



# Assessing Water Point Sustainability in Northern Mozambique

## Background

As part of the Millennium Development Goals (MDGs), the United Nations has aimed to halve by 2015 the population that lacks sustained access to safe drinking water<sup>1</sup> (UN 2011). The world is on target to meet, if not surpass, this proposed benchmark as 84% of people in the developing world now have access to improved water sources<sup>2</sup> (UNICEF and WHO 2010). However, despite over a billion dollars invested in the water sector and great progress made towards the MDG, the sustainability of the various governments' and non-governmental organizations' actions in the water sector are poor at best.

The IRC estimated that \$1.2-\$1.5 billion of investments have been largely wasted in Sub-Saharan Africa over the last two decades due to implementing hand pumps that cease working prematurely (WASH Sustainability Form). Recent research suggests one-third of all water points in rural Sub-Saharan Africa are non-functional (Jimenez and Perez-Foguet 2011). In order to address this issue, CARE USA commissioned a research study on Water Point Sustainability in two districts in Mozambique. The research was conducted by two Emory University students with support from CARE USA Water Team and the CARE Mozambique *Environmental Hygiene and Productive Use of Water* (HAUPA) Project Team, in December 2011.

## Objective

Ultimately, this study aimed to improve the sustainability record of water points, such as the Afridev hand pump, by identifying and addressing the factors that impede long-term functionality.

The specific objectives of the study were:

- To elucidate factors that impact long-term functionality of water points
- To illuminate associations between levels of local governance in the water sector and water point sustainability.

Political Map of Mozambique



<sup>1</sup> Safe drinking water refers to "improved drinking water sources", or "improved water sources"

<sup>2</sup> The WHO defines improved drinking water sources to be household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections. Contrarily, unimproved water sources include unprotected wells, unprotected springs, vendor-provided water, and water provided by tanker. (WHO 2011)

## Location of study

The study was implemented in the Balama and Montepuez districts of Cabo Delgado province in Northern Mozambique. These districts were chosen based on CARE's involvement in the HAUPA Project, which was administered in the Cabo Delgado province and neighboring Nampula province from 2004 to 2011. Over the course of the HAUPA project a total of 600 water schemes were newly installed or rehabilitated.

## Methodology

Utilizing a mixed methods approach, the field team visited 86 communities across two project districts in July 2011. The main method employed by the researchers was a governance snapshot survey (GSS) tool for each community. The GSS began with contextual questions regarding the water point followed by five questions on each of the following: accountability, transparency, participation, and inclusivity of the community's local water governance (20 questions total). The responses were scored on a 3-point scale, which indicated a low, medium, or high level of engagement (1=low, 3=high).

Other methods included water point observation in every community, recording the following: current functionality, taste of water, and date when the water point was constructed. In addition, key informant interviews with local government officials and focus groups with community members were utilized to provide additional insight into factors affecting the management and sustainability of the communities' improved water sources. During the field period, 103 water points were observed in the 86 communities. From observation, the majority of improved water points across the two surveyed districts were boreholes that utilized Afridev pumps. Afridev pumps are

## Water Point Survey Findings

### Overview

Governance snapshots were conducted for 86 water points—50 in Balama District and 36 in Montepuez District. Of the water points surveyed, 86% had been implemented by CARE through the HAUPA program (Figure 1). Due to the small number of non-CARE water points, the majority of analyses were performed on all water points, regardless of origin, unless otherwise specified.

As of July 2011, the median age for the improved water points surveyed was 3 years, meaning many of the points were constructed in 2008 (Figure 2). Ninety-six percent of all the points visited had been constructed in the last four years; three water points surveyed were constructed in the late '80s, ranging between 24 and 25 years old. Two communities could not recall when their water points had been implemented.

Figure 1. Origins of Improved Water Points surveyed (n=86).

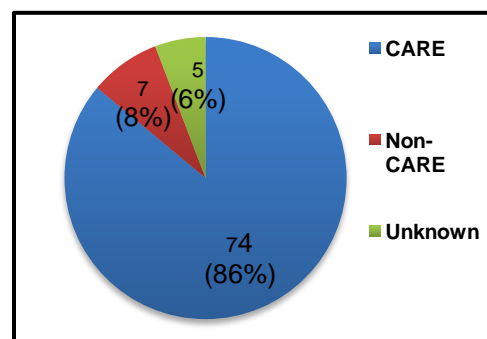
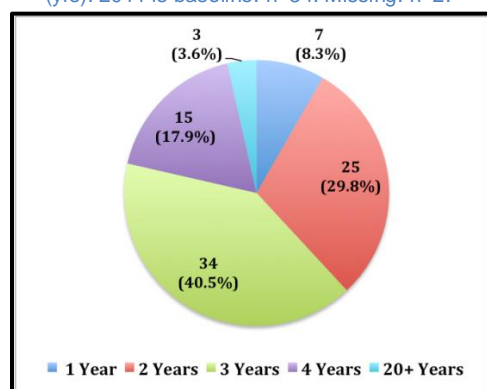


Figure 2. Approximate age of water point (yrs). 2011 is baseline. n=84. Missing: n=2.



## Functionality of Water Points

Two-thirds of the surveyed water points were found to be functioning without any problems (Figure 3). Of the 27 pumps that lacked full functionality, 22 (82%) reported having had problems for more than a month; the remaining 5 (18%) reported only having problems for between one week and one month. Through the GSS, these communities indicated an assortment of problems with their water point related to governance and/or technology (Figure 4). Communities could report more than one problem.

Figure 3. Functionality of surveyed water points across both districts

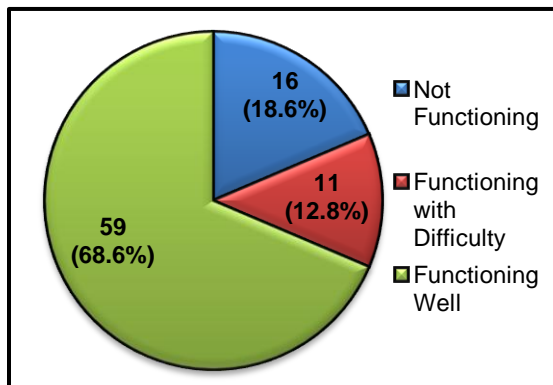
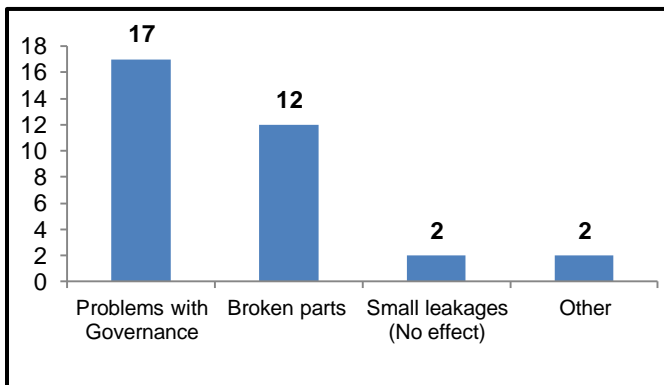


Figure 4. Type of problem related to water pump functionality (n=33). (NB: Only communities reporting non-functionality answered this question (n=27), but multiple responses could be given).



**The most common complaint was related to governance;** communities often stated that there were problems with attendants or the water committee. Although only 47% of all communities indicated that problems with governance affected their water supply, 17 of the 27 communities (63%) with poorly/non-functioning water points did recognize this to be a problem. **Another commonly reported problem from the non-functioning water points was broken parts.** Although no one reported water leakage to interfere with water supply, 44% of communities (12 of 27) reported that broken parts affected their water service. Local CARE staff expressed great concern over the availability of spare parts for rope pumps as well as the most-utilized hand pump, the Afridev.

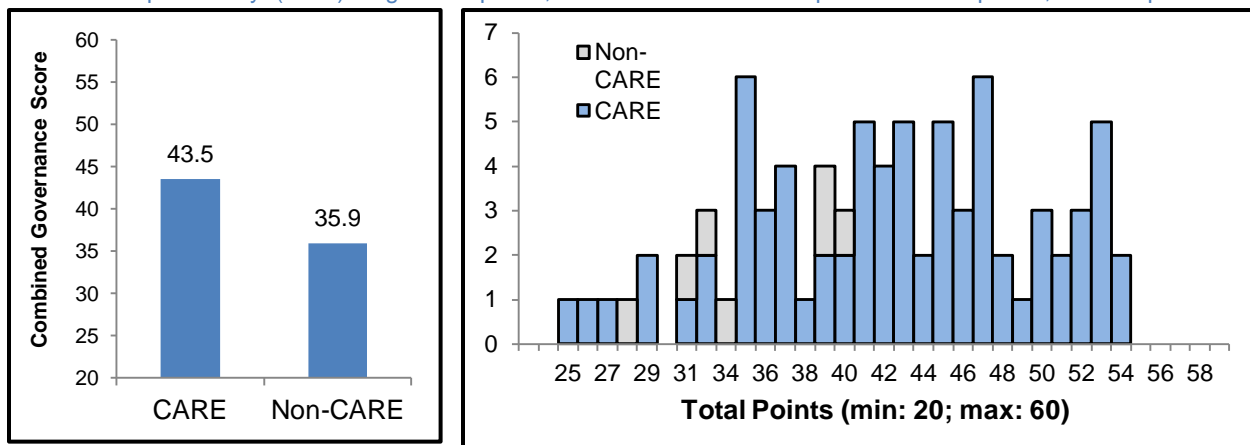
**It is also important to note that a number of communities reported problems with their water point because of both technology and governance.** For example, five communities stated that broken parts and problems with attendants/water committees directly affected their water supply. This provides further credence for the need to analyze water governance in relationship to water point functionality.

## Community-Based Water Governance

CARE-implemented water points reported an average total governance score of 43.5 out of 60. Although there were very few non-CARE water points sampled (7 compared to 74), the CARE water points had an eight point higher average for the total governance score than non-CARE water points (Figure 5). CARE water points scored an average of 2.2 points (out of 3) per question in comparison to 1.8 points for non-CARE implemented water points. However, communities with CARE-implemented water points have a wider and higher variety of scores than non-CARE communities

(range: 26-55 points vs. 35-41 points, respectively) (Figure 6). Two CARE communities scored 55 out of 60 on the governance assessment.

**Figure 5. [LEFT]** Average Total Governance Score for CARE (n=74, Std Dev=7.2 points) and non-CARE water points (n=7, Std Dev=4.6 points). Missing: n=5. **Figure 6. [RIGHT]** Distribution of Total Governance Scores for CARE water points only. (n=74). Avg = 43.5 points; Standard Deviation=7.2 points. Min: 26 points, Max: 55 points.



### Accountability, Inclusivity, Participation, and Transparency

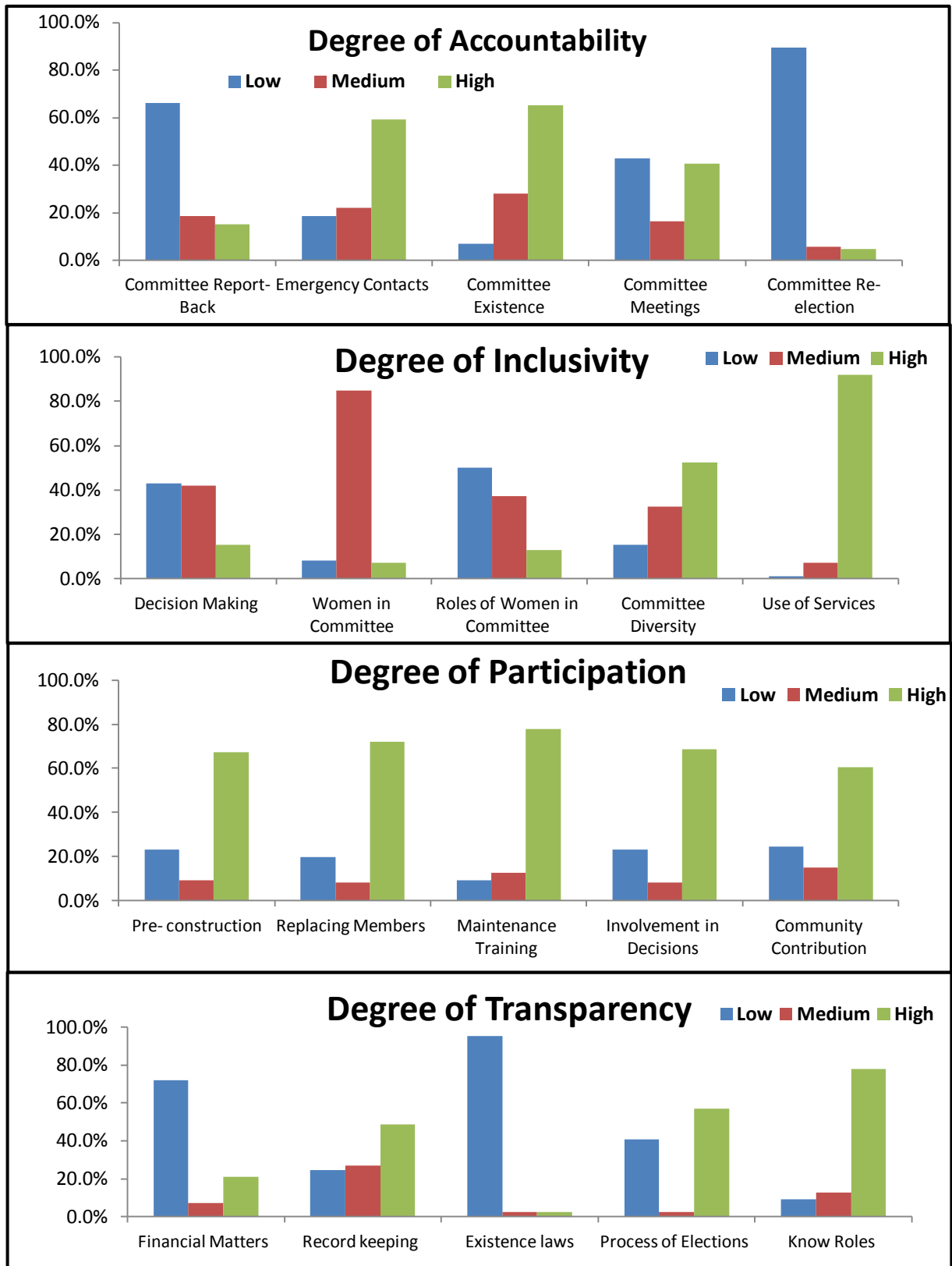
Breaking down governance to the four topical areas (accountability, inclusivity, participation, and transparency) addressed in the GSS reveals important strengths and weaknesses of community-based water governance in the areas surveyed (Figure 7).

**Accountability** encompasses water committee existence and its operating functions. The **transparency** questions covered record-keeping, bylaws and guidelines to govern the committee. Involvement of the community in the decision-making process for initial service provision, labor contributions, and maintenance of the scheme are included in the **participation** section. Lastly, the **inclusivity** questions covered how inclusive the committee was of all community groups, such as women and different ethnic groups.

Overall, communities are strongest in **participation**, with more than two-thirds of communities reporting high levels of involvement in the construction and upkeep of the water pump. Based on focus group discussions it appears that communities with NGO-sponsored wells had more sustained participation, as exhibited through regular monthly meetings, which specific government-sponsored wells lacked.

Communities were much more variable in the degree of **accountability**, **inclusivity**, and **transparency** in their water governance. Within each of these three areas, there were variables that depicted very high and very low levels of governance. For example, under transparency, 78% of communities reported understanding their roles and responsibilities in the water sector, while 95% lacked any specific by-laws or guidelines to lead the committee. Moreover, answers for each variable were sometimes very polarized, indicating highly variable levels of governance across different communities. For example, approximately 40% of water committees reported holding meetings on a regular basis, whereas another 40% of water committees reported that they had never held a meeting. A similar trend exists in elections for leadership within the water committee: 57% of communities reported that persons were elected whereas 41% reported that persons were selected.

**Figure 7.** The percentage of all surveyed communities scoring low, medium, and high for each question on water governance (n=86). 'Low', 'Medium', and 'High' indicate a score of 1, 2, and 3, respectively, for the designated question. The exact question is listed in Table 2 and corresponds to the question number in these figures.

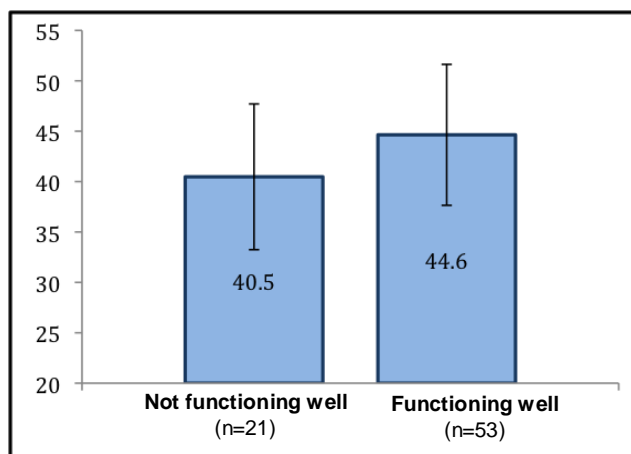


## Governance and Water Point Functionality

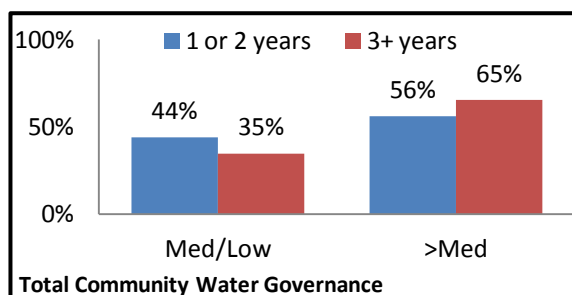
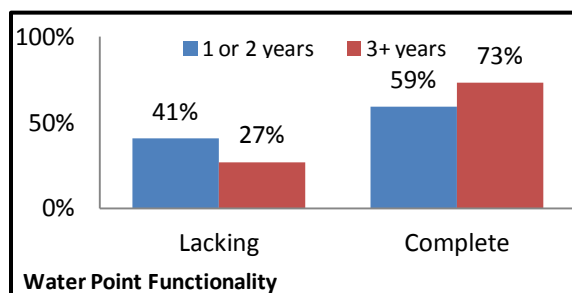
Based on the results of the snapshot survey, there appears to be an association between communities having both better governance and also more functional water points.<sup>3</sup> Specifically among communities with CARE water points, the average total governance score was significantly higher for communities that had well-functioning water points than for those communities with water points that functioned with difficulty ( $p=0.025$ ) (Figure 11).<sup>4</sup>

**Confounders** – There are a variety of factors that could impact the relationship between governance and water point functionality that must be considered (e.g. distance from main road, type of water source, age of water source, etc). However, the scope of this survey limited the number of factors that could be controlled for through statistical analysis. Based on the available information, age of the water point appears to be the only confounder that could be identified. Age is related to both water governance and water point functionality, leading it to confound the association between the two (Figures 9 and 10). For example, if the improved water point was implemented or renovated three years before or more, it was 68% more likely to both be completely functional and have better governance than water points implemented/renovated within the last two years (Table 3 – on next page). This pattern follows for each of the four measured factors of governance as well. That is, overall governance and water point functionality are more closely associated with older water pumps than those more recently constructed. Due to the effect of age on governance and on water point functionality, age was adjusted for in subsequent analyses examining their association.

**Figure 8.** Average Total Governance Score for CARE Haupa Improved Water Points based on Functionality ( $p=0.025$ ). Error bars indicate +/- 1 standard deviation from mean.



**Figure 9 (TOP):** Functionality of water points based on age of water point. Sample:  $n=84$ . Missing:  $n=2$ . **Figure 10 (BOTTOM):** Total Governance Score based on Age of water point. Sample:  $n=84$ . Missing:  $n=2$ .



<sup>3</sup> This study utilized a cross-sectional design, so no linear relationships can be definitively proposed through this analysis. However, associations between variables can be suggested, with recognition that it is not possible to even suggest a causal pathway.

<sup>4</sup> For this analysis only, non-CARE points were excluded because CARE points were known to have higher levels of functionality

**Table 1.** The primary **Strengths and Weaknesses** that surveyed communities demonstrated for each sector of governance.

<i>Factor</i>	<b>Strengths</b>	<b>Weaknesses</b>
<b>Accountability</b>	<ul style="list-style-type: none"> <li>● <b>Committee Existence:</b> Two-thirds of communities reported that there is a committee that meets and that others know about the committee and its meetings.</li> <li>● <b>Emergency Contacts:</b> Almost two-thirds of water committees believe they have clear information on who to contact in case of problems with the water point that are beyond the local capacity.</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Re-election processes:</b> Almost all communities report there to be no agreed length of office term for water committee members.</li> <li>● <b>Reporting back to the community:</b> More than two-thirds of communities report no system of for water committees to report back to the community (i.e. decisions made, problems, etc).</li> </ul>
<b>Inclusivity</b>	<ul style="list-style-type: none"> <li>● <b>Women Participants:</b> Women are involved with water committees in 92% of surveyed communities. In addition, communities stated that women held decision-making power at the household level and were accepted in water committees.</li> <li>● <b>Diversity:</b> More than 50% of communities reported that committee and office-bearers are representatives of different named interest groups.</li> <li>● <b>Equitable Usage:</b> 92% of communities stated that all community members used the water services equally and equitably and that there are initiatives in place to help those who might not otherwise be able to access services. Through focus groups, it was explained that anyone was welcome to water, as long as they paid (exception: The elderly did not have to pay).</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Women Participants: Women comprise half of the water committee in only 7% of surveyed communities.</b></li> <li>● <b>Women's Role:</b> Although women are involved in water committees, almost 80% lack enough power to effectively contribute and make decisions.</li> </ul>
<b>Participation</b>	<ul style="list-style-type: none"> <li>● Approximately two-thirds of surveyed communities reported high participation in matters dealing with the improved water point and water governance including: <ul style="list-style-type: none"> <li>○ <b>Maintenance training;</b></li> <li>○ <b>Pre-construction consultation;</b></li> <li>○ <b>Replacing ineffective community members; and</b></li> <li>○ <b>Community involvement</b> through decision-making and contribution of labor, finances, skills, etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Decision Making:</b> Although a large proportion of persons reported involvement in the decision-making process, there remained 31% of communities not regularly involved in decision-making.</li> <li>● <b>Community Contribution:</b> 24% of communities reported that there has been no community contribution to the construction and upkeep of the improved water point (money, time, etc).</li> </ul>
<b>Transparency</b>	<ul style="list-style-type: none"> <li>● <b>Roles and Responsibilities:</b> 78% of community members and water committees reportedly understand their roles and responsibilities in maintaining the water point.</li> <li>● <b>Record Keeping:</b> Regular record keeping on water-sector matters is occurring to some extent in more than two-thirds of water committees.</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Bylaws or Guidelines:</b> Almost every community reported that the water committee functions without bylaws or guidelines.</li> <li>● 72% reported that members of the community have no information about the regular financial matters of the water system (i.e. total monthly income from the community to support the water point and expenditures to maintain the scheme).</li> </ul>

**Table 2.** The association between the level of water governance in a community and functionality of water points.

Governance Factor	Crude PR ≤2 yrs (95% CI) n=32	Crude PR ≥3 yrs (95% CI) n=52	Adjusted PR <sup>^</sup>	95% CI	P-value
Accountability	1.21 (0.69, 2.13)	1.56 (1.12, 2.17)	<b>1.46*</b>	1.10, 1.94	0.027
Inclusivity	0.94 (0.52, 1.68)	1.86 (1.23, 2.81)	<b>1.48*</b>	1.06, 2.07	0.025
Participation	1.49 (0.60, 3.69)	1.48 (0.87, 2.50)	<b>1.48</b>	0.94, 2.34	0.085
Transparency	1.02 (0.55, 1.88)	1.41 (1.04, 1.90)	<b>1.32</b>	1.01, 1.73	0.182
<b>Total Governance</b>	<b>1.33 (.72, 2.547)</b>	<b>1.985 (1.17, 3.38)</b>	<b>1.68*</b>	<b>1.12, 2.51</b>	<b>0.004</b>

\*Significant at the 95% confidence level. <sup>^</sup>Adjusted prevalence ratios are adjusted for age (water points being ≤2 years or ≥3 years). P-values are two-sided and based on the Fischer Exact test. A p-value <0.05 is considered significant at the 95% confidence level.

The prevalence ratios (PR) compare the communities with high governance and high functionality to the ratio of communities with low governance and high functionality. A PR of 1.56 says that communities with high governance were 56% more likely to have functional water points than communities with lower governance. Governance='high' for a community if it scored on average >2 points per question (Total governance: >40 points; Accountability, inclusivity, participation, or transparency: >10 points).

### Accountability

The probability of water points functioning well was 46% higher amongst communities that expressed having high accountability in the water sector than amongst communities with low accountability (Table 2) (p<0.05). It also appeared to be more strongly associated with increased functionality in older water pumps than those more recently installed (Table 2). Communities with high accountability for each of the accountability variables (except the reporting back variable) were found to be approximately 30% more likely to have functioning water points than communities that expressed low levels of accountability (Table 3). Most significantly, communities that held regular committee meetings were 35% more likely to also have functioning improved water points than communities that did not (95% CI: 1.03, 1.78; p=0.075) (Table 3). However, the extent to which committees reported back to the community was not seen to be at all associated with water point functionality.

**Table 3.** The association between accountability in a community and functionality of water points. A governance score was 'high' if the answer to the question was 3; the score was low/medium if it was 1 or 2.

Accountability Variable	Governance Score	Functionality		Adjusted PR <sup>^</sup>	95% CI	P-Value
		Lacking	Working			
Committee Existence	Low/Medium	13	16	1.33	0.92, 1.93	0.13
	High	14	41			
Committee Meetings	Low/Medium	20	31	1.35	1.03, 1.78	0.075
	High	7	28			
Committee Re-elections	Low/Medium	27	53	1.39	1.09, 1.77	0.28
	High	0	4			
Committee Report Back	Low/Medium	22	49	0.97	0.64, 1.45	0.41
	High	5	8			
Emergency Contacts	Low/Medium	15	19	1.31	0.91, 1.90	0.13
	High	12	38			

For each question, n=84, as age of water point was missing for two surveys. \*Significant at the 95% confidence level. <sup>^</sup>Adjusted prevalence ratios are adjusted for age (water points being ≤2 years or ≥3 years). P-values are two-sided and based on the Fischer Exact test. A p-value <0.05 is considered significant at the 95% confidence level.



## Inclusivity

The inclusivity variables pertained to questions about including women and other marginalized groups such as certain ethnicities, clans, religions, low socioeconomic status, those with disabilities or chronic illness, etc. in the decision-making of the water committee. The probability of water points functioning well was 48% higher amongst communities that expressed having high inclusivity in the water sector than amongst communities with low inclusivity ( $p < 0.05$ ) (Table 2).

*Ten of the eleven communities that reported women to be significantly involved in their water committees were found to have functional water points. Although not statistically significant, communities that reported women to have significant roles in decision-making in the water committees were 41% more likely to have functional water points than communities where women lacked such a role (95% CI: 1.10, 1.82;  $p = 0.15$ ).*

Examining specific factors of inclusivity (Table 4), water committees that were diverse in their representation of various groups in the community were 71% more likely to have functioning water schemes than communities that did not embrace such diversity (95% OR: 1.23, 2.37;  $p = 0.0006$ ). Moreover, although the presence of women in water committees was not significantly associated with well functioning water points, having women with more prominent roles in the committees was valuable.

Inclusivity of decision-making appeared to be similarly associated with water point functionality. Twelve of the 13 communities that reported having an inclusive decision-making process had functional water points, making this group 46% more likely to have functional water schemes than communities without such inclusivity ( $p = 0.15$ ).

**Table 4. The association between a community's level of inclusivity in the water sector and functionality of the water points<sup>5</sup>.** A governance score was 'high' if the answer to the question was 3; the score was low/medium if it was 1 or 2.

Inclusivity Variable	Governance Score	Functionality		Adjusted Prevalence Ratio <sup>^</sup>	95% Confidence Interval	P-Value
		Lacking	Working			
Decision Making	Low/Medium	26	45	1.46	1.15, 1.85	0.069
	High	1	12			
Women in Committee	Low/Medium	25	53	0.98	0.55, 1.77	0.99
	High	2	4			
Roles of Women in Committee	Low/Medium	26	47	1.41	1.10, 1.82	0.15
	High	1	10			
Committee Diversity <sup>^</sup>	Low/Medium	20	20	1.71*	1.23, 2.37	0.0006
	High	7	37			
Use of Services	Low/Medium	5	2	2.50	0.77, 8.13	0.065
	High	22	55			

For each question,  $n = 84$  as age of water point was missing for two surveys. \*Significant at the 95% confidence level. <sup>^</sup>Adjusted prevalence ratios are adjusted for age (water points being  $\leq 2$  years or  $\geq 3$  years). P-values are two-sided and based on the Fischer Exact test. <sup>°</sup> P-values are two-sided based on the Mantel Haenszel chi-square statistic. A p-value  $< 0.05$  is considered significant at the 95% confidence level.

<sup>5</sup> Prevalence Ratios for variables of inclusivity measurements were not adjusted by age, except for 'Committee Diversity'. If segregated by age, the total number of respondents was too small in many of the categories, which would have made age-adjusted calculations less accurate.

## Participation

Overall, high community participation was not found to be significantly associated with high water point functionality (Table 2). However, the probability of water points functioning well was still 48% higher amongst communities that expressed having high participation in the water sector than amongst communities with low participation (not statistically significant). All variables measuring participation except for maintenance training were also found to have little association with functional improved water points (Table 6). Communities that had taken maintenance training and had demonstrated an ability to maintain the scheme when it ceased functioning were 2.2 times as likely to have functional water points as communities that lacked this maintenance training and capacity (95% CI: 1.13, 4.32; p=0.002).

**Table 5. The association between a community's level of participation in the water sector and functionality of its water points.** A governance score was 'high' if the answer to the question was 3; the score was low/medium if it was 1 or 2.

Participation Variable	Governance Score	Functionality		Adjusted Prevalence Ratio <sup>^</sup>	95% Confidence Interval	P-Value
		Lacking	Working			
Pre-construction Consultation	Low/Medium	10	18	1.17	0.83, 1.63	0.47
	High	17	41			
Involvement in Decisions	Low/Medium	10	17	1.19	0.84, 1.69	0.35
	High	17	42			
Community Contribution	Low/Medium	12	22	1.18	0.86, 1.61	0.46
	High	15	37			
Replacing Ineffective Members	Low/Medium	10	14	1.18	0.80, 1.74	0.42
	High	17	45			
Maintenance Training	Low/Medium	12	7	2.21*	1.13, 4.32	0.002
	High	15	52			

For each question, n=84, as age of water point was missing for two surveys. \*Significant at the 95% confidence level. <sup>^</sup>Adjusted prevalence ratios are adjusted for age (water points being  $\leq 2$  years or  $\geq 3$  years). P-values are two-sided and based on the Fischer Exact test.

## Transparency

Overall, transparency of the water sector was found to have the smallest impact on water point functionality (Table 2). However, increased transparency for each of the five variables was found to be associated (but not significantly) with having functional water schemes (Table 6). Communities that reported having transparent elections were 25% more likely to have functional water points than those with less transparent election processes. Similarly, communities reporting transparent financial matters and regular record keeping were approximately 30% more likely to have functional water schemes than those without such transparency.

The age of the water point played a significant factor in the association between a water committee recognizing their roles and responsibilities and having functional water

points. Pumps that were at least three years old were 77% more likely to have working water points if committee members recognized their roles and responsibilities in the water sector ( $p=0.059$ ). In comparison, this association was not evident amongst water points that had been established within the last two years. For this age group, known roles and responsibilities was associated with 25% lower functionality ( $p=0.54$ ).

**Table 6. The association between a community’s level of transparency in the water sector and functionality of its water points.** A governance score was ‘high’ if the answer to the question was 3; the score was low/medium if it was 1 or 2.

Transparency Variable	Governance Score	Functionality		Adjusted Prevalence Ratio ^	95% Confidence Interval	P-Value
		Lacking	Working			
Law existence, functionality	Low/Medium	27	55	1.42	1.03, 1.97	0.99
	High	0	2			
Process of Elections	Low/Medium	15	21	1.25	0.91, 1.724	0.16
	High	12	36			
Roles and Responsibilities	Low/Medium	8	11	$\leq 2$ yrs: 0.72	0.42, 1.24	0.54
	High	19	46	$\geq 3$ yrs: 1.77	0.91, 3.44	0.059
Financial Matters	Low/Medium	23	43	1.33	1.02, 1.73	0.14
	High	4	14			
Regular record keeping	Low/Medium	17	25	1.30	0.98, 1.75	0.090
	High	10	32			

For each question,  $n=84$ , as age of water point was missing for two surveys. \*Significant at the 95% confidence level. ^Adjusted prevalence ratios are adjusted for age (water points being  $\leq 2$  years or  $\geq 3$  years). P-values are two-sided and based on the Fischer Exact test.

## Lessons Learned

### 1. There is an association between governance and water point sustainability.

Governance scores were significantly associated with water point functionality, although it is impossible to infer a directional relationship from a cross-sectional study such as this one. Specific governance factors that were most strongly associated with having highly functioning water points were as follows:

- **Existence of water committees and regular meetings of these committees.** This was associated with a 30% increase in prevalence of functional water points.
- **Diversity and inclusivity of water committees.** Having a diverse committee membership was associated with a 71% increase in prevalence of functional water points. Female involvement alone was not strongly associated with water point functionality, but empowering females with roles in the committee saw an increase of 41% in prevalence of functional water points.
- **Participation in maintenance training.** Water points were 2.1 times more likely to be functional if they had a high level of engagement for basic maintenance training for the water scheme.

### 2. Multiple factors impact sustainability of water points in Northern Mozambique.

Like everywhere else, there are many determinants that affect the sustainability of water points in Northern Mozambique. These factors range from geographical

influences such as seasonal changes to economic and technical factors such as availability of replacement parts in local markets. In addition to the universal issues of governance, policy, participation, and technology, this study found that there were a variety of personal preferences that influenced the long-term upkeep of water points. Specifically, taste of the water and convenience were seen to be important amongst community members. If a community had access to other points in close proximity, even if they were not 'improved water sources', they were more likely to use it instead and let the improved water point lapse if the taste was poor, the walk was too long, or if upkeep became bothersome.

**3. The association between governance and water point functionality increases with age of water point.**

The association found between increased governance and water point functionality was consistently lower, and sometimes nonexistent, amongst water points less than two years old in comparison to water points that were at least three years old. With age, there is a substantial increase in association between good governance and water point functionality for all governance categories except participation. Overall, this suggests that as water points start to break down, the role of strong governance could be increasingly important to ensure sustainability.

**4. Maintenance training is crucial to sustainable water points, but the supply chain must be developed to increase access to spare parts.**

Water committee members expressed satisfaction with the maintenance training that they received from CARE, but felt it was insufficient to prepare them for fixing the more advanced problems that inevitably occurred. However, the lack of supplies in local markets was clearly a barrier to sustainability, and the local CARE staff's biggest concern with the program. A system must be put in place to improve availability of spare parts to ensure long-term sustainability of water points. However, even without easy access to materials, the snapshot survey showed that proper maintenance training continues to be significantly associated with sustained functionality.

**5. Increasing village-level understanding of the government water policy is necessary to improve water point sustainability.**

This field investigation found that only the provincial government staff understood the roles and responsibilities of the actors involved in water provision for rural areas. In particular, it became apparent that communities often did not understand the government's water policy and specifically lacked an awareness of the roles and responsibilities of each actor involved (i.e. NGOs, government, and the community). This hindered such communities' abilities to take full ownership and ensure the sustainability of their water sources, as they waited for the government to fulfill tasks that were outside of its responsibilities. If communities clearly learned what *their* responsibilities were, in comparison to those of the government and NGOs, they could more effectively collaborate with the other agencies, holding the other actors accountable for their actions and ensuring that the community was upholding its responsibilities in return.

**6. Accountability must be increased and resources better allocated to ensure policy compliance.**

Despite the adequate water policies that exist, accountability and resources were lacking to ensure that this policy was followed (e.g. communities must pay an initial contribution for water points and water committee training is required, but these actions can frequently fail to occur). As communities already lack an understanding of each actor's responsibilities, the lack of accountability for the existent policies only serves to further confuse community members.

**7. Increased follow-up between NGOs and communities would be beneficial.**

The receiving communities were very thankful for CARE's support in implementing or improving the water schemes, but after this project, CARE's involvement with the communities appeared to cease. As one community member said to CARE, "We are happy that you came to our community because it means that CARE did not forget about us." This suggests that CARE was only able to provide minimal follow-up (if any) on the water points for as long as they remained in the area and had ongoing project funding. Communities expressed desire for and are clearly in need of follow-up, especially to provide additional training sessions in water point management.

**8. Increased communication regarding water point sustainability is necessary across the sector.**

The many diverse actors involved in HAUPA expressed different understandings or perceptions of the factors that impact water point sustainability. This suggests that increased communication is necessary between sectors to bolster awareness of sustainability so that programs are designed to maximize long-term functionality. For example, if the implementing NGO (e.g. CARE) knew that easy accessibility to other water points decreased the sustainability of the newly implemented source, CARE could collaborate with the community water committee to develop plans to address and overcome this obstacle. Likewise, if the government recognized a primary reason for water point failure to be that replacement supplies were unavailable, it could collaborate with local businesses and NGOs to provide incentives to improve the local supply chain.

## Next steps

Follow up work is being planned in Mozambique, building on the lessons learned from this study. In particular, this includes an expansion of the sustainability snapshot to include more detailed questions around finance and governance issues. Also included is a free-listing element that asks the communities to identify the main current constraints and future fears regarding the sustainability of their schemes.

CARE USA Water Team  
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