

Table S1. Causal Conditions

Literature Review			Calibrated conditions and outcomes to run fsQCA		
Hypothesized Causal Condition			NVivo Codes	Final FsQCA Causal Conditions	
Name	Definition	Source		Name	Definition
Alternative Nearby Water Sources	Communities' members have access to other nearby improved water sources that are functioning, cheaper or for free.	Broek and brown (2015), Parry-Jones et al. (2001) Koehler et al. (2015) Foster and Hope (2016) Whittington et al. (2009)	Nearby improved water sources	Alternative Improved Water Sources (AltSources)	Community members have access to other nearby improved water sources that are functioning, cheaper or for free.
Water Availability and Quality Perception	Community members experience reliable water supply and perceived their water of good quality	Foster and Hope (2016) Kativhu et al. (2017)	Water quality Water availability	Water Availability and Quality perception (WatAvail&Qual)	Community members experience reliable water supply and perceived their water of good quality
Water Payments Beliefs and Preference	The general belief among people that water should be free of charge, and/or expectation that payments should be collected only when the hand pump is broken. It also includes users expectation of external support upon breakdown.	Broek and brown (2015), Foster and Hope (2017) Whittington et al. (2009)	Belief of free water Payment preference upon breakdown PM costs perception	Perception about Water Payments (PayPerception)	The general belief among people that water should be free of charge, and/or expectation that payments should be collected only when the hand pump is broken.
Water User Committee (WUC)	Active engagements of WUC members that have proper technical and managerial skills.	Broek and brown (2015), Harvey et al. (2006), Kamruzzaman et al. (2013) Madrigal et al., (2011) Kwangare et al. (2014)	Organization and responsibility WUC legitimacy	WUC Organization (WUCorg)	WSC takes active responsibility for water source with no significant WSC conflict; WSC has legal status and authority to perform their task
Community Conflicts	Pre-existing tensions between community members that result in lack of cooperate among community members	Broek and brown (2015),	Conflict		
WUC Training and Ongoing Support	WSC members are properly equipped with technical managerial skills and feel that they have ongoing support	Quin et al., (2011) Terry et al., (2014)	Communication Support Training	Ongoing Support & Communication (Supp&Com)	There is an overall understanding about the PM model with no significant miscommunication between WSC, water users and service provider. WSC members feel that they have technical and managerial support for ongoing O&M.
N/A			Break down experience Mistrust from previous expetience	Previous break-downs and funds misusage experience (Breakdowns)	A community's prior exposure to continuous break-downs of hand pumps and misusage of funds
Not included in the fsQCA					
Hypothesized Condition	Definition	Source	NVivo Codes	Reasons why these codes were not included in the fsQCA analysis	
Rainfall Pattern	Seasonal trend in revenues and expenditures	Foster and Hope (2016) Foster and Hope (2017)	Rainfall patterns	Lack of information in each case to assess the presence or absence of a specific condition	
Gender Representation in WUC	Active women representation in key WUC roles	Mommen et al., (2017) Foster (2013)	Women representation Gender dynamics	The study was not able to draw conclusions on a possible correlation between women participation in WUC and payment compliance	
Productive Water Use	Financial benefits arising from activities like raising livestock and small-scale irrigation that enable households to pay consistently	Foster and Hope (2016)	Productive water use	Lack of information in each case to assess the presence or absence of a specific condition	
Reliable Maintenance Service	Water users experience reliable and fast maintenance service	Koehler et al. (2015)	Customer satisfaction in PM services	Negligible variance between cases	

Table S2. Survey instrument

Date:		
Sub-county:		
Community:		
Person's attending genders: _____ Female _____ Male		
PART A: DEMOGRAPHIC & INCOME		
1	How many people live in your house [in your community]?	
2	What are the major income generating activities in your family/community?	<input type="checkbox"/> Maize <input type="checkbox"/> Cassava <input type="checkbox"/> Coffee <input type="checkbox"/> Sweet potatoes <input type="checkbox"/> Rice <input type="checkbox"/> Beans <input type="checkbox"/> Other crop: _____ <input type="checkbox"/> Animal raising, what animals? _____ <input type="checkbox"/> Commerce, what type?
3	Does dry seasons or rainy seasons impact this major income generating activity?	<input type="checkbox"/> No <input type="checkbox"/> Yes, what are the impacts? _____
4	Do you catch water from a specific water source to help with this income generating activity?	<input type="checkbox"/> No <input type="checkbox"/> Yes
5	If yes to Q4., where you catch water for your income generating activity?	
PART B: SERVICE RELIABILITY & WATER USE		
Water Use – Please consider just the hand pump that the PM service provider takes/took care		
6	Who usually collects water in your household?	<input type="checkbox"/> Women <input type="checkbox"/> Man <input type="checkbox"/> Kids
7	For what the water collected from the hand pump is used for?	<input type="checkbox"/> Domestic <input type="checkbox"/> Commerce <input type="checkbox"/> Other: _____ <input type="checkbox"/> Gardening <input type="checkbox"/> Livestock _____
8	How much water do you collect daily from the hand pump during dry seasons and during rainy seasons?	Dry seasons: _____ Rainy seasons: _____
9	How many trips you do per day to catch water from the hand pump and how long does each trip take?	_____
10	The water you catch from the hand pump is enough for all your water needs?	<input type="checkbox"/> Yes <input type="checkbox"/> No, why is not enough? _____
Water System Functionality - Please consider just the hand pump that PM service provider takes/took care		
11	How many times the hand pump broke the last year?	
12	Do you remember when was the last time that the hand pump broke?	<input type="checkbox"/> No <input type="checkbox"/> Yes, when did it happened?
13	→ If yes , for how many days you were not able to catch water?	_____ days/ weeks/months
14	How long does it normally take to fix the hand pump?	<input type="checkbox"/> 1 to 5 days <input type="checkbox"/> 1 to 4 Weeks <input type="checkbox"/> 1 to 6 Months <input type="checkbox"/> More than 6 months <input type="checkbox"/> Breaks are not fixed
Water Availability – Please consider just the hand pump that PM service provider takes/took care		
15	Do you need to wait in line to catch water?	<input type="checkbox"/> No <input type="checkbox"/> Yes
16	Is there any restrictions/rules on when you can catch water during the day or how much you can catch water?	<input type="checkbox"/> No <input type="checkbox"/> Yes, what are the restriction / rules? _____
17	→ If yes to question 14: Does the restrictions / rules affects your family?	<input type="checkbox"/> No <input type="checkbox"/> Yes, how does the restriction affects your family?
18	When functioning, does the source provide sufficient water for the community all year?	<input type="checkbox"/> No <input type="checkbox"/> Yes
19	→ If no , when does the source NOT provide sufficient water?	<input type="checkbox"/> Dry season <input type="checkbox"/> Other: _____ <input type="checkbox"/> Rainy season
20	→ If no , what do you do during periods of less water?	<input type="checkbox"/> I use less water <input type="checkbox"/> Other: _____ <input type="checkbox"/> I use another water source

21	Do you use any other water sources?	<input type="checkbox"/> No <input type="checkbox"/> Yes
Alternative water sources (just for those that answered YES to question 19)		
22	What additional water sources you use?	<input type="checkbox"/> Lake <input type="checkbox"/> River <input type="checkbox"/> Rainwater Harvesting <input type="checkbox"/> Spring box <input type="checkbox"/> Another hand pump <input type="checkbox"/> Other: _____
23	Why do you use the water from another source and when you normally use it?	_____
24	For what do you use the water from these other water sources?	<input type="checkbox"/> Drinking <input type="checkbox"/> Cooking <input type="checkbox"/> Other: _____ <input type="checkbox"/> Washing <input type="checkbox"/> Agricultural _____ <input type="checkbox"/> Livestock <input type="checkbox"/> Commerce _____
25	How many trips you do per day to catch water from this other source and how long does each trip take?	_____
Water Quality		
26	How good is the water quality of the hand pump?	<input type="checkbox"/> Very good <input type="checkbox"/> I don't know <input type="checkbox"/> Not good
27	The water from the main hand pump has a better quality than the water from other water sources	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree

PART C: PREVENTATIVE MAINTENANCE SERVICE AGREEMENTS (PMSA)

The decision-making process to (re)sign the PMSA

28	Why did the community decide to sign the agreement with PM service provider in the first place?	_____
29	→ Follow-on in case of second year of PMSA: Why the community decided to resign the agreement with PM service provider in the second place?	_____
30	Are you satisfied with how decisions were made for (re)signing the agreement with PM service provider?	<input type="checkbox"/> Completely satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Somewhat satisfied <input type="checkbox"/> Unsatisfied
31	→ Follow-on: What aspects of the decisions making-process you are(were) particularly satisfied or not satisfied with?	_____

PMSA

32	How the PMSA works? More specifically, what are the activities/responsibilities of the WUC, of the PM service provider, and water users?	The PM service provider _____ WUC _____ Water users
33	Are you satisfied with the PMSA?	<input type="checkbox"/> Completely satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Somewhat satisfied <input type="checkbox"/> Unsatisfied
34	→ Follow-on: What are the main aspect of PMSA you are particularly satisfied or not satisfied with?	_____

35	How can the PM service provider improve their services?	
The role of the WUC		
36	Are you satisfied with the services provided by WUC?	<input type="checkbox"/> Completely satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Somewhat satisfied <input type="checkbox"/> Unsatisfied
37	→ Follow-on: What are the main aspect of WUC's services you are particularly satisfied or not satisfied with?	_____
38	How frequently the community meet to discuss about water issues?	<input type="checkbox"/> Monthly <input type="checkbox"/> Once every three months <input type="checkbox"/> Only when the hand pump break <input type="checkbox"/> Very rarely or not at all
The role of Local Technicians		
39	Are you satisfied with the services provided by the WSP?	<input type="checkbox"/> Completely satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Somewhat satisfied <input type="checkbox"/> Unsatisfied
40	→ Follow-on: What are the main aspect of WSPs you are particularly satisfied or not satisfied with?	_____
***Payment compliance		
41	Why the agreement is on warning/suspended?	<input type="checkbox"/> I don't really know <input type="checkbox"/> Other: _____ _____
42	Does your family wants PMSA?	<input type="checkbox"/> No <input type="checkbox"/> Yes
43	→ Follow-on: Why your family wants/not wants PMSA?	_____
44	How the hand pump will be taken care if the agreement is suspended?	_____

PART D: FINANCIAL STRUCTURE

45	Do you think it is important to pay for water?	<input type="checkbox"/> No <input type="checkbox"/> Yes
46	→ If yes or no , can you explain why?	
47	Do you have to pay for water?	<input type="checkbox"/> No <input type="checkbox"/> Yes
48	→ If yes , how regularly you need to pay for water?	<input type="checkbox"/> Weekly <input type="checkbox"/> Daily <input type="checkbox"/> Monthly <input type="checkbox"/> Other:
49	→ If yes , how much you need to pay for water?	
50	→ If yes , is there any fines for not payment of water fees or late payments?	<input type="checkbox"/> No <input type="checkbox"/> Yes, what are the fines? _____
51	→ If yes , are the fines truly applied?	
52	My family can easily afford the water we need	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
53	The money I pay for water is fair for the services I receive	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
54	I trust that the money I pay for my water is used to ensure that the hand pump is always working	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
55	→ Follow-on, what can be done to increase your trust that the water payments are used to ensure the hand pump is always working?	_____
56	Would you pay for a higher water fee if:	- Your water system was improved <input type="checkbox"/> No <input type="checkbox"/> Yes - You could use water for multiuse <input type="checkbox"/> No <input type="checkbox"/> Yes
57	Is there any other reason that would make you pay for a higher water fee?	

PART E: WATER SUPPLY BEFORE PMSA

58	What is the main difference between how the water supply was before and with the PM service provider?	_____
59	Before PMSA, what was done to fix any break or solve any problem with the hand pump?	_____
60	Before PMSA, did people also pay for water?	<input type="checkbox"/> No <input type="checkbox"/> Yes
61	→ If yes , how was the water payment done?	

PART F: SOCIAL & NON-BUILT ENVIRONMENT		
62	How often the community meet up to discuss about issues and problems?	<input type="checkbox"/> Once a week <input type="checkbox"/> Only when something happens <input type="checkbox"/> Once a month <input type="checkbox"/> Very rarely or not at all
63	Which of the following descriptions about making decision you feel is most accurate?	<input type="checkbox"/> We can reach to an agreement easily. <input type="checkbox"/> We need to discuss a lot before we reach to an agreement. <input type="checkbox"/> It is difficult for us to reach to an agreement.
64	In case of difficulties related to water supply, does the community seeks support from NGOs?	<input type="checkbox"/> No <input type="checkbox"/> Yes, how these organizations help? _____

** The following section is just for Water and Sanitation Committee's members:

PART G: THE ROLE OF THE WUC		
The role of the WUC		
7	When the WUC was established?	
8	The WUC have how many members?	
9	→ Follow-on: How many of them are women?	
10	→ Follow-on: Are the members of the WC compensated somehow for their work?	<input type="checkbox"/> No <input type="checkbox"/> Yes, how? _____
11	What are the activities/responsibilities of the WUC?	_____
12	→ Follow-on: What are the main challenges to do those activities?	
13	→ Follow-on: How to overcome these challenges?	_____
14	Is the WUC legally registered?	<input type="checkbox"/> Yes <input type="checkbox"/> No, why?
15	Does the WUC have a bank account?	<input type="checkbox"/> Yes <input type="checkbox"/> No, why?
16	How frequently the community meet to discuss about water issues?	<input type="checkbox"/> Once a week <input type="checkbox"/> Once a month <input type="checkbox"/> Twice a month <input type="checkbox"/> Only when the hand pump break <input type="checkbox"/> Very rarely or not at all
17	Did the WC have access to any type of training?	<input type="checkbox"/> No <input type="checkbox"/> Yes, by who and what type of training? _____
18	In case of difficulties related to water supply, does the community seeks and discusses support from NGOs?	<input type="checkbox"/> No <input type="checkbox"/> Yes, how these organizations help? _____

Table S3. Calibration scores and definitions for conditions and outcomes

Condition	Fuzzy-Score	Definition
BreakDown	0	Out-of-set. Community does not report about relevant negative experience with break-downs and/or misuse of funds.
	1	In-set. Community reports about negative experience with break-downs; misuse of funds; or comment about the challenges from surrounding hand pumps that are poorly maintained.
AltSource	0	Out-of-set. There are nearby functioning improved water sources.
	0.33	Partially out-of-set. There are nearby improved water sources but poorly-functioning or of poor water quality and/or there are distant improved water sources.
	1	In-set. There are no nearby improved water sources.
WatAvail&Qual	0	Out-of-set. There is not enough water and/or water is perceived as bad quality year around.
	0.33	Partially out-of-set. Some water availability and/or quality problems are appearing especially during dry season.
	1	In-set. Water is available and is perceived as good quality.
WUOrg	0	Out-of-set. No active WUC.
	0.33	Partially out-of-set. WUC takes minimal responsibility with occasionally lapses in management or is unorganized; intra conflicts occurs; members provide contradictory information.
	0.67	Partially in-set. WUC takes responsibility for water source with no significant intra conflict; WUC has a constitution, collect payments records but are not legally registered nor have a bank account.
	1	In-set. WUC takes active responsibility for water source with no significant intra conflict; WUC is legally registered, has bank account, and collect payments records.
PayPerception	0	Out-of-set. Overall there is a general belief that water should be free of charge or that payments should be collected only when the hand pump is broken.
	0.33	Partially out-of-set. Overall water users perceive the price paid for PM high and WUC struggles with families that don't understand the reason for regular payments.
	0.67	Partially in-of-set. Water users understand the reason for regular payments but perceive the price paid for PM high or the quality of the water source poor for the price of PM. Some families might not understand the reason for regular payments.
	1	In-set. Water users understand the reason for regular payments and no significant number of families report that they perceive the costs too high or don't understand the reason for regular payments.
Supp&Comm	0	Out-of-set. There is critical miscommunication with participants reporting that they are unaware about the PM service provider, the PM framework, or even the WUC. WUC members perceive they lack support and training.
	0.33	Partially Out-set. There is no significant miscommunication with an overall understanding of the PM framework, but WUC members perceive that PM will not solve the community current problems.
	0.67	Partially in-set. There is no significant miscommunication, but WUC members perceive they lack support and training.
	1	In-set. There is no significant miscommunication and WUC members perceive they have support and received training to overcome challenges.
Payment Compliance	0	Out-of-set. PM agreement was suspended, that is, the community was non-compliant with payments.
	0.33	Partially out-of-set. PM agreement was suspended, however, WUC members are not aware of the suspension and/or WUC haven't received a suspension letter.
	0.67	Partially in-set. PM agreement was compliant; however, the community is struggling to be compliant with payments.
	1	In-set. PM agreement was compliant, that is, the community was compliant with payments.

Table S4: Truth Table

Case #	Causal Conditions						Outcome
	<i>BreakDown</i>	<i>AltSources</i>	<i>WatAvail&Qual</i>	<i>WUCOrg</i>	<i>Pay Perception</i>	<i>Supp&Com</i>	<i>Successful Payment Compliance</i>
1	1	1	1	0.33	0	0	0.33
2	1	0.33	1	1	0.67	1	1
3	1	0.33	1	1	0.67	0.67	0.67
4	1	0.33	1	1	0.67	0.67	0.67
5	0	1	0	0.33	0.67	0.33	0
6	0	1	1	1	1	0.67	1
7	0	0	0.33	0.33	0	0	0
8	0	0	0	0.67	0.67	0.33	0
9	1	0	0	0.67	0.67	0.33	0
10	1	0.33	1	0.67	0.67	0.33	0.33
11	1	0	1	0.67	0.33	0.67	0.67
12	1	0.33	1	1	1	1	1
13	0	1	0.33	0.33	0	0	0.33
14	0	0	0.33	0	0	0	0
15	1	0	1	1	0.33	0.67	1
16	1	0	1	1	0.67	1	1