

## Challenging pathways to safe water access in rural Uganda: From supply to demand-driven water governance

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**Abstract:** Uganda has experienced a major policy shift from a supply-driven to a demand-driven approach in rural water provision since 1990. The article sheds light on the rural population's access to safe water within the changing institutional frameworks. We analysed individual and group interviews with key informants from national to community levels and relevant official documents with the 'Social-Ecological Systems' framework and the 'design principles'. Since the implementation of the demand-driven approach, rural safe water coverage has slightly improved but operation and maintenance of water sources pose a great challenge hampering long-term access to safe water. The abrupt and top-down imposed policy shift has resulted in competing signals from old and new policies creating uncertainty and ambiguity about responsibilities, rules and incentives. The analysis shows the importance of taking into account the implications of national institutional disturbances on local collective action for long-term access to safe water.

**Keywords:** Collective action, drinking water, policy change, social-ecological systems framework

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## I. Introduction

Water is central to humanity's social and economic existence (Agnew and Woodhouse 2011). Not having access to safe water therefore, is a form of deprivation that threatens life, destroys opportunity and undermines human dignity (UNDP 2006). Cognizant of the importance of water, the United Nations General Assembly recognised the human right to water and sanitation.<sup>1</sup> Despite such aspirations, safe water<sup>2</sup> access is still a challenge. In Africa, it is estimated at 62% with 47% in rural areas (Mathew 2004). In Uganda, national safe water coverage is estimated at 66% with 42% coverage<sup>3</sup> in rural areas (DWD 2011a). The actual water coverage levels are considered much lower given the hypothetical statistical procedures of deriving the coverage and the fact that most dysfunctional water sources are not controlled for (Carter et al. 1999). The continued water supply deficit, both in Uganda and elsewhere, has been attributed to a water governance crisis (GWP 2002; Asingwire 2008; Mugumya 2013; Starkl et al. 2013). GWP (2002) defines water governance as the range of political, social, economic and administrative systems that are in place to regulate the development and management of water resources and provision of water services at different levels of society.

The response to the water governance crisis has taken different forms in developing countries. In situations of insufficient public budgets, corruption and public mismanagement, private sector mechanisms like competition and the efficiency imperative were considered to be a panacea to state failures (McGranahan and Owen 2006; Golooba-Mutebi 2012). Despite problems like appropriate water provision technologies, high transaction costs and possible regulatory weaknesses, there is evidence of better performance in private utilities compared to state-owned utilities (Kirkpatrick et al. 2004; Gopakumar 2010). Yet privatisation also encountered strong opposition partly due to the perceived

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1 On 28th July 2010, through Resolution 64/292, the United Nations General Assembly recognised the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights.

2 In the context of rural Uganda, safe water is clean drinking water, which comes from a protected source such as a borehole, shallow well, gravity flow scheme or protected spring; recently also domestic rainwater harvesting is considered as safe water source.

3 In the context of Uganda, rural safe water coverage refers to the percentage of the rural population with access to a safe water source within a walking distance of 1.5 kilometers.

conflicts between privatisation and equity, and the unclear role of the state and community (Hall et al. 2005).

A third way between central state provision and privatisation is local self-governance, also referred to as community-based water management or demand-driven approach. Cognizant of the fact that most of the governance problems and issues remain highly local and contextual (Hirsch 2006), an increasing body of water governance literature encourages inclusion and participation of the local community (Meinzen-Dick 2007; Carlsson and Sandström 2008; Marshall 2008; Seixas and Davy 2008). Referring to Olson (1971), Golooba-Mutebi (2005) challenged the principle mechanism of transferring operation and maintenance (O&M) to local collective action, assuming that associated free riding will necessarily result in a collapse of the mechanisms. He further argued that it cannot be generally assumed that people in Uganda were keen to participate in public affairs, that they possessed the capacity to do so, and that all they needed was opportunities (ibid). These critical conclusions contrast with best-practice examples as documented in the commons literature (e.g. Madrigal et al. 2011 for Costa Rica, Fielmua 2011 for Ghana; Chitonge 2011 for Zambia), where communities have successfully operated and maintained the local water infrastructure.

In demand-driven approaches, we often find complex multi-level networks of actors sharing the responsibilities and related scopes of action; they comprise state authorities, local communities, non-government organisations (NGOs) and private sector enterprises. The goal of Uganda's government to achieve sustainable provision of safe water within easy reach of households is also based on a complex interaction of various actors: the policy and financial responsibility of state authorities, the management responsibility and ownership by local waters users, the support of donors, NGOs and commercial enterprises. The progress in the achievement of this goal is measured against a set of performance and outcome indicators that among others include access, functionality and gender participation (number of women on Water User Committees) (GoU 2009).

Over 80% of the population in Uganda live in rural areas and 76% of the rural population receives water from a point water source<sup>4</sup> (DWD 2010b). New point water sources are constructed by the government in close collaboration with local water users, who have to express their demand through an application letter to the district beforehand. The water user community – usually a village, sometimes beyond – is required to make an up-front contribution towards initial capital costs, to provide the land where the water source is located, to manage and to operate and maintain the infrastructure. Therefore, point water sources in rural Uganda are collectively owned, used and managed by the local water users. The common infrastructure yields a limited amount of subtractable water (resource units), i.e. there is rivalry in use. Furthermore, the exclusion of users

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4 These include boreholes, shallow wells, protected springs, and gravity flow systems.

is difficult. Hence, the situation of rural water governance is characterised by common pool resources problems, such as overuse and free riding (Poteete et al. 2010). Therefore, collective action of local water users and local self-governance is key for (i) the ability of the community to organise and mobilise resources to operate and maintain the infrastructure and (ii) setting and enforcing user rules (Ostrom 1990; Baland and Platteau 1999; World Bank 1999). However, not all communities are equally successful in protecting and managing their common pool resources in a sustainable manner (Gautam and Shivakoti 2005).

As devolution trends are spreading internationally, reforms in the water sector have taken place in various developing countries such as Ghana (Imoro and Fielmua 2011), India (Gopakumar 2010), Zambia (Chitonge 2011), Malawi and Tanzania (Mathew 2004), Zimbabwe (Kujinga and Jonker 2006; Derman and Hellum 2007), Ethiopia (Lenaerts et al. 2013), Burkina Faso and Mali (Cherlet and Venot 2013) or South Africa (Goldin 2010). The results of water policy reforms in Sub-Saharan Africa are a mixture of success and failures as indicated by evidence from Uganda (Asingwire 2008; Nkonya et al. 2008; Nakano and Otsuka 2011; Mugumya 2013), Ghana (Fielmua 2011), Zambia (Chitonge 2011) or Ethiopia (Lenaerts et al. 2013). Due to the still unclear picture of devolution success and failure in Sub-Saharan countries, the institutions coordinating water provision and use in Uganda form an interesting study subject, even more because of the recent change from a supply to a demand-driven approach.

Our knowledge of the institutional dynamics of resource regimes, such as those triggered by an abrupt, top-down imposed policy change, is comparatively underdeveloped (Young 1999, 2010; Janssen et al. 2013). As a contribution towards this research gap, the objective of this article is to identify the key challenges to water provision within the changing policy frameworks as recorded in relevant documents and as perceived by key-stakeholders and experts at national, district and community levels. Therefore, the two guiding questions of this study are: i) What are the implications of the shift from a supply-driven to a demand-driven approach for safe water access in rural Uganda? ii) What are the current challenges to sustained access to safe water in rural Uganda?

### **1.1 Uganda's rural water policy reform**

In the course of reforms, the government of Uganda has grappled with different approaches under different policy regimes. During the pre-colonial era<sup>5</sup>, clan leaders, elders or kingdoms<sup>6</sup> successfully mobilised community members to participate in self-help projects such as road and water source maintenance (Asingwire 2008). Trust, unity, local rules, sanctions and high levels of social cohesion characterised and motivated community members to support each other

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5 The period before Uganda become a British colony.

6 These were communities with centralised administration based on dominant tribal groupings especially among the Bantu in central, west and southern Uganda.

(Mugumya 2013). This collective approach to problem solving remained in force till the onset of colonialism which introduced a centralised state-controlled welfare system of water governance in the last quarter of the 19th century (Nabuguzi 1995; Manyire and Asingwire 1998). Uganda's post-independence regimes inherited this supply-driven approach from their former colonial masters (Muhangi 1996; Manyire and Asingwire 1998), i.e. safe water provision was solely the responsibility of the government and no pre-conditions were set for communities to fulfil before the state provided the infrastructure. The aim was to decrease socio-economic disparities by universal accessibility to water.

However, areas of concern emerged under the supply-driven approach. These included (i) how to ensure the pace of progress needed to provide the majority of the population in rural areas with safe water within a reasonable timeframe, and (ii) how to ensure the long term sustainability of water services, particularly in terms of the O&M of water infrastructure (DWD 2001). The model of direct state intervention was considered fragile and less fiscally sustainable (World Bank 1999; Batley 2004). These concerns resulted in a shift from the supply-driven to a demand-driven approach which was piloted in 1990 under a Danish International Development Agency funded project (Asingwire 2008). The government implemented a "*radical programme of devolution*" (Golooba-Mutebi 2012), "in which users are expected to be fully involved and contribute to the cost of facilities and services to promote ownership and sustainability" (GoU 1999). Although the reforms had led to the creation of new infrastructure and thus improved access, O&M and sustaining this infrastructure still pose a great challenge accounting for over 50% of non-functionality of water sources in rural areas (DWD 2011a).

## **1.2 The formal requirements under the demand-driven approach**

With the reform of 1990, the private sector, water users and lower tiers of government (i.e. districts, sub-counties, and the communities) have become major players in the water policy implementation. The national framework for O&M of rural water supplies sets out the rules, requirements and responsibilities of all the stakeholders involved in rural water governance (DWD 2011b) and has shifted decision making, management functions and O&M responsibilities to local water user groups. Their executive organ is a locally elected water user committee<sup>7</sup> (WUC) that has to be established at each improved point water source. The water user groups (through their WUC) need to provide an up-front monetary contribution and a formal application before the water infrastructure can be put in place with the state covering the biggest share of the capital costs. NGOs also finance infrastructure and support O&M. The WUC has to nominate hand pump mechanics and source caretakers, who should be trained by district authorities. The WUCs pay the hand pump mechanic for the repairs carried out and finance the source caretaker's everyday O&M work using the fees collected from water

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<sup>7</sup> Committee elected by users at community level to oversee O&M.

users. However, the government acknowledges that most rural communities cannot afford to meet the full cost of O&M and thus funds major repairs beyond community capacity, such as the replacement of hand pumps and borehole desilting repairs. Further requirements to water infrastructure installation include gender composition of WUC and a 3-year realistic and viable plan prepared by the WUC to ensure continuous and reliable operation of the installed facilities. The different actors involved, their roles, functions and relationships are shown in Figure 1.

## 2. Analytic framework, study area and methods

### 2.1 The social-ecological systems framework and the design principles

In spite of the growing body of literature on water governance and collective action for natural resource management (e.g. Ostrom 1990; Poteete and Ostrom 2004; Cleaver and Toner 2006; Franks and Cleaver 2007; Nkonya et al. 2008; Huitema et al. 2009; Nakano and Otsuka 2011), there is no broadly accepted single theory to explain the link between institutions and water provision. However, there are some ontological frameworks that help to structure the analysis. Due to water's characteristics of a common pool resource (see introduction) and the complex interaction between nature, technology and humans for local water governance, we selected the Social-Ecological Systems framework and the design principles (Ostrom 1990, 2007).

The SES builds on the long-standing Institutional Analysis and Development framework (Ostrom et al. 1994). It provides a set of related categories of variables and thus structure to the analysis. The framework's core is the conceptual unit called the "action situation", defined as the social place where actors interact, make decisions, solve problems or fight (Ostrom 2007). The character of the action situation shapes activities, interactions and exchange among individuals. The framework furthermore identifies a set of first (resource systems, resource units, governance systems, actors, action situation, related ecosystems as well as related social, economic and political systems) and second-tier variables (e.g. location, rules, group size, monitoring) that characterise and influence action situations.

The design principles (Ostrom 1990; Cox et al. 2010) have been derived from long-enduring common pool resource institutions and can also be considered as helpful to analyse the water governance system in the study area. Although the design principles do not provide a blueprint for analysing resource management regimes (Ostrom 2011), they have been found consistently in long-enduring common pool resource situations. The eight design principles are summarised in Table 1.

We used the SES second-tier variables and the design principles to analyse the documents and interview transcripts regarding the patterns of interaction of actors and outcomes observed in the study area. Although the research design was guided by these two analytic frameworks, caution was taken to allow for

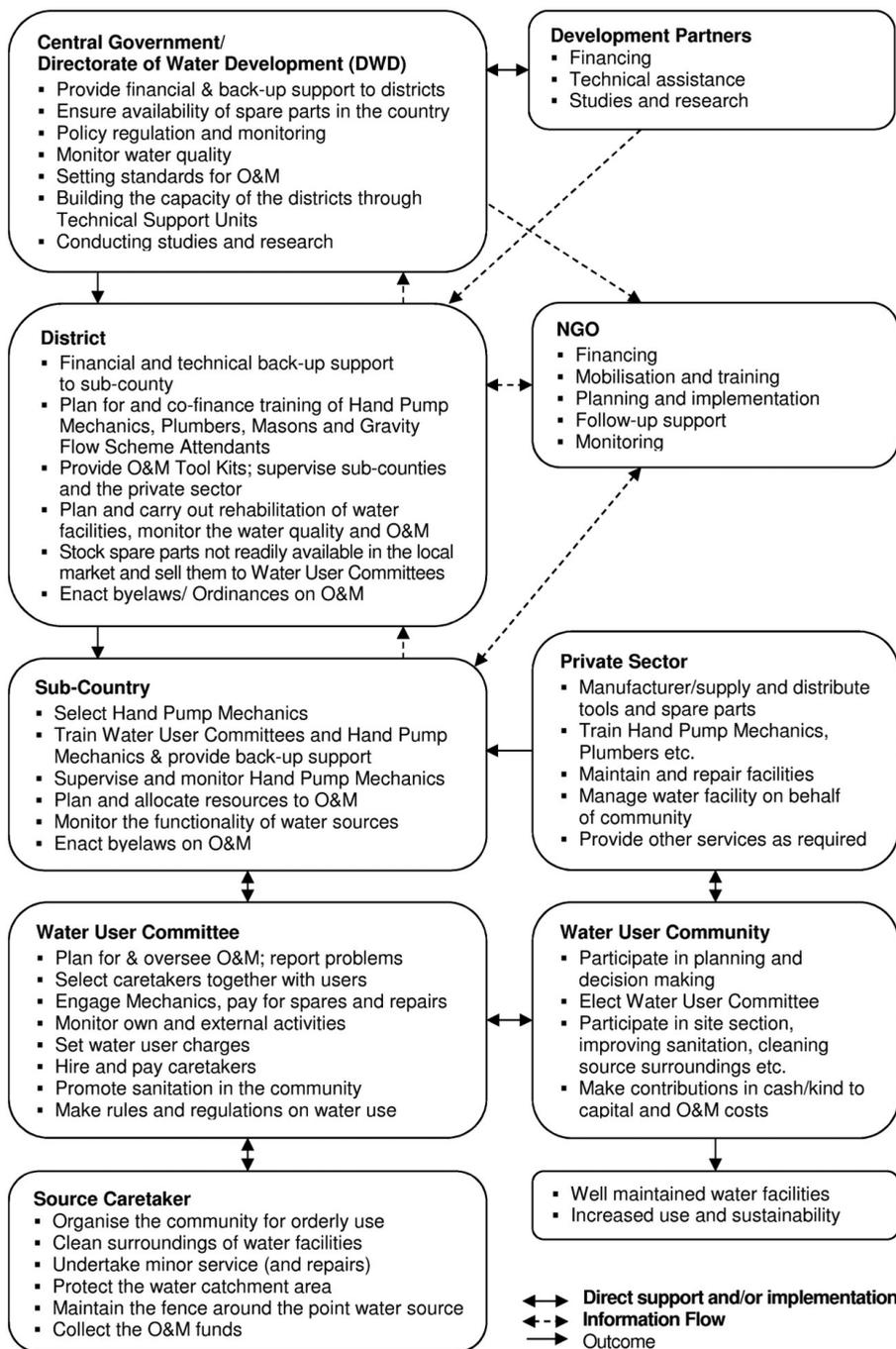


Figure 1: Formal roles and relationships of key actors (own illustration according to DWD 2011a).

Table 1: Design principles.

	Principle	Explanation
1	Clearly defined boundaries	Clearly defined boundaries of resource system and its legitimate users.
2	Congruence	The appropriation and provision rules are congruent with local social and environmental conditions and should allocate benefits in proportion to the inputs, such as labour, material or money.
3	Collective-choice arrangements	Most individuals affected by the operational rules can participate in modifying them.
4	Monitoring	Monitors who are accountable to the users monitor the appropriation and provision levels of the users and the condition of the resource.
5	Graduated sanctions	Users who violate operational rules are likely to face graduated sanctions.
6	Conflict-Resolution Mechanisms	Users and their officials have rapid access to low-cost local arenas to resolve conflicts.
7	Minimal recognition of rights to organise	The rights of users to devise their own institutions are not challenged by external or higher authorities.
8	Nested enterprises (for CPRs that are part of larger systems)	Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple nested layers.

Source: Ostrom 1990; Cox et al. 2010.

discovering explanations that might not be covered by the categories deduced from the frameworks, not least to also indicate possible blind spots of the design principles and the social-ecological systems framework.

## 2.2 Case study selection and methods

Based on discussions with local experts in the Water Ministry and the national university in Kampala, Isingiro district was selected as the case study area due to its representativeness for the O&M challenges faced by most districts which are dominantly served with boreholes and shallow wells in rural Uganda. In a second step the sub-county of Masha was selected. Masha has a population of 396,700 of which 28 per cent has access to safe water (DWD 2010b). Moreover, functionality of water source facilities in Isingiro is estimated at 50%, i.e. below the national average, which however also covers better performing urban areas (DWD 2010a, 2011a). In contrast to other sub-counties where many households have alternative safe water sources (e.g. privately owned harvesting tanks and underground tanks) in Masha 92% of the household depend on borehole and shallow wells. This share is very similar to the national share of point water sources in rural Uganda. Bearing in mind that communities in Uganda are not homogeneous, several studies in Uganda indicate that communities with the same type of technologies are largely

confronted with similar challenges (Muhangi 1996; Asingwire 2008; DWD 2011a; Baguma et al. 2013; Foster 2013; Mugumya 2013; Naiga and Penker 2014). Thus, the case study promises a fruitful perspective on possible pitfalls, challenges and innovations for rural water governance elsewhere in Uganda.

We reviewed literature and policy documents at national level – mostly from DWD, Directorate of Water Development, Ministry of Water and Environment (MoWE), district level (Isingiro district) and community level (Masha sub-county) – to integrate existing knowledge on water management in Uganda. The 19 key informant interviews and three focus group discussions were carried out in April 2012 and between August to December 2013. They involved officials at the MoWE (cited as KIn), officials in the water department at Isingiro district headquarters and the technical support officer at Mbarara Water Regional Support Unit offices at the district level (KId), local water users (KIc) as well as focus group discussions of WUC members in three different communities (cited as FGD). While local water users were randomly selected, also taking into account gender balance, higher-level key informants were purposively selected based on their roles, experience and knowledge. We recorded, transcribed and analysed the interviews – like the documents – based on codes that were derived from the Social-Ecological-Systems framework and the design principles. The qualitative nature of the analysis allowed us to identify aspects that might be neglected by the analytic framework (inductively derived codes).

### 3. Results

#### 3.1 Performance of drinking water governance according to official documents

Since the implementation of the demand-driven approach, rural safe water coverage has improved in Uganda. Access to an improved water source reportedly increased from 44% in 1990 to 60% in 2004 and to 66% in 2010 (UBOS 2010). Rural-urban differentials showed that on average urban households travelled 0.2 km to the main source of safe water; those in rural areas 0.8 km with an average waiting time for water of half an hour (UBOS 2010). However, the average distance to the main source of safe water in Isingiro was estimated at 1.5 km (UBOS 2010). Unreliable supply in rural areas complicated the situation further as elaborated by a study that assessed the effectiveness of community-based maintenance system for rural water supply in all the 112 districts of Uganda (DWD 2011a). According to this study, only 53% of the water sources surveyed were fully functional (i.e. regular and adequate yield throughout the day), about a quarter (24%) were partly functional (low and intermittent yield) and 18% non-functional, 30% of shallow wells were non-functional, followed by gravity flow scheme taps (25%), deep boreholes (19%), and protected springs (5%), while all the surveyed rainwater harvest tanks were functional (DWD 2011a). In Isingiro 35% of the boreholes and 33% of the shallow wells were non-functional (DWD 2011a).

In addition to user fees, users are expected to contribute labour for cleaning and fencing the water sources. However, out of 160 sources surveyed, only 52 had clean surroundings with well cut grass (ibid). The drainage channels for a number of them were blocked with back flow increasing the possibility of contamination. Missing fences exposed most sources to destruction of the catchment area by both humans and animals (ibid). National reports pointed at ineffective supervision and monitoring in both the area of this study and in other districts (DWD 2005). Only 38.1% of the existing water user committees in Masha received training and 9.4% refresher training by 2010 (DWD 2011a). Whereas the official reports give quantitative answers to questions of “how many” and “what”, the interviews explain “why” and “how” questions and thus shed some light on the underlying causalities for challenges in water governance (Yin 1994).

### 3.2. Water resources and deficits in infrastructure

Local farmers practice both crop and animal farming. Animal farming contributes to contamination and water scarcity, as both humans and animals compete for the same water source. Closely related to water scarcity, is the variability of water supply over time and the disperse location of water sources as reported by local water users. Female water users emphasised the long distance to the water source and observed the tendency of boreholes and shallow wells to be installed in isolated localities such as valleys. One woman remarked “*I use two hours to and from the nearest water source while others from Karubanda [another village] use even more than three hours*” [K1c2]; another observed that “*It is very frustrating to walk all the way for nothing; the problem is that water is not available all the time*” [K1c6]. Women need much time for water provision, which negatively affects other household chores such as child care and income generating activities.

Non-functionality of boreholes is due to poor O&M of the water infrastructure emanating from missing repairs, corrosion and sinking of water pipes; in some instances, boreholes are not used due to salinity of the water [K1d1]. O&M is also influenced by the availability of alternative sources of water such as unprotected wells (ponds): “*pond water is free while borehole I have to contribute both user fees and labour to keep the source clean*” [K1c2]. In Uganda, like in most parts of Africa, water sourcing is considered the primary role of women. “*I believe there are many who see paying for O&M as a burden, but even the men will shift the burden to women. Water like firewood is a responsibility of women. Therefore, men will tell women to find free water*” [K1n3]. The district water officer stated: “*Once a source breaks, then communities resort to alternative water sources, however unsafe they might be*” [K1d2].

Water user committees and water source caretakers regretted that spare parts outlets are located over five kilometres away. Long distances for getting spare parts do not only result in delayed repairs, but also into increased costs and mistrust by the community members due to their inability to verify the actual costs of spare parts [FGD, Rubeho; FGD, Kabaare; FGD, Nyarubungo]. The issue of affordable

and appropriate technology was also raised: *“The present technology is expensive that is why government and communities cannot afford it. There is need to involve communities in technology design and choice [...] in order to reduce costs” [KIn3].*

### 3.3 Inconsistent and ambiguous national rules

Inconsistent and ambiguous national rules hinder effective community based water management. For instance the *‘National Framework for Operation and Maintenance of Rural Water Supplies’* defines the local water users as responsible for O&M (DWD 2011b). While this may be in line with the National Water Policy (1999) and the demand-driven approach, it contradicts with the Constitution (GoU 1995a), which recognises water as a human right and hence is considered to support a supply-driven approach. The technical support officer stated that during her fieldwork visits she was often confronted with the same questions: *“Is there a right to water for everyone as demanded by the Constitution? And if so, would the pre-conditions of the demand-driven approach [making application and raising financial contribution before supply] then be relevant? Then what happens to those who cannot fulfil them?” [KIn9].* Referring to these lingering questions, a male key informant argued that: *“a demand-driven approach puts an economic spin to an otherwise public good. It would not only limit access to particular groups but also contradict the right to water as stated in the Constitution of the Republic of Uganda” [KIn4].*

Arguments for and against the water users’ responsibility for O&M varied across the respondents. While some take water access as a right guaranteed by the Constitution, others understand the importance of contributions made for sustainability reasons. For example, one male informant at national level argues that *“water is not free, there is need to ask communities to contribute towards O&M even when the government can afford. That is when they will take care of the water resource; keep the water clean, they will not let anybody graze cattle at the water source because they have participated and contributed towards the water source. It is like a tax versus gift, if you have paid you feel the pain. If you don’t contribute you think it will always come anyway” [KIn3].*

Another pertinent ambiguity is that of property rights and the understanding of *ownership*. The National Water Policy (GoU 1999) describes the community as the “owners” of a water facility. However, the Water Statute (1995b) vests the ownership in the Directorate of Water Development, with the community managing and maintaining it. This unclear division of rights and duties between state authorities and the water users resulted in a lack of perceived ownership on the local level, which in turn is considered as highly relevant for a successful demand-driven approach [KIn3]. The inconsistencies within the legal frameworks do not only undermine the implementation process of the demand-driven approach but also result in contestations of the rules of the game. In this sense, an expert from the Ministry confirmed that contradicting signals can raise resistance from different sections of the population [KIn4].

### 3.4 Multiple actors with insufficient capacity

The problem of access to safe water in rural areas can also be attributed to insufficient capacity of multiple actors (see Figure 1). Diverse barriers prevent actors from fulfilling their functions as defined by law. While the communities are responsible for management and maintenance of the water facilities, district authorities have the mandate to plan and oversee the implementation of water development programmes, including regulating water demand in an effort to support beneficiary communities. This should be done by capacity building and raising community awareness about the demand-driven approach (see Figure 2 showing an illustration used for community awareness building).

In fact, communities are often incapable of repairing and maintaining the water sources without having to seek external support from the district. The inability is largely due to a lack of technical capacity and a lack of knowledge on the impacts of land use on water quality [FGD, Rubeho]. In relation to higher level responsibilities, a male informant at national level however cautioned: *“it is very easy to blame the challenges in water accessibility and operation and*



Figure 2: Illustration supporting community awareness building (the women selling the food-crop to raise money for paying the water user fees) (Isingiro district community sensitisation tool kit).

*maintenance on community [...]. One needs to question the broader management structure at national and community level” [KIn4].*

Although it was a condition for each water source to set up an elected WUC and a water source caretaker prior the installation of the water source, some had neither source caretaker nor WUC in place and in other instances WUCs being inactive. A respondent explained: *“Our borehole has been non-functional for almost a year, because we do not have a water user committee to collect user fees and to also report the breakdown to the district headquarters” [K1c1].* Although the O&M framework states the WUC tenure of office as 2 years, one of the WUCs analysed has been in place for over 7 years and as a result some members have migrated or died without replacement [K1c6]. While WUCs are considered to be in charge of water sources on behalf of the communities, they are not registered; their mandates, roles, liabilities and responsibilities are not fully and clearly defined and even less monitored. In the cases analysed, they do not keep a record of accounts, although their existence is an explicit monitoring indicator according the O&M framework. A water user explained: *“We don’t hold meetings to discuss the expenditure on borehole repairs and income raised from user fees that is why I refuse to pay sometimes” [K1c4],* while a WUC member argued: *“What happens when the treasurer cannot read and write? For us the most important thing is to make sure that the borehole is functional.”* She further elaborated: *“When I was being elected I was not asked whether I knew how to write, then the law needs to change in favour of the educated because as far as I remember the law encourages women participation in key positions such as treasurer [...] Regarding the bank account, we don’t even collect enough for repairs, how can we operate a bank account?” [K1c7].*

Related to the above was absence of water source caretakers; not all communities studied have a source care taker as stipulated in the O&M guidelines. Others that have one are ill equipped to handle technical problems. One of the caretakers explained: *“I was trained for 3 months at the district headquarters, but I was not given tools to use. It was hoped that the community would contribute money towards the purchase of the tools” [K1c1].*

The interviewees attributed the challenge of inactive and non-existing WUCs and source caretakers largely to lack of supervision and monitoring by the district. Some observed that district officials rarely “visited” their area [K1c4, FGD, Kabaare II]. Poor performance of the supervisory role was also confirmed by the district officer who blamed national level for limited funds allocated to software<sup>8</sup> activities. He explained that *“funds from central government are delayed therefore; we do not get sufficient time to carry out our designated roles in accordance with the rules. But also software activities are allocated almost nothing i.e. 2% of the total budget” [K1d2].* Another issue mentioned was the ignorance of national actors of the local situation and a missing up-ward information flow. One member

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<sup>8</sup> Umbrella term used in water governance to refer to a package of activities involving awareness creation, community mobilisation, post construction follow-up and community support.

even argued *“That is why the national statistics are consistently wrong because those who compile and publish them sit in Kampala (the capital city) and Isingiro district headquarters just to rely on rumours”* [FGD, Rubeho]. WUCs are not organised in any higher-level organisation, which would allow for horizontal and vertical information exchange. Interviewees expressed the need for higher level representation as a means of minimising delays and distortions on issues affecting them. They expressed disappointment with the tendency by district authorities to portray a rosy picture about access and functionality of water services [KIC7; KIn3 and FGD, Rubeho].

Also unclear social boundaries in terms of who is supposed to use the water source affect local water governance. While the district stipulates the number of households to be between 150–400 per water source, WUC members reported that the numbers for point water sources range between 400 and 500 [FGD, Rubeho, FGD, Nyarubungo, FGD, Kabaare II]. One interviewee observed: *“When the source in my village breaks down, there is no rule stopping me from using a source in another village after all water is God given and in our culture sharing is a virtue”* [FGD, Kabaare II]. Closely related to unclear social boundary was a lack of conflict resolution mechanisms [KIC5, FGD, Nyarubungo and FGD, Rubeho].

While a number of NGOs have continued to embrace the supply-driven approach, others have complimented government efforts in pursuing the demand-driven approach. Thus, there are still pluralistic strategies to support water provision in Uganda. A key informant at the district level also explained that sometimes they supply water infrastructure to communities that have failed to fulfil the requirements of the demand-driven approach due to missing capacities. The district water officer stressed that the *“demand-driven approach is largely in theory but not in practice; it largely remains on paper but practice is difficult given the capacity of rural people”* [KId1]. A technical support officer further stated: *“Observed failure of O&M is a ‘price’ for our double standards because while policy documents state that all community development projects must be bottom-up, those supported by donors are in most cases done so hurriedly with hardly no time for community participation and sensitisation, yet sensitising users after implementation failure has proved a challenge of our times”* [KIn9].

The ambiguous roles in water provision were further elaborated by the district official: *“Funds are released late, almost at the end of the financial year and yet they expect the district to return the funds if not utilised by the end of the financial year. Therefore, instead of returning the money we identify a community with the need and supply without the community fulfilling the requirements of the demand-driven approach* [KId1]. He went on to explain the implication of such action: *“we know that our actions may result into resistance of the demand-driven approach in the long-run”* [KId1]. Politicians, especially members of parliament seeking votes, fully sponsored water infrastructure installation during the election period. This kind of political interference does not only contradict the devolution

process but also promotes the culture of “hand-outs” which erodes the spirit of ownership and encourages free riding [KId2].

There appears to be a strong connection between O&M associated problems with the *national water policy changes* initiated in the 1990s. One male key informant explained that: “*the demand-driven approach was a foreign discourse to begin with, so in a way it disorganised established local initiatives*” [KIn4]. Another male informant at national level pointed at false assumptions: “*So they are making assumptions that the community knows how to preserve what to them is an otherwise natural resource. It is like you find Guavas and pick and then somebody tells you to maintain the tree when you know that the tree is there and you just go to pick the Guavas when they are ready. Similarly O&M has been a challenge because we don’t adhere to defined roles and responsibilities and we are yet to appreciate the capacities of communities*” [KIn4]. Insufficient time allocated to community mobilisation and participation also challenged the implementation in the study area. The communities were hardly involved in the transition process but rather informed about the change that had taken place [KId2]. In this line a district official argued: “*If given time to sensitise and involve communities; demand-driven approach is the best way to empower communities to take charge of their own development. But the problem was that it was too sudden and top-down*” [KId2].

### 3.5 Challenges for O&M as outcome of the action situation

Whereas about one third of rural communities got access to water by infrastructure built in the last two decades (UBOS 2010), sustaining the long-term functionality of this infrastructure is still a major challenge. The high degree of non-functionality of more than 50% of the water sources in Isingiro district (DWD 2011a) might be explained by a vicious circle as demonstrated in Figure 3.

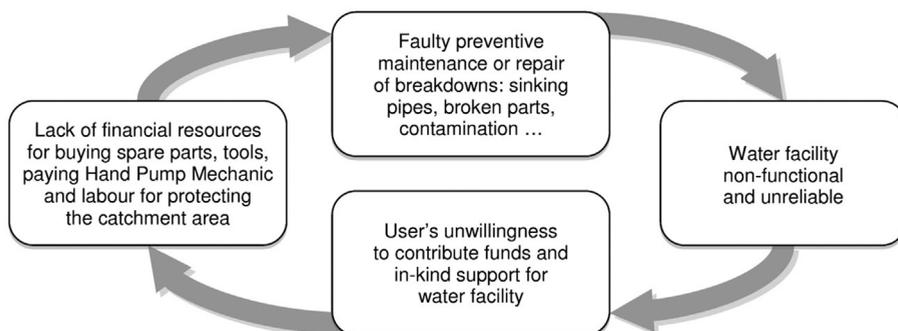


Figure 3: The vicious circle of inadequate institutions challenging effective O&M and sustained access to safe water.

## 4. Discussion

### 4.1 Discussion of results

In the study area, the demand-driven approach seems to be effective in terms of building new infrastructure and hence extending access to safe water, thus maybe contradicting Van Koppen's (2003) argument that water scarcity in Africa results from lack of private and public economic resources and incentives to develop water resources. We rather see the challenge with long-term collective action needed to operate and maintain the infrastructure, as indicated by half of the water sources being non-functional. Similar short-comings regarding O&M were also observed by Golooba-Mutebi (2012) who analysed the situation in the district of Masaka. Contrary to Uganda, reforms in Zambia suggests much progress related to O&M performance, however little success in core areas such as expanding the water network, service coverage, hours of service, and reducing the affordability burden especially among low income-households (Chitonge 2011).

According to our results, problems with O&M can also be attributed to the policy shift that was not accompanied by a consistent regulatory framework, adequate funding, time and staff for training, sensitisation, and monitoring, particularly in early phases of policy change. If the resources to accompany policy reforms are not available and therefore the reform remains fragmented, policy change can become a challenge to effective service delivery instead of a remedy as initially hoped for. Like Uganda, insufficient sensitisation was also reported for Zimbabwe, Mali and Burkina Faso (Kujinga and Jonker 2006; Cherlet and Venot 2013). Referring to the transformation process in South Africa, Kemerink et al. (2013) also observes that unless the inherently political nature of the participatory process is recognised and different institutional settings become part of the negotiation process of the 'why' and 'how', water user associations will not effectively contribute to achieving the envisioned transformations. It needs adequate sensitisation and preparation for local self-governance. Top-down devolution processes do not automatically empower local water users to demand for transparency and accountability from government officials or to learn about localised systems that can be easily adjusted to changes and conditions around them (Goldin 2010).

The policy change resulted in inconsistencies in the implementation and incentive structures. Today's local water governance in rural Uganda is impeded by expectations, conventions and structures inherited by the past supply driven approach, i.e. from a time when state authorities bore all responsibilities for drinking water supply. The devolution of management responsibilities from the central to the local level have often been based on the assumption that collective action at community level exists or that users will easily organize and accept the necessary management tasks (Meinzen-Dick et al. 2002). But in the worst case, this top-down policy change might even have destabilised past community initiatives due to the creation of unclear roles and rules. Water reforms in Zambia also posed multiple challenges to current local management norms and practices

(Derman and Hellum 2007). Whereas it seems that strong policy backup has strengthened local water institutions in Zambia (Chitonge 2011), or deliberate technical assistance supported local communities in Ghana (World Bank 2005), the Ugandan implementation process might have been too fast and without enough support. This confirms Seppälä's (2002) diagnosis that in developing countries, policy and institutional changes have in many cases, been pushed through too rapidly, without adequate consideration for the policy transition and adequate capacity building. We can therefore conclude that the incompleteness and inconsistencies within the devolution processes in Uganda have far reaching implications on the collective action required for sustained access to safe water.

#### **4.2 Discussion of analytic frameworks**

Being aware that institutions for water governance are context sensitive, the authors are cautious in transferring an analytic lens from one place to another. As there was not yet an empirical study applying the Social-Ecological-Systems framework to drinking water supply in Uganda, we opted for a research design that was open enough to also include upcoming aspects that are not covered by the framework. The Social-Ecological Systems first- and second-tier variables that have fruitfully contributed to shedding light on rural water governance in Uganda are: resource systems (boundary clarity, infrastructure, location, size, spatial and temporal heterogeneity); governance systems (rules, property rights); actors (group size, socio-economic attributes such as illiteracy, history of use, leadership, resource dependence, technology used); action situation (monitoring, sanctioning, conflict resolution, provision, policy making); related social, economic and political systems. The dynamic processes associated with the policy reform are particularly relevant for understanding water access in rural Uganda. These dynamic aspects include among others changing roles and responsibilities, changing financial resource allocation, and WUC capacity building. The Social-Ecological Systems framework from its conception was mostly used for analysing the sustainability of local socio-ecological systems, with a particular focus on analysing present or planning future resource management systems. Dynamic processes over time such as the evolving implication of a national policy reform are more difficult to grasp. There is only one variable in the SES (the history of use) that has an explicit time dimension to it. However, for understanding the change of rural water governance in Uganda, dynamics have to be taken into account for all the variables.

Ostrom's (1990) eight design principles to a major extent explain the institutional challenges identified in the study area (see Table 2). These include problems with the exclusion of non-legitimate water users (unclear social boundaries), rules that are not congruent with the local situation (e.g. illiterate WUC members being responsible for accountability records), missing collective-choice arrangements in communities with non-existing or non-functional WUCs, insufficient or missing monitoring, a lack of sanctions and conflict resolution

*Table 2: Design Principles and situation in the study area.*

Design Principle	Situation in case study area
1. Clearly defined boundaries	Challenges regarding the excludability of external water users.
2. Congruence	No, as nationally defined rules do not fit with local contexts.
3. Collective-choice arrangements	Partially yes, however no, if WUC is missing or non-functional.
4. Monitoring	Mostly no, as monitoring is rarely carried out.
5. Graduated sanctions	Usually no sanctions against free-riding.
6. Conflict-Resolution Mechanisms	No explicit conflict resolution mechanisms in place.
7. Minimal recognition of rights to organise	Partially yes; self-governance however is contradicted by NGOs and higher-level authorities providing top-down services without any or with only limited local participation.
8. Nested enterprises (for CPRs that are part of larger systems)	Water users and WUCs are not organised or represented at higher levels (no bridging organisations).

mechanisms, reliance on user guidelines at national level and limited ability of local water users to design and change user rules as and when need arises. Furthermore, local WUCs are not organised on higher levels in bridging organisations, which could facilitate learning among WUCs, but also between WUCs and district or national authorities. In the current situation, the information flow across water user committees and from the local to the national level is very limited.

Sarker and Itoh (2001) observe that the design principles are primarily based on developing countries where government or external entities can barely afford a large investment cost in physical capital. We would argue, however, that overall financial resources (government budgets as well as financial health of the local Water User Committees) are not a focus of the design principles, albeit – as illustrated by our case – the lack of resources and capacities can be critical for effective technical assistance and capacity building accompanying policy change (see section 4.1). The design principles may not explain the success or failure of collective action without taking into account external policy change and resources for capacity building.

Thus, despite the broad applicability of the design principles, our results also confirm prior findings that their explanatory value is limited by external factors, e.g. in resource systems – as water provision in rural Uganda – involving much donor assistance and higher-level policy intervention (Agrawal 2002; Gautam and Shivakoti 2005; Cox et al. 2010). The design principles do not explicitly address the interaction between higher level state authorities, NGOs and local water user groups; and hence cannot adequately explain the effects of rapid national policy change or the influence of powerful donor organisations and central state

authorities who partly counteract the local self-governance rights and duties. Our findings illustrate that the dynamics associated with policy change can critically impede local water management. This insight might also be relevant to other studies on common pool resource management in changing policy contexts.

Our analysis is of course limited by the number and quality of the documents and interviews included. However, it clearly points at cumulative effects of an incomplete policy change: such as ambiguous roles and responsibilities, contradicting rules, lack of resources for local capacity building, missing upward and down-ward accountability and contradicting financial signals by donors and higher-level authorities. The “external disturbance” of the top-down imposed change of institutional arrangements (Janssen et al. 2013) in some communities even has reduced levels of local collective action, and thus increased the vulnerability of local water governance systems. Furthermore, our findings provide a foundation for deriving hypotheses about those factors that determine the water users’ willingness to contribute to O&M (e.g. trust in WUC, the distance of water source from households) for subsequent large-N studies (Poteete et al. 2010; Naiga and Penker 2014).

## 5. Conclusions

In the context of recent devolution processes in Uganda, the operation and maintenance of drinking water infrastructure still pose a major challenge. It depends on local collective action and hence is much more challenging than ‘only’ assuming the communities’ ability to demand for water and the government’s capacity to supply infrastructure for water provision. The incompleteness and inconsistencies within the devolution processes in Uganda, i.e. the policy change itself seems to have destabilised the local collective action required for sustained access to safe water. Thus, our results illustrate how multiple actors’ inability to cope with external policy change can impede local water governance. The question to pose is therefore not necessarily the approach used in water provision, but rather how to provide a consistent multi-actor and multi-level governance structure that ties in with past institutions and provides long-term motivation for local water users to contribute to water provision.

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