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Determinants of Users' Willingness to Contribute to Safe Water Provision in Rural Uganda

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ABSTRACT In the context of recent devolution processes in Uganda, operation and maintenance of drinking water infrastructure still pose a major challenge. Given the importance of water user fees and local collective action for operation and maintenance, it is paramount to consider factors influencing the users' willingness to contribute. Based on 802 structured household interviews, this article looks into the link between willingness to contribute and actual contribution and presents variables influencing users' willingness to contribute to water provision. The variables demonstrated by the logistic regression model to increase the likelihood of users' willingness to contribute are categorized as institutional, bio-physical and demographic ones.

KEYWORDS: • collective action • willingness to contribute • drinking water infrastructure • operation and maintenance • Uganda

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1 Challenges of drinking water governance in rural Uganda

Lack of access to safe water is highly regarded to be a fundamental cause of poverty and mortality (UN, 2000; GoU, 2005; Mathew 2004). Also in Uganda, lack of access to safe water is mortality challenge. For instance the birth and under-five mortality rates for households without access to safe water are twice as high as in those households with adequate access to safe water (MoH, 2002; MoFPED, 2002). Given the centrality of water there have been concerted efforts to provide safe water to the majority of the population as a prerequisite for poverty reduction (GoU, 2005). In striving to provide safe water to its citizens and to address the continued poor performance of past water supply programmes particularly in rural areas, the government of Uganda has grappled with different approaches. Since the early 1990s, Uganda's water sector has been object of major reforms culminating into a shift from a supply-driven to a demand-driven approach. Unlike the situation under the supply-driven approach where water provision was largely a responsibility of the government with limited or no community involvement, under the demand-driven approach local communities have to financially contribute to new water infrastructure and are fully responsible for operation and maintenance. Emphasis on community participation under the demand-driven approach is heavily influenced by the wide spread documentation of participation as key to the long-term sustainability of water service and achievement of environmental goals (Narayan, 1995; Propoky, 2005; Golooba, 2005; Nandita, 2006; Kujinga and Jonker, 2006; Goldin, 2010; Nandita, 2008; Nuggehalli and Prokopy, 2009).

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 approximately 66% in 2010 (UBOS, 2010). Of those having access to safe water, twenty four percent received water from public outlets, private and institutional connections while 76% received water from a point water source (boreholes, shallow wells, protected springs, rain-water harvesting tanks, gravity flow tap stand) managed by users'; The latter is the predominant way of water provision in rural areas (Ministry of Water and Environment, 2010). Although the reforms had led to improved access, operation and maintenance (O&M) still poses a great challenge accounting for over 50% of non-functionality of water sources in rural areas (DWD, 2011).

Since O&M is the sole responsibility of water users and as O&M still poses a great challenge in rural areas, this article looks into the factors influencing local water users' contribution towards O&M. The questions that guide this article therefore are twofold: Firstly: "Is there a link between willingness to contribute and actual contribution towards O&M for sustained access to safe water in rural Uganda?"; And if yes: Which factors explain users' willingness to contribute towards O&M?

Efforts by water planners in search for the underlying reason leading to defective O&M have proven elusive. Some of the reasons cited include poor construction, inappropriate technologies and lack of spare parts; poor governance structures and lack of community participation; poor pricing, poverty, and corruption (World Bank, 2004; 1993, DWD, 2011). While these reasons provide some understanding, their proportional, explanatory value is unclear as most of the literature on local water governance, but also more generally on collective action in common-pool resources is built around single case studies and meta-analyses (Poteete et al., 2010). Therefore, the major contribution of this article is to add to the body of qualitative knowledge, by actually quantifying the impact of different factors on willingness to contribute. By interviewing more than 800 household located across 25 Local Water User Committees we can provide results on how diverging local governance aspects affect water users' willingness to contribute to drinking water provision in rural areas of Uganda.

This article is organized in nine sections: The next section describes the local collective action in the context of the Ugandan water policy. Section three presents the socio-ecological systems framework guiding the analysis. In section four the study area, the sampling, the data collection and data analysis methods are discussed. In section five and six the demographic characteristics of the interviewees and the relationship between willingness to contribute and actual contribution are presented respectively. The results of the logistic regression on factors influencing the willingness to contribute are presented in section seven and discussed against the international literature in section eight. The paper concludes with an outlook on possible measures that could improve local water users' willingness to contribute to the operation and maintenance of the rural water infrastructure.

2 Collective action as key for effective drinking water governance: changing roles of actors

With the reform of 1990, lower tiers of government that is districts and sub-counties, the communities and the private sector have become major players in the water policy implementation. Uganda's demand-driven approach adopted in 1992 is based on the devolution of decision making, implementation functions and responsibilities to districts and user communities. Local governments have thus been empowered by the Local Governments Act (1997) to provide safe water using grant funds and locally mobilised resources. However, the central government is still in charge for capacity building, setting standards and quality assurance. The Rural Water and Sanitation Operation Plan 2002-2007 sets out the rules, requirements and responsibilities of all the stakeholders involved in rural water governance.

A locally elected Water user committee (WUC) is the executive organ of a water user group. Its foundation for each (improved) water source point (e.g. tap stand) is a key requirement before water infrastructure instalment. In effort to promote participation of different user groups, women are supposed to occupy a third of the WUC positions including at least two of the influential positions on the WUC. The water user communities (through their WUCs) need to provide an up-front monetary contribution and a formal application including the selection of the technology type before the water infrastructure can be put in place with the state covering the biggest share of the capital costs. Hand pump mechanics and source caretakers are to be nominated by the WUC and are trained by district authorities. The WUCs are required to pay the hand pump mechanic for the repairs carried out and financing the everyday operation and maintenance work done by a source caretaker using fees collected from water users. In addition to financial contribution, water users are supposed to ensure protection of the catchment area through cleaning and ensuring that there is no grazing around the water source. However, it is generally agreed that most rural communities cannot afford to meet the full cost of O&M, and that there is need for external support to meet such costs. Government acknowledges this and has made a provision within the current conditional grants funding for major repairs beyond community capacity. These include replacement of hand pumps and borehole desalting and repairs. Also NGOs support O&M, hence it is not that clear what aspects of O&M are to be financed by whom and when (DWD, 2011). However, without water user communities contributing fees and local collective action for O&M, there will be no long-term access to safe water in rural Uganda.

3 Conceptional framework and explorative analysis

As this article's focus is on collectively managed common water infrastructure (shallow well, borehole and gravity flow schemes), we decide for the conceptual framework of Social-Ecological Systems (SES) (Ostrom, 2007). This ontological framework is commonly used for the institutional analysis of the collective governance of common pool resources that involve a complex interaction between nature, technology and humans, such as water provision (Ostrom, 2007). For instance, the characteristics of the different types of technologies used in water provision and land use have direct impact on water quality and availability. The SES builds on the long-standing Institutional Analysis and Development (IAD) framework that has a particular focus on institutional factors affecting the collective management of common resources (Ostrom *et al*., 1994). The SES framework's primary value lies in providing a set of related categories of variables (Ostrom and Cox, 2010) and orientation for an analysis of the factors that might influence willingness to contribute to water provision. The framework's core is the conceptual unit called the 'action situation' (Figure 1). It is 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

exchanges among individuals. The framework furthermore identifies a set of variables that characterize and influence action situations (see Figure 2).

Figure 1: Social-Ecological Systems framework first tier components (Source: Ostrom and Cox, 2010)

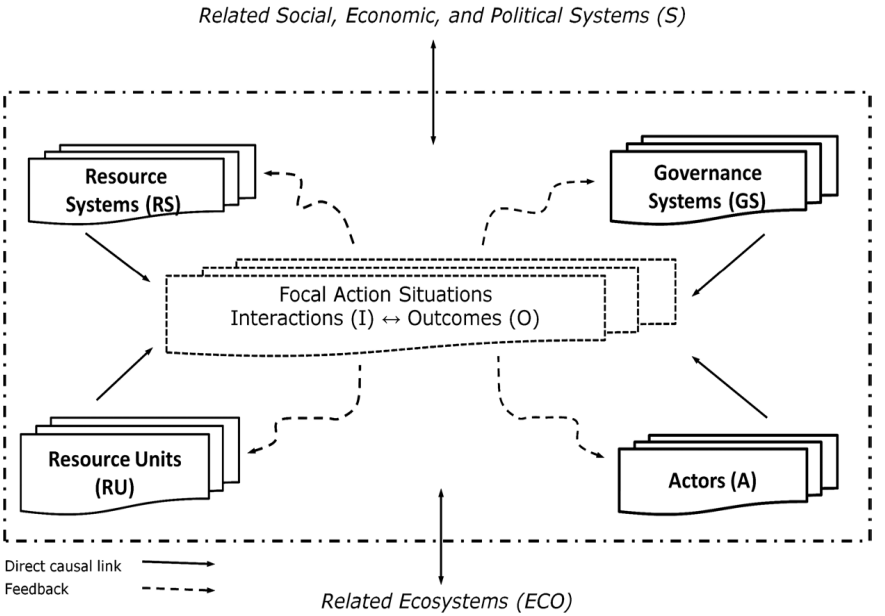
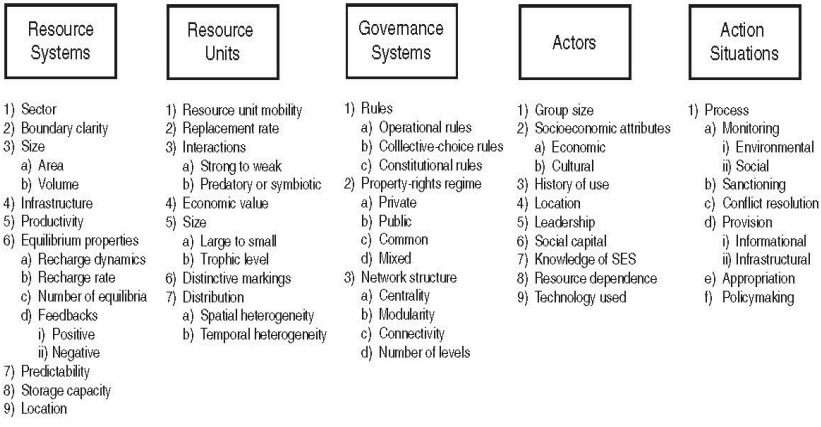


Figure 2: Social-Ecological Systems variables (Source: Ostrom and Cox, 2010)



We have to keep in mind that the variability of socio-economic and bio-physical situations (Meinzen-Dick 2007) ask for a context-specific analyses. Therefore, before drafting the structured interviews, we had a series of 19 explorative interviews with representatives of all governance levels from the Ministry of Water and Environment, to the district and local level as well as three focus group discussions with female and male water users (in April and December 2012). From this explorative analysis we identified the explanatory variables presented in Figure 3.

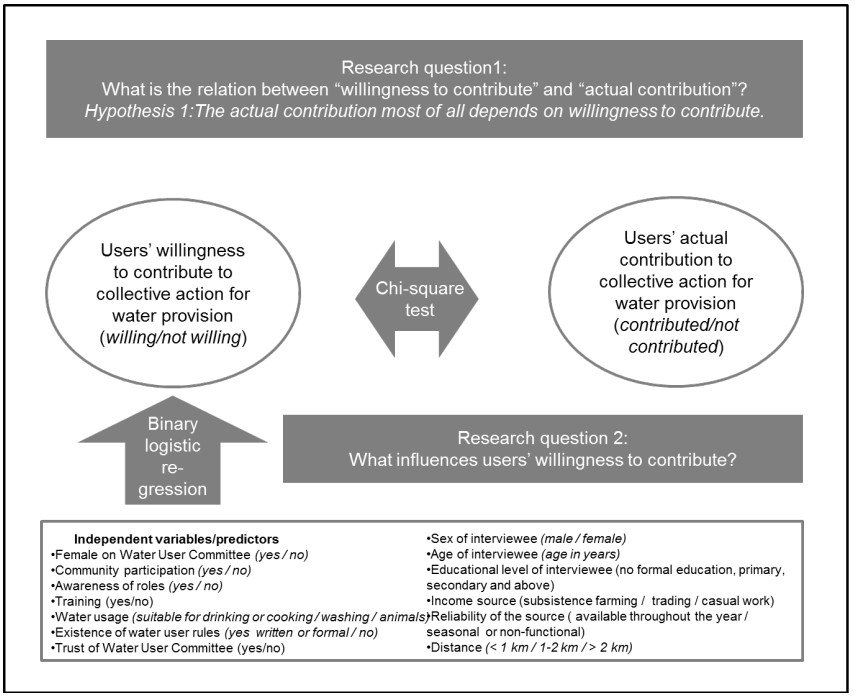
Findings of our exploratory interviews – which we used to select the valuables to be included into the analysis (see Figure 3) - were also supported by other authors. For instance Wisinki (2013) found that individual attributes such as education, income, gender, age and marital status influence participation. Madrigal et al (2011) pointed at the relevance of user rules and water quantity in ensuring collective action for water. Also lack of community participation and inadequate information and knowledge was identified as a hindrance to collective action in general and water transformations in particular (Poteete and Ostrom, 2004; Kujinga, 2006; Fielmua, 2011; Cherlet et al, 2013; Golooba, 2005; Blair, 2000; Braimah and Fielmua, 2011; Nandita, 2006; Madrigal et al, 2011; Nuggehalli and Prokopy, 2009; and Pretty and Ward, 2001; Mowo et al, 2008; Asingwiire, 2008). Meanwhile, Foster found out water quality, technology type and women in key water committee positions to significantly influence functionality of the water source (Foster, 2013). Also according to the participatory constraints and opportunities analysis conducted in three watersheds in Tanzania and Ethiopia, water quantity and quality were found to be the major hindrance to adaptation of integrated natural resource management practices (Mowo et al, 2008). On the other hand (Ward, 2001; Madrigal et al, 2011) noted accountability and trust as key to successful management of water facilities and distance to water source was noted by Meinzen-Dick et al (2002).

4 Research design, sampling, methods of data collection and analysis

4.1 Research design

Figure 3 presents the research design, the variables included in the analysis as well as the categorical and continuous answer categories. The first research question is operationalized by the hypothesis that actual contribution depends mostly on willingness to contribute as one of the results of the exploratory research. Regarding the second research question, we test if those factors identified by the Social-Ecological System framework and confirmed to be of relevance to the context of rural Ugandan during the explorative research phase, are actually increasing or decreasing the probability of water users' willingness to contribute to local water provision.

Figure 3: Research design



4.2 Study area and sampling

The study was carried out in Western Uganda. The region was purposively selected due to the variety of water source technologies, variations in water source and Water User Committee functionality. Based on the recommendation of the O&M expert at the Ministry of Water and Environment (MoWE) in Kampala, the water governance researcher at Makerere University, and a technical support officer at the regional water technical Support Unit (TSU) office in Mbarara district, two districts were purposively selected. Isingiro was selected as a worst and Sheema as a best practice example regarding local governance, with the objective to include a broad variety of functionality of water sources and WUCs. Also the selection of one sub-county per district (Masha in Isingiro and Kigarama in Sheema) was purposively done to include a broad variety of functionality and technologies) as recommended by technical expert at regional water office in Mbarara, after consultation with district officials. The costs and efforts to access villages did not allow for a national survey, and there was no data on local governance performance indicators to facilitate or enable other forms of selection procedures.

Simple random sampling was used to obtain parishes and villages in Masha and Kigarama. Out of the seven parishes in Masha, four parishes were selected, while out of the nine parishes in Sheema, five were picked. In each of the selected parishes, four villages were picked from Masha, and five villages from Kigarama for investigation. Using local leaders, the list of household heads in the selected villages was obtained and households randomly selected. 100 households were randomly interviewed in each of the 4 villages in Masha (total 400), and in Kigarama 80 households were interviewed in each of the four villages except Masheruka where 82 households were selected (total 402).Therefore the total number of 802 households were investigated. Each water source is supposed to have a WUC with a minimum of seven members. The villages in Kigarama had two water sources on average, while in Isingiro only one. While each WUC was supposed to be composed of a minimum of 7 members, one water source in Masha had only five members, therefore a total of 25 WUC members were interviewed in Masha. While on average three members from each of the water source in Kigarama were interviewed. In all a total of 50 WUC members were interviewed, 25 in each Sub-county. The information of these interviews was used for cross-checking and supplementing the results from the household interviews, which are at the core of the analysis presented in this article.

4.3 Methods of data collection

The questionnaire was designed after explorative research (see section three) and discussed with experts from the Ministry of Water and Environment, Directorate of Water Development, a regional water Technical Support Unit officer, a water policy research consultant and a district water officer. In addition, pre-testing was also carried out with three WUC members and ten household interviewees in each of the two sub-counties. The feedback loop was not only helpful in cross checking the content (whether all relevant questions had been included) and clarity (if the questions were understandable), but also for testing the consistency, completeness, un-ambiguity or non-overlap of answer categories, for checking the feasibility (time needed and ‚interviewees' willingness to cooperate) and for clarifying how to deal with sensitive questions (e.g., corruption).

Pre-testing showed that a four point Likert scale to measure the dependent variables "users' willingness to contribute towards O&M" (i.e. four answer categories) was not manageable in the context of face-to-face interviews given the low literacy levels of the majority of the household interviewees. Therefore, we opted for dichotomous answer scales of the dependent variables ("contributed" or "not contributed", "willing" "not willing"; see Figure 3). The explanatory variables were measured on categorical (male/female, yes/no, never/once/several times), and continuous scales (age of interviewees).

Six research assistants trained by the authors collected household data while WUC interviews were carried out by the first author, however all being at the village at the same time. Data for the quantitative analysis was collected from January to April 2013. After data cleaning and checking, we were able to include a total of 802 full household interviews and 50 WUC interviews for the further analysis.

4.4 Methods of data analysis

Three types of analysis are presented in this article: Firstly, the characteristics of the study sample are compared with those of the country (see Table 1 and section 5) for judging the representativeness of the sample. The second part of the analysis is the Pearson Chi-square test to establish the interdependence between the two categorical variables - willingness to contribute and the actual contribution of water user fees in the last six months (see Figure 3). The cross tabulation is presented in Table 2 and in section 6. The third analysis was the binary logit model which was used to quantify the effects of the different explanatory variables on the probability of the users' willingness to contribute towards O&M of the water infrastructure in the areas of study (see Table 3 and section 7).

Before the analysis the data was crosschecked in order to ensure that all the prerequisites for the types of analyses used are fulfilled. Apart from data distribution, we did cross tabulation of all combinations of predictors to check for completeness of the information. None of the expected counts had less than 5. Thus the basic requirement for chi-square but also for the logistic regression has been met. Also multi-collinearity tests were carried out to check for dependencies between the different explanatory variables. For all variables, the tolerance values are above 0.4, the VIF values are below 2.5 and the Eigenvalues are well distributed along the dimensions. Therefore we can safely exclude a multi-collinearity problem (Field, 2009).

5 Demographic characteristics of the interviewees

Before answering the research questions, we describe the demographic characteristics of the sample and compare it to the characteristics of the population in Uganda. Table 1 shows that there is a slight bias towards a higher share of female interviewees. This can be explained by the household division of labor: women tend to work at or near the home. Hence females were more available than men. As the analysis show that females are more willing to contribute, the overall share of interviewees willing to contribute might be slightly over-estimated.

The comparatively lower educational level and the higher share of agricultural sources of income is typical for rural areas in Uganda, which cannot directly be compared to the national average including cities like Kampala of more than one million inhabitants. We did not interview children, as we considered them not as

those making decisions regarding water user fees or collective action towards O&M. The most obvious difference between the sample and the national data is regarding the functionality of the water source. According to several WUC members interviewed, sources although non-functional in reality are listed as functional in official lists. Thus, the difference might not only be a sample issue but also due to quality of national data. According to our information, the sample is small and quite representative in terms of demographic and organizational factors; however, we have to keep in mind that the bio-physical conditions vary from region to region in Uganda.

6 The nexus between willingness to contribute and actual contribution

Table 2 presents the cross-tabulation of the dichotomous variables "willingness to contribute" (associated question in the interview: "In general, are you willing to contribute to safe water provision?") and actual contribution ("In the last six months, have you contributed your water user fee?"). The results of the Pearson's chi-square test show a highly significant relationship between the two variables ($\chi^2(1)=96.85$, $p<0.001$). Based on the odds ratio, the likelihood of actual contribution is 19.6 times higher if the water user is willing to contribute (436/273) compared to those not willing (7/86). Due to the clear link between willingness and actual contribution, we decided to present in the following section the explanatory factors for the willingness to contribute to local water provision.

7 Factors influencing users' willingness to contribute to water provision

Results of the analysis are presented in table 3. Overall, the underlying regression model predicts 92.1% of the cases correctly. Variables found to significantly influence the probability of users' willingness to contribute to water provision are listed in black and others in grey. Those black variables that are in the equation can be classified into three categories: institutional, bio-physical and demographic ones.

7.1 Institutional variables

The variable with the most negative effect on users' willingness to contribute to water provision was lack of community participation in water related activities. It reduces the users' probability to contribute by 0.213 ($p<0,001$). During the survey, respondents were asked whether they had participated in water related decisions before water infrastructure installation. According to the national Operation and Maintenance framework for rural water facilities, water users are supposed to participate in major decisions such as making an application for water, selection of technology type, selection of the location/site, making upfront contribution towards capital costs and election of a Water User Committee (DWD, 2004). The

interviews showed however that in reality many of the water users were not actually involved before infrastructure installation.

Another institutional variable with significant negative influence on user's willingness to contribute was users' unawareness of their roles and responsibilities. This variable reduces the likelihood to contribute by 0.268 ($p<0.001$). During the survey, respondents were asked whether they were ever sensitized and therefore aware of their roles and responsibilities towards water provision. The national Operation and Maintenance framework for rural water facilities, stipulates the role of each actor in water provision including water users. As a result of decentralization, it is the role of the district to carry out sensitization including awareness creation of water user roles and responsibilities at the community level.

Furthermore, mistrust of Water User Committee mostly due to missing downward accountability seems to negatively influence willingness to contribute According to the odds ratio, mistrust of WUC reduces the likelihood to contribute by 0.393 ($p<0.01$). Respondents were asked whether they generally trusted their WUC and also if they received financial reports regularly from the Water User Committee. According to the Operation and maintenance framework, one of the means to ascertain both downward and upward accountability as well as transparency of WUC activities is the availability of books of accounts and bank account. However WUCs in both districts did not keep books of accounts and had no bank accounts. It seems that water users' who had no evidence and means to find out how and what their contributions were being used for, were also less willing to contribute to local water provision.

Another significant variable ($p<0.05$), was the existence of female Water User Committee members increasing the likelihood of willingness to contribute by 2.7 times compared to water users that were not represented by female members. In Uganda, like in most parts of Africa, household safe water sourcing is considered the primary role of women. As females take the major burden of water provision and have to deal with consequences of unsafe-water consumption, Ugandan government has considered them to have a vested interest but also the relevant knowledge for local water governance. Despite that women are supposed to compose a third of the WUC and at least should occupy two out of the three influential positions (chairperson, secretary and treasurer), we found out that in most cases women were less than a third and were not in leading positions as stipulated in the O&M guidelines. For instance, only two WUCs in Isingiro have women as treasurer while Sheema had one WUC with a woman as secretary. Despite women being fewer than stipulated and despite their non-influential positions, the regression indicates a positive effect of woman WUC members on the water users' willingness to contribute to water provision. This result provides a preliminary support for the government's policy of women empowerment.

7.2 Bio-physical variables

Surprisingly the reliability of water supply is not in the equation. In contrast to the explorative interviews, the regression does not show a significant influence. Interviewees were asked whether the water supplied by their infrastructure was available throughout the year or if it was seasonal or non-functional. The fact that in Isingiro district none of the interviews assessed the sources as reliable throughout the year, may to the biggest part be explained by bio-physical effect. Isingiro is naturally a water stressed area compared to Sheema. Also unlike Sheema which is dominated by crop farming, in most parts of Isingiro both crop and animal farming is practiced. Animal farming contributes to water scarcity and contamination as humans and animals compete for the same water source. Due to morphological characteristics gravity and associated technical reasons, the option for gravity schemes does not exist and the quality of the water provided by bore holes is often poor due to salinization. Furthermore, boreholes and shallow wells are associated with bigger and more expensive technical challenges but also with the problem of expensive hand pumps being stolen. However, some communities with supposedly reliable gravity flow systems in Sheema, too, are confronted with unreliable supply due to low water pressure. Hence in both districts water users experience seasonal supply and non-functionality of the sources, but apparently without significant influence on their willingness to contribute.

Another significant variable is the distance to the water source. A comparable shorter distance (below one km) was indicated as positively affecting willingness to contribute with a regression coefficient of 0.904 ($p<0.05$). During the survey, interviewees were asked to indicate the distance they walked to the water source (less than 1 km, 1 to 2 km, or more than 2 km). According to the odds ratio, users' closest to the water source are 2.5 times more willing to contribute to water provision than those more than two km away.

7.3 Demographic variables

Apart from institutional and bio-physical factors, the interviewees' sex also seems to influence willingness to contribute. The results indicated that female water users' are four times more willingness to contribute to water provision than the male interviewees ($p<0.001$), this is the highest positive effect recorded.

Furthermore, there seems to be a significant ($p<0,05$) negative effect on the willingness to contribute by water users depending on subsistence farming. If water users are subsistence farmers the odds of their willingness were 0.304 times lower.

8 Discussion of the results

Our results suggest variables that hinder or facilitate local collective action for water provision in rural Uganda. According to our interpretation of the results, problems with local collective action for the operation and maintenance of water sources could be attributed to the fast policy shift that provided not sufficient time for participation, awareness creation and sensitization on roles and responsibilities. Results clearly show that users that are unaware of their roles and responsibilities are less willing to meet their collective action responsibilities. This also confirms Seppälä's (2002) judgment that in developing countries, policy changes have in many cases been pushed through too rapidly, without adequate consideration for the policy transition and adequate capacity building. Like Uganda, insufficient sensitization was also reported for Zimbabwe, Ghana, Mali and Burkina Faso (Kujinga, 2006; Fielmua, 2011; Cherlet et al, 2013).

Ward and Pretty referring to a meta-study of 25 World Bank projects indicated that when beneficiaries knowledge is sought and incorporated in planning and implementation project activities are more likely to be sustained (Pretty and Ward, 2001). In the study area but also elsewhere in Uganda, where communities were involved in water infrastructure installation, the sources tend to be more sustainable over the long run than where they are not (Asingwiire, 2008; DWD, 2011). Ghana's experience also shows that sources installed without community participation were abandoned by users (Braimah, 2011). According to White (1995), participation provides the possibility for sharing information, building trust, constructing rules, monitoring and sanctioning behavior necessary for effective institutional structure which in turn allow participants to share risks, leverage resources, extend pay-back periods, test innovations, and make effective contributions to collective O&M. Braimah (2011) emphasized that knowledge of ownership influences attitudes and behavior towards facility management. On the other hand, Smith (2008) is quick to mention that participation should not be unquestioned and unproblematically considered as a panacea in water management. Similarly, Golooba (2005) questions the general assumptions that people are keen to participate in public affairs, that they possess the capacity to do so and that all they need is opportunities. From our explorative and quantitative analysis results, we derive that participation in local water governance – where already implemented in rural Uganda – has a significant positive effect on users' willingness to contribute. However, local participation does not happen automatically, but has to be facilitated through capacity building and awareness creation.

As one would expect, users are willing to contribute if they are sure that their fees would be put to the intended use. This is confirmed by our results showing mistrust as a challenge to willingness to contribute. According to Pretty and Ward (2001), trust lubricates co-operation and liberates resources since investment in

monitoring others is not needed. Our results are rather in line with Fielmua (2011), who emphasized accountability as key to successful management of water facilities in Ghana and with Madrigal et al (2011), who found downward accountability to be an important factor affecting performance of community-based drinking water organizations in Costa Rica. Thus we see trust rather as a result of than as a substitute for down-ward accountability.

Apart from institutional factors, the study indicated distance to the water source as influencing willingness to contribute, however, surprisingly not the reliability of the source. Madrigal et al (2011) found out that in Costa Rica low performing water organizations rather managed systems with more technical challenges. White (1995) observes that collective action will take place and continue as long as a critical mass of stakeholders has practical knowledge of the benefits. In the case of Uganda, it is still unclear if reliability of the source is rather a cause of effect of faulty operation and maintenance work.

Household income might also play a role, considering that the results show a comparatively lower willingness to contribute for subsistence farmers. Explorative interviews however also indicated that water user fees are so low that every household should be able to afford them. More research would be needed to give a full answer to this issue. According to the logit model, women are more willing to contribute. This result is not surprising because water sourcing for the household is considered a primary responsibility of women and girls. Women in Uganda, like elsewhere in developing countries endure the burden of water scarcity in all parts of Uganda, as also confirmed by a study in Luwero and Wakiso in Uganda (Baguma et al, 2012). Water sourcing as a responsibility of females was also noted in Pakistan and India where women and girls spend 5 to 6 hours a day collecting water for domestic use from distant water sources (Smith, 2008; Nandita, 2006). Furthermore, respondents are more willing to contribute if they are part of a water community governed by female Water User Committee members. Both results are very encouraging for Ugandan's policies on women participation and empowerment in local water governance. In most WUCs analysed, the national goals of female participation, both regarding the quantity of one third of members and quality of positions, are not yet met.

Contrary to our findings, other studies report age of water users, water quality, training of WUC members, the existence of clear rules to be influencing collective action (Golooba, 2005; Agrawal; 2001; Pretty and Ward, 2001; Komives, 2008; Winisinki, 2013; Meinzen- Dick et al, 2002; Merret, 2001; Madrigal, 2011; Swallow, et at. 2009; Poteete and Ostrom, 2004; White, 1995 and Foster, 2013). It is too early to exclude these variables form the list of potential predictors, as they were also identified in some of the exploratory interviews.

9 Conclusion

The Pearson chi-square test supports the assumption that there is a clear link between willingness to contribute and actual contribution. This result is very encouraging for Uganda's demand-driven water policy that crucially depends on water users meeting their responsibilities for water infrastructure operation and maintenance. The logit-model provides insights into how to increase the probability of water users' willingness to contribute. Non-governmental organizations and governmental organizations can actively support good governance including sensitization on user roles and responsibilities, local participation, clear rules for and monitoring of downward accountability and the building of new water sources closer to the households of the water users. Female interviewees' comparatively higher willingness to contribute to local water provision and the positive effect of female water user committee members on users' willingness to contribute, provide supportive arguments for further affirmative action for women in local water governance.

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Appendix

Table 1: Demographic characteristics of the sample and national population

	Uganda	Masha Sample (Isingiro)	Kigarama Sample (Sheema)	Both samples
No of households/population and household interviews	6.2 M (households) 24.4M (population)	400	402	802
Gender (Uganda population and interviewees)				
Female (%)		54	63	59
Male (%)	49	46	37	41
Education (Uganda -15years & above population and interviewees - household representative)				
No formal education (%)	17	26	12	19
Primary level (%)	52	51	71	61
Secondary and above (%)	31	23	17	20
Source of income (Uganda population and households interviewed)				
Farming (subsistence & commercial)(%)	46	61	50	56
Non –agricultural enterprise (manufacturing, trading) (%)	21	23	38	30
Employment (wage/artisan, salary) (%)	25	16	12	14
Transfer payments &others	8	0	0	0
Age (Uganda population and interviewees)				
0 – 14 (%)	51	0	0	0
15- 64 (%)	46	97	96	96
65+ (%)	3	3	4	4
Marital status (Uganda -18years &above population and interviewees - household representative)				
Single (%)	19	9	9	9
Married (%)	66	82	81	81
Divorced/separated (%)	7	4	6	5
Widowed/Widower (%)	8	5	4	5
Type of water sources (Uganda and households interviewed)				
Gravity scheme (tap stands)	15,462	0	48	48

Borehole	28,732	13	4	17
Others (spring, shallow well, dams)	43,906	22	12	34
Functionality of water source (Uganda and households interviewed)				
Gravity scheme (%)	84	-	94	94
Borehole (%)	85	39	50	42
Others % (spring, shallow well, dams)	83	50	58	53

Source: Uganda Bureau of Statistics (2010), Ministry of Water and Environment (2013) and interview data

Table 2: Cross tabulation of willingness to contribute and actual contribution

	Not contributed in the last six months[2]	**Actually contributed in the last six months[2]**	**Total**
Not willing to contribute[1]	86	7	**93**
Willing to contribute[1]	273	436	**709**
Total	**359**	**443**	**802**

[1] Yes or No answer to the question: "In general, are you willing to contribute to safe water provision? "In the last six months, have you regularly contributed your water user fees?"
[2] Yes or No answer to the question: "In the last six months, have you regularly contributed your water user fees?"

Table 3: Results of logistic regression model for factors influencing users' willingness to contribute to water provision.

Predictors	B	S.E.	Sig.	Exp (B)	95% Confidence Interval for Exp (B)	
					Lower	Upper
Female on Water User Committee*	1.010	.415	.015	2.745	1.217	6.193
Lack of community participation**	-1.545	.441	.000	.213	.090	.507
Unawareness of water user roles***	-1.316	.350	.000	.268	.135	.533
Lack of training	-.088	.539	.870	.916	.318	2.633
Water not considered suitable for drinking and /or cooking	-.643	.385	.095	.526	.247	1.117
Water not considered suitable for washing	.306	.329	.352	1.358	.713	2.585
Water considered suitable for animals	-.340	.353	.336	.712	.357	1.421
Existence of water user rules	.360	.310	.244	1.434	.782	2.630
Mistrust of Water User Committee*	-.935	.356	.009	.393	.196	.789
Sex of the respondent (female)***	1.424	.335	.000	4.152	2.166	7.960
Age	-.002	.014	.867	.998	.971	1.025
Educational level (no formal education	.230	.447	.607	1.258	.524	3.020
Educational level (primary	.302	.390	.439	1.352	.630	2.903

level)						
Source of income (subsistence)	-1.191	.599	.047	.304	.094	.984
Source of income (trading)	-.981	.624	.116	.375	.110	1.275
Reliability of the source	1.296	.805	.107	3.655	.754	17.716
Distance (less than 1kilometre)*	.904	.424	.033	2.471	1.077	5.668
Distance (1-2 kilometers)	-.264	.347	.447	.768	.389	1.515
Constant	4.382	1.110	15.597	80.015		

*p<0.05, ** p<0.01, ***p<0.001