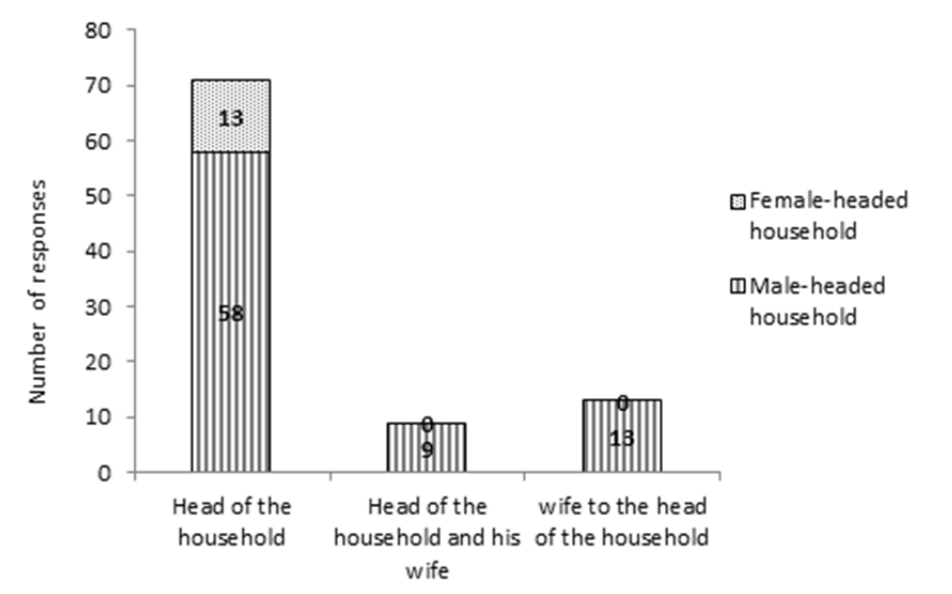


Figure 5.2 Household headship and members who paid cash contribution to the initial capital

In the male-headed households the responsibility for the cash contribution was shared between the head of the household and his wife. Female household's heads shouldered the costs of the cash contribution to the initial capital on their own. We did not find a significant correlation between the household's level of income and cash contribution to the initial capital. The key informants and FGDs yielded more information on the cash contributions. We found that most of the contributions were organised in phases and in most cases collected after harvesting, for example in the villages of Chase Chinyika and Seluka (cf. Mandara *et al.* 2013b). A Kidoka village leader reported that *"when we were raising money for the village's five percent to the initial contribution each household had to pay a fixed amount and the right timing was after harvesting, because that is feasible and avoids unnecessary quarrels with the fellow villagers."*

Management and maintenance involvement

After the water project is installed, the community is responsible for managing and maintenance. We examined community involvement in cleaning around the pump house or the gravity scheme source, repairing water infrastructures, and reporting breakdown. Community involvement in the latter activities was generally low. Household involvement ranged from 22.6 to 29.0 percent. Involvement in reporting was higher (29.0%) than in cleaning (22.6%) and repairing (26.2%). By reporting people hope to prevent compromising the availability of the water service to the community and the household.

The following reasons for the low community involvement in water infrastructures' management and maintenance were reported and confirmed by

village leaders: cleaning is mostly perceived as the responsibility of the VWC members and is not carried out frequently; repairing requires specific technical skills that most villagers do not have; reporting is deemed voluntary. In addition, cleaning differs with type of the water source in the village. To clean the storage tank for boreholes, the tank needs to have a stairway and an outlet pipe. For the gravity schemes cleaning involve maintaining the catchment area and removing sand deposits and mud that clog the intake, particularly during the rainy season and when farming and grazing take place close to the intake. The following statement by a key informant in Lupeta village summarises the issue: *“It takes a lot of effort to clean the intake and it can inconvenience availability of clear water after cleaning the intake.”*

Participation by district shows significant differences between Kondoa and Mpwapwa, with lower community involvement in Mpwapwa than in Kondoa (see Table 5.1).

Table 5.1 Proportion of households involved in activities related to water infrastructure management by districts

Activity	Kondoa	Mpwapwa	χ^2 value
Cleaning	33 (30.3)	17 (15.2)	$\chi^2 = 7.192$ $p = 0.007^*$
Repairing	39 (35.8)	19 (17.0)	$\chi^2 = 10.103$ $p = 0.001^*$
Reporting	41 (37.6)	23 (20.5)	$\chi^2 = 7.832$ $p = 0.005^*$

Figures in brackets are percentages; *significant at 1% level

The Mpwapwa district officials mentioned low community participation in development activities as the main challenge they face in the water supply projects. The 2010 and 2011 Mpwapwa district profile and budget report documented low community participation as a factor in poor project implementation. The Kondoa District Council also recorded poor community participation (cash contribution and physical labour) for three consecutive years as a major factor interfering with the implementation of development projects (2008, 2009, 2010). In both districts the district officials reported the following factors contributing to low community low involvement: low morale among many villagers, being used to free social services

by the government, and political interference which causes confusion about participation.

When examining participation by gender, we found that significantly ($p=0.007$; $\chi^2=15.417$) more men than women were involved in all activities.

Table 5.2 Proportion of household members involved in activities related to infrastructure management by gender

Activity	Men	Women	Both
Cleaning	33 (14.9)	6 (2.7)	9 (4.1)
Repairing	46 (20.8)	12 (5.4)	1 (0.5)
Reporting	40 (18.1)	20 (9.0)	6 (2.7)

Figures in brackets are percentages.

Gender structures men's and women's involvement in the management of infrastructures. For example, cleaning the water tank and around catchment area and the intake for the gravity scheme is perceived as an activity that requires male physical strength. For women, reporting is important because they need water for domestic use. From the interviews with key informants and other villagers, it transpired that mostly it is the women members of the VWC who are engaged in cleaning at the water point surroundings. Repairing, though also requiring technical skills, is seen as 'masculine' and cleaning as 'feminine' work. Regarding repairing, it is noteworthy that in Kondoa district there was not one female technician among 16 technical staff and in Mpwapwa there were only two female technicians among 11 technical staff.

5.4.4 Village council and social welfare committee

In our study, all village councils have men and women. As can be inferred from Table 5.3, the proportions of men in the village councils ranged from 56 to 76 percent and that of women from 24 to 36 percent. On average, the proportions of women are close to and slightly above the 25 percent policy requirement (Shivji and Peter, 2003: 27; Venugopal and Yilmaz, 2010: 216). Qualification criteria for membership of the village council are the same as those described in the previous subsection under Section 4.4.1.

Table 5.3 Composition of the village council by village

Village name	Men	Women	Total
Potea	18 (72)	7 (28)	25
Kelema Maziwani	19 (76)	6 (24)	25
Kidoka	18 (72)	7 (28)	25
Sambwa	18 (72)	7 (28)	25
Chase-Chinyika	16 (64)	9 (36)	25
Berege	17 (68)	8 (32)	25
Seluka	18 (72)	7 (28)	25
Mbori	17 (68)	8 (32)	25
Lupeta*	14 (56)	6 (24)	20(*)

Figures in brackets are percentages.

(*) In Lupeta village the membership of five members (three men and two women) had been terminated as they had not attended meetings since they were elected.

For the standing committees, we focused on the social welfare committee because domestic water service is among the public services monitored by this committee. The size of the social welfare committee ranges from six to nine members, with two to four women. Women featured more in this committee than in the other two committees, presumably because social welfare comprises services that are important for women to carry out their domestic gender roles.

5.4.5 Membership and participation in social and economic groups

Membership and participation in social and economic activities can be linked to social organisations that facilitate collective action and cooperation for mutual benefits (Cleaver, 2005; Nombo, 2007). Apart from gender-neutral groups, women's social and economic groups (henceforth WSEGs) are traditionally common institutions in Tanzania (Nombo, 2007; Msonganzila, 2013). The emergence of WSEGs can be traced from the 1970s to 1990s and is linked to Women in Development, Women and Development and Gender and Development approaches that aimed at integrating women into development (Parpart *et al.*,

2000). In Tanzania, the government recognises these groups and supports them (cf. JMT, 2000; 2007; ILO, 2008).

We found that only 34 percent of the respondents were aware of the existence of such groups in the study area. There were two types of groups: gender-neutral and women's only groups. Men were members of the gender-neutral groups such as SACCOS¹⁵, FINCA¹⁶ and power tillers groups (only in Berege village). Women were members of gender-neutral groups and women's only groups, including burial and festival groups, church-based groups, and groups for income generating activities (IGAs) in poultry, goat and bee keeping. The groups combine formal and informal modes of operation. All groups have bylaws that stipulate their members' responsibilities, such as paying the required fees and attending meetings, and offer services that comprise four major categories: microfinance, moral support, skills training (in IGAs), and help with farm implements. There were significantly ($p=0.000$) more members of groups in Mpwapwa than in Kondoa. Burial and festival groups, SACCOS, FINCA and IGAs attracted most members.

Women (both members and non-members of WSEGs) have used WSEGs to convey their dissatisfaction about the water services and lobby for better ones, and to convince fellow women to contest for leadership positions in and outside their village and campaign for them. Statements from interviews and FGDs support the role played by WSEGs as a platform to advocate for good leadership and better water services that are responsive to women's water needs. A women's group leader in Lupeta village said: *"My fellow women in our poultry keeping group appointed me to communicate with the village leadership on the difficulties that women experience from non-functional distribution points. These women said I have the calibre to speak up and be listened to."* The qualities of the WSEGs' leaders were linked to their ability to break cultural barriers and report women's concerns, including being approachable and knowledgeable, having exposure and experience, being reasonable and mature, having convincing power and confidence, and being respected by the community. In the women's FGD in Kidoka village it transpired that women indeed discuss their concerns about desired water services in the groups. In Seluka village there were neither gender-neutral groups nor WSEGs. There, a male village leader said: *"In our village it is very challenging to mobilise people to restore our water project, because we do not have any social and economic groups which could be an entry point as I have experienced in other villages I worked previously."* Clearly, WSEGs have the potential to be a vehicle towards improved public water services, as was reported in other studies (Nicol, 2000; Vijayanthi, 2002; UNEP, nd).

¹⁵ Savings and Credit Cooperative Organizations

¹⁶ Foundation for International Community Assistance

5.4.6 What supports and hinders women in their quest to become leaders

In this section we present examples of how women go about and perform in community leadership in practice. The following three cases reveal the multiple intersections between women's involvement in public leadership and gender relations in the arenas of household and community.

Case 1: Mama AB¹⁷ attained primary education, is married and has five grown-up children and several grandchildren. For over two decades she has been involved in leadership roles in different capacities and institutions, including secretary of the women's wing in the ruling political party and member of the village government. She is a facilitator on reproductive health and HIV/AIDS in and outside her village. She is a member of SACCOS and a leader in two different WSEGs. She links her capacity to fulfil leadership duties with learning from mistakes and the challenges she experienced as a person. She manages to balance her domestic and public responsibilities because she is fully aware of what is expected from her and likes her positions in and outside the household. She warned that 'bad' practices such as staying in unknown places when traveling as a public figure can cause trouble. She emphasised that married women have to be open about their whereabouts and the purpose of the trip to their husband and the unmarried women to their family. She attested that 'good' communication with the family helps in case of false accusations. Mama AB said that questionable behaviour of women leaders triggers wrong perceptions in the society, such as associating those women with extra-marital affairs and domineering attitudes. She added that any woman in leadership needs to be straightforward, confident, always convincing, and not commanding those she leads. She said that when she started to hold leadership positions in her 30s, it was challenging compared to now in her late 50s. She attributed her success to fulfilling her domestic responsibilities first and then works for community, insisting that hard work, confidence, and good moral values are her charms to public acceptance and respect.

Case 2: Mama CD is in her early 40s. She is married and has two children; a teenager and a toddler. She attended several training and study tours in her village and in other parts of Tanzania. Since the early 2000s, mama CD has been involved in several awareness creation campaigns on public health, child nutrition and vaccination, and she is leading the poultry and bee keeping groups in her village. She revealed that her engagement in community work has made her a public figure in her village. However, mama CD has been confronted with criticism and negative comments on her involvement in public work. Some fellow villagers even warned her husband not to tolerate her becoming too much of a public figure, because she

¹⁷ The letters AB, CD, and EF are pseudonyms to protect the identity of these women.

could become a 'bad' wife who would cheat on him and irresponsible mother, due to the demanding leadership roles. In spite of all this, her husband supports her. Sometimes her mother-in-law looks after the children in her absence. Mama CD mentioned that her husband was aware of her public and leadership engagements before they got married and had accepted it. She ended the interview by insisting that good planning is a key for a woman leader to fulfil her primary responsibilities at her home and her community obligations.

Case 3: Mama EF is in her mid-50s. She is married and has four children and three grandchildren. She has primary education and moved into the village when she married. In the conversations with her she struck us as well informed and courageous. She has questioned village leadership on the poor performance of the water project. Mama EF wanted to become a member of the VWC but she was not elected despite her name being proposed, because some village leaders and 'influential' men secretly campaigned against her. She said that her husband and family have no problem with her contesting for leadership positions but it is the prevailing patriarchal system that causes community members to oppose bold women like her to become leaders.

Case 1 specifically highlights that individual character and experience, 'good' manners and relations with the family are important attributes for women to access and excel in public leadership. 'Bad' family relationship can be a factor in women's withdrawal from local management and politics (cf. Tripp, 1999). Also Case 2 demonstrates the importance of family support, especially the role of a supportive husband. Case 3 reveals that even with family support, it is hard for women to become leaders in a patriarchal context. This case underscores the point made by Rao and Kelleher (2005) that for gender mainstreaming interventions to succeed, efforts need to be directed at both formal and informal structures.

The cases depict positive and negative factors. They show that against all odds women venture into local governance and politics, capitalising on family support and personal attributes like knowledge and determination. These women also put in an extra effort by performing their leadership roles only after having taken care of their traditional domestic duties. At the same time, the cases reveal sceptical community perceptions on leadership by women of which the bottom line is that public leadership is not an ideal thing for 'good' and responsible women. The cases make clear that women who are engaged in local management and politics are exposed to unfair criticism and humiliating stereotypical assumptions. Even when these stereotypes do not reflect the reality, they are constantly reproduced and frustrate women's quest for voice in public decision-making spaces. Apparently, the situation has not changed much since the 1990s when studies on women's political participation established that prohibitive

cultural attitudes and perceptions such as being thought of as 'loose women' or 'unfit mothers' (Tripp, 1999: 16-17) and being falsely accused of having extra-marital affairs (Andersen, 1992), were suppressing women's participation in public leadership.

5.5 General discussion and conclusion

Our results imply that the creation of the formal opportunities to involve women in the local decision-making structures on domestic water does not guarantee women's participation and gender-responsive services. Whether women can make use of these opportunities largely depends on informal structures. An individual woman's agency, personal and social costs and the power relations between a woman and her husband (head of her household) influence whether a woman will accept and perform leadership roles (Kabeer, 2005). The woman in Potea village who withdrew from the VWC because her husband disapproved of her being involved in community leadership, made this choice to save her marriage and family. The norms and values underpinning intra-household relationships shape the negotiations between men and women that determine women's involvement in community roles (cf. Moser, 1989; Kabeer, 1994; Agarwal, 1994, 1997).

This being the general picture, the results also uncover the layered and contextual nature of the interfaces between formal and informal structures. Firstly, more specific norms may provide some women with a better bargaining position than others. We could observe that for older women and widows the gender norms were less restrictive. A study in India also found that mainly elderly women were involved in community leadership (Singh, 2008). Such gender intersectionalities are embedded in traditional frameworks and influence leadership criteria and representation of women (Agarwal, 2001).

Secondly, the compliance of women's traditional gender roles with the type of public function makes a difference, because the reasons for women being accepted or not in certain public functions are ingrained in the local circumscriptions of women's gender roles (Kabeer, 1994; Van Koppen, 2001; Cleaver and Hamada, 2010). Harvey and Reed (2004: 89) observed that "women are often concerned about the operation of their water supply and are motivated to do something about it because it directly affects them." While this may be the case, the types of water governance activities women engage in show gender-specific patterns. A Nepalese study found that women did not have financial and managerial roles in local water governance structures but were highly involved in cleaning around tap-stands (Bhandari and Grant, 2009). Various studies, including ours, found that men assume responsibility for the maintenance of wells, tanks, ponds, or storage reservoirs (e.g. Van Koppen, 2001; Harvey and Reed, 2004; Bhandari and Grant, 2009). Singh (2008: 937) concluded that "maintenance and

management of water sources is still seen as the men's arena of work." Although men are VWC members too, women's membership of the VWC was explained by their willingness to volunteer and their being committed and patient, an explanation that clearly refers to their reproductive gender roles. This echoes the argument of Goetz (2007: 89, 95) that "women are nurturers, family managers [...] and more trustworthy and public-spirited than men." In our study, women's involvement in the social welfare committee reflects the continuity between women's gender roles in the private and public spheres. It also shows that villagers and their leaders recognise complementarity among men and women. Thus, positions held by women and the types of the committee of which they are a member signify a tendency of reproducing women's 'traditional' gender roles. The excuse or alibi of women's demanding domestic duties for women not to aspire or be admitted to a position in the public domain is an example of the same mechanism.

If traditional gender roles are endlessly reproduced, nothing will change. However, according to Giddens' structuration principle (1986), individual agency and structures may interact in such a way that change in the one may lead to change in the other. Indeed, opportunity costs, hierarchies, status and perceptions on socially appropriate behaviour shape the participation of men and women in community governance (Cleaver, 1998a; Agarwal, 2001; Hemson, 2002; Kabeer, 2005; Cleaver and Hamada, 2010). Additionally, patriarchal culture impedes women's agency in participating in and speaking up in meetings and other public domains (Hicks, 2010; Todes *et al.*, 2010). For the women in our study, being talkative in public meetings could damage their reputation. However, attending meetings such as the village assembly meetings is an important practice. Although women may at first only exercise their agency by attending, this 'passive' participation can pave the way to 'active' participation in the village's decision-making spaces and processes (cf. Agarwal, 2010). Thus, men and women who attend public meetings get exposed to the format of such meetings. For women, this exposure may help them to speak up and express their views in meetings and to devise tactics to get their views across in decision-making on water services that meet their practical gender needs.

Another venue that facilitates structural change through women's agency is membership of social and economic women groups. We concur with the view of Jones (2011) that local women's groups are hybrid in the sense that they combine 'invited' and 'created' space and enhance their members' capacity to handle money from contributions. The WSEGs in our study have the skills and bylaws to manage monetary contributions too and they can share their experience with the VWCs. The literature on gender, development and social capital considers WSEGs in the following ways: (i) as alternative ways to address women's practical and strategic needs that are either partially or inappropriately addressed due to women's

exclusion in development trajectories (Kabeer, 1994; Parpart *et al.*, 2000; Msonganzila, 2013); (ii) as spaces in which women can collectively participate in political representation and local decision making (Cleaver, 2005); and (iii) as platforms to articulate their needs, mobilising and lobbying for improved public services (Vijayanthi, 2002; UNEP, nd). WSEGs have enlarged women's exposure to external sources of knowledge and information and have increased their awareness on various opportunities in and outside their villages. Studies in India and Tanzania established that WSEGs have improved women's bargaining power and negotiation and leadership skills (Vijayanthi, 2002; Nombo, 2007; Msonganzila, 2013).

Thus, on the one hand our findings on women's participation in local water governance structures do not seem to deviate much from the picture found in the literature. Other studies in Africa have established that, for example, women were simply described as "committee members" (Harvey and Reed, 2004: 88) and occupied "secondary" and "supportive" positions in the committees (Hemson, 2002: 27). Such descriptions substantiate Hicks' argument (2010) that women's involvement in local governance follows their traditional roles. In the same vein Cleaver (1998a: 354) stated that "appointing women to committees may just be reinforcing their role as "housekeepers" of the water sources rather than enhancing their decision-making capacities." We have also shown that women still face many obstacles when they want to exercise their agency in leadership and decision making in the public sphere and that these obstacles are embedded in resilient patriarchal norms and values about 'women's place'.

On the other hand, however, our research reveals a layered picture in which entry points for change can be identified. Since social-cultural institutions and practices in which gender is embedded vary across time and space, paying attention to the local context in the provision and management of the water services is vital. Thus, policy makers and practitioners need to explicitly take into account the local context in which men and women operate and how the formal and informal function in a particular setting. They should investigate how policies can appropriately support or challenge the existing structures, instead of introducing a new approach that seems technically correct but culturally inappropriate. The VWC quota system needs monitoring and could be extended to include not only women's representation but also the leadership positions, so that women are not just "committee members" (cf. Harvey and Reed, 2004). That could make a difference for enabling these women to address local women's domestic water needs.

Having women in the VWC, village council and committees might function as an engine that propels change but does not guarantee that women's strategic gender needs are met. Based on the Rao and Kelleher (2005) model, for gender integration in the public water service to become evident it requires changes at an

individual, household, community and state levels and in the formal and informal structures. As Kabeer (2005) noted, “changes in one dimension can lead to changes in other spheres.” We identified three points from which change could emanate. Accepted and successful women leaders (and their husbands if supportive) who can be role models are a first. It is high time to learn from women who have succeeded in bridging the gender gap between household and community decision making. The second mechanism is that of women’s passive participation in decision-making spaces (attending meetings), which provides them with the relevant exposure that they may use for more active participation. The third is the potential of local social and economic women groups. These groups embody women’s expression of agency and contribute to their public participation skills which can be used in water services governance. Progressively, the three mechanisms can kindle changes on gender relations within the household and in the community.

Chapter 6

Users' Perspectives and Rural Water Services¹⁸

This chapter discusses the importance of the users' perspectives in the rural domestic water services. The findings show that users were not equally involved in all the stages. For instance, prior to the installation of the water scheme, households were hardly involved as users to articulate their preferences on the location of the distribution points and choice of technology. That experience is reflected in the users' (dis)satisfaction with the existing domestic water services. Basically, not establishing users' requirements before implementation contradicts the demand-responsive approach which is the key principle in the national water policy. This raises questions about the authenticity of the responsiveness of the demand-responsive approach, such as whether it only elicits response to the overall need of a water service from a technical angle and the (potential) users' perspectives is glossed over.

¹⁸ This chapter is in preparation as the following article:

Mandara, C.G., Niehof, A. and Butijn, C. Users' perspectives: the missing element in rural water services of Tanzania.

6.1 Introduction

Users' perspective (or end-user(s) perspective or user-centred) is a concept which has been applied in information and communication technology, business and marketing related subjects as well as in urban water studies (Rakodi, 2000; Lieberman *et al.*, 2006). Given the nature of these disciplines, it implies a focus on the interaction between users on the one hand and providers, producers, or suppliers on the other. As a consumer, a user applies for or buys a service from a provider and as customer a user buys a product from a producer or supplier. Scholars have studied or applied the users' perspective in agriculture (cf. Hardon-Baars, 1997) in analysing rural livelihoods (cf. Niehof and Price, 2001), and in consumer studies (Groot-Marcus, 2002). In the fields of agricultural education and extension there is extensive experience in applying the concept, especially in developing countries. Sanitation-related studies have applied household-centred approaches by placing the household at the core of planning and implementation processes since the household is the minimum practicable size domain for resolving environmental sanitation problems (Lüthi *et al.*, 2007). The concept of users' perspective echoes bottom-up approaches whereby designing and implementation of the services are done or supposed to be done in the light of what is appropriate to the users. In a review of different disciplinary applications of the concept of users' perspectives by Hardon-Baars, the common point of emphasis in the reviewed studies was that of *starting with the user of products and services in the context of actual uses and to end with that user* (Hardon-Baars, 1997: 24). This also implies the need for a process orientation when studying rural water supply.

In this chapter, I employ the concept of the users' perspective to examine how users were integrated during the planning and designing of rural water services and what their views are on the existing domestic water services. I have opted to study rural domestic water services through the users' perspective lens because the concept concurs with the national water policy principle on involving the users before and after implementation of the water services. The 2002 water policy emphasises decentralization reforms and adopts a demand-responsive approach which relies on users' participation in establishing, owning, managing, and ensuring full cost-recovery for O&M of their water schemes (URT, 2002; Jiménez and Pérez-Foguet, 2010a). The provision of rural water services is a process that has several phases before and after having water at the distribution points (Jiménez and Pérez-Foguet, 2010a; De Palencia and Pérez-Foguet, 2011). Service users are designated to play key roles in the use, management and O&M of the rural water facilities (Mandara *et al.*, 2013a).

Governance approaches in the Tanzania's rural water sector have experienced changes emanating from external and internal factors alongside with

the alterations in the political processes and developments (Cleaver and Toner, 2006; Jiménez and Pérez-Foguet, 2010a; De Palencia and Pérez-Foguet, 2011). The 1991 water policy, for example, became outdated as a consequence of the profound political and economic transitions in Tanzania during the late 1980s to early 1990s (Wobst, 2001). Other factors that induced change were the legal and institutional shortfalls in the 1991 policy that lacked alignment with international and national reforms as well as attention for the comprehensive linkages between substantial actors from different administrative levels (URT, 2002, 2008a). Currently, the 2002 water policy is the overall guiding framework for rural water service delivery (URT, 2002, 2008a). The existing water policy is based on international water discourses and agreements such as the 1981–1990 International Drinking Water Decade, the 1992 Dublin Principles, and Agenda 21 (WHO, 1982; ICWE, 1992; URT, 2008a; Jiménez and Pérez-Foguet, 2010a, 2010b).

Tanzania's rural water sector mainly provides water for domestic uses and livestock watering. Water is delivered at the distribution points (DPs) and cattle troughs, through a community management, with or without the involvement of a private operator (Mandara *et al.*, 2013a). The District Water Department (DWD) assists with technical support and logistical facilitation to implement the national water policy in the villages. Other district-level departments such as those of Community Development, Planning, Health, Education, as well as the Legal Unit, collaborate with the DWD. Therefore, the rural water sector involves multiple actors with different roles and from different administrative levels (cf. De Palencia and Pérez-Foguet, 2011; Mandara *et al.*, 2013a; Masanyiwa *et al.*, 2013). These features of rural water services delivery also apply to my study area: the districts of Kondoa and Mpwapwa. The next section explains how the concept of users' perspective relates to that of the demand-responsive approach.

6.2 Users' perspectives and the Demand-Responsive Approach

Responsiveness is the key feature of the demand responsive approach in the rural water supply. To realise responsiveness it is important to integrate both users' and providers' perspectives and forge a link between users and providers. The concept of users' perspective shares the bottom-up approach feature with other participatory approaches. The recent body of literature on participation and rural water supply in Tanzania mainly examines users' participation in relation to decentralisation and sustainability, particularly on topics like participation in construction and involvement in decision-making and management after installation of the infrastructures (cf. Cleaver and Toner, 2006; Jiménez and Pérez-Foguet, 2010a, 2010b; Masanyiwa *et al.*, 2014). Several scholars have studied participation and rural water supply since the adoption of participatory approaches became a major paradigm shift in the sector, which till then was supply-driven (Bos, 2001; Deverill *et al.*, 2001). From these studies it became

evident that for the water project to respond to the users, it was mandatory to involve the users in the whole project cycle rather than in just parts of it. I concur with these studies, but – at the same time – recognise the importance of flexibility and being responsive to the local context rather than applying fixed guidelines (Harvey and Reed, 2004).

Rural water supply is an activity that unfolds in phases in which changes occur. These changes can emanate from individuals users or the community involved. Such changes are related to users' preferences and demographic features within and beyond the household. It can be that what the users deemed to be acceptable before and during the implementation of the facilities could no longer be so later. Since rural public water services in Tanzania are communally organised, pre-implementation assessments to establish users' needs in compliance with the demand-responsive approach principle are done at community level. Such assessments range from determining the demand for water services to assessing the community members' willingness to contribute for the required five percent to the capital costs, in cash or in kind (URT, 2002; 2008; Jiménez and Pérez-Foguet, 2010a, 2010b). Once the pre-implementation assessments have been accomplished in a certain community, it is presumed that the community members demand water services (Bos 2001; Deverill *et al.*, 2001). The community's readiness to manage their water schemes and be responsible for all O&M is then taken as self-evident (URT, 2002; Jiménez and Pérez-Foguet 2010a, 2010b). Several studies have reported on the potential of the demand-responsive approach towards improved and sustainable rural water services (Bos, 2001; Deverill *et al.*, 2001; Harvey and Reed, 2004). But these are macro-level studies that cannot show how the demand-responsive approach works out for the users at the village level. Therefore, the current literature misses information on the actual implications of the demand-responsive approach for the service users and on the macro-micro interaction.

In this chapter, the users' perspectives is conceptualised as the users' preferences and as their perceptions on the appropriateness of the water services regarding quality and sensory attributes as well as the technical and managerial attributes of the water sources in a specific local environment (cf. Elmendorf and Isely, 1983; Van Wijk-Sijbesma, 1998; De França Doria, 2010; Mandara *et al.*, 2013b). Additionally, users are not assumed to be a homogeneous group. Hence, measuring appropriateness implies taking the gendered social and cultural context, and the diversity of rural households' activities into account (Wajcman, 2000; FAO, 2004; Groot-Marcus *et al.*, 2006; Bhandari and Grant, 2009; Amin, 2010; Joshi *et al.*, 2011). I see rural domestic water services delivery as a phased process (Harvey and Reed 2004: xix) and the users' perspectives as dynamic and subject to change depending on the phase in the process and the contingent factors in each phase. Current approaches towards establishing public domestic water services in

villages, however, are mostly based on the one-time pre-implementation assessment and take that to represent the overall users' perspectives. This chapter examines whether users' preferences articulated from the households were integrated in the existing water services before implementation and whether these preferences match the existing services that are in use. I start with the users' participation before implementation because it is the important initial step in the demand-responsive approach (Bos, 2001; Deverill *et al.*, 2001; URT, 2002; Jiménez and Pérez-Foguet 2010a, 2010b).

6.3 Study area and methodology

The chapter is based on a field research conducted in 2011-2012 in the rural districts of Kondoa and Mpwapwa in Dodoma region. The two districts are among the first districts which implemented phase one of the Rural Water Supply and Sanitation Project 2002/2003. The districts are located in the semi-arid zone of central Tanzania and rely mostly on the ground water sources for their water supply (Kaliba *et al.*, 2003). Data collection was carried out in nine villages that were purposively selected on the basis of their location in the district, presence of a public water project, type of water source and management arrangements.

Data were collected using a combination of quantitative and qualitative methods, to achieve triangulation and enhance the validity of the results (Scrimshaw, 1990; Axinn and Pearce, 2006). A household survey was conducted in 221 randomly selected households. Semi-structured and unstructured interviews on the situation of the domestic water services were held with key informants like district officials, village leaders and specific villagers. Additionally, six FGDs were conducted in the villages of Kidoka and Seluka. The FGDs consisted groups of men, women and members of the Village Water Committees (VWC). Pertinent secondary data from the 2000 national water policy and documents on domestic water topics from the district council and village office were reviewed and analysed to supplement the primary data. Non-participant observation was used throughout this research on the villages' water infrastructures and the actual provision and uses of water at the DPs, cattle troughs and around dwellings. At the district level I consulted district council officials of the water, planning and community development departments to get the providers' perspectives on policy matters and technical experience. At village level, I concentrated on the (dis)satisfaction with the water services as reported to the village administration. The households and FGD participants represented the primary users of water services and they provided information on users' satisfaction with the services and on the actual and desired condition of the existing domestic water infrastructures and services. The users' satisfaction on the existing water service was measured by using a three-point scale that ranged from 'not satisfied', through 'somewhat satisfied', to 'very satisfied'.

Through the lens of the users' perspectives concept, in this chapter I unpack the demand-responsive approach and highlight users' preferences articulated at different stages of the rural water supply cycle before and after implementation. I selected stages with immediate effect on the accessibility of water services and the sustainability of the water infrastructures. For the pre-implementation phase I focused on planning and designing. Regarding planning I examined the processes and practices of identification of potential sites for water infrastructures and the selection of locations for the domestic DPs and cattle troughs. Location of the DPs forms an important criterion which the national water policy uses to define the accessibility of water services, according to which DPs should be available within a walking distance of 400 meter from the home (URT, 2002; 2008). Regarding designing, I examined the processes and practices in the choice of technology. Apart from technical expertise, the existing water policy stipulates that potential users need to be facilitated to choose technologies that are affordable and appropriate in their local environment (URT, 2002). The post-implementation phase was examined by assessing the users' satisfaction on the appropriateness of water for domestic uses, O&M of the water infrastructures, handling of the revenues from the user fees, as well as monitoring and evaluation practice.

6.4 Results and discussion

6.4.1 Users involvement prior to installation of the water infrastructures

This section acquaints readers with how users' were involved in the identification of the areas deemed potential water sources, location of the domestic DPs and the cattle trough, as well as in choice of technology.

Identification of areas with water potential

Users have their own ideas about particular services even before having the service in place, and these ideas may change over time due to social, economic and demographic factors. From each village office I learned that village leaders and a few older men accompanied the experts from the DWD to identify potential areas with water supply. The village leaders and the elders mainly rely on history and local knowledge, taking the distribution of acacia and sycamore trees as indicators of water availability. Sometimes this knowledge was supplemented with information from households with large herds of cattle and women because of their involvement in domestic water provision. These practices of using local knowledge and natural resources management were observed already two decades ago (Niamir, 1990). After agreeing on the identified areas, technical tests were conducted by the experts to verify availability of water and its suitability for domestic purposes. When the tests indicated an area as viable, the village leaders informed the villagers in a meeting at which a ban on human activities in the

selected area was proclaimed. Each villager was requested to be a guard of the identified area. In the case of a planned borehole, all human activities are banned within about 500 meters from the borehole area because this is the site where the pump house will be built and it is required to be fenced. For the gravity scheme, no human activity is allowed on and around the catchment area. In Lupeta village, for example, some villagers used to cultivate vegetables and sugarcane for commercial purposes very close to the water source and in the catchment area. Those farmers resisted and it took an extra effort to remove them. The key informants in the village and water technicians reported that WaterAid, one of the key stakeholders in Mpwapwa district, decided to withhold its support subject to the termination of activities around the catchment area. Then, the villagers united and stopped those who were farming around the catchment area. This shows that the success of the identification process relies on the inside knowledge of the villagers to support and enrich the technical expertise.

The location of the distribution points and cattle trough

Choice of location for the DPs and cattle trough followed after agreement on the location of the borehole and, in case of a gravity scheme, the distribution tank. The first priority was to place DPs at public social service institutions, such as the dispensary, the school and sometimes the mosque. For the other DPs the villagers articulated their desired location based on the downward water flow, features of the terrain, the number of subvillages and what they saw as the centre of the neighbourhood. For the cattle troughs the economic activities in the area form an additional criterion as the cattle and their keepers need a track to and from the watering site. In the villages of Kelema Maziwani and Kidoka there were some noteworthy developments regarding the process of determining the locations, which are reported below.

Kelema Maziwani has seven subvillages separated by the trunk road, but the DPs are in only four subvillages in one section of the village. To dig trenches and lay the distribution pipes to the other three subvillages across the road the village had to get permission from the regional office of the Tanzania Roads Agency in Dodoma town. Organising the permit took time as it involved contacts and procedures between the administrative levels of the village, the district headquarters, and the regional and national road agency offices. The villagers needed water urgently and the village could not accomplish these procedures within the timeframe of the contractors who would build the water scheme. During the survey and other visits to the village it was confirmed that the villagers needed additional DPs, especially in the three subvillages that had none. This shows that realising the users' perspectives on the DPs location sometimes require technical and legal support beyond the rural water sector.

Another issue is about the location of the cattle trough in Kidoka village. During the men's FGD it emerged that the current location of the cattle trough was perceived as no longer appropriate because the area is getting busier and progressively surrounded by human activities. Discussions with key informants in Kidoka indeed confirmed that there were plans to relocate the cattle trough, although no start with this has yet been made. The Kidoka case reveals that the users' perspective on the location of the cattle trough changed following changes in land use and economic activities. This brings to light that for incorporating the users' perspective using a single assessment does not suffice; what was acceptable before implementation is not necessarily so afterwards.

Users involvement in the choice of technology

Only 26 percent of the respondents in the survey were involved in the choice of technology by being informed in the village meetings that they attended. The majority of the prospective users did not have the opportunity to express their views on the type of technology and they were retrospectively informed about the engine installation. This is in contradiction with the policy emphasis on facilitating prospective users to choose appropriate technologies that are affordable and suitable for their local environment (URT, 2002). All four functional diesel-mechanised boreholes in Berege, Kidoka, Potea and Chase-Chinyika have the same type of engine of the reputable British brand Lister Petter. Its label says that the engine is clean, reliable and durable. However, the DWD officials mentioned that sometimes the pump and engine systems face technical challenges. Results from the survey tallied with the latter observation, as users have experienced non-functionality of the water infrastructure including the pump and engine system with a mean duration of 4.3 months in a year.

Placing my findings in the light of sociological studies of technology (cf. Akrich, 1992; De Laet and Mol, 2000; Wajcman, 2000), the appropriateness of the engine becomes debatable due to its foreign origin and the fact that it is used in rural areas without trained local technicians. This reflection raises the following questions. Was the engine locally evaluated on its versatility to the rural realities regarding availability and fluidity of spare parts? Was the engine designed to be compatible with the hot semi-arid climate? How well and for how long is the engine expected to function without trained local technicians in the village for basic repairs and maintenance? (cf. Mandara *et al.*, 2013a: 93). How was the engine tailored to local circumstances and patterns of use and abuse? (cf. De Laet and Mol, 2000: 236). Another issue is the analysis of other interactions of the pump and engine system apart from the technological specificities (Akrich, 1992; Bijker and Law, 1992; Groot-Marcus *et al.*, 2006). Does the feedback on the engine performance reach all actors (the users in the village, providers at the DWD, the Ministry of Water, and the designer)? Thereafter, how is the feedback reflected in

the subsequent engine consignments and how is that crosschecked? Several studies have established over 40 percent of rural water schemes are non-functional (Taylor, 2009a, 2009b; Jiménez and Pérez-Foguet, 2011a). Pump and engine schemes have functionality rate of 48 percent (Moon, 2006: 6), and 30 percent of the schemes become non-functional in the first five years (Jiménez and Pérez-Foguet, 2011a, 2011b). Echoing my questions and the studies cited above, to enhance the sustainability of rural water schemes I recommend further investigation on the projected use setting versus the real use setting of pump and engine systems.

6.4.2 Post-implementation

Once the water scheme is completed and the infrastructures are installed then the project is ready and actual use starts. Users' (dis)satisfaction can be realised through their interaction with the infrastructures, management entities and actual use of water. This section presents findings on the users' satisfaction on the appropriateness of the exiting water services, operation and maintenance, management of the user fee as well as on monitoring and evaluation.

Users' satisfaction on the existing domestics water service

To assess the users' satisfaction on the existing water services, I examined users' perception on the overall performance in terms of quality of the water services during the first five years after installation and extent to which users were satisfied with specific features (see Table 6.1). There was significant difference ($p=0.001$) on the overall performance of the water service between villages. Clarification from the village leaders indicated that water projects are often subjected to the following: political interference which causes reluctance among users to contribute the user fee or to raise money to repair water infrastructures, questionable quality of the spare parts, and mismanagement of the user fee revenues. Other studies report similar observations, especially on the linkages between political influence, performance of the water services, and the local management structures (Rakodi, Cleaver and Toner, 2006). It is important to note that the response on features number 8 and 9 in Table 6.1 does not add up to 221 (100%) because in the villages of Mbori, Sambwa and Seluka users were not paying the user fee (see Chapter 4). For feature number 9, the remaining 49 respondents did not have information on the management of the water revenues thus that question was not applicable to them. Sixty-eight users (30%) were not satisfied with the taste of the water, 35 percent were dissatisfied with the distance to the facility, 33 percent with its functionality, 32 percent with water reliability and abundance, and even more users expressed dissatisfaction with management and expenditures (45%), and performance of the VWC (41%), respectively. This implies that users are most troubled by technical and managerial attributes, followed by taste as one of the sensory attributes, which are all vital for the sustainability of the water schemes.

The users' dissatisfaction about the taste of water specifically relates to women's domestic roles and needs and water efficacy to quench one's thirst and for washing clothes (see Chapter 4 for details). Also the dissatisfaction about distance and functionality correspond to the findings reported in the Chapters 4 and 7. Besides, the respondents linked the challenging experience on the reliability and abundance of water at the DPs to the small quantity of water emitted at the tap. As one woman explained, "*Sometimes we (referring to her fellow women) are forced to fetch water from the further waterpoint because the ones close to our houses do not emit much water*" (A villager in Potea, February 2012). Another reason for dissatisfaction is linked to the practice of closing some DPs during rainy season (see Chapter 3). Lack of transparency of the management and expenditures of the water revenue is one of the factors responsible for users' reluctance to pay user fees (Harvey, 2007). Generally, my findings are in accordance with those of studies on users satisfaction in Nepal and South Africa (Bhandari and Grant, 2007; Kanyoka *et al.*, 2008).

Table 6.1 Users' satisfaction on the existing domestic water services n=221

Features assessed	Level of satisfaction			Total
	Not satisfied	Somewhat satisfied	Very satisfied	
1. Colour	28 (13%)	49 (22%)	144 (65%)	221 (100%)
2. Smell	23 (10%)	31 (14%)	167 (76%)	221 (100%)
3. Taste	68 (30%)	52 (24%)	101 (46%)	221 (100%)
4. Location of the DPs & boreholes	34 (15%)	51 (23%)	135 (62%)	221 (100%)
5. Distance to the facility	76 (35%)	40 (17%)	105 (48%)	221 (100%)
6. Functionality of the infrastructures	73 (33%)	77 (35%)	71 (32%)	221 (100%)
7. Reliability & abundance of water at the DPs	71 (32%)	90 (41%)	60 (27%)	221 (100%)
8. Amount and type of the user fee	40 (18%)	22 (10%)	87 (39%)	149 (67%)
9. Management & expenditure of the fee collection	100 (45%)	46 (21%)	26 (12%)	172 (78%)
10. Performance of the VWC	91 (41%)	70 (32%)	60 (27%)	221 (100%)

In order to understand the users' desired domestic water services the respondents were asked to indicate how they would like their service to be in the light of the features listed in Table 6.1. Considerable proportions of the respondents indicated that they wanted improvement regarding the following

aspects: reducing distance by adding more DPs (52%), enhance the functionality of the water infrastructures by timely repairing and using quality spare parts (67%), increase reliability and abundance of water at the DPs by checking the distribution pipes (50%) and changing the pump and engine system (21%). Others proposed the regular presentation of the report on water revenues and expenditures (40%), and a few respondents mentioned taking legal action against mismanagement of water revenues. To improve the performance of the VWCs, the majority suggested electing new members (65%) and a few respondents insisted on training for the VWC members and the village council. Reflecting on the proposed measures from the users' perspective leads to the conclusion that the users take an active stand and are knowledgeable about measures for improving their water services. Combining the users' knowledge with the relevant information and technical skills from other actors and administrative levels can result in a better understanding of the challenges and developing pertinent measures from the users' and providers' points of view. The literature shows that users need access to information such as financial reports to enable them to evaluate the performance of their water projects and make objective and informed decisions on the way forward (Rakodi, 2000; Harvey, 2007; Bhandari and Grant, 2009).

Operation & Maintenance when there is no trained local technician

In the study area, no village had a trained local technician. To mend broken infrastructures in the absence of trained local technicians, the villages relied on the pump or tank attendant(s) and villagers with basic vocational skills for minor and uncomplicated repairs. All villages had very few men with either of the following skills: welding, metal fabrication, basic engine mechanics, carpentry, masonry, and motor rewinding. Six villages had pump/tank attendants who were trained on the ABCs of pumping water after installation of the water scheme. In the villages of Mbori, Sambwa and Chase-Chinyika, for minor repairs help was mainly solicited from villagers with vocational skills. For major repairs and replacements the villages either seek help from the DWD or hire a private technician and take the inoperative part(s) to private welding workshops (see the case of Chase-Chinyika in Mandara *et al.*, 2013a). Interaction between breakdown, seasonality, and type of source could be observed. During the rainy season, notably during mid-December to April, the gravity scheme intakes at Lupeta and Sambwa get clogged by sand and mud and the distribution pipes are washed away by rainstorms. In the villages with boreholes, the engine and its fittings break down in the dry season, especially in the period of August to early December. On average it takes three days to three weeks to fix broken infrastructures, depending on the complexity of the damage. In Sambwa, sometimes it takes over a month to unearth pipes, joints and other parts of the infrastructure that were destroyed and submerged by rainstorms.

The condition of the storage tank, meters, pump house and taps was generally satisfactory, but there could be problems with one or more objects. Seluka's water scheme had almost completely collapsed, the tank and pump house being the only operative parts of the infrastructure. Non-functionality of meters is of particular interest, because it is a challenge in all villages except Berege, despite the fact that meters are instrumental for establishing the amounts of water pumped and minimising revenue loss (cf. Mashauri and Katko, 1993; Chitonge, 2010). The water tanks in Kidoka and Chase-Chinyika could not be fully utilised due to, respectively, leakage and a missing staircase. The safety of the engine in Kidoka was jeopardised because the pump house had a loose window and that of Chase-Chinyika was even at higher risk because its pump house was entirely unfinished. Usually one to two taps in a village are non-functional or semi-functional. By semi-functional it means a loose tap that is unlockable and sometimes closed with elastic rubber tape.

Village water fund account and handling of revenues

For the sustainability of the rural water schemes their local financial management is crucial, because the users depend on it to cover the costs for the O&M. From the survey it transpired that the majority of the users were not satisfied with the handling of the user fees. At the initial stage of the water project the DWD facilitated each village to open a water fund account in a public bank at the district headquarters. The DWD does not endorse execution of the prospective project in a village without such an account. The account is to ensure that the village's contribution to the initial capital and water project revenues are safeguarded. Withdrawing money from the account requires multiple authorisations, including all signatories, two VWC members and the DWE or a DWE representative. In addition, the signed minutes of the village government that specify items and amount of money are required.

Table 6.2 shows that all nine villages had a water fund account. However, in three villages the account is dormant and it was unclear since when this was the case. The bank defines an account as dormant when there have been no customer-induced transactions for 12 months. The villages with dormant accounts had poor and inadequate water services with multiple broken down infrastructures, like in Seluka (see for details Mandara *et al.*, 2013a). The latter finding amplifies the observation by Binder (2008: 6) that "raising and maintaining adequate funding for water [...] facilities is of critical importance for sustainability". Hence, proper and transparent handling of the user fee are key factors for sustainable rural water schemes.

The estimated balance in the account of the villages with an active account varied from TSH 7,000,000 (about US\$ 4480) to TSH 80,000 (about US\$ 51). Berege and Kidoka which had the highest amount of money, had subcontracted a private

operator and their VWCs were monitoring the operator closely. They also timely crosscheck the deposit slip once the operator has deposited the money. Mbori had a dormant account with the lowest amount of money, and since early 2011 the village had adopted a private operator management. The water account of Mbori was dormant when the village hired its private operator. That was unexpected in a village just about 20 km from the district headquarters, on the main road, and with direct public transport connections to the district headquarters and even Dar Es Salaam. The situation of the Mbori water project negates what was established as favourable features for a water account to thrive (Moon, 2006). This prompted me to seek clarification on how the village had contracted the private operator. The village leaders reported that tender was done single-handedly by the village. The DWD officials confirmed that the tender was not competitive and that it was flawed in the terms of payment to the village. The village had not approached the DWD and the Legal Unit for technical support and had not used a standard contract. The operator was given a six-months trial which was about to expire in December 2011. I could not see a copy of the contract but the village leaders reported that the amount payable to the village was 10 percent of the monthly revenues. The latter is extremely low. Berege village, for example, gets 41 percent of the monthly revenues. Of the remaining 59 percent 39 percent goes to the operator and 20 percent covers O&M. Other reasons for the small amount of money in the Mbori water account were the low user fee TSH 10 (about US\$ 0.006) for a 20 litres bucket and the users' reluctance to pay the user fee given the presence of the Matomondo river as an alternative source of water that, according to the villagers, tastes better than tap water. A study on rural water supply across Africa found that "optimum sustainability of systems often depends upon the lack of availability of alternative water sources" (Harvey and Reed, 2004:72). This is substantiated with the information that emerged during a separate setting interview with men and women key informants in Kidoka village. *"We cannot let our water scheme collapse carelessly; we know how life was without water scheme in this village. It was difficult for family and village development, there was a very small number of 'good' houses as it takes much water to make bricks and build, and women were often walking for a very long time to Haneti village"* (Male key informant, August 2012).

Table 6.2 presents a complex message on the performance of the water fund account. My findings rebut the role of the distance to the bank (cf. Harvey, 2007) and the age of the water scheme (cf. Nkongo and WaterAid Tanzania, 2009) in the performance of water fund account. Based on my research, the following factors affect the performance of the water fund account: the timespan of employing a private operator by the village, mutual benefits of the contract between the village and operator, the difficulties experienced when the village had no domestic water services, and documenting the water revenues before banking. The latter is important since misuse of money can only take place prior to banking it, because

withdrawing money from water account requires multiple authorisations which can hardly be fabricated. The two DWEs could prove that user fee collections were not banked on time, especially in the schemes managed by the VWC. A multiple districts study has shown that villages with private operators have good quality services and generate greater amounts of public savings (Moon, 2006). Having similar observation, except for Mbori, I looked for clarification from the DWD and the village leaders. The district water engineers (DWEs) affirmed that the district council prefers private operators to VWCs because a standardised contract increases the possibility to cover O&M and enhances sustainability of the water facilities. *“Privatised water projects perform better than the ones operated by the VWCs”*, said the Mpwapwa DWE. Results from the survey also showed that users’ satisfaction was significantly associated ($p=0.00$) with management approach and user fee.

Table 6.2 Status of village water fund account and features of the water schemes (n=9)

Village name	Type of source and technology/mechanisation	Year the water project was established	Management approach	User fee per a bucket of 20 litres in TSH.	Status of the account	Estimated balance in the account in TSH	Estimated distance to the district headquarters in kilometres
Berege	Borehole with diesel pump	2006	Private operator & VWC since 1990s ¹⁹	40	Active	About 7 million	31
Seluka	Borehole with diesel pump (not functioning)	2005/06	Unstable VWC	50	Dormant	Unclear *	90
Mbori	Shallow well with hand pump	2009/10	On transition: Private operator & VWC	10	Dormant	About 80,000/=	20
Lupeta	Gravity scheme	2005	VWC	20	Active	About 700,000/=	12
Potea	Borehole with diesel pump	2008	VWC	25	Active	About 500,000/=	46
Kelema Maziwani	Borehole with electrical pump	2006/07	VWC	25	Active	About 2.5 million	30
Kidoka	Borehole with diesel pump	2007	Private operator & VWC since 2008	20	Active	About 7 million	65
Sambwa	Gravity scheme	2009	Unstable VWC	Free service	Dormant	No records	55
Chase-Chinyika	Borehole with diesel pump	2008	On transition: Private operator & VWC	30	Active	About 1.1 million	120

¹⁹ Berege was the first village in Mpwapwa district to contract a private operator, as an initiative to solve acute water problem. It has continued to be a good role model for other villages also in other districts (cf. Boydell, 1999; Moon, 2006; Taylor, 2009a)

Monitoring and evaluation

Analysis of secondary data shows that the Ministry of Water conducts monitoring and evaluation (henceforth M&E) through its officials visiting the completed and ongoing projects as well as by using national surveys, census and routine data. The diverse ways of data collection may lead to disparities according to source and measurement units and procedures (MoWLD *et al.*, 2002; URT, 2009b; 2012). Routine data is collected by the LGAs and collated by the Ministry of Water, whereas national surveys and census data are collected and coordinated by the National Bureau of Statistics (MoWLD *et al.*, 2002; Taylor, 2009c; URT, 2009b; 2012). Routine data monitors the presence and functionality of the infrastructures and measures access based on the estimated number of households per service point, while survey and census data monitor actual household access to water (URT, 2009b: 74).

At the district level the DWD conducts M&E in the villages to examine performance of the domestic water services, the physical condition of the water infrastructures and progress of the projects which are under construction. DWEs reported that preparation of the annual M&E schedules considers the villages' feedback, seasonality, and stage of the on-going project. However, the timing, frequency and area coverage of the M&E is often affected by shortages of transport facilities, funds, and technicians and impassable roads during the rainy season (cf. Mandara *et al.*, 2013a). Sometimes the DWD carries out M&E in collaboration with officials from the Ministry of Finance, other development partners and non-governmental organisations such as TASAF²⁰, WaterAid, MAMADO²¹, and CMSR²²-Tanzania.

In the village, M&E is an integral part of water users and management entities, such as the village council and water committee as well as the private operators. The villagers as the primary service users and beneficiaries are supposed to frequently observe their water schemes and notify the village authority about shortcomings. Users, mainly women interact with most of the water infrastructures on a daily basis in the course of fetching and providing water for their households. The earlier mentioned management entities do M&E as part of their monthly and daily activities through physical inspection of the water schemes and information from the users. The case of the concerns about the location of the cattle trough in Kidoka mentioned in Section 6.4.1, and seasonality-accessibility dynamics (see Chapter 3) indicate the potential role of the villagers in the M&E exercise.

²⁰ Tanzania Social Action Fund

²¹ Maji na Maendeleo Dodoma

²² Centro Mondialite Sviluppo Reciprocal-Tanzania

Looking critically at the M&E exercise, temporal gaps can be observed and procedural differences implied in the trajectory of approaches from the national down to the village level. These gaps become manifest in the following circumstances: the periodical and organisational nature of the surveys and census at the national level; the erratic logistics and shortage of resources and capability at the district level; and the technical insufficiency at the village level. Thus, I call for continuous synchronisation of the M&E information from the village to the higher administrative levels because the users' needs and perspectives change with changing social, economic and demographic parameters. It is important to emphasize that the synchronisation process requires a clear analysis and predefined decisions on who measures *what*, *when* and *how*. The synchronisation processes can follow my proposal of integrating and harmonising the mapping approach that I explained in Chapter 3. Then observed changes during the M&E can be addressed in the existing projects and lessons can be learned from the changes and their causes for new projects.

6.5 Conclusion

The findings presented in this chapter, have vital implications for policy and development interventions. A substantial part of my results shows that users of the domestic water services have knowledge on the potential water sources, the type of service they want and on how to improve the features that they are not satisfied with in the existing services. Nevertheless, service users had little opportunity to articulate their views and contribute their knowledge prior to the establishment of the village domestic water project. The preceding description is mirrored in the process of identifying potential water sources and the choice of technology, since these mostly involved very few representatives of the user community that was poorly informed on the installation. The approach employed to effectuate the choice of technology is in considerably conflict with the demand-responsive approach and ignores existing realities such as the absence of village-based technicians. All this ultimately endangers the sustainability of the rural water facilities. The extent of the users' dissatisfaction with the existing services reveals a mismatch between what is available vis-à-vis users' preferences due to restricted fora for users to communicate what they want and ongoing social, economic and demographic change.

Users' perspectives are diverse and subject to change from predictable and unpredictable factors. This adds to the challenges faced by the DWD, the Ministry of Water, local and international actors financing rural water supply as these institutions have scarce resources. The earlier mentioned observation justifies the importance of integrating the local knowledge from the users and that of the village management structures to complement the planning and designing of

water schemes and, thereby, enhance their sustainability. By doing so, local actors from the households and villages at the micro level will be appropriated as active social actors (cf. Long, 2001), with the ability to collaborate with the district and ministerial actors as macro levels in development interventions. That interaction is supposed to facilitate mutual understanding of the domestic water needs, problems and jointly establishing serviceable and realistic solutions from the users' and providers' perspectives. Thereafter, the dual perspectives approach will be a catalyst to the macro-level actors to place users at the centre of the design, actualisation and expansion of the rural domestic water services. In this respect, I fully agree with the scholars on the subject of the users' perspective who insist on *starting with the user of services in their context* (Hardon-Baars, 1997) and affirm that users are *active actors* (Long, 2001) *who have resources, and are a resource* (Niehof and Price, 2001). By doing so, all actors linked to the rural water sector will be able to develop a comprehensive understanding of the (gendered) perspectives of the users and the temporal and technical gaps revealed by the users' daily interactions with the water schemes as compared to the providers' mere periodical interactions, which will enrich technical and policy knowledge. Then the sustainability issue will be less problematic. The current system raises doubts about the responsiveness of the demand-responsive approach when only effectuated by responding to the overall need of improved water service from a technical standpoint instead of incorporating the (potential) users' perspectives.

Chapter 7

Community Management and Sustainability of Rural Water Facilities²³

This chapter addresses the question of whether community management in water services delivery affects the sustainability of rural water facilities at village level, in terms of their technical and managerial aspects, and what role capacity building of users and providers plays in this process. Findings show that sustainability of water facilities is in jeopardy and that villages far from the district council headquarters experience numerous technical and management problems. The national water framework does not clearly define the roles of the key actors at the district, village and household levels. District Water Departments do not have enough resources to render the services needed adequately and in a timely manner. In all the villages studied there were no local technicians trained for basic operation and maintenance. This implies that the concept of community management cannot be taken at face value; its actual meaning needs to be specified in order to offer a realistic and feasible option in the decentralization of rural water provision. With regard to capacity development, I recommend several measures specific to each level and actor, including establishing workshops for clusters of villages to repair breakdowns, and coordinate the availability of appropriate, good quality and affordable spare parts.

²³ A shorter version of this chapter is published as :

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7.1 Introduction

“Water provision is indisputably the most politicized public service, and developing countries have been greatly affected by the consequences of the ideological and political tendencies surrounding it” (Jiménez and Pérez-Foguet, 2010b: 93). The sector has experienced major internal and external changes. Tanzania has an extensive experience of the political processes and developments that govern rural water service delivery (Jiménez and Pérez-Foguet, 2010b). Since 1945, the governance of the rural water supply in Tanzania has passed through different stages, from the colonial era to the liberalization and privatization period (Boesen, 1986; Therkildsen, 1988; Maganga *et al.*, 2002; Cleaver and Toner, 2006; URT, 2002, 2008a; Jiménez and Pérez-Foguet, 2010a, 2010b). These changes reflect modifications in international water policies, such as the 1981–1990 International Drinking Water Decade, the 1992 Dublin Principles, and Agenda 21 (WHO, 1982; ICWE, 1992; URT, 2008a; Jiménez and Pérez-Foguet, 2010a, 2010b). Cleaver and Toner (2006: 3) note that “the Tanzanian approaches in water service delivery reflect international priorities in water governance and are characterized by a shift from interventionist ‘high modernist’ to ‘polycentric’ governance.” In Tanzania, the sector has experienced pendulum swings over time in terms of policies and achievements (see Table 7.1 for an overview).

Tanzania’s decentralization policies have affected all public sectors, including the rural water supply. Decentralization is a complex process and a multi-dimensional concept (Rondinelli and Nellis, 1986; Olowu, 2001). It refers to ‘the transfer of authority and responsibility for public functions from the central government to subordinate or quasi-independent government organizations or the private sector’ (Litvack and Seddon, 1999: 2). One aspect of decentralization is that rural water services have entailed a shift from water being a social good to becoming an economic good, and water users being made responsible to pay for the full cost of O&M through user fees (Maganga *et al.*, 2002; Cleaver and Toner, 2006; Jiménez and Pérez-Foguet, 2010a, 2010b). Additionally, local communities became responsible for the management of efficient and equitable service delivery. Policy implementation, however, is affected by intergovernmental structures and the division of power and responsibilities between the different levels of government. This also raises issues of institutional capacity and governance (Litvack and Seddon, 1999; Andrews and Schroeder, 2003). Within the current local government structures, the District Water Department (DWD) is responsible for technical coordination and administration of rural water supply to all the villages in the district. Decentralized rural water supply requires well-defined roles, skills, strategies and structural arrangements from the national level, down to the village and household level, where the service is managed and utilized. This mode of rural water service delivery produces an interaction between a community management

approach and a transfer of responsibilities to the lowest levels of government and service users (households). The implication is that institutions and actors at all levels need to have the essential capabilities to fulfil their respective roles towards sustainability of the rural water facilities (Litvack *et al.*, 1998; Harvey and Reed, 2004; Smoke, 2003, 2010; IOB, 2011).

Tanzanian villages are diverse in terms of managerial and technical capacity related to water service delivery (Cleaver and Toner, 2006; Jiménez and Pérez-Foguet, 2010a, 2010b). Some are well organized and located close to the administrative centres, others are less organized and situated in remote areas. Weak administrative or technical capacity at local levels contributes to inefficient and ineffective service delivery in some parts of the country (Litvack and Seddon, 1999). Yet, continuous capacity building of the management entities at the village level and of the users at the household level is hardly considered in the implementation of decentralized rural water supply in Tanzania, which threatens the sustainability of the whole system.

The roles of actors at various levels have been changing along with the changes in political ideologies and service delivery models. The extent of community participation, for example, has shifted from users being passive service recipients to becoming active service managers. This is reflected in the naming of water service users through time. From the 1970s to the early 1990s, they were called beneficiaries, whilst from the early 2000s to date; they are referred to as users, owners and managers of the rural water schemes (Therkildsen, 1988; Maganga *et al.*, 2002; URT, 2002, 2008a). As part of the decentralization process, the current NAWAPO requires villagers to contribute money or physical labour to the capital investment, to manage the water schemes, and to take responsibility for O&M (URT, 2002, 2008a). However, studies on rural water supply in Africa have observed that achieving the required level of sustainability of water facilities necessitates a clear definition of the roles of each actor and at all levels, as well as the capabilities to perform them (Harvey and Reed, 2004; IOB, 2011). Already in 1988, an evaluation on the Tanzania rural water supply considered capacity building and clearly defined roles of the different actors as essential to improving the sector's policies from the village to the national level (Therkildsen, 1988). Local communities require appropriate knowledge and skills to perform their roles and responsibilities, including O&M. However, the 2002 NAWAPO and 2008 National Water Sector Development Strategy (henceforth NWSDS) do not explicitly describe the roles and responsibilities of the actors at the lowest levels and do not clearly indicate who will train the communities (URT, 2002, 2008a). Failure to address these critical issues debilitates the efforts invested in the sector (Harvey and Reed, 2004; De Palencia and Pérez-Foguet, 2011). This is a concern, because in Tanzania more than 40 percent of rural water schemes experience persisting non-functionality due to hardware problems, sources falling dry and poor

management, which ultimately threatens their sustainability (Giné and Pérez-Foguet, 2008; Taylor, 2009a, 2009b; Jiménez and Pérez-Foguet, 2011a). Besides, micro-level analyses reveal that the relationship between decentralization and sustainability of rural water facilities is not well-documented (Litvack *et al.*, 1998; Cleaver and Toner, 2006; Robinson, 2007a, 2007b).

At the same time, since services depend on existing institutional arrangements, power relations, policy coherence, and on technical and managerial capacity at local levels, the outcomes of the decentralised water services vary (Rondinelli, 1991; Conyers, 2003; Smoke, 2003, 2010; Harvey and Reed, 2004; Robinson, 2007a, 2007b; De Palencia and Pérez-Foguet, 2011; IOB, 2011). Hence, there is a need for more precise contextualization in the assessment of the functioning of decentralized rural water services. Furthermore, the meaning of community management as it works out in practice is often taken as self-evident and is neither defined nor discussed. Drawing on existing debates about the sustainability of rural water supply and decentralization, this chapter addresses the following questions: (1) how do the current community management arrangements at the district and village levels in fact work, and how do they affect the sustainability of rural water facilities at the village level in terms of technical and managerial aspects; and (2) how can capacity building of providers and users be integrated into current community management arrangements and contribute to the sustainability of rural water facilities?

Table 7.1 Evolution of water policy and provision of improved rural water services

Period	Roles of different actors and major occasions in the rural water supplies	Coverage achieved
Colonial period (1945–1960)	<ul style="list-style-type: none"> • Construction through cost sharing between central government and the native authority.²⁴ • Capital investment: 25% by local authorities and 75% from central government. • Full operation and maintenance (O&M) by the native authority. • In the 1950s, the water department²⁵ took over O&M. 	<ul style="list-style-type: none"> • No clear and consistent figures indicated • Prime areas: townships, mission stations, large estates, trading centres, expatriates & government settlements. • Public connections in few native authorities. • Charcoal dams for livestock in the mainly cattle keeping areas.
Post-independence: Socialism and self-reliance period (1961–1980s) – the ‘free water to all’ era	<ul style="list-style-type: none"> • 100% capital investment by the central government. • Early 1961–1965, O&M by the native authorities; central government took over again later. • In 1970, the ruling party abolished the users’ cash contribution to construction and O&M. • Multiple donor-funded projects in about 12 regions by different donors and using contrasting approaches to those of the 1970s and 1980s. • Community participation based on self-reliance ideology, and community members participated in activities like digging trenches for water networks. 	<ul style="list-style-type: none"> • Improved access from 12–46% in 1985 (URT, 2008a). • Mainly public standpoints and cattle troughs. • Mainly domestic uses and few points for livestock watering.
Transition: Economic restructuring, public sector reforms and liberalization period (1990s–2001)	<ul style="list-style-type: none"> • 100% capital investment by the central government. • O&M partially financed by users. • Village managed small schemes, regional and national authorities managed large schemes. • Limited private sector involvement, only in areas where government could not intervene 	<ul style="list-style-type: none"> • Improved access: From 44 to 48.5% in 2000 (URT, 2008a; Jiménez and Pérez-Foguet, 2010b). • Mainly public standpoints and cattle troughs. • Domestic and livestock watering.
Liberalization and privatization period 2002– to date	<ul style="list-style-type: none"> • About 90% of capital investment by the central government, 5% by local government & 5% by users. • Full O&M by users through user fee. • Donor and international influence • Demand-driven approach, community participation in all stages of the project. • Services managed by users through village water committee and/ or private operator. 	<ul style="list-style-type: none"> • Improved access reached about 57% in 2010 (URT, 2010a; 2011c). • Mainly domestic distribution points and cattle troughs • Domestic and livestock watering

Sources: Boesen 1986; Therkildsen, 1988; Maganga *et al.*, 2002; URT, 2008a, 2010a, 2011c; Cleaver and Toner 2006; Giné and Pérez-Foguet 2008; Jiménez and Pérez-Foguet 2010b; PMO-RALG nd.

²⁴ During colonial era, ‘native authority’ referred to the local council, which is equivalent to district level in the current local government structure.

²⁵ Under colonial administration, the water department functioned like the Ministry of Water in the current system.

7.2 Decentralization, community management and sustainability of the rural water facilities: a complex nexus

Decentralization has multiple features; scholars have defined it in different ways and its scope has changed overtime. According to Rondinelli and Nellis (1986: 5), decentralization is the “transfer of responsibility for planning, management, and the raising and allocation of resources from central government ministries and agencies to field units of central government ministries or agencies (de-concentration), to subordinate units or levels of government (devolution), to semi-autonomous public authorities (delegation), and to non-governmental private or voluntary organizations (privatization).” Decentralization as the assignment of fiscal, political and administrative responsibilities to lower levels of government is occurring worldwide for different reasons, at a different pace and through different means (Litvack *et al.*, 1998). Governments in many developing countries have decentralized their development planning and management functions since the 1970s and early 1980s (Rondinelli and Nellis, 1986). To some countries, decentralization emerged as a way to address political and economic reforms (Litvack *et al.* 1998) or to meet the increased demand of public services, primarily due to internal demographic factors (Rondinelli and Nellis, 1986).

The degree of responsibility transferred, the discretion in decision-making and level to which it is transferred, connote different forms and types of decentralization (Rondinelli and Nellis, 1986). These constitute the basis upon which Litvack and Seddon (1999) identify three main types of decentralization: (i) political decentralization, which basically aims at pluralistic politics and representative government, whereby citizens or their elected representatives have more power in public decision-making i.e., the formulation and implementation of policies; (ii) administrative and fiscal decentralization, which seeks to redistribute authority, responsibility and financial resources for providing public services among different levels of government by the transfer of responsibility for the planning, financing and management of certain public functions; and (iii) economic or market decentralization, where there is a shift in responsibility for functions from the public to the private sector.

In this chapter, I link decentralized rural water services to political, administrative and financial forms of decentralization because VWCs are elected through political procedures, and the shift of the management and technical roles and responsibilities to the community entails that users play a primary role in administrative and financial activities. The 2002 NAWAPO and the ‘subsidiarity principle’ in Agenda 21 of 1992, emphasize the involvement of the lowest level beneficiaries’ to manage and ensure full cost-recovery for O&M (URT, 2002, 2008a). The subsidiarity principle has resulted in a paradigm shift from community participation to community management of rural water schemes. Subsequently,

these changes form a nexus between community management, sustainability and transfer of decision-making, management authority and payment responsibility to the communities at the village and service users at the household level. This nexus underlies our theoretical framework that links community management and the sustainability of rural water schemes (Rondinelli, 1991; Harvey and Reed, 2004, 2007), and highlights capacity constraints as one of the neglected challenges in implementing decentralization (Smoke, 2003, 2010). This study investigates the interconnections between the roles and responsibilities assigned to the community to manage water schemes and pay for the cost of O&M, and the needed technical and management capabilities. "Capacity building and sustainability are closely related; without adequate, appropriate capacity at different levels of government and at local level, services will not be sustainable" (Abrams, 1996, as cited in Harvey and Reed, 2004: 53).

I acknowledge the complexity of the decentralization process and the challenges facing its integration in rural water services and other public services (Rondinelli, 1991; Litvack *et al.*, 1998; Bardhan, 2002; Andrews and Schroeder, 2003; Conyers, 2003; Harvey and Reed, 2004, 2007; Smoke, 2003, 2010). Because communities are heterogeneous, decentralization processes should be contextualised by considering sectoral, temporal, structural and locational specificities (Litvack *et al.*, 1998; Cleaver and Toner, 2006; Harvey and Reed, 2007). In addition, there is a need to reconceptualise 'community management', in theoretical and operational terms, because the phrase has become a buzzword and is used as a blanket statement in the development literature, interventions and policies (Cleaver, 1999; Cleaver and Toner, 2006; Cornwall, 2008). Thus, it is important to deconstruct and unpack the meaning of community management and define its dimensions and constituting elements, such as structures, actors, obligations, implications and mechanisms of accountability (cf. Larson and Ribot, 2004; Ribot *et al.*, 2006). Figure 7.1 shows community management as pictured by Harvey and Reed (2004: 16, 41).

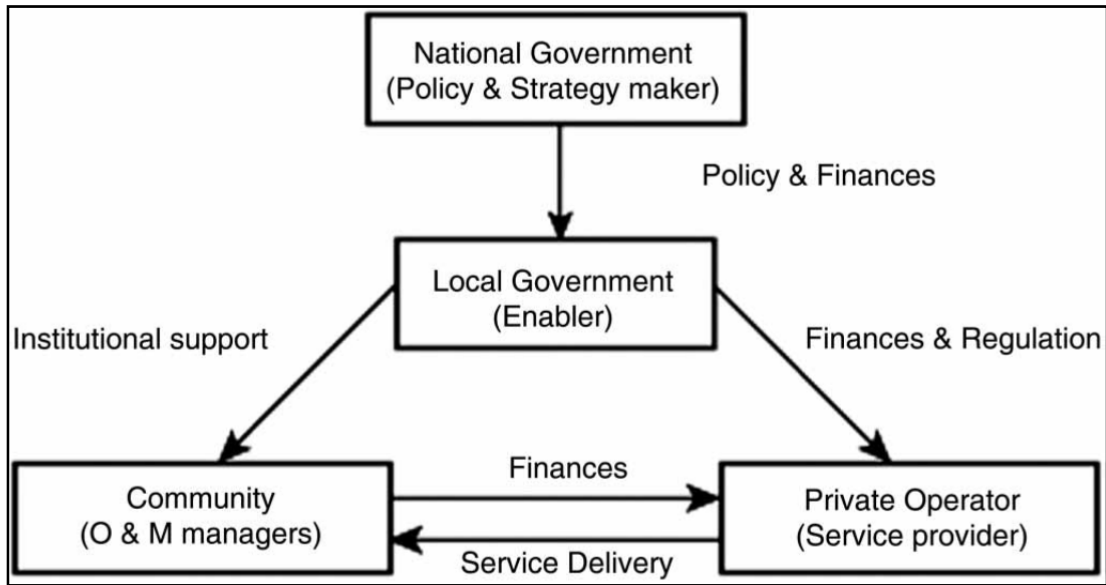


Figure 7.1 Community management model (Harvey and Reed, 2004)

However, the Harvey and Reed model gives rise to questions. The box 'community' comprises 'O&M managers' but does not place these managers and their responsibilities within village structures and context. In this chapter, I intend to open the 'community' box, which requires an addition to Harvey and Reed's framework. The issues of contextualization and capacity development are other points that are not depicted clearly by Harvey and Reed. Appropriate capacity development is required for all actors at all levels, with special emphasis on maintenance, record keeping and financial management for the villages. Finally, the Harvey and Reed model is a top-down model with the arrows pointing in one direction, hence feedback mechanisms are not visible. In these respects, I have added theoretical dimensions to the community management model. The results can be seen in Figure 7.2 that presents the theoretical framework used for this study.

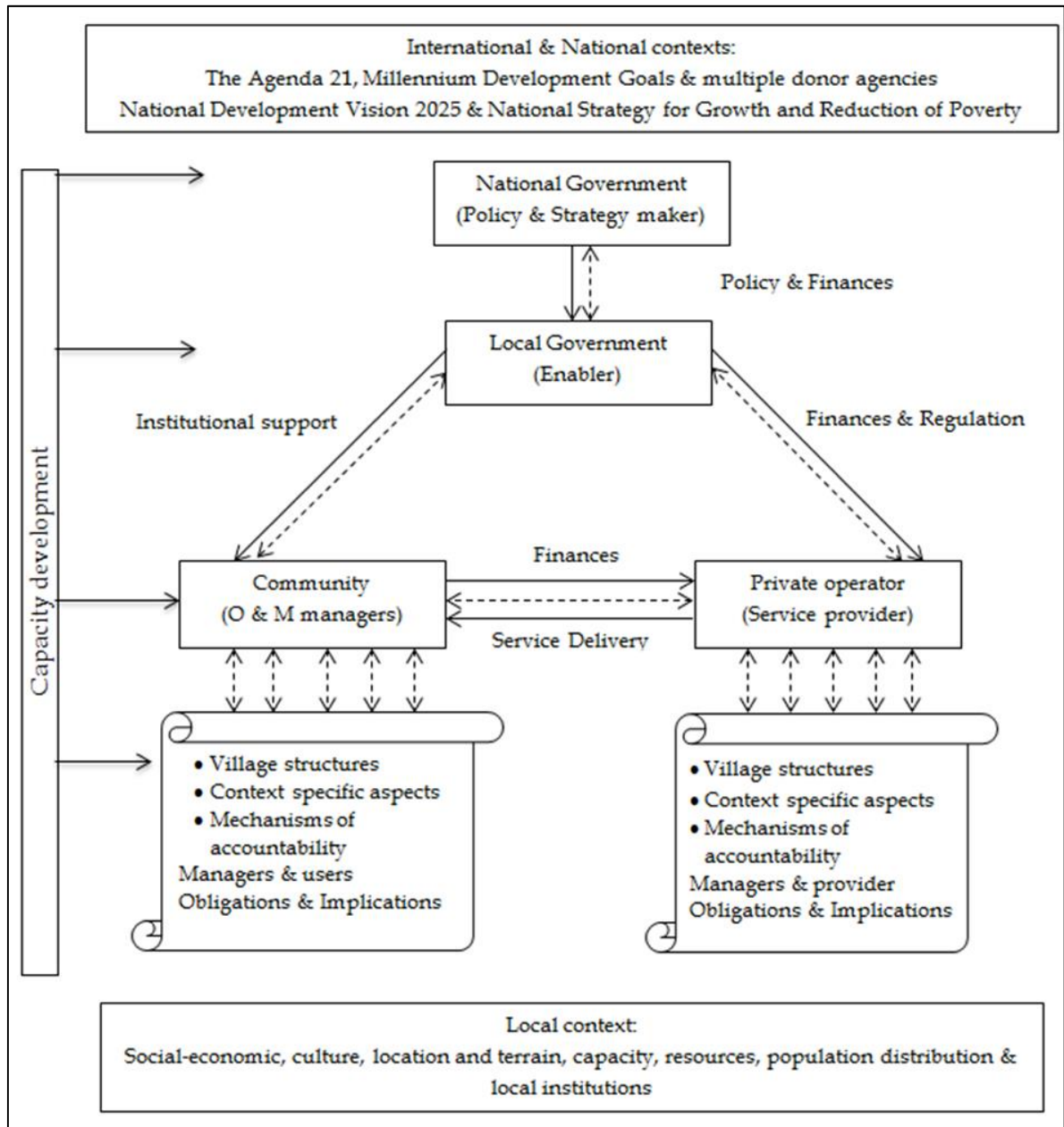


Figure 7.2 Expanded community management framework.

Based on this framework, the following questions can be raised:

- What does community management entail in terms of skills and knowledge?
- Who is responsible for appropriate water services capacity development?
- Do communities in the villages have the required skills and knowledge to perform the technical and the management roles?
- If not, from whom, how and where do they get the necessary assistance?
- If they do not, what are the implications for the sustainability of the water infrastructures?

- Does capacity building pertaining to rural water supply at the community level in the villages get the same attention as capacity building at other levels of government?
- Should the one precede the other or should they be implemented simultaneously?

7.3 Study area and methodology

The fieldwork for this study was conducted between October 2011 and September 2012 in the districts of Kondoa and Mpwapwa in the Dodoma region in central Tanzania. The region is in a semi-arid area that relies on ground water. The two districts are among the pilot districts to implement the Rural Water Supply and Sanitation Program (RWSSP)-Phase I, which aimed at ensuring access to improved and sustained water and sanitation services in rural communities. The main water sources for domestic use in these districts are deep boreholes with mechanised pumps, shallow wells, gravity schemes and a few rainwater harvesting schemes. During the rainy season, traditional-hand dug wells, riverbeds wells and springs are among the dependable sources of water in areas without the improved sources, or where improved sources are inoperative. Data collection was undertaken in nine villages: five in Kondoa district and four in Mpwapwa district. The villages were purposely selected based on types of water source, management approach, and location and distance from the district council headquarters. Five villages had boreholes, two had gravity schemes, one had a shallow well and one of the villages had a broken-down borehole. Two of the study villages had a private operator supervised by the VWC, five villages had a VWC only. The remaining two villages used to have a VWC and had just began to work with a PO.

This study combined quantitative and qualitative methods to optimize their complementary advantages (Scrimshaw, 1990; Rao and Woolcock, 2003). Quantitative data on household characteristics and domestic water service was collected by a household survey among 221 randomly selected households, whilst qualitative data was collected through FGDs, in-depth interviews with village leaders and a few villagers, and field observation. The FGDs were held in two villages with six groups of men, women and VWC representatives, in which 21 men and 18 women participated. Semi-structured interviews with village leaders and district council officials were conducted to collect information on domestic water services. Detailed case studies of two villages were undertaken to get context-specific and detailed qualitative information, because, as explained earlier, the outcomes of the decentralized public services vary and are influenced by specific local features. The description of the case villages is presented in Sections 7.4.1 and 7.4.2. Secondary data from the district water and planning departments, and Village Executive Officers (VEOs) supported the village selection and

supplemented the primary data. To understand the roles assigned to the actors at different levels, I did a detailed review of the rural water supply section in the 2002 NAWAPO and water supply section in the 2008 NWSDS. This yielded comprehensive information on the way the national water frameworks define and assign roles and responsibilities to different actors.

To address the concepts of community management and sustainability in this study I highlight and analyse the actors' roles, responsibilities and capacity to manage and maintain rural water schemes at different levels. At the national level, our analysis focuses on the actors, levels, roles and responsibilities as identified and defined in the (rural) water supply sections in the NAWAPO and NWSDS. At the district level, the study focuses on the DWD's capacity and resources to provide and coordinate technical support to the villages so that the villages can manage and maintain their water facilities. At the village level, I concentrate on the training of VWCs, pump attendants and local technicians. At the household level, the study sought the service users' views on the challenges posed by the breakdowns of public water facilities and on alternative sources of domestic water. I chose multiple units of analysis in order to systematically elicit empirical evidence on macro policy-micro interactions and their bearing on the management and maintenance of sustainable rural water facilities.

7.4 Results

7.4.1 The case of Chase-Chinyika

Chase-Chinyika village is located about 120 km to the south of Kondoa district headquarters. The village has a public transport connection in the form of a bus that makes only one trip a day to Kondoa town, but which is occasionally interrupted in the rainy season. In 2011, the village had a population of about 4846 (1219 households), comprising a mix of tribes, mainly the Sandawe, Gogo and Maasai. There are eight subvillages: Chase Shuleni, Naante, Zezengwalo, Chinyika, Hubu, Gwandi, Dalayi and Ziawa. The main sources of income are farming, animal husbandry and small-scale business. The current water project was established in 2008 through the Water Sector Development Programme. Representatives of the VWC confirmed that the borehole has improved the quality of water services in the village. Previously, villagers depended mainly on (unclean) hand-dug wells in the neighbouring villages of Lukuri, Bubu, Mpendoo and Maziwa. In the dry season, people had to walk up to 16 km to get a bucket of water. Villagers' contribution to the capital investment was organized per household and collected in three phases: first TSH 1000 (about \$US 0.64), second TSH 2000 (about \$US 1.28) and third TSH 8000 (about \$US 5.12). Households that could not contribute in cash provided physical labour by digging trenches and collecting sand and stones. Water infrastructures in the village consist of a diesel-

pump borehole, two functional and one non-functional DP, one cattle trough, one water tank without stairs and one half-finished pump house. The half-finished pump house endangers the security of the pump. Villagers and village leaders wondered why the contractor did not complete the water tank and pump house, but they could not intervene because the contractor was hired by the district council and not the village. The village leaders have repeatedly reported the matter to the DWD but no definite measures have been taken, despite numerous promises from the district council and local politicians to settle the issue. Water users pay TSH 30 (about \$US 0.02) per 20-litre bucket of water. A cow is charged the same price, while sheep and goats are charged TSH 10 (about \$US 0.006) per head. Daily collections from the user fees, range from TSH 2,000 to 2500 (about \$US 1.28–1.60) at the DPs and TSH 24,000 to 30,000 (about \$US 15.35–19.20) at the cattle trough as the livestock keepers in the neighbouring villages use the cattle trough too. On average, the highest monthly user fees collection is TSH 900,000 (about \$US 575.82) and the lowest TSH 144,000 (about \$US 92.14), during the dry and rainy seasons, respectively.

The VWC counts six men and six women, in accordance with the national guidelines that require an equal representation of men and women (URT, 2002, 2008a). They manage the water project and supervise the private operator (PO). Except for two subvillages, each subvillage has two representatives in the VWC, a man and a woman. After their election in 2008, the VWC members were trained for one day by facilitators from the DWD on management of the borehole, carrying out minor repairs, and safeguarding cleanliness around the borehole and water tank. From the interviews with the representatives of the village council and the VWC, it transpired that, to become a VWC member, one should have the following qualifications: be aged 18 and above, able to read and write, be accepted by the community, trustworthy, patient and ready to volunteer. Patience is required because whenever the water service is not up to the villagers' expectations, the VWC members are among the first to be blamed, even when the problem is not their fault. Willingness to volunteer is important since members of the VWC are not compensated for their time. The VWC meets once a month and convenes extra meetings in cases of emergency. The VWC has to: supervise the PO; ensure there is enough water at the DPs and in the cattle trough; and make sure that the PO pays the village TSH 100,000 (about \$US 64) every month. The ward councillor helps the village to deposit the revenue at the water fund bank account at the district headquarters. There were no water metres at the DPs and the cattle trough to regulate the quantity of water sold, so that the VWC cannot check whether the revenues reflect the amount of water pumped and sold.

In September 2010, the PO was contracted for one year through a tender. The village opted for the PO because, when the project was operated by the VWC, it did not get regular revenues. The amount payable to the village does not change

with the season, although water use increases in the dry season and decreases in the rainy season. The tender was handled by the village council without help from the DWD and the district legal unit. Further details on how the tender was processed and administered could not be obtained. The contract of the PO expires annually, after which the village office calls for new applications. The operator is allowed to hire water sellers for all the DPs and the cattle trough. The water sellers are responsible for collecting user fees and have to submit the money to the PO. The latter is responsible for minor operation costs, such as needed to change oil, paying monthly allowances to the pump attendant and the security guard, and paying the water sellers. The pump attendant and the security guard are paid TSH 15,000 (about \$US 9.60) each per month. The amount paid daily to the water sellers was not revealed.

The brand of the water pump engine is a Lister Petter, fixed on a metal frame. During the fieldwork, it was reported that the pump and the metal frame often break down, especially in the dry season (July–October), yet the village has no local technician for repairs. Whenever a breakdown occurs, the VWC and members of the village council have to look for a private technician from Kondoa town. Through the water project, the village pays TSH 70,000 (about \$US 44.80) for the expertise and transport costs each time the village hires the technician. Moreover, the pump attendant reported that the metal frame holding the pump had broken down three times between July and October 2011, costing the village a total of TSH 100,000 (about \$US 64) on welding services. On average in the dry season, apart from expenses for other maintenance and buying spare parts, the village spends between TSH100,000 and TSH170,000 (about \$US 64–109) each month on repairs. Most of the spare parts, such as replacements for water taps, gate valve, exhaust pipe, air cleaner and engine filter, are procured in Dodoma, and rarely in Kondoa town. The VWC and the operator commented on the good quality of the spare parts and said that it takes one to two days to get the spare parts required.

The discussions with village leaders, VWC and villagers revealed that the lack of stairs on the water tank is a major challenge, because cleaning inside the tank becomes difficult and ultimately pollutes the water at the DPs. During observation at the water infrastructures, two women at one of the DPs, while showing the water in their bowls, said: ‘The water is not as bright as it used to be when the project just began; now there are particles which can be seen at the bottom of the container after the water has settled. The particles seem to increase because our tank has no stairway to get in and clean it.’ A second challenge is the poorly finished pump house without windows and a door, which threatens the security of the pump’s engine. A third is the lack of a local technician to fix the engine and repair the exhaust system. Further challenges are the frequent breakdown of the engine and its metal frame, the lack of water meters at the tank,

the DPs and the cattle trough, insufficient DPs, the destruction of the wooden padlocked boxes that are used to lock up water taps at the DPs, the inadequate managerial and technical training of the pump attendant and VWC members, and, finally, the controversy about the PO's intention to increase the user fee (the users' view is that the current fee should be enough for the PO to provide the water service with a profit). The photographs in Figure 7.3 portray the situation of the water infrastructures in Chase-Chinyika village. The photographs were taken by the author during data collection in the village in 2011.

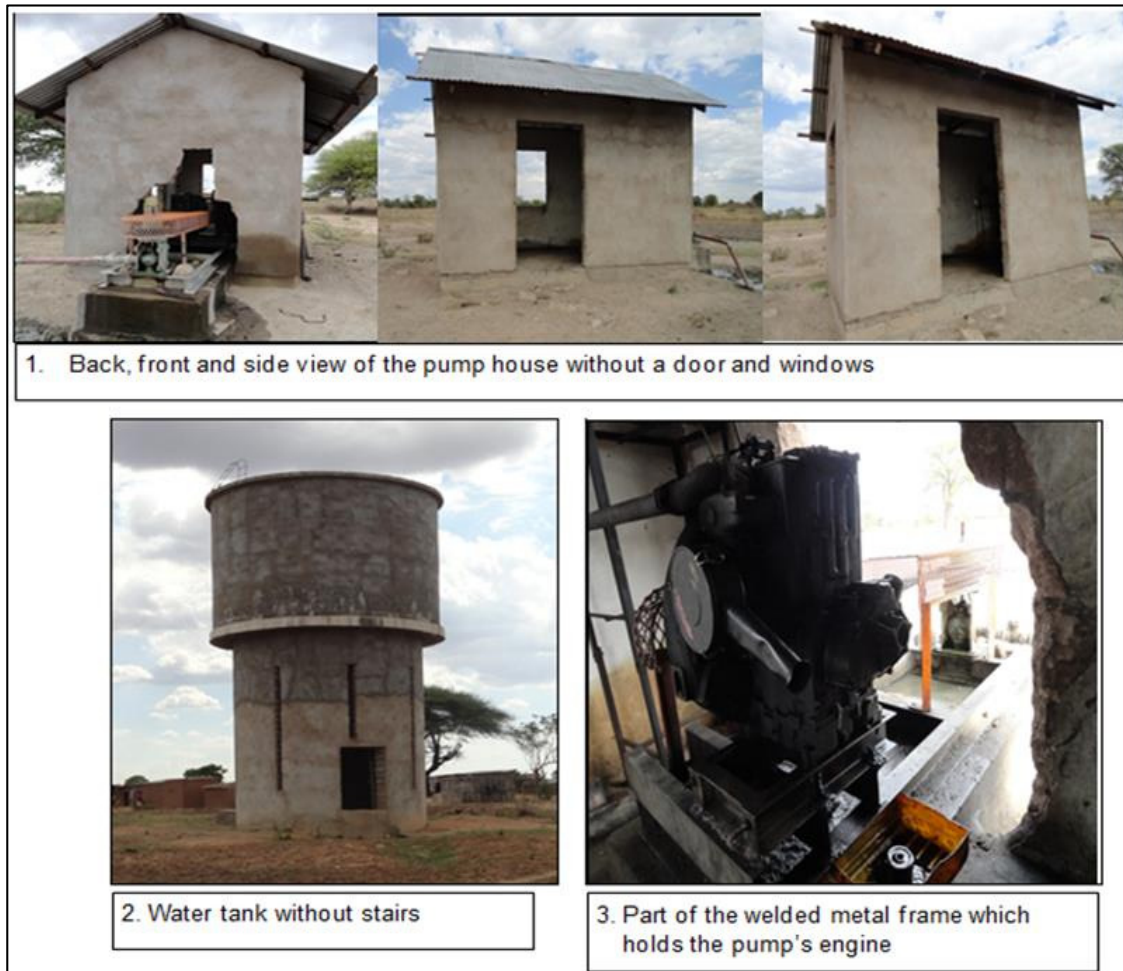


Figure 7.3 Photographs showing water infrastructures with defects in Chase-Chinyika village.

7.4.2 The case of Seluka

Seluka village is located about 90 km from the district council headquarters, in the south of Mpwapwa district. There is no direct public transport connection to the district headquarters. In 2011, the village had a population of about 2894 (771 households). There are five subvillages: Miengweni, Nyabu, Mbuyuni, Shuleni and Ofisini. The main ethnic groups are the Gogo and Hehe, while recently the Sukuma

and Barbaig have been migrating into the village to farm and keep livestock. The village had a water project that was established in 2005/2006. The villagers contributed to the capital investment by paying TSH 1,000 (about \$US 0.64) and TSH 2,000 (about \$US 1.28) in the first and second phase, respectively, or by providing physical labour (digging trenches and laying the distribution pipes). The water infrastructures in the village include a pump house, a diesel-pump borehole, six domestic DPs, one cattle trough, one water tank, water meters and their boxes. During the fieldwork, only the pump house and water tank were operational. At the beginning of 2007, the water project started to collapse, initially with numerous bursts of the distribution pipes followed by non-functionality of the DPs, particularly in the subvillages of Nyabu and Miengweni. As a result, the villagers depend on traditional hand-dug wells and riverbed-sand wells for domestic water.

The village has a VWC with five men and five women, two members from each subvillage. Qualifications for VWC membership are similar to those in Chase-Chinyika. From 2006 to September 2012, the composition of the VWC changed several times. It was not clear when VWC members were last trained. VWC members are responsible to ensure an adequate water flow to all DPs and smooth delivery of services, to prepare the water-selling roster and take turns to sell water at the DPs, along with submitting user fee collections to the VWC treasurer and mobilising fellow villagers to restore the water project. The FGDs participants indicated that frequent changes in the composition of the VWC disrupted its efficiency in managing the water project. Loss and inappropriate hand-over of the project's records was attributed to these changes. In 2011 alone, the VWC membership changed three times. The changes occurred because some of the VWC members were dissatisfied with the lack of transparency on the expenditure of the water revenues and resented political interference. Others wanted to retire because they were tired of the complaints of fellow villagers about the poor performance of the project.

Water users were paying a user fee for water services when the project was functional. The user fee changed three times: from TSH 20 for a 20-litre bucket (about \$US 0.01) in 2006, to TSH 30 (about \$US 0.02 USD) in 2007 and TSH 50 (about \$US 0.03) 2010. The increase of the user fee started when daily running costs exceeded the amount of user fees collected. The latter happened due to the decrease of functional DPs, frequent breakdowns of the pump and distribution pipes, and an increase of transport costs to Mtera, the nearby town where diesel was bought. The villagers were dissatisfied with the rise of the fee because they expected to have savings in the water fund account from the fees they had been paying since the project started. When asked for details about the challenges facing their water scheme, the FGDs participants reported that most villagers are dissatisfied due to the following: (a) the bad quality of the distribution pipes caused frequent bursts; (b) a lack of transparency and accountability on water revenues

expenditure; (c) lack of appropriate feedback from the village office; (d) miscommunication between the villagers and the district council; (e) lack of accountability and questionable ethics among some of the water technicians from the district; (f) no receipt of financial reports; (g) the village leaders not taking the matter seriously; (h) conflicting interests and political interference; and (i) the overall poor management of the water project.

It also became clear that burst pipes disturbed the flow of water to the DPs, which made some of the villagers sceptical about restoring the water project. As the problem escalated and all DPs became non-functional, the village leaders attempted to mobilise contributions from the villagers for repairs. However, the response was negative because the villagers were not getting answers to their queries on the overall management of the water services. This did not cause lack of water because there were about 65 traditional hand-dug wells and several riverbed-sand wells that were dependable sources of water for domestic and livestock uses. One major point of dissatisfaction among the villagers was the unclear status of the water fund account, as they had not received any financial report since 2008 when the village chairperson notified them that the project was operating at a loss. More queries on the water fund account could be observed in the FGDs with ordinary villagers than in the FGD with the VWC representatives, who said that they were told by the village leadership that there was TSH 1,000,000 (about \$US 640) in the account. However, the VWC representatives could not recall the last time they checked the balance. They reported that the account became inactive in 2008 (when they were not yet members of the VWC) when user fee collections were very little and not enough even to buy diesel and cover other running costs.

The FGDs revealed that the traditional hand-dug wells in Nyabu and Miengweni subvillages had been there for more than fifteen years while the shallow riverbed sand wells were dug during the rainy season. The traditional hand-dug wells belong to rich livestock keepers, who had dug them to have a reliable water source for their large herds of cattle. Since these wells were primarily meant for livestock, now there are schedules and arrangements on when to access the water for domestic use. In the FGDs with women and in-depth interviews with the representatives of the village council, no conflicts between livestock keepers and the domestic water drawers, mainly women, were reported. The women normally fetch water from about 6 to 10 a.m. and after that, the water is for the livestock. Additionally, the wells have been categorized into wells for both domestic and livestock use and wells for livestock use only. The owners of the wells do not charge any user fee to water drawers. But some of the youths in the village were also fetching water from the wells, transporting it by bicycle and selling it to fellow villagers at TSH 300 (about \$US 0.19) for a 20-litre container.

Some villagers who own bicycle(s) lend the youths a bicycle to transport water and, in return, get a reduced price (TSH 200 for a 20-litre container).

7.4.3 Roles and responsibilities of different actors and levels

The 2002 National Water Policy and the 2008 National Water Sector Development Strategy

The 2002 NAWAPO and the 2008 NWSDS reflect international and national debates and features of the rural water supply. The government introduced the 2002 NAWAPO after numerous technical studies and sectoral reviews that identified areas in need of attention in order to be compatible with global and national reforms. It encompasses three major sections: (i) water resources management, (ii) rural water supply; and (iii) urban water supply and sewerage. In 2008, the government published the NWSDS for 2006–2015) to foster the implementation of the 2002 NAWAPO and to describe the institutional and legislative changes. The 2008 NWSDS was developed to support the NAWAPO's realignment with the major national frameworks, e.g. the National Development Vision 2025, and the National Strategy for Growth and Reduction of Poverty, and to ensure that the new institutional frameworks reflect devolution and decentralization principles in water supply services. With regard to the roles of different actors and levels in rural water supply, the NWSDS states that 'the NWSDS focuses on specific roles of the various actors, through clearly defining roles and responsibilities and hence the removal of duplications and omissions' (URT, 2008a: i). The Ministry of Water coordinates, formulates and regulates policy and guidelines pertaining to rural water supply, to facilitate the implementation of rural water supply initiatives.

However, when reviewing the 2002 NAWAPO and the 2008 NWSDS I found a number of weaknesses. First, the roles of the VWCs and households, who are the primary actors, are not explicitly described. Second, from the empirical evidence, the actual roles, especially those from local government level down to the household, divert from the documented ones. A third weakness is the vague descriptions of roles. For example, it is not clearly indicated who will train the communities (cf. URT, 2002: 33–34, 36, 38; 2008a: 44, 52). Fourth, there is an urban bias in the roles assigned to the district councils, with only four out of the nine roles applicable to rural areas (see Table 7.2). These weaknesses contradict the sustainability principle, which acknowledges that "sustainable development and delivery of rural water supply services relies on clear definition of the roles and responsibilities of the various actors as well as those of the stakeholder groups" (URT, 2002: 31). Table 7.2 provides an outline of the actors at different levels and their specific roles in the rural water supply.

Table 7.2 Comparison of roles and responsibilities of different actors and levels, as indicated in the major rural water supply frameworks and actual situation from empirical data

Level	Actors	Roles and responsibilities as indicated in the 2002 national water policy and the 2008 national water sector development strategy	Actual roles and responsibilities taken from empirical data
Central government	Ministry of Water (MoW) and donors	<ul style="list-style-type: none"> • 'Hands off, eyes on' i.e. Policy and guideline formulation, coordination, monitoring & regulating. • Liaise with donor-funded rural water supply programmes & projects. 	<ul style="list-style-type: none"> • As indicated in the policy and strategy
	Prime Minister's Office - Regional Administration & Local Government (PMO-RALG)	<ul style="list-style-type: none"> • Coordinate planning of water projects from local government authorities (LGAs). • Coordinate water projects' budgets in the LGAs. • Coordinate capacity building of the personnel working with Water department in the LGAs. 	<ul style="list-style-type: none"> • As indicated in the policy and strategy
Local government	Local government authorities (LGAs) <ul style="list-style-type: none"> • <i>Urban authorities:</i> city, municipal & town councils. • <i>Rural authorities:</i> District Councils, township authorities, village councils; District Water Department (DWD) 	<ul style="list-style-type: none"> • Regulate water users' entities. • Representation on Water Supply & Sewerage Authority (WSSA) boards. • Co-ordinate WSSA budgets within Council Budgets. • Disburse block grant funds to WSSAs. • Co-ordinate physical planning with WSSAs. • Conduct performance monitoring & evaluation (M&E) and regulation of Community-Owned Water Supply organizations (COWSOs). • Provide and/or promote on-site sanitation. • Formulate by-laws on water supply and sanitation. • Training in basic technical and managerial features. 	<ul style="list-style-type: none"> • Liaise with the MoW, PMO-RALG and institutions working on and affected by rural water supply. • Liaise with Planning, Education, Health & Community Development departments in the DCs. • Coordinate all villages' water projects in the district. • Provide technical expertise in planning & design, construction, and O&M. • Conduct erratic M&E for the villages. • Occasionally train the VWCs and/or selected villagers in basic technical and managerial features.
Village government	Village Councils	<ul style="list-style-type: none"> • Regulate water users' entities. • Promote establishment of COWSOs. • Representation on COWSO management body. • Co-ordinate COWSO budgets within Council Budgets. • Resolve conflicts within and between communities. • Formulate by-laws concerning water supply and sanitation. 	<ul style="list-style-type: none"> • Liaise with the DWD. • Overall supervision of the water project(s). • Supervise and collect villagers' contributions to capital investment. • Coordinate election of the VWC members. • Coordinate processes to get Private Operators (POs). • Oversee performance of the VWCs and/or POs. • Communicate financial report to the villagers.
	Village Water committees (VWCs)	<ul style="list-style-type: none"> • Not explicitly indicated 	<ul style="list-style-type: none"> • Monitor performance of the water project. • Supervise fetching of water at distribution points

Table 7.2 Comparison of roles and responsibilities of different actors and levels, as indicated in the major rural water supply frameworks and actual situation from empirical data

Level	Actors	Roles and responsibilities as indicated in the 2002 national water policy and the 2008 national water sector development strategy	Actual roles and responsibilities taken from empirical data
			<p>(DPs), in the villages that do not use the PO approach.</p> <ul style="list-style-type: none"> • Sell water and collect water user fees in the villages that do not use PO approach. • Do and coordinate cleanliness around the borehole, DPs and water tank.
	Private operators (POs)	<ul style="list-style-type: none"> • To provide water services based on varying contractual arrangements. 	<ul style="list-style-type: none"> • Provide water services as per agreement with the village. • Pay the village the amount of money agreed, in cash or by depositing it to the water fund account. • Pay for minor repair of water infrastructures. • Hire water sellers for all the DPs. • Supervise water sellers to sell water and collect user fees. • Remunerate pump attendants, security guards and water sellers.
Community	Community members i.e. villagers	<ul style="list-style-type: none"> • Initiate demand for improved water services. • Approve and supervise design, construction and operational contracts for their water supply systems. • Contribute to part of the capital investment in cash and in kind. • Cover full costs of O&M through the users' fee. • Protect and conserve water sources. 	<ul style="list-style-type: none"> • Contribute to the 5% capital investment through a flat rate contribution from a household as a whole and/or each able adult above 18 years old in the household, and through physical labour. • Protect and conserve water sources as well as water infrastructures. • Other roles are similar to the ones in the policy and strategy.
Household	Users in households	<ul style="list-style-type: none"> • Not explicitly indicated. 	<ul style="list-style-type: none"> • Paying users' fee. • Participate in village assembly and other village development meetings deliberating on water services. • Participate in management activities pertaining to water services.

The District Water Department and its support of village public water services

The DWD is based at the district council headquarters and has to coordinate all villages' water projects in the district by providing on-going technical assistance and performing other roles as mentioned in Table 7.2. The villages differ with regard to location, water sources, technical challenges, and capacities and resources to manage and maintain the public water facilities. Kondoa district has an area of 13210 km² with 193 villages, whilst Mpwapwa district has an area of 7379 km² and 93 villages. The DWD is required to serve all villages in all districts. To carry out its responsibilities, the DWD needs financial, human and technical resources and capacities. Table 7.3 shows that both districts had at least half of the number of employees required, but there was a pronounced deficit of plumbers and masons. Neither district had a laboratory (to check water quality) or electricians (for repairs to the electrical pumps). In both districts, the DWD faces more challenges in the dry season, when pumps may break down because of over-utilization. During the rainy season, villages with gravity schemes, such as Sambwa, experience delays in getting technical assistance from the DWD because the road to the village is not passable. The fact that transport facilities are needed to reach remote villages, adds to the challenge.

The DWD in Kondoa and Mpwapwa had some transport facilities for monitoring, evaluation, training and major repairs in the villages. The DWD has a budget for fuel and service of the vehicles. Kondoa had one Toyota land cruiser, a truck and four motorcycles, but they require two land cruisers and eight motorcycles. The truck is old and frequently breaks down. Mpwapwa district had one Toyota land cruiser and three motorcycles instead of the needed three cars and six motorcycles. The shortage of vehicles and motorcycles in both districts interferes with timely field trips by the DWD's technicians to the villages that need repairs or other technical and administrative assistance from the DWD.

The District Water Engineer and Planning Officer in the two districts reported that the DWD has a shortage of technicians, money and motorcycles. Kondoa district experienced untimely and inadequate disbursement of funds. In 2011/2012, the district requested about TSH 2.4 billion (about \$US 1,535,509) for new water schemes, but only TSH 1.4 billion (about \$US 895,713.40) was approved. This required budget reallocation was a demanding and time-consuming process that caused delay in the implementation of activities. In addition, the officials revealed that the national authorities consider population size to be a major criterion in allocating funds. The DWEs in both districts questioned the relevance of this criterion and, instead, pointed to factors like size of district, type of water source, technology and infrastructures, geographical location and condition of the terrain. Other challenges faced by the DWD include lack of funds for follow-up training of the VWC members and village councils, and the absence of a budget for

maintenance of old water schemes. The DWEs reported interference in their daily work, especially changes in the fieldwork schedules in terms of timing, frequency and area coverage due to insufficient funds, vehicles, motorcycles, technicians, as well as other logistical challenges.

Table 7.3 Employees and transport facilities in the water department in Kondoa and Mpwapwa districts.

Kondoa district					Mpwapwa district			
<i>Employees</i>								
	Highest level of education attained				Highest level of education attained			
Employee Category		Required	Available	Deficit		Required	Available	Deficit
Water Engineer	BSc	2	1	1	MSc	3	1	2
Water civil technician	FTC*/Diploma	7	7	-	FTC /Diploma	2	1	1
Pump &engine technician	Basic certificate	3	3	-	FTC/ equivalent to basic certificate	2	1	1
Electrical technician		1	-	1		2	-	2
Laboratory Technician		2	-	2		1	-	1
Surveyor	FTC /Diploma	2	1	1	FTC /Diploma	2	2	-
Plumber	Basic certificate	5	1	4	FTC/ equivalent to basic certificate	4	2	2
Mason	Basic certificate	5	3	2	FTC/ equivalent to basic certificate	6	4	2
Total**		27	16 (59)	11 (41)		22	11(50)	11 (50)
<i>Transport facilities</i>								
Vehicle		Required	Available	Deficit		Required	Available	Deficit
Toyota land cruiser series 70 (Hardtop)		2	1	1		3	1	2
Truck		1	1	-		n/a	n/a	n/a
Motorcycle		8	4	4		6	3	3

Source: based on information from the water department in Kondoa and Mpwapwa districts.

*A Full Technician Certificate is an award in a technical field, equivalent to an Ordinary Diploma or Basic Certificate, depending on the duration and the level of study.

**Numbers in brackets are percentages.

Village-based institutions in management and maintenance of water facilities

In each of the study villages, the VWC was responsible for the management of the village water project. Nevertheless, Seluka village in Mpwapwa district had an unstable VWC due to frequent membership change. In Sambwa, problems with the VWC due to tensions between the VWC, village leadership and villagers were in the process of being resolved. Information from the VEOs in the study villages indicated that only the first cohort of VWC received one day of training from the district council staff, except in Mbori village where the training was facilitated by a WAMMA²⁶ team. The VWC members are elected every three years but often do not serve their term because of poor performance or other reasons specific to the village. The training of the VWC members covered topics related to: (a) general management of the water services; (b) cleanliness around the borehole and water tank; and (c) carrying out minor repairs.

The WAMMA team had staff from WaterAid and the district council to train and build local capacity to enhance the villagers' ability to manage their water schemes (for further details on WAMMA, see Mathew, 2004). No village had a trained local technician, although pump attendants perform some of the technical work. There were trained pump attendants in five villages and a tank attendant in Lupeta village (which has a gravity scheme). The villages in the previous description had one-day training at the start of the project in their village. Training was mainly facilitated by the DWD staff and covered topics related to: (a) operating the engine to pump water; (b) changing engine oil and fixing the belt; (c) cleaning the pump house; and (d) checking the DPs. Kidoka village was exceptional, because two villagers were trained as pump attendants, although I met only one. There was also training by the contractor who installed the water infrastructures in the villages. Table 7.4 details village institutions involved in management and O&M.

All the villages bought spare parts for minor replacements in the district's town or in Dodoma. Villages incur costs for fare and food for whoever is sent to buy the spare parts. Return bus fares to the districts town range from TSH 2,000 to 22,000 (about \$US 1.30–14.00), depending on the location of the village and type of transport. Lupeta village (located about 12 km from Mpwapwa town) paid the lowest fare, and Chase-Chinyika (about 120 km from Kondoa town) and Seluka (about 90 km from Mpwapwa town) the highest.

²⁶ WAMMA stands for 'WaterAid, Maji, Maendeleo ya Jamii and Afya'. The italicised Swahili words represent the three departments: Water, Community Development and Health at the District councils.

Table 7.4 Village institutions for management, operation and maintenance of the water facilities (n=9).

Village name	Management approach	Training for the VWC	Type of source	Technology and functionality	Presence of trained local technician	Presence of trained pump/tank attendant
Berege	Private operator and VWC	Yes in 2008	Borehole	Diesel pump-Functioning	No	Yes in 2008
Seluka	Unstable VWC	Yes but no records of the exact year	Borehole	Diesel pump-Not functioning	No	Yes in 2006
Mbori	In transition: Private operator and VWC	Yes in 2010	Shallow well	Hand pump-Functioning	No	No
Lupeta	VWC	Yes in 2005	Gravity scheme	Gravity-Functioning	No	Yes in 2005
Potea	VWC	Yes in 2008	Borehole	Diesel pump-Functioning	No	Yes in 2008
Kelema maziwani	VWC	Yes in 2008	Borehole	Electrical pump-Functioning	No	Yes in 2008
Kidoka	Private operator and VWC	Yes in 2007	Borehole	Diesel pump-Functioning	No	Yes in 2007
Sambwa	Unstable VWC	Yes in 2009	Gravity scheme	Gravity-Functioning	No	No
Chase-Chinyika	In transition: Private operator and VWC	Yes in 2008	Borehole	Diesel pump-Functioning	No	No

Household experiences with the breakdowns of water infrastructures

The household survey (n=221) revealed that all villages have experienced the non-functionality of the water infrastructure, with a mean duration of 4.3 months in a year. The non-functionality differs per season and type of source. Engine breakdown is common during the dry season in villages with a borehole, whereas villages with gravity schemes have problems with pipes being washed out by rain-storms. Twenty percent of the respondents mentioned August–December as the period of high non-functionality. The minimum time to repair breakdowns was half a day and the maximum three weeks. Infrastructure breakdown caused several problems to households (see Figure 7.4). While waiting for a technical problem to be fixed, households deployed alternatives to get domestic water, the most common of which included fetching water from the neighbouring village (104

responses), using unimproved sources in and out of their villages (66 responses), and buying water at extra cost (18 responses).

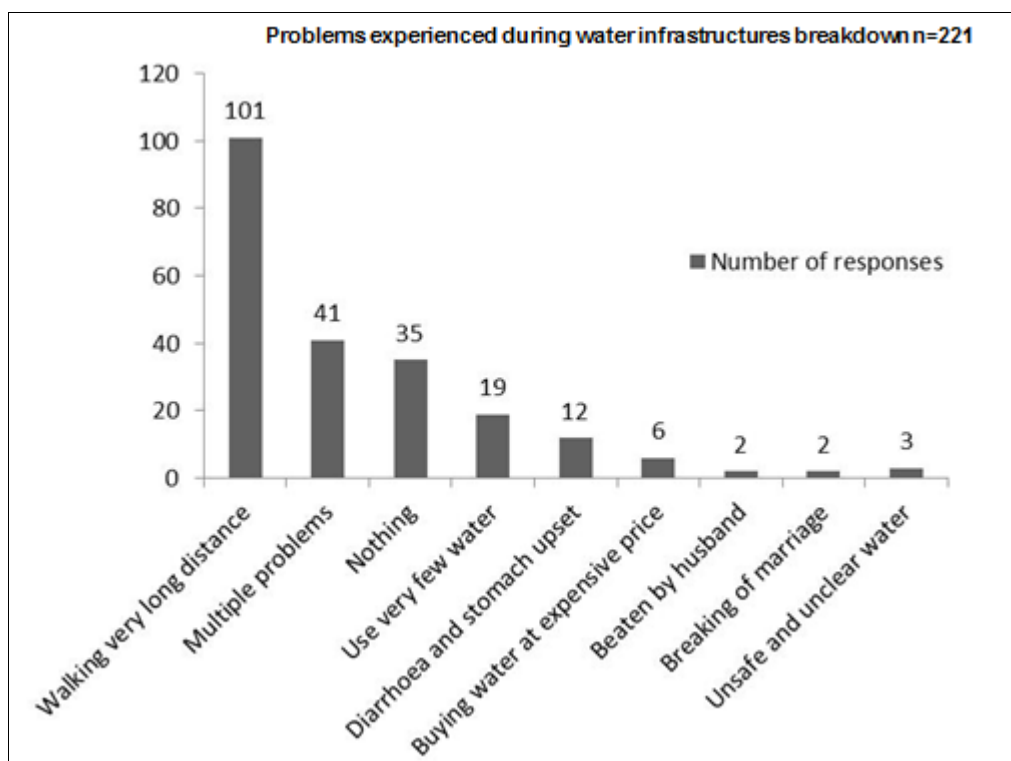


Figure 7.4 Problems experienced by households when water infrastructures broke down.

(‘Multiple problems’ implies responses that include walking a very long distance, getting stomach-related diseases and buying water at an expensive price)

7.4.4 Adjustments to current arrangements and sustainability of the rural water facilities: policy implications

The DWD staff, village leaders and households were asked about how (in their opinion) the major technical and management challenges in rural water services could be met. Their answers are summarized as follows:

At the district level

The DWE in the two districts proposed that the Ministry of Water and the Treasury reconsider the criteria for allocating water funds to the regions and districts. Instead of allocating equal amounts to all the regions and districts, they recommended adding practical criteria relating to the size of the region and district, geographical location and terrain, type of potential water sources and technology, population and existing needs for water service. For example, the gravity scheme and terrain of Sambwa village in Kondoa cause the distribution

pipes to be washed away by rain. The district staff also emphasized the importance of timely and adequate funding along with enough transport facilities and human resources. The staff of the water and planning departments indicated the importance of specific funding for follow-up management training at village level and maintenance of the older schemes.

At the village level

All VEOs and VWC members suggested the training of technicians to ensure that each village had its own local technician. Moreover, they requested follow-up training of VWCs, local technicians, pump and tank attendants, and the harmonising of the training of VWC members with their election. In Seluka village, the recommendations were specifically about measures to restore water service and appropriate ways to get good village leadership and feedback from the district council, especially the DWD.

At the household level

At household level, in all villages the common points made concerned increasing the number of DPs and the cleanliness of the water tank. The households of Kidoka village specifically raised the issue of replacing the engine with a bigger one to pump more water, and the possibility of in-house connections. In Kelema Maziwani village, the households commented on the need to install the DPs in Chokobai, Amiti and Darajani – subvillages that had no DPs at the time of data collection.

Researchers' proposals

Based on information about existing practices in rural water services derived from the review of the 2002 NAWAPO and the 2008 NWSDS, as well as on the empirical evidence from the study area, the following proposals for improvement are noted:

- (i) Within the NAWAPO and the NWSDS, the roles, responsibilities, and accountability of each actor from the national to the household level, as well as the practical meaning of community management, need to be redefined and clarified. Inadequate descriptions make these frameworks susceptible to what could be avoidable failures. It is important to note that the village council or any other village structure do not automatically represent the VWCs and households.
- (ii) The district council employees in the DWD and in other departments working on rural water supply need in-service training on ways to contextualise the implementation of decentralization in the rural water sector, in relation to the specific features of the villages. Sharing information on rural water services between staff from the DWD and other relevant departments in and outside their own district is essential and requires incentives.

- (iii) Training of local technicians and VWC members is key to performance of the water structures. Contextualization of (some parts of) the training can ensure that the knowledge is applicable in different types of villages. Because of the complexity of rural water governance, the contents of the training manual needs input from different disciplines, such as water engineering, management, sociology, anthropology, policy analysis, law and vocational education. The facilitation team could include professionals, practitioners and policy makers, as well as academics with varied disciplinary backgrounds, and the public and private sectors. In addition, facilitation could include inputs from villages with successful and unsuccessful water services.
- (iv) A water point register could help villages to record time and type of breakdowns and maintenance of all water infrastructures in the village. It could be kept by the local technicians after their training and/or by the tank and pump attendants. During fieldwork, I found there was no standard practice for keeping such records. The occurrence of breakdowns was usually only stored in the memory of the villagers involved.
- (v) Existing local expertise in welding, carpentry, motor repair and masonry needs to be identified. Then, through collaboration with the DWD, vocational education practitioners and other relevant actors, selection criteria can be developed to select male villagers who have the ability and commitment to become local technicians. I suggest men to comply with the gender division of labour in the villages, but it is important to introduce this aspect using a case-by-case approach by finding out each village's preference in advance. Persons selected can be given tailor-made training. This is expected to build local capacity, create an enabling environment for apprenticeship for new technicians and enhance rural employment creation (cf. Ishumi, 1988; Bennell and Nyakonda, 1992; Okojie, 2003; Palmer, 2007; 2009; Coenjaerts *et al.*, 2009; King, 1999; Oketch, 2007).
- (vi) To coordinate maintenance, quality, availability and affordability of the spare parts, I propose establishing workshops at zonal level for clusters of villages that are located within neighbouring wards. Based on a feasibility study, such zonal workshop centres could be established through public and private partnership.
- (vii) Integrating the service provider's perspectives, in this case the DWD, as well as the perspectives of water users and managers, and implementing the improvements suggested above, will enhance capacity development at all levels.

7.5 Discussion and Conclusion

Villages and households have been assigned managerial and technical roles without being given the required capacities and resources. Studies in the 1980s already indicated failures in community management systems because of the lack of training of community members who did not have the basic capacity to repair and maintain their water schemes (Mujwahuzi, 1985; Therkildsen, 1988). This raises questions about the one-day training provided for VWC members. How was the training organized to enable the VWC members to execute their roles? The situation calls for a reassessment of the appropriateness of the training in terms of purpose, content, duration, frequency and setting. The training should be organized in a way that will enhance mutual accountability between the villagers and the district officials responsible for the water projects.

The fact that Chase-Chinyika village leaders and villagers could not hold the contractor accountable for the uncompleted pump house and water tank, and that Seluka villagers could not formally communicate their doubts about the ethics of some water technicians, reminds us that “being involved in a process is not equivalent to having a voice” (Cornwall, 2008: 278). This calls for modifications in the procedures for engaging contractors in rural water programmes. It is important to have transparency within the flows of information and communication systems between the DWD, the district council and village structures. “Poor information and weak capacity make hierarchical accountability particularly difficult in developing countries” (Litvack *et al.*, 1998: 22). The village case studies signify that the involvement of the community at the lowest appropriate level is predominantly a passive participation and participation by consultation, which does not sufficiently allow community members to exercise their voice and influence (Cornwall, 2008). This jeopardizes achieving the aim of sustainable water services through community management and maintenance (cf. Harvey and Reed, 2004; 2007; Cornwall, 2008). The situation demoralizes the villagers, as they are entrusted with roles and responsibilities with neither the corresponding authority to control financial flows nor the technical ability to maintain the quality of the water infrastructures.

Furthermore, there is a need to examine how legal powers can be appropriately adjoined to the package of the roles and responsibilities assigned to each actor, to create a more conducive and realistic operating environment to accomplish their job. Hence, the NAWAPO and the NWSDS need to be very clear on who does what, when and how, and to be realistic about the resources and capacities needed at each level and by each actor to pursue their roles. When the two major frameworks do not explicitly define the roles of VWCs and households, the guidelines ignore micro-level processes. Cleaver’s (2004) assertion, that little attention is given to define the responsibilities of sector-related institutions at the

micro level, which shape accessibility to and sustainability of the rural water facilities, is corroborated by this study. Ministries involved in rural water supply also need to take intra- and inter-community variation into account (cf. Cleaver and Elson, 1995; Cleaver, 1999; Cleaver and Toner, 2006). To enhance sustainability it is important to relate the wider picture of policy, strategy, governance, institutions and finance to local conditions and communities (Harvey and Reed, 2004). I acknowledge that it is challenging and nearly impossible to develop a one policy that fits all. Alternatively, I call for appropriate policies that recognize variability at local levels and for responsible authorities to create an enabling environment for their employees and other actors involved, to contextualize the implementation of the decentralization of the rural water sector.

Shortage of money, technical staff and transport facilities inhibit the DWD to carry out its work promptly and adequately. As De Palencia and Pérez-Foguet (2011) argue, inadequate finances and top-down water funding allocation procedures are among the major challenges in the rural water sector. Their study revealed that top-down funding allocation does not reflect the needs of villages and conflicts with bottom-up planning processes. They emphasise “Main financing, allocation of funds and responsibility for overall results of the RWSSP are at ministry level, while implementation relies on district authorities” (De Palencia and Pérez-Foguet, 2011: 47). Other studies conducted in Tanzania since the 1980s and recent ones (Mujwahuzi, 1985; Therkildsen, 1988; Jiménez and Pérez-Foguet, 2010a, 2010b; De Palencia and Pérez-Foguet, 2011) have pointed to the inadequacy of the DWD staff. Therefore, it is high time to find appropriate solutions regarding shortage of staff and transport facilities; the problem has been documented and has persisted for a long time. The responsible authorities could attach equal importance to and ensure coherency of district *and* village capacity building, using resources such as Local Government Capital Development Grants and locally available scholarships (Pallangyo and Rees, 2010).

Training and capacity building programs for key actors at village level are of crucial importance (Rondinelli, 1991; Harvey and Reed, 2004, 2007; Smoke, 2010). The programs are supposed to aim at skills and knowledge corresponding to the roles assigned to the community to manage and maintain their water schemes. Capacity constraints interfere with targeted implementation. Pallangyo and Rees (2010: 733) noted that ‘most village and hamlet (subvillage) chairpersons had not received training relating to their responsibilities despite playing a vital role in decision-making at the lower levels of LGAs’. Another study found that the lack of local qualified technical personnel is one of the most common problems that cause villages to continuously depend on the technicians at the DWD (Nkongo and WaterAid Tanzania, 2009).

Reconceptualising community management, continuous capacity development, follow-up training and institutional support at all levels are among the key

factors to achieve sustainable decentralized water services. I propose that the meaning of 'community management' should include actors, structures, obligations, implications and the mechanisms of accountability. The comprehensive conceptualization of community management across all actors should reflect the demand for resources and capabilities and include integrated institutional capacity development. Community management requires on-going institutional support because policies and technologies change, people move, and knowledge becomes obsolete. All professionals and actors in the rural water sector need to get rid of the assumption that community management entails a sense of ownership by all community members that automatically translates into a sense of responsibility and willingness to finance and manage. Besides, the government and donors have vital roles to ensure the presence of a well-knitted coherence between policies, approaches and development interventions to reduce or remove contradictions and obstacles during their implementation. Because of varying local contexts, there is a need to create room for flexibility when designing and implementing development interventions such as decentralized rural water supply.

Chapter 8

Conclusion and Synthesis

This chapter presents the overall findings of the study and the conclusions. In the first part I give a summary of the answers to the research questions formulated in Chapter 1. The second part addresses theoretical and methodological reflections. Then policy implications are explained together with the areas for future research as a way of establishing what could be done differently in the rural water services.

8.1 Answering research questions

The main question for this research was: *How do gender, household and community influence appropriateness, accessibility and sustainability of domestic water schemes in rural Tanzania and in what way do domestic water services take women's gender needs into account.* To answer this overall question, three questions were formulated in Chapter 1, and these are addressed in several sub-questions in the empirical Chapters 3 to 7. A combination of methods was used to illicit the interfaces between gender roles and needs in water provision and use at the household level on the one hand, and decision-making spaces in the village's management structures and its relationship with the district level structures on the other. These interfaces were then related to women's practical and strategic gender needs. In the following section the three questions are revisited in the light of the research findings.

Research question 1: *To what extent and how are gender roles and needs integrated in rural domestic water schemes and to what extent do these schemes address women's gender needs and reaffirm or change the social construction of gender?*

Chapters 4 and 5 address this question through the lens of gender analysis, to understand the intra-household organisation of domestic water provision and men's and women's participation in local management structures. Water provision for household use is a gendered activity in which cash, labour and time are involved as resources for paying user fees and fetching and transporting water. The person in the household who pays the user fee differs according to household headship. In male-headed households, it was a shared responsibility between the head and his spouse, whereas female heads of households shouldered the cost alone. Mainly women and girls fetch water for household uses and for productive activities that are carried out in or nearby the house. Men and boys fetch water for productive activities that are conducted at the distribution points or close by. To transport water women usually carry the water containers on their head and in a few cases use a bicycle, whereas for men it is common to use a bicycle or a donkey-drawn cart. A few men could afford tractors. Clearly, women and girls bear the brunt of the work involved in domestic water provision.

Compared to men, women are more experienced about the appropriateness of domestic water for different uses. In spite of that, the social-cultural context and prevailing stereotypes restrict women's involvement in the designing and planning of water services at community level and their influence in local water management. Hence their preferences and perceptions are not integrated into the water projects. In this way, the potential benefit of including women as primary and active actors in development interventions such as village-based domestic water projects is not achieved. Realising women's potential as knowledgeable

actors requires a shift from the traditional reductionist ideology of considering women as merely *drawers, carriers and users* of domestic water at the household level to seeing women as active actors whose experience and insights regarding water use and appropriateness could benefit the wider community.

Through the existing water policy, the government has set quota for women's representation in the village council and the village water committee (VWC), in order to safeguard women's participation in the local management and governance of domestic water provision. However, the findings show that the informal structures in the household and community reaffirm the social construction of gender and in fact constrain participation in these governance and management structures. Low and passive participation of women is intertwined with traditions and socio-cultural values which have the power to constrict women's access to and functioning in village management structures. The patriarchal system which is deeply rooted in cultural norms and values, scepticism and negative stereotypical assumptions about women leaders reinforce women's exclusion from public leadership. Thus, the pragmatic approach of setting quota for women's representation comes up against the complex and context-specific informal structures within and between the household and the community. These normative structures circumscribe women's expected behaviour in the private domain of the household and as well as in the public domain of the community.

Because of the interconnections between women's role in decision making in the household and in the community, the household decision-making process is reflected in community decision-making spaces. Sometimes women who are public leaders are expected to assume these leadership roles as the extension of what is considered their traditional housekeepers' role. To better meet women's practical and strategic gender needs regarding domestic water, having women in the village council and in the VWC is a starting point but does not automatically ensure women's voice in decision making. Still, I am in favour of the affirmative action, despite its challenges, because it gives women exposure and knowledge beyond their villages and district. This can be a foundation for women to strengthen their decision-making role and eventually achieve a leadership position. The latter is illustrated by the cases of three women as well as by the usefulness of the women's social and economic groups as alternative fora to meet their strategic needs.

Efforts towards gender integration into the rural water sector should not be regarded as a one-fits-all solution. In shaping these efforts, the local and international actors involved in the rural water sector and other development interventions need a thorough understanding of the gender relations within and beyond the household. This is because "gender relations are neither uniform nor historically static" (Agarwal 1994: 51), and do "create and reproduce systematic differences in the positioning women and men in relation to institutional processes and outcomes" (Kabeer, 1994: 280). Besides, gender relations are interwoven in the

broader set of social relations that structure the power balance between men and women and have a profound effect on the division of labour, roles, responsibilities and resources between men and women within and between households (cf. Agarwal, 1997; Kabeer, 1994; Parpart *et al.*, 2000; Rao and Kelleher, 2005).

Research question 2: *What is the actual situation of the criteria of accessibility and appropriateness to the village domestic water service?*

Chapters 3, 6 and part of Chapter 4 focused on this research question. By using the community water service mapping technique in the case of Kidoka village, water service coverage and the local dynamics of the accessibility of domestic water services at the micro level were documented. The approach facilitated the collection and validation of relevant, accurate and representative information on water service coverage at village level. It also revealed the seasonality and accessibility intersections as well as the spatial distribution of the population and new settlement patterns that have a bearing on the accessibility of the existing water services. Besides, community mapping revealed yet unreported intra-village variations and enabled capturing the physical condition of the water infrastructures.

Chapters 4 and 6 concentrated on the users' satisfaction regarding the appropriateness of the water services in their villages. Users articulated their (dis)satisfaction about the existing domestic water services. Prior to installation of the water infrastructures, the user community was represented by a few elder men to identify potential sources of water. Users were involved to choose the location of the distribution points and cattle troughs, but occasionally technical and legal factors beyond their village and the rural water sector interfered with their choices. The choice of technology is in practice dominated by the provider, which raises several questions on the appropriateness of the selected technology in terms of similarities and differences between the projected and real-use setting. Linking the findings on the users' dissatisfaction (Chapter 6) and the results of the enquiry on the households' participation in the establishment and management of the domestic water services (Chapter 5) showed that users' involvement, particularly of women, was mainly passive and piece-meal. Apart from that, the planning and designing of the village-based domestic water projects are based on a single pre-implementation assessment whereas users' perspectives change along with the changing social, economic and demographic features of an area. When looking critically at the improvements proposed by the users, it is clear that the users are active and knowledgeable actors who know what type of service they want. Hence, it is important to merge the users' perspectives that result from daily and frequent interaction with the water facilities with those of the providers that incorporate technical and policy knowledge.

Research question 3: *How do gender roles and responsibilities in the provision, use and management of the domestic water service and the criteria of appropriateness and accessibility to the water service influence sustainability of the public water facilities in rural areas?*

This question has been partly answered in Chapters 3 to 6. Chapter 7 exclusively deals with the issue of sustainability by assessing the technical and managerial roles assigned to the actors at the village level in the light of the community management model (Harvey and Reed, 2004). The overall findings indicate that the sustainability of the water infrastructures is in jeopardy. The 2002 National Water Policy and the 2008 Water Sector Development Strategy, which are the main guiding frameworks on rural water service delivery, do not clearly define the roles of the key actors at the district, village and household levels. This does not only conflict with the local and international policy focus on the management at the lowest appropriate level, but also glosses over the reality that the village is a layered administrative unit that comprises multiple institutions. Additionally, these national frameworks are rather silent on the actual roles and obligations of each actor, resources needed, mechanisms of accountability, and the implications for the infrastructures, users and providers in case of missing resources and capabilities at the lowest levels. The latter features amplify the already existing complexity of the sustainability of the rural water services.

Sustainability of the village water facilities is a complex phenomenon, with intra- and inter-village variations due to multiple factors. These variations and factors comprise the type of water source, management approach, availability of trained local technicians, capacity and resources, as well as geographical location and terrain. Others are communication between village and district structures, quality of the spare parts, informal local institutions (Chapter 5), handling of the water revenues before banking (Chapter 6), and presence of a reliable unimproved water source as an alternative (Chapters 4, 6 and 7). Reflecting on my findings in relation to the numerous studies on the sustainability of rural water supply (Sara and Katz, 1998; Carter *et al.*, 1999; Harvey and Reed, 2004, 2007; Giné and Pérez-Foguet, 2008; Taylor 2009a, 2000b; Montgomery *et al.*, 2009; Bakalian and Wakeman, 2009), I concur with the observations on the complex interconnections between the factors that have an impact on sustainability. But it also has to be noted that the sustainability of rural water facilities transcends these factors because of their embeddedness in households and communities as the primary contexts that host the users and village management structures.

8.2 Theoretical and methodological reflections

In this section I revisit the theoretical framework, discussing the key concepts I have used in relation to the situation of the rural domestic water services, and I briefly reflect on the methodological approach that I applied in this study.

8.2.1 Blended theoretical framework

In several ways, this study has benefitted from combining the theory of ecological modernisation, gender analysis, the concept of users' perspective, and the community management model. Firstly, ecological modernisation theory departs from an actor-oriented approach in studying service users as actors and places them in the household, community and institutional contexts. That creates scope to investigate the policy-practises nexus of the public-domestic water services in the household and community through their separate and combined interactions in governing intra-household practices and public management processes. Secondly, adding a gender dimension to ecological modernisation theory enriched the analysis and information on the household-community interplay in the domestic production and local management of the water services. Applying the concept of users' perspective as a variant of the actors' perspective was useful to capture the users' perceptions on the existing water service and their ideas about improvement. Using the adapted community management model facilitated opening the 'community' box, made the feedback mechanisms between national and local levels visible, and allowed for bridging the gap between directed and actual roles of all actors. A combination of ecological modernisation theory, gender analysis, community management model and a users' perspective was essential for situating the duality and interconnectedness between macro-meso-micro levels, users' and provider's viewpoints, formal and informal structures as well as household and community contexts.

However, for two reasons I could not apply ecological modernisation theory to do a thorough analysis on the compatibility of the village water services with the household's internal organisation and examine rationalisation as outlined by Spaargaren and Van Vliet (2000). The first reason is that improved domestic water service is organised in a collective manner in most of the rural districts in Tanzania. The second is that there are no multiple public and private suppliers from which the users can choose. Thus, the users have to take what they are offered, even though they may have their misgivings about it.

8.2.2 Gender relations and development interventions

Local and international funding is invested in development interventions that are aiming at improving rural welfare, such as rural water provision. These interventions are confronted with sector-specific challenges and other problems that are area and time specific and based on social, economic, demographic and political conditions, and even philosophical assumptions at the core of their design. Gender integration is among the mechanisms that have received local and international support in various sectors. The rural water sector too introduced gender mainstreaming in the management of water resources and supplies because men and women have different needs, roles, and experiences regarding domestic water. Hence, the presence or absence of domestic water services affects them differently. However, the introduction of women's participation in the local decision-making and management structures in most of the African countries including Tanzania was rather hegemonic because it had to meet the donors' requirement (cf. Harvey and Reed, 2004; Harris, 2009; Furlong, 2010).

The approach and timing to advance gender mainstreaming in the rural water supply overlooked local contexts in which men and women operate in terms of social-cultural settings with their specific gender relations. Gender relations have a paramount role in the division of labour and govern how men and women relate in the household and community as private and public arenas, respectively (cf. Agarwal 1994, 1997; Kabeer, 1994). Against the background of my findings and the preceding line of reasoning, I see the comprehensive understanding of gender relations as a prerequisite to unveil both latent and obvious factors impinging on the realisation of gender integration in local structures, and to identify local entry points for intervention. This is especially vital because gender integration as the formal strategy requires systemic changes in formal and informal structures and concerns individuals, society, and the intra-household decision-making system (cf. Wolf, 1990; Rao and Kelleher, 2005). Most of the rural development policies and reforms regard the household as a focal point, under the assumption that the decision(s) made by the head of the household represent and benefit other members. However, power and gender relations on the ground refute this assumption. My observations during fieldwork and the example of a woman who was elected a member to the VWC but was not allowed to take her position by her husband, highlight the intra-household power relations. According to Wolf (1990: 60) "the household can neither think nor decide [...] rather certain people within the household make decisions. One or more persons with enough power to implement them make decisions and other, less empowered household members follow them." Understanding gender relations alongside their local specificities can be a point of departure towards finding alternative ways of improving women's participation. The improvement can be realized through quota or through informal

approaches that are locally considered appropriate, both technically and in terms of local demographic and cultural features. In some cultures, banning women from public leadership cannot be questioned as it is regarded as *doxa* (cf. Bourdieu, 1977).

8.2.3 Conceptualisation and contextualisation of community management

“Community is a word with many meanings and uses” (Doe and Khan, 2004: 361). Conventionally, community has been associated with group of people with common features and interests that can mostly be delineated by area-based geographical boundaries. The importance of understanding the meaning of community in relation to rural water policy cannot be overemphasised for several reasons. One, community is a prime policy focus of current policy documents and community management is presented as a universal panacea for meeting the challenges in the sector (Cleaver and Elson, 1995; Harvey and Reed, 2004). Two, the meaning of community is taken as self-evident and the existence of varying features within a community is ignored (Cleaver, 1999; Doe and Khan, 2004; Harvey and Reed, 2007). The introduction of the community management approach in the rural water sector was driven by neoliberal ideologies, and participatory and decentralisation principles (cf. Harvey and Reed, 2007, Moriarty *et al.*, 2013). The underlying assumption is the vision of a community as unitary, capable and resourceful (Cleaver, 1999; Harvey and Reed, 2007). That is why community management is seen as a vehicle through which collective action is exercised for the common good (Doe and Khan, 2004). As I could observe, for example in Sambwa village (see Chapter 4), a community is not always unitary and does not automatically become so by being situated within the same village or area. Certain circumstances and rules that are subsequently applied as a means to deal with the situation can create temporary or permanent divisions depending upon reiteration of these circumstances.

Referring to Chapter 7, for community management to become realistic, service users and community management institutions need capabilities that correspond to the roles assigned to them in terms of *what* is expected of them, *when* and *how*. The *what*, *when* and *how* in the latter sentence refer to the relevance, admissibility and coherence between the theory and practice of the required capabilities. According to Nussbaum (2003), capabilities are fundamental entitlements which determine what people are actually able to do and to be. In this case capabilities have intrinsic importance to the users and the local management structures to pursue all the roles assigned to them as individuals and as the water using community. Nussbaum’s analysis on capabilities questions the logic of viewing a water using community with very limited capabilities as instrumental to achieving sustainability of the rural water facilities. Doing so, a substantial amount

of resources invested in the rural water sector will be wasted, which causes losses to the national and international actors and disappointment to the service users. Other empirical evidence and my findings call for a critical stance on the community management approach when it is no longer availing the expected results and there is alarming non-functionality (Harvey and Reed, 2007; Moriarty, 2013). There is a need for deconstructing and unpacking the concept and its theoretical and practical attributes, as well as for defining its dimensions and constituting elements, such as structures, actors, obligations, implications and mechanisms of accountability, as I have attempted in this study. This will contribute towards revealing the ambiguities in the meaning of community as well as the limitations of community management (cf. Doe and Khan, 2004; Harvey and Reed, 2007; Kwashie, 2010; Moriarty, 2013).

8.2.4 Methodological reflections

Through the literature review as part of this study, I have observed methodological and conceptual challenges that need to be addressed. Therefore, reflection on these methodological challenges will advance better research outputs towards improving public water services.

There was information inconsistency in terms of varying records on similar indicator(s) by the government key agencies and institutions working on the rural water sector. For instance, the proportions of the population with access to water services in reports published by the Ministry of Water were different from the ones reported by the National Bureau of Statistics. It is high time to harmonise *who* measures *what*, *how*, *when* and *where* among the key institutions that deal with rural water at the local and central government. At the district level too there were slight differences in the records, mainly related to the purpose of the report. For example, there were differences between the figures in the routine record keeping for district development work and the figures reported to visiting higher officials. To make the information more coherent there has to be feedback between all administrative levels, from the village to the national level. Irregularities in the information on rural water supply have also been reported in other studies conducted in Tanzania (cf. Jiménez and Pérez-Foguet, 2010a, 2010b; De Palencia and Pérez-Foguet, 2011).

Another feature concerns the sampling strategy and multiple units of analysis in research activities as well as in monitoring and evaluation. I could observe that it was common for the district to have overall data on the villages' water schemes but none or little information on the functionality status of the schemes and the spatial distribution of the population (see Chapter 3). To grasp the real picture, I suggest to compare 'easy to reach' villages with remote ones. Likewise, multiple units of analysis and triangulation of multiple data sources can facilitate the validation of the information. The mixed-methods approach in this

study comprises numbers, text, context and maps, with which I could elicit and systematically unpeel quantitative, qualitative and graphic information within and between units of analysis and connect the dots within and between sources. I agree with Dey 1993, cited in Niehof (1999:37) that quantitative and qualitative methods are mutually dependent and that “meanings cannot be ignored when we are dealing with numbers, and numbers cannot be ignored when we are dealing with meaning.”

8.3 Policy and research: What could be done differently?

Generally the study has indicated a complex nexus between policies and practices of rural water services and that the existing water policy does no longer correspond to the practices at the household and community levels. Based on the primacy of the domestic water for the hygiene, health, and overall well-being of the rural populations, below I formulate proposals for improving the rural water sector. The recommendations encompass short and long term interventions from the village to the national level, and require further research on their feasibility.

A campaign should be conducted to create more awareness on the importance of collaboration between villagers and village management institutions in safeguarding domestic water schemes. I recommend renowned local and national politicians to spearhead such a campaign and underline the importance of the villagers’ assertiveness to be well informed about the critical features of the water scheme in their village and to report irregularities and discrepancies to the village leadership and leaders at higher administrative levels. The aim of the awareness creation would be to realize a shift of the mode of interaction between providers and users from competition to collaboration. When there is a level playing field, all actors involved will have the same opportunity to query and be heard and get their queries appropriately, timely and seriously addressed.

Another promising approach could be to introduce appropriate motivation mechanisms to the village management institutions and villagers with outstanding contribution to domestic water services. This can take the form of study tours and excursions to the villages with successful and unsuccessful water services. Such trips could be pertinent for vivid examples and lessons learnt as an incentive for leaders and villagers who are dedicated to sustain and improve village-based domestic water. Implementation of this proposal requires financial and logistic support of the visiting and the host villages and district(s). Additionally, the district and village councils could collaborate with the media, philanthropists, non-governmental organisations, academic institutions and local and international funding agencies to establish and finance inter-village competition on the presence of year-round functional water facilities, for which qualification criteria can be developed. The winning village and district could be rewarded with a certificate of

recognition, a trophy, a study tour or technical support for major repairs or expansion of the water facility. I would discourage a cash money prize.

Another intervention includes initiating water infrastructures registers and public promotion of a standard contract for private operators. For the register, the village and water department at the district can agree on the items to be included and then start using a simple hardcover exercise book. The overall objective of the register is to keep records on the number of infrastructures and their technical and functionality conditions, such as time and type of breakdowns and maintenance of all water infrastructures in the village. The register will serve as a record-keeping tool to ensure consistency and continuity of the information for managerial purposes. During the fieldwork I found that such records were mostly stored in the memory of the villagers involved, which causes inconvenience when these villagers are no longer there or do no longer have a management or leadership position. The standard contract for private operators will yield several benefits. The users will have voice and value for money on the quality of the water service in their village. I could observe this in the villages of Kidoka and Berege where villagers and leaders were closely following up on the situation of the water service. Even though in these villages the private operator was a fellow villager, villagers and village leaders had a clear understanding about what is the operator was supposed to do and about possible measures against noncompliance of either party.

I also see a need to find out on how water revenues could be invested into profitable ventures instead of just keeping all the money in the bank. Thus, I would recommend each village to set a reserve fund of a certain ceiling that can be determined by considering the physical and technical condition of the water scheme involved. Other aspects to consider are the market prices of spare parts, the type of water source, and the location and climate condition of the village (and district) concerned. For example, part of the revenues could be invested in agro business such as sunflower and sesame oil processing and in post-harvest processing for maize, groundnuts and other locally produced crops. Other areas of investment can be bee keeping, cultivation of Roselle, and small-scale peanut butter processing. For these investments, their practicality in the rural area has to be considered. Small to medium size enterprises in terms of capital investment with relatively short business cycles are feasible. However, further research is needed to establish gender compatibility, the compliance with existing rural livelihoods, procedures on handling profit and/or loss, ownership of monetary and non-monetary assets, membership procedures, as well as the legal and technical viability. Investing in appropriate and profitable enterprises is an innovative path towards ensuring sustainability of water scheme and reducing individual and area-based poverty.

Extra attention needs to be paid to enhancing the performance of the actors involved by improving the existing legal frameworks. For instance, villagers need

information on *how*, *when* and *where* to report malpractice that affects the handling of the water funds, sources and infrastructures. More specifically it need to be clear what legal actions will be taken against individuals who misuse water revenues, village water committees who do not issue financial report, and for breaches of contract between private operators and the village government. I insist on taking legal action against individuals who are accountable for a given task when needed rather than against institutions such as the village council and village water committee. Litigation against institutions takes a long time, so that the punishment might not match the loss caused and does not result in lessons to the community.

Furthermore, I call for comparative, multidisciplinary and anthropological research on the practicalities of women's position in patrilineal and matrilineal communities. The aim is to find how the informal structures in different settings respond to women quota, what lessons can be learnt from different areas and how these can be integrated in policy development and implementation. Similar research can be conducted at the district and ministerial level to examine the willingness of policy makers to challenge the prevailing socio-cultural gender orders. Pioneering a certain national and international agenda does not always mean that there is common understanding of the agenda among the actors within and beyond the village. It has been empirically proven that individuals do not easily leave their culturally defined gender perspectives (Ahmed, 2002; Udas, 2012). Apart from that, there is a need to conduct comparative studies on rural water supply in areas with different dominant livelihood systems, such as those based on animal husbandry or fishing and in different circumstances such as being adjacent to commercial agricultural estates or mining centres, because of the ensuing different water needs. Likewise, in such studies in the sampling strategy a distinction can be made between easy to reach and remote villages. Additionally, it is important to devise collaboration mechanisms between researchers, service users, politicians, and development practitioners on the practical implementation of the research outputs.

To conclude, when reviewing the existing national water policy it is inevitable to synchronise the policy with the current reality on the ground as well as to work on the reconceptualization and contextualisation of the community management approach. Additionally, there is a need to improve the synergy and coherence between the water policy and other emerging national frameworks and to ensure the horizontal and vertical consistency between policies and framework. In this review process attention should be paid to local and international discourses such as the debate on the community management approach.

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Appendix 1

Part 1: Household information: Demographic and socio-economic characteristics

Name of Interviewer: Date of Interview:

District:..... Name of the ward:

Name of the village: Name of the sub-village:

No (1)	Name of household member (2)	Sex (3)	Age (4)	Marital status (5)	Relation to household head (6)	Education level (7)	Occupation (8)

(1) Household head gets number 1

(6) 1=Head; 2=Spouse; 3=Child; 4=Grandchild; 5=Parent; 6.Other relative; 7=Non-relative

(2) Fill in the names of the household members

(7) 1= No formal education; 2= Adult education; 3= Primary education; 4= Secondary education; 5= Tertiary education; 6= University/college education (specify level);7= Other (specify); 0=Not applicable

(3) 1=Male; 2=Female

(8) 1= Farmer; 2= Livestock-keeper; 3= Casual labourer; 4 = Artisan; 5=Small scale business; 6=Wage employment; 0=Not applicable

(4) Age

(5) 1= Married;2=Single;3=Widowed; 4=Divorced; 5=Separated; 0=Not applicable

1. What is the religion and ethnicity of the head of this household?

1. Religion

2. Ethnicity

2. Indicate occupation which is the major source of household income

Major source of the household income	Estimated Total income	
	Amount in (Tshs)	Per unit 1. Day 2. Week 3. Month 4. Season 5. Year
1. Farming- cash crops		
2. Farming- food crops		
3. Livestock keeping		
4. Farm labourer		
5. Food vending		
6. Local brewing		
7. Other non-farming small scale business		
8. Employee		
9. Others (specify)		

3. If major occupation is farming, what crops are you cultivating? (mention specific crops)

1. Food crops

2. Cash crops

4. Do you cultivate enough crops for your household year-round food consumption?

1. Yes ☐

2. No ☐

5. How was the farm land acquired?

1. Bought ☐

2. Inherited ☐

3. Hired ☐

4. Given by village government ☐

5. Other (specify).....

6. If you are a livestock keeper, indicate type and number of livestock that you own

S/ No	Type of livestock	Number of livestock
1	Cow	
2	Goat	
3	Sheep	
4	Pig	
5	Donkey	
6	Chicken	
7	Others (specify)	

7. How long have you lived in this village?

1. Less than 5 years
2. 5-10 years
3. More than 10 years
4. Since birth

8. Are you living in your own house or renting?

1. Own house
2. Renting
3. Others (specify)

9. What is the type of the main house? (also through observation)

1. Corrugated iron roof, concrete-plastered walls and cement floor
2. Corrugated iron roof, mud walls and cement floor
3. Grass thatched roof with mud walls and floor
4. Others (specify).....

Part 2: Household sanitation facilities

10. Indicate type of toilet and bathroom you and other members of your household use and why? (Ask to go and observe)

Type of toilet	Reasons
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
Type of bathroom	Reasons
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

11. Do the toilet and bathroom indicated in question 10 belong to your household or not?

1. Yes
2. No

12. If no, please give reasons

.....

13. Do you have specific container and place for hand-washing after using the toilet?

3. Yes
4. No

14. If not, please give reasons

.....

15. How do you and other members of your household wash hands after using the toilet?

.....

Appendix 1

Part 3: Household domestic water collection and uses

16. Which water source are you using for different domestic water uses in your household and how frequent you or other members of your household fetch water from those sources? (Tick the appropriate).

Household domestic water uses	Frequency of fetching in a week (Options are indicated below the table)	1. Individual dug well	2. Public tap/stand pipe	3. Handpump- well	4. Rain water	5. Neighbour's well	6. River	7. Charcoal dam/pond	
1. Drinking									
2. Cooking									
3. Cleaning dishes									
4. Washing clothes									
5. Cleaning the house premises									
6. Bathing									
7. Livestock watering									
8. Vegetable gardening									
9. Food vending kiosk									
10. Local brewing									
11. Bricks making									
12. Others (specify)									

Frequency of fetching water in a week

1= Daily; 2= Two times per week; 3= Three times per week; 4= Once a week; 5= Others (specify)

17. Why does your household opt for the frequency you have answered in previous question?

.....

18. What are the reasons for using different sources for different uses? (Indicate source between brackets, using the numbers in the Table, in question 16).

1.
2.

19. Considering the water sources you are using for household domestic water in question 16, how appropriate are they in terms of the following characteristics:

Water sources (Fill in the numbers of the water source indicated in the table in question 16)	Water source characteristics	Not appropriate	Appropriate	Very appropriate
	1= Costs (users' fees) 2= Water taste 3= Water colour 4= Water smell 5=Distance from the house to the facility 6= Water availability 7=Water abundance and reliability			

20. Among the sources indicated in the table in question 16, which ones experience seasonal availability of water? (Use the numbers in the Table in question 16).

1.
2.
3.
4.
5.

21. Estimate, how many buckets (small 10 litres and big 20 litres) do you use per day for household needs? (Mention type of bucket).....

1. 1-5 buckets
2. 6-10 buckets
3. 11-15 buckets
4. 16-20 buckets
5. More than 20 buckets (specify)

22. How do you or other members of your household transport water containers from the source to your house?

1. Carry on the head
2. By using bicycle
3. By using wheelbarrow
4. By using donkey
5. By using oxen
6. Others

(specify).....

23. Do you use same amount of water for domestic activities during rainy and dry season?

1. Yes
2. No

Appendix 1

24. If no, in what activities does the amount of water used vary per season in your household?

Household domestic water uses	Same amount of water used throughout the year	Increased amount of water used during rainy season	Decreased amount of water used during dry season
1. Drinking			
2. Cooking			
3. Cleaning dishes			
4. Washing clothes			
5. Cleaning the house premises			
6. Bathing			
7. Livestock watering			
8. Vegetable gardening			
9. Food vending kiosk			
10. Local brewing			
11. Bricks making			
12. Others (specify)			

25. Who is responsible to fetch water for different uses in your household?
(Tick the appropriate)

Household domestic water uses	Responsible person										
	1. Wife	2. Husband	3. Daughter	4. Son	5. Daughter in-law	6. Son in-law	7. Grand daughter	8. Grand son	9. Domestic worker	Other relatives (Specify)	
1. Drinking											
2. Cooking											
3. Cleaning dishes											
4. Washing clothes											
5. Cleaning the house premises											
6. Bathing											
7. Livestock watering											
8. Vegetable gardening											
9. Food vending kiosk											
10. Local brewing											
11. Bricks making											
12. Others (specify)											

26. Indicate how far you or other members of your household have to walk to the nearest water source you are using during rainy season

Distance from the house to the source during rainy season	water sources						
	1. Individual dug well	2. Public tap/stand pipe	3. Handpump- well	4. Rain water	5. Neighbour's well	6. River	7. Charcoal dam/pond
1. Within 400 metres (0.4km)							
2. Between 500 - 1000 metres (0.5-1 km)							
3. Between 1000 - 1500 metres (1 -1.5 km)							
4. Between 1500 - 2000 metres (1.5 - 2 km)							
5. More than 2000 metres (2 km): specify							

27. Are you using the same source during dry season?

1. Yes ☐

2. No ☐

28. If not, indicate how far you or other members of your household have to walk to the nearest water source you are using during dry season.

Distance from the house to the source during dry season							
	1. Individual dug well	2. Public tap/stand pipe	3. Handpump- well	4. Rain water	5. Neighbour's well	6. River	7. Charcoal dam/pond
1. Within 400 metres (0.4km)							
2. Between 500 - 1000 metres (0.5-1 km)							
3. Between 1000 - 1500 metres (1 -1.5 km)							
4. Between 1500 - 2000 metres (1.5 - 2 km)							
5. More than 2000 metres (2 km): specify							

29. How much time does it take to for one "water fetching" round-trip during rainy season? (Time used: to and from, including queuing and wait)
-
-

Appendix 1

30. How much time does it take to for one “water fetching” round-trip during dry season?
(Time used: to and from, including queuing and wait)

.....
.....

Part 4: Costs to access the domestic water service from public water facilities

31. Are you paying for domestic water users’ fees?

1. Yes ☐
2. No ☐

32. Indicate amount required for payment schedule that is used in your village/ sub-village to pay for users’ fees

Payment schedule	Amount to pay (in Tshs)
1. Pay as you fetch	
2. Other (specify)	

33. Do you have any outstanding debts for water users’ fees?

1. Yes ☐
2. No ☐

34. If yes, for how long haven’t you paid for the outstanding debts?

.....

35. Who is responsible for the expenses of domestic water users’ fees in your household?

1.
2.

36. If your household does not pay water users’ fees, please mention reasons.

1.
2.
3.

37. If your household does not pay water users’ fees, what alternative strategies do you use to get water for domestic activities?

1.
2.
3.

Part 5: Public water facilities’ functionality and technological issues

38. Are the public water facilities that you are using physically functional throughout the year?

1. Yes ☐
2. No ☐

Indicate months which the facilities are physically functional and non-functional? (put F for functional and NF for non-functional)

Months	JAN	FEB.	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Functional												
Non-functional												

39. If there is non-functionality, what are the reasons for that?

1.
2.

3.
40. How long does it take to repair broken public water facilities in your village/subvillage?
1. ½ to 1 day
 2. 2-5 days
 3. 1 week
 4. 2 weeks
 5. More than 2 weeks
41. What problems do you face when the public water facilities are broken?
1.
 2.
 3.
42. While waiting for the public facilities to be repaired which alternative do you use to get domestic water?
1.
 2.
 3.
43. Do you have local technicians for water facilities in the village?
1. Yes
 2. No
 3. I do not know
44. If yes, do you know how many are men.....and women.....

Part 6: Participation in establishment and management of public water facilities

45. In which of the following activities did you or other members of your household participate?

Activities and levels	Yes	No	If yes, who participated (refer to Household information table)
Planning			
1. Informed about village (domestic) water development meeting and plans to implement the project.			
2. Attended the meeting about village domestic water development.			
3. Contributed the initial capital for public water facilities.			
4. Speaking up/Informed about choice of location of the public water facilities during the meeting.			
Implementation			
5. Repairing broken public water facilities.			
6. Cleaning public wells/ boreholes.			
7. Notify relevant authority about breakdown/abnormality of public water facilities.			
8. Involved in any activity related to development and			

Appendix 1

management of public water facilities in the village.(specify)			
--	--	--	--

46. If you or any member of your household did not participate in any of the activities in question 45, please give reasons

1.
2.

47. Indicate types of meeting in your village, their schedules, who attend from your household and how often attended?

Types of meeting	Times scheduled per year						Attendees from your household			Frequency of attendance			
	1. Once a month	2. Once per 3	3. Once per 6	4. Once per 9	5. Once a year	6. Other time (specify)	1. Male members	2. Female	3. Both (male and female)	1. Always	2. Frequent	3. Less frequent	4. Not at all
1. Village general assembly													
2. Village (domestic) water development meeting													
3. Village government													
4. Sub-village													
5. Others (specify)													

48. When was the last time you attended the meeting related to domestic water services in your village?

49. What were Domestic Water Services issues discussed during the meeting?

1.
2.
3.
4.

50. What is your observation about composition of the VWC with regard to representation of men and women?

1.
2.

51. What is your remark about performance of the VWC?

1.
2.

52. Have you or other members of your household ever got information on the following items?

Items	Yes	No	Who got the information (refer to Household information table)
1. Village water fund report			
2. Any of the village development budget			

53. Through what ways did you and/ or other members in your household got the information in previous question?

1. Village general assembly
2. Public notice board at the village's office
3. Public notice board at school
4. Others (specify)

54. Indicate how you are satisfied with the quantity and quality of the public water facilities over the past 5years (first five years after establishment of the water scheme)?

Level of the service	First five years
Quantity	
Quality	

55. Indicate how you are satisfied with the following features in the current water service and how you would prefer them to be in future?

Attributes of the domestic water facilities	Existing	Desired
1. Colour		
2. Smell		
3. Taste		
4. Location of the Distribution point and borehole		
5. Distance from the house.		
6. Functionality of the infrastructures		
7. Reliability and abundance		
8. Amount & type of water users' fees		
9. Management & expenditure of the fee collections/ revenues		
10. Performance of the VWC		

Appendix 1

Part 7: Women involvement in social and economic groups

56. Are there economic and social groups in the village?

1. Yes ☐
2. No ☐
3. I do not know ☐

57. If yes, mention the groups and their activities

Groups

Activities

- | | |
|---------|---------|
| 1. | 1. |
| 2. | 2. |
| 3. | 3. |

58. Are you a member in any of the groups you have mentioned?

1. Yes ☐
2. No ☐

59. If you are a member, why did you join those groups?

1.
2.
3.

60. If no, please give reasons

1.
2.
3.

61. Are you holding any leadership position in the groups which you have joined?

1. Yes ☐
2. No ☐

62. If you are a leader, which post(s) are you holding?

1.
2.
3.

63. What are your roles as a member and/ or a leader in the groups you have joined?

1.
2.
3.
4.
5.

64. What are the benefits and challenges of being a member and /or a leader in the economic and social groups?

Association or post in the group	Benefits	Challenges
Member		
Leader		

65. Mention any other economic and social groups outside your village in which you are a member or leader?

.....

66. Indicate reasons to join the group(s) outside your village

.....

Part 8: General remark on the village domestic water services

67. Any other remark(s) about the water services

.....

Thank you very much for your cooperation

Appendix 2: Checklist for Focus Group Discussions with MEN and WOMEN

- 1) Improvements in access to water services
 - What are the main domestic water uses?
 - What have been the important improvements in access to water (availability, affordability, quality) in this area over the past five years?
 - What factors have contributed to these changes?
 - Who has been involved and how?
- 2) Payment mechanisms for water services
 - How do people pay for water services in this village?
 - Who sets the tariffs, which criteria are used, and who collects?
 - Are there any households failing to pay, what proportion?
 - Are there any groups that exempted from paying user fee?
 - How is the money spent, who decides, and are you satisfied with water funds expenditures?
- 3) Appropriateness of water services to women needs
 - How appropriate are water services to the needs of user/women in terms of the following:-
 - Cost (user fee)
 - Taste
 - Distance to water point/source
 - Smell
 - Colour
 - Location
 - Water availability at the distribution point
- 4) Participation in management of public water sources
 - How many pump attendants... men....., women.....
 - How much is the allowance of the pump/tank attendant per day/ month?
 - Who decides on the amount of the pump/tank attendant's monthly allowance?
 - Is the pump attendant responsible for security of the pump?
 - How much is the allowance for security guard per month?
 - How many local technicians?....men,women
- 5) Private operator
 - When did the private operator start to work in your village?
 - What was the situation of public water services before private operator?
 - What was the situation of public water services before private operator?
- 6) Patriarch system
 - How do you explain patriarch system? What are the examples of patriarch system?
 - What are factors contributing to the existence of patriarch system?
 - Is the system changing or not and in what ways? What factors are contributing to the change?
- 7) What are the main challenges this village is facing in accessing water services?
 - Any political interference related challenge? How does it affect provision and sustainability of water service?

Appendix 3: Questionnaire for Village Leaders

- District name Ward name
- Village name Date of interview
1. Name of interviewee
 2. Sex
 1. Male
 2. Female
 3. Age
 4. Marital Status
 1. Married
 2. Single
 3. Widowed
 4. Separated
 5. Divorced
 5. Religion (denomination) of respondent
 1. Catholic
 2. Protestant (specify).....
 3. Muslim
 4. Traditional religion
 6. What is your tribe/ethic group?
 7. Highest education level attained
 1. Adult education
 2. Primary education
 3. Secondary education
 4. Vocational training
 4. College/University education
 5. No formal education
 8. In which village committee are you a member?
 1. Village council
 2. Water committee
 3. Village council/ Social welfare committee
 9. For how long have you been a member of this committee?.....
 10. Do you hold any leadership position in this committee?
 1. Yes
 2. No
 11. If yes, which position?
 1. Chairperson
 2. Secretary
 3. Treasurer
 12. Before you became a member of this committee, were you a member of any other committee in the village?
 1. Yes
 2. No
 13. If yes, which committee was that?.....
 14. For how long were you a member of that committee?
 15. What are challenges for being in village leadership?
 16. To what extent are you motivated to continue working in this committee?

Appendix 4: Checklist for Focus Group Discussions with Village Water Committee

- 1) Membership in village water committees
 - What are the qualifications to become a member of VWC?
 - What is the proportion of young men and women in the VWC? Why are there few young men and women in the committee?
 - How does age influence relationships and decision making among VWC members?
- 2) Responsibilities of the committee
 - What are the main responsibilities of the VWC?
 - Do both men and women in the VWC perform the same responsibilities or is there division of responsibilities? If so, who does what and why?
 - How do women rate their involvement in the VWC?
- 3) Decision making in VWC
 - How often do women in VWC attend meetings? How often do they speak up, and do they have influence in decision making?
 - How has the presence of women in VWC helped to improve water services? How has they helped to address women's water needs?
 - What barriers are constraining women's active involvement in VWC?
- 4) Patriarch system
 - How do you explain patriarch system? What are the examples of patriarch system?
 - What are factors contributing to the existence of patriarch system?
 - Is the system changing or not and in what ways? What factors are contributing to the change?
- 5) Payment and management of water funds
 - How do people pay for water services in this village?
 - Who sets the tariffs, which criteria are used, and who collects?
 - Are there any households failing to pay, what proportion?
 - Are there any groups that exempted from paying water tariffs?
 - Do you have an active water fund account? When did you open water fund account? How is the money spent? And who decides?
 - How is the overall management of water fund's collections?
- 6) Private operator (PO)
 - When did the PO start to work in your village?
 - What were procedures to get PO?
 - What was the situation of public water services before PO, and after PO?
 - Main challenges the village is facing about contract with the PO
 - What are your suggestions about continuing with current PO?
- 7) What are the main challenges this village is facing in accessing water services?
 - How does it affect provision and sustainability of water service?

Appendix 5: Guideline for Community mapping exercise

1. Information and/or resources mapped

1. Institutions with water sources (primary schools, churches, mosques, dispensary)
2. All public water sources i.e. distribution points. To get their location and other attribute data as it is shown in table below.
3. Public water services supporting facilities such as pump-house and main water tank. To get overview of their location and it's interaction to management as well as sustainability.
4. Main settlement areas. To get information on the location and distance of the settlements and that of water points, accessibility.
5. Men and women preference of location and water points they fetch water for their households' domestic water uses. To capture men and women perspectives in terms of location of the existing water points, their preferred location and water points they rarely and frequently fetch water for domestic water.
6. Discussion with mapping participants throughout the mapping exercise and after having completed mapping.

Example of information collected during transect walk

Location Name (Water point/infrastructure)	Code	X-Coordinates	Y-Coordinates	Z-Coordinates	Remarks (Include type of water source, water taste, colour, smell, functionality, physical status, users per water point and other relevant info. For attribute table)
1					
2					
3					
4					
5					

Summary

Since 1945 to date the governance of the rural water sector in Tanzania has passed through multiple phases, from the colonial era to the times characterized by liberalization, decentralisation and privatization. Generally, changes in the policies and governance strategies reflect a correspondence with national and international reforms in the political and economic spheres. In turn, these changes made the sector to experience pendulum swings over time in terms of policies and achievements.

The main objective of this study was to examine how gender, household and community shape the appropriateness, accessibility and sustainability of domestic water schemes in rural Tanzania, and to explore whether and in what ways domestic water services take women's gender needs into account. The study aimed at a critical analysis of the policy-practices nexus in terms of appropriateness, accessibility and sustainability in the contexts of the household and the community as representing the water users and hosting local water management structures, respectively.

The theoretical pillars of the study are ecological modernisation theory, gender theory, the concept of users' perspective, and the community management model. These were blended into one theoretical framework. The fieldwork for the study was conducted between October 2011 and September 2012 in the rural districts of Kondoa and Mpwapwa in Dodoma region, in central Tanzania. It consisted of three overlapping phases in which quantitative and qualitative research methods were used to collect data from multiple units of analysis. Data collection for primary data was done through the household survey, focus group discussions, interviews with key informants, village and women case studies, participatory sketch mapping, and field observation. Secondary data was collected through the analysis of information from relevant documents at the village, district and national levels. Overall a total number of 334 respondents were involved in the study.

The study found that accessibility to the improved domestic water services is associated with seasonality and that, surprisingly, the average distance to the water distribution points increases during the rainy season. This is because then few water distribution points are operational. The mean number of users per water point is higher than the standard set by the policy guidelines, because the planning and designing of the water schemes rely on population projections and do not take migration and the spatial distribution of the population into account.

It was found that there is a difference between the existing water policy and practices related to domestic water uses and management at the micro levels of the household and the village. Within the household, the provision and use of

domestic water is organised based on the gendered division of labour in domestic production. At the community level, the same pattern of the gendered division of labour influences men's and women's participation in the management of the public water schemes. At both levels the gendered division of labour and performance of men and women is shaped by social norms and traditions that are rooted in patriarchal culture. Women relate to domestic water more closely than men because they are the managers, providers and users of water for carrying out their reproductive roles in the household. This makes women knowledgeable about the appropriateness of water for domestic uses. However, women's preferences and perceptions on the appropriateness of the domestic water are rarely integrated in the designing and planning phases of water projects. The government, in collaboration with the international community, has established women quota to ensure women's participation in local decision-making spaces and management structures. However, the informal structures which are embedded in the normative traditions within and beyond the household, explicitly and implicitly deter women's involvement in the public management of the water schemes.

Water users' participation, and women's participation in particular, was very minimal in the pre-implementation phase of village water projects. Hence, the users' perspectives are poorly represented in the early stages of the water schemes. In general, there was low community participation not only before but also after implementation of the water schemes. Additionally, the sustainability of the rural water infrastructures is endangered mainly because water using communities have been assigned technical and managerial roles without being equipped with the corresponding capabilities. The district water departments which are responsible to provide technical support to the villages, are also confronted with shortages of human and financial resources plus inadequate transport facilities.

The findings from this study reveal the need to review the existing water policy and change the current community management approach. This thesis concludes by identifying ways forward through research, programs and policies to improve the rural domestic water provision in Tanzania.

Samenvatting

Sinds 1945 zijn het bestuur en het management van de rurale water sector in Tanzania vanaf de koloniale tijd tot de tegenwoordige tijd door verschillende fasen gegaan, waarvan de laatste fase gekarakteriseerd kan worden met de begrippen liberalisatie, decentralisatie en privatisering. In het algemeen weerspiegelen de verschillende fasen nationale en internationale politieke en economische hervormingen. Op hun beurt waren de veranderingen in de water sector door de tijd heen aanleiding voor 'pendulum swings' in beleid en in resultaten.

Het hoofddoel van deze studie was het verkrijgen van inzicht in de wijze waarop de aspecten gender, huishouden en lokale gemeenschap vorm geven aan de gepastheid, toegankelijkheid en duurzaamheid van projecten voor de watervoorziening van rurale huishoudens in Tanzania en in de manier waarop rekening wordt gehouden met de belangen van vrouwen in de dienstverlening op dit terrein. Het onderzoek was gericht op een kritische analyse van de beleid-praktijk relatie in termen van gepastheid, toegankelijkheid en duurzaamheid in de context van huishoudens en de lokale gemeenschap als, respectievelijk, gebruikers en managers van lokale watervoorziening.

De theoretische pijlers van de studie zijn de theorie van ecologische modernisering, gender theorie, het concept van het gebruikers perspectief, en het community management model. Deze werden geïntegreerd in een theoretisch kader. Het veldwerk voor de studie werd verricht in de periode oktober 2011-september 2012 in de districten Kondoa en Mpwapwa in de Dodoma regio in centraal Tanzania. Het veldwerk bestond uit drie overlappende fasen waarin zowel kwantitatieve als kwalitatieve methoden van data verzameling en verschillende eenheden van onderzoek en analyse werden gebruikt. Primaire data werden verzameld door middel van een huishoudsurvey, focus groep discussies, interviews met sleutelinformanten, case studies, participatory sketch mapping, en observatie. Secondaire data werden verkregen door rapporten en beleidsdocumenten te raadplegen. In totaal waren er 334 respondenten betrokken in de studie.

Een van de bevindingen van het onderzoek is dat de toegankelijkheid van verbeterde water voorziening voor huishoudelijk gebruik seizoensgebonden is. Anders dan verwacht bleek de toegankelijkheid in het regenseizoen slechter dan in de droge tijd. Dit komt omdat in de regentijd minder distributie punten van water worden opengesteld. Het gemiddeld aantal gebruikers per distributiepunt is hoger dan de officiële beleidsstandaard, omdat in de planning en het ontwerp van de water projecten geen rekening wordt gehouden met bevolkingsgroei, immigratie en de ruimtelijke verspreiding van de bevolking.

In het onderzoek werd een kloof geconstateerd tussen het bestaande beleid en de praktijken gerelateerd aan huishoudelijk water gebruik en water management op de micro niveaus van huishouden en dorpsgemeenschap. De voorziening en het gebruik van water in huishoudens is gebaseerd op de arbeidsdeling naar sekse in de huishoudelijke productie. Op dorpsniveau wordt de participatie van mannen en vrouwen in het management van de watervoorzieningen eveneens beïnvloed door de geldende arbeidsdeling naar sekse. Op beide niveaus is de verdeling van arbeid gebaseerd op wat mannen en vrouwen geacht worden te doen volgens sociale normen en tradities die zijn geworteld in patriarchale cultuur. In de huishoudelijke context zijn vrouwen verantwoordelijk voor watervoorziening en gebruik vanwege hun reproductieve rol in huishouden en gezin. Om deze reden weten vrouwen uit eigen ervaring het beste wat goede watervoorziening voor huishoudelijk gebruik zou moeten zijn. De wensen en visies van vrouwen worden echter zelden geïntegreerd in de ontwerp en planning fases van water projecten. De regering heeft, in samenwerking met de internationale gemeenschap, quota vastgesteld om de stem van vrouwen in de besluitvorming en het management van water voorzieningen te garanderen. De op normatieve tradities gebaseerde informele structuren belemmeren echter de volwaardige deelname van vrouwen.

Participatie van water gebruikers, in het bijzonder van vrouwen, bleek minimaal in de fasen voorafgaande aan de implementatie van water projecten. Het gebruikers perspectief is nauwelijks vertegenwoordigd in deze fasen. In het algemeen was er sprake van een laag niveau van betrokkenheid van de gemeenschap, niet alleen voorafgaande aan de implementatie maar ook daarna. Tevens wordt de duurzaamheid van water projecten bedreigd door het feit dat de betrokken lokale gemeenschappen worden geacht technische en management bijdragen te leveren zonder dat ze beschikken over de capaciteiten en kunde die daar voor nodig zijn. Op districtsniveau worden de water afdelingen die technische ondersteuning aan de betrokken dorpen moeten verlenen, geconfronteerd met menselijke en financiële tekorten en met gebrek aan transport faciliteiten.

De resultaten van het onderzoek maken duidelijk dat een revisie van het bestaande waterbeleid nodig is en dat het geldende model van management door de dorpsgemeenschap moet worden bijgesteld. In het slothoofdstuk van dit proefschrift wordt aangegeven op welke wijze dit zou kunnen gebeuren en hoe door initiatieven in onderzoek, specifieke programma's en beleid de huishoudelijke watervoorziening in Tanzania verbeterd zou kunnen worden.

About the author

Christina Geoffrey Mandara was born in Mbulu, Tanzania. In 2002, she graduated from the Community Development Training Institute, Tengeru with an Advanced Diploma in Community Development. In 2003, she obtained a Postgraduate Diploma in Environmental Planning from the Institute of Rural Development Planning (IRDP)-Dodoma. In 2005, she was awarded a NUFFIC scholarship to pursue a Master of Science in Geo-information Science and Earth Observation (majoring in Natural Resources Planning and Management) at the ITC, Enschede, in the Netherlands. She graduated in 2007.

Christina is presently a lecturer at the IRDP- Dodoma where she has been working since 2004 and is involved in training, research and consultancy. Her research interests include domestic water services, community and rural development, environmental studies as well as policy analysis and its integration into development interventions.

In October 2010, Christina obtained a PhD scholarship from the NICHE/TZA/002 project, and she started doctorate studies at the Sociology of Consumption and Households group, Wageningen University. As part of her PhD project, Christina has published the following articles:

- Mandara, C.G., Niehof, A., van der Horst, H. (2013). Does women's representation in local water management lead to better meeting women's domestic water needs? *International Journal of Social Sciences and Humanity Studies*, 5 (1), 43-62.
- Mandara, C.G., Butijn, C. and Niehof, A. (2013a). Community management and sustainability of rural water facilities in Tanzania. *Water Policy*, 15 (SUPPL. 2): 79-100.



Wageningen School
of Social Sciences

Christina Geoffrey Mandara

Completed Training and Supervision Plan

Wageningen School of Social Sciences (WASS)

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
Research Proposal Writing	SCH	2010	6.0
Gender and Natural Resources (IWE 33806)	Wageningen University	2011	6.0
Rural Gender Studies (SCH 50303)	Wageningen University	2011	4.0
Research Methodology: From Topic to Proposal	WASS	2010	4.0
Qualitative Data Analysis: Procedures and Strategies (YRM 60806)	Wageningen University	2010	6.0
B) General research related competences			
Introduction Workshop	WASS	2010	0.3
Information Literacy for PhDs	WGS	2011	0.6
"Participatory Forest Management" summer school	FNP	2011	3.0
Mobilising your scientific network	WGS	2012	1.0
Techniques for writing and presenting a scientific paper	WGS	2012	1.2
Project and time management	WGS	2012	1.5
C) Career related competences/personal development			
Research Seminar	SCH	2012-2013	2.0
Village Water Committees or Private Operators? Comparing Management Approaches for Rural Public Water Facilities in Tanzania	3 rd International Conference on Water, Economics, Statistics and Finance, Marbella, Spain	2013	1.0
Community Mapping in assessing village domestic water services in Tanzania	WASS PhD Day	2013	1.0
Gender Perspectives on household's domestic water services in rural Tanzania	International Conference on Social Sciences, Izmir Turkey	2013	1.0
Structural arrangements and sustainability of rural water facilities in rural Tanzania	5 th Delft Symposium on Water Sector Capacity Development, Delft, the Netherlands	2013	1.0
Total			39.6

*One credit according to ECTS is on average equivalent to 28 hours of study load

Photo Cover: Improved water point, hand-dug well, improved cattle trough and
traditional cattle trough

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