Baseline Evaluation Report
Millennium Water Program, Kenya
USAID SF 424

November, 2010

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List of Acronyms

ASAL	Arid and semi-arid lands
CARE	Cooperative for Assistance and Relief Everywhere (organization)
CDC	U.S. Centers for Disease Control and Prevention
CGSW	Center for Global Safe Water at Emory University
CRS	Catholic Relief Services (organization)
FH	Food for the Hungry (organization)
IWRM	Integrated Water Resources Management
LI	Lifewater International (organization)
LWI	Living Water International (organization)
MEL	Monitoring Evaluation and Learning
MWA	Millennium Water Alliance
MWP-K	Millennium Water Program, Kenya
USAID	United States Agency for International Development
WASH	Water, sanitation, and hygiene
WVI	World Vision International (organization)

Executive summary

This report details district-level water, sanitation, and hygiene coverage for seven districts targeted by partners of the Millennium Water Program in Kenya (MWP-K). The baseline report, a part of the USAID-funded SF 424, can be used as a first step in a process of long-term data-driven strategic thinking for MWP-K. During June and July 2010, data were collected from 2,147 households and 37 schools. The development of tools and protocols was a collaboration between MWP-K partners and Emory University's Center for Global Safe Water.

The proportion of all households with access to a safe drinking water source within 1 kilometer is 47.3% for the rainy season and 16.4% for the dry season. Surface water, which is usually unsafe for drinking, was relied upon as a drinking water source in the past year by 70.5% of households, for a median two months. The median total travel time required to fetch water is 25 minutes in the rainy season and 70 minutes in the dry season, which is critical because of the potential for water to become contaminated during transport and storage. When asked if they usually treat their water, 53.7% of households claimed they do, the majority of which reported using a chlorine-based treatment method such as Waterguard or PUR (33.3% overall).

Latrines were observed at 59.7% of all households. Sanitation coverage is lowest in Tana North District (8.7%) and Marsabit District (12.0%). It is highest in the Living Water International and World Vision International program areas. The proportion of households with latrines of satisfactory cleanliness at the time of the visit was 47.4%. Respondents in 55.2% of households reported that all family members use a household latrine. Less than 1% of households had a handwashing station observed near a latrine. Although water was available at some households, soap was rarely observed. According to self-report, handwashing is commonly practiced before eating in all areas, but handwashing on other important occasions is less common.

The school data from all program areas show that 73.0% of program schools provide water to pupils for any purpose for an average 4.6 months out of the school year. The combined pupil-to-latrine ratios are much higher than the Kenyan Government's standards, with an average of 102 boys per latrine and 99 girls per latrine. According to conditions observed at the time of data collection, the proportion of schools that did not have any latrines of acceptable cleanliness for boys were 32.4%, and for girls, 20.0%. There were no handwashing water containers in 55.6% of schools. Only 27.3% had at least one container with water in it for handwashing. The majority of schools (83.8%) reported never providing soap or ash for handwashing.

These and other indicators in this report as well as the related discussion provide partners with a basis for reflection on the current status of WASH access and behaviors in their program areas. We recommend they also be used to determine whether programmatic adjustments could be made to improve outcomes. The current conditions illustrated by these data reveal a need for a comprehensive strategy for addressing WASH infrastructure and hardware, knowledge gaps, behavior change, and equity. One key issue confronting partners will be how to target interventions moving forward and how best to engage all stakeholders (government, communities, and NGO partners) to institute a sustained, high impact program. These data are an invaluable tool as part of this process.

Introduction

According to the United Nations Development Program's Human Development Index, Kenya ranks 128th out of 169 countries (UNDP 2010). This ranking incorporates comparative measures of access to health care, education, and economic opportunity, showing that Kenya falls behind in these areas. In 2010 it was estimated that more than 46% of Kenya's population lives in poverty (Government of Kenya 2010). In 2008 the United Nations estimated that 59% of Kenyans are using an improved drinking water source and 31% use an improved sanitation facility[1](United Nations 2008). Although there has been a steady improvement of one or two percentage points each year, Kenya is far from achieving the sanitation and water targets of Millennium Development Goal #7, which are to reach 70% coverage for improved water source and 90% for sanitation access by 2015.

Millennium Water Program

The Millennium Water Program in Kenya (MWP-K) is a partnership of organizations engaged in water, sanitation, and hygiene (WASH) development work. This partnership was formed under the leadership of the broader international coalition, Millennium Water Alliance (MWA). In 2010 MWP-K began a two-year program, with funding from the United States Agency for International Development (USAID), to improve access to WASH in seven districts of Kenya through a variety of school and community-based approaches. These include the promotion of hygiene education, construction or improvement of water points, and promotion or construction of sanitation facilities. Partners in this endeavor are Food for the Hungry (FH), which is working in Marsabit and Moyale Districts in northern Kenya, Catholic Relief Services (CRS), which is working in Tana River District, CARE in Garissa District, World Vision International, Kenya (WVI) in Kibwezi District with its partner Lifewater International (LI), and Living Water International (LWI), which is working in Butere and Kisumu West Districts of western Kenya. Figure 1 depicts these areas.

All of the sites except those in the West are arid or semi-arid lands (ASAL) with low rainfall and great challenges related to water access. One key objective of the program is to use the principles of integrated water resources management (IWRM) to reduce target communities' vulnerability to water-related shocks such as drought and to improve quality of life. The overall program framework is based on the following strategic objectives:

1. ***Good governance:*** *Local and community governance and the enabling policy framework are improved*
2. ***Integrated water resources management (IWRM) and multiple use of water:*** *Efficient, effective, equitable, sustainable domestic and productive uses of water, sanitation, and hygiene are increased*
3. ***Risk management:*** *Vulnerable rural communities cope effectively with drought and floods in the context of climate change*

[1] Different estimates exist for these indicators depending on the source of data and the definitions used. Another UNDP progress report issued in 2010 claims that 81% have access to "sanitary means" (GoK and UNDP 2010). The large discrepancy between this and the UN's 31% figure from only two years prior may be a reflection of a more permissive definition for "sanitary means".

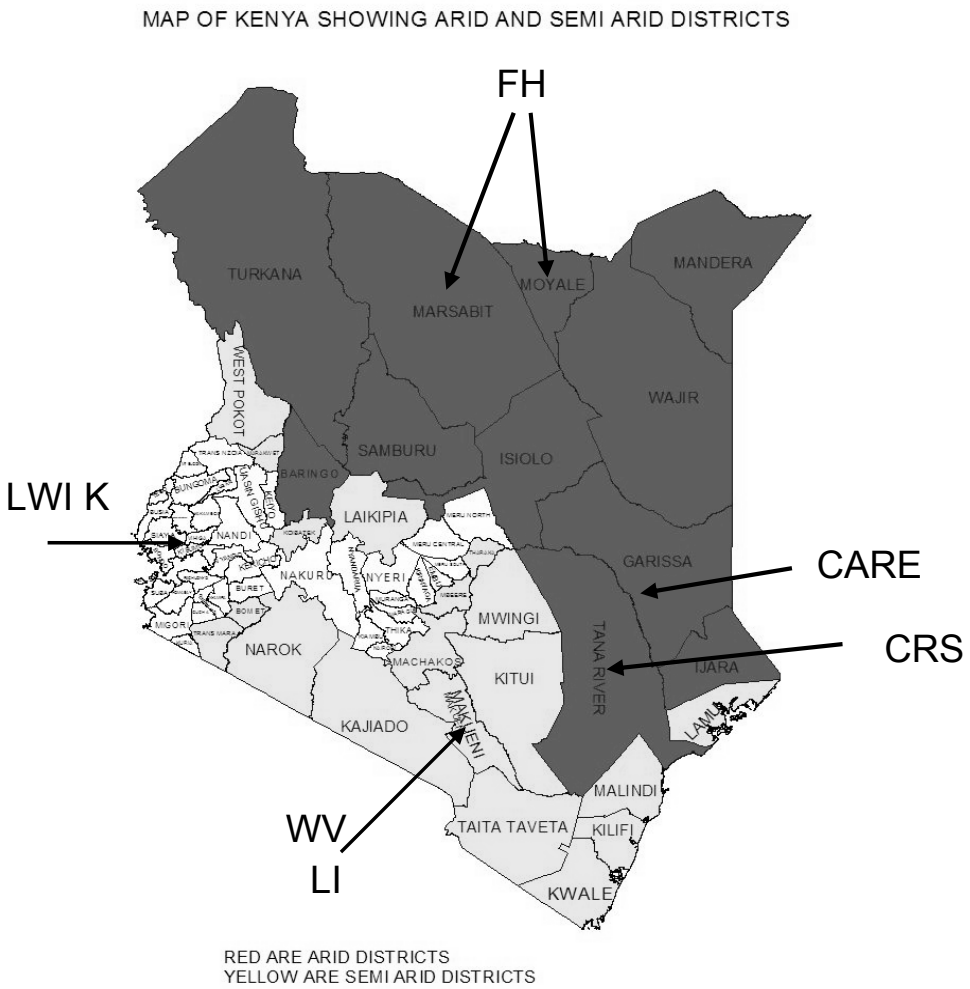

Figure 1. MWP Kenya partner program areas

Role of the Center for Global Safe Water

MWA and MWP-K engaged the Center for Global Safe Water at Emory University (CGSW) to assist in the development of a unified monitoring, evaluation, and learning (MEL) strategy for this program, with an eye towards laying a foundation for future expansion of the program. The main objective of this process was to enable MWP-K to evaluate the various projects being implemented by different partners across the country in a systematic and consistent way and to maximize the utility of lessons learned. This strategy is described in detail in the document *Monitoring, evaluation, and learning (MEL) framework for the Millennium Water Program, Kenya*. In addition to the overall MEL framework, CGSW has facilitated the development of baseline data collection tools and protocols, developed a data entry and management plan, and trained partner staff on sampling and data management. This report describes the methods and results of the baseline assessment. The data generated from the baseline will be used to set impact and outcome benchmarks and guide long-term program strategy. CGSW played a facilitative and advisory role, while MWP-K partners ultimately drove the process and made final decisions.

The mission of CGSW at Emory University is to promote global health equity through universal access to safe water, sanitation, and hygiene solutions for the world's most vulnerable populations. Our key strength is applied research and capacity building: turning data from monitoring, evaluation, and research into learning that can be fed into program implementation. CGSW began in 2003 as a collaboration between Emory's Hubert Department of Global Health, the United States Centers for Disease Control and Prevention (CDC), and CARE International to bring together researchers and practitioners interested in applied WASH research.

CGSW has facilitated the development of improved MEL programs for other coalitions including the Millennium Water Program in Ethiopia and another multi-site, multi-partner school WASH program in Mali, funded by Dubai Cares. In addition to those involved in MWP Ethiopia, CGSW has previously worked with MWA partner organizations such as Water.org in Honduras and Kenya, and CARE in Kenya, Mozambique, and Mali.

Methods

Baseline preparation

In late May of 2010, CGSW led a baseline evaluation planning workshop with MWP-K partners in Nairobi to develop consensus on indicators for the program's logical framework, the sampling strategy, and questionnaires and protocols for the baseline assessment.

Logical framework indicator development

The final logical framework is included as Appendix D. Achievement of the program's intended goals and outcomes will be measured against the indicators in this logical framework. A clear line is drawn between expected program outputs, which we define as the direct end product of an activity (e.g. number of trainings conducted or latrines constructed by an organization), and intended program outcomes, which measure whether the target group responds to the outputs in the expected way. For example, after an organization constructs a latrine at school (output), we expect that the school will maintain the facility and children will use the latrine (outcome). Outcome indicators typically measure behavior change and are a step outside of an organization's direct control. The baseline evaluation is designed to assess outcome indicators from the logical framework in *Strategic Objective 2: Sustainable natural resource management (IWRM) and multiple use of water.* Evaluation of outcomes under objectives 1 and 3 require the incorporation of more qualitative methods and are therefore not included in this quantitative assessment.

Evaluation tools and protocol development

CGSW designed evaluation tools and protocols for a household, school, and health facility survey and presented them to MWP partners for review and modification at the baseline planning workshop. Questions were reviewed one-by-one, and changes were made according to group feedback. These tools are available as Appendices E, F, and G. CGSW led workshop participants in a discussion of sample requirements and methods in order to obtain consensus on the final sampling framework. This is discussed in detail later in this report. During the final day of the workshop, participants pretested the household questionnaire in a community on the outskirts

of Nairobi, after which final modifications were made. Immediately following the workshop, representatives from each organization hired and trained local residents in their districts to be enumerators for the household survey. A protocol for school data collection and household data collection, sampling, and enumerator training are available as Appendix H.

Household survey methods

Partners conducted the household survey in June and July 2010. Enumerators fluent in the common local language were hired from the local community and trained. Household survey questions were written in both English and Kiswahili for the reference of the enumerator. When possible, they conducted the survey in Kiswahili; however, in areas where this was not commonly spoken, they were trained to translate questions into the local language while speaking with a respondent. An exception is Living Water International, which translated the printed survey to Dholuo due to the prevalence of this language in their program area.

The preferred respondent was the female head of household. Questions addressed the household composition, water sources and patterns of use, WASH behaviors and conditions, and vulnerability status of household members. The enumerator also conducted structured observations of sanitation and hygiene conditions. We assessed wealth through typical asset inventory questions, inquiring about possession of animals and other items, from radios to cars. We conducted principal components analysis using the FACTOR procedure in SAS to derive one variable to indicate wealth, which we then divided into quintiles and terciles for easier interpretation (Vyas and Kumaranayake 2006).

In the field, supervisors monitored data quality and checked for completeness of surveys. All partners conducted the household survey except CARE, whose MWP-funded program activities do not include community-based work but rather activities focused on schools. CGSW provided a data entry form in Microsoft Excel, which included drop-down options for most variables and other data validation checks to ensure quality. Data entry was performed by each organization.

Household survey sampling framework

A cluster-based sampling design was chosen. Cluster sampling is a common approach in program evaluation that is more practical than simple random sampling when a geographic intervention area is large and when complete lists of household names and addresses are unavailable. Each partner first selected villages where they anticipated their program benefits would reach. For example, an organization might expect that people within the neighboring five villages will use a new water point. We refer to these as *intervention villages*, and they serve as the cluster, or primary units for sampling.

At each intervention village, partners then aimed to collect a target sample of seven to 15 household surveys, with a preference for the higher number unless time or resources became a constraint. Households were sampled systematically to improve efficiency and reduce selection bias. This method requires enumerators to randomly select a first household to visit in the center of the village, and then adopt a skip pattern proportional to the population size to help select households moving away from the center towards the edges of the village.

At a minimum, MWP-K partners chose to collect data from every intervention village, with the exception of Food for the Hungry, which took a random sample in order to slightly reduce their large number of intervention villages to a more manageable number. Food for the Hungry, Catholic Relief Services, and World Vision chose a wider area of sampling coverage to include additional *non-intervention villages* in order to prepare for anticipated expansion of the program into areas beyond those planned for USAID SF424. Data from non-intervention villages will be used to help with future targeting and evaluations and will serve as a comparison group in the MWP-K follow-up evaluation[2]. Given limited resources for data collection, Living Water International opted to collect data only from villages expected to benefit from the intervention.

Partners selected non-intervention villages randomly from a full list of villages within their intended geographic catchment area. FH intends to eventually cover the entire districts in which they work, so villages were selected from a full list of villages in each district. CRS intends to cover the administrative location[3] in which they work, and therefore selected from all villages within the location. WVI did the same within Mtito Andei Division. Given the need to understand the unique challenges that face communities in the two very different riverine and "hinterland" geographic areas in their location, CRS also chose to divide, or stratify, the list of possible non-intervention villages into these two groups and randomly selected an equal number of villages from both types of landscape. Table 1 depicts the sample selection information for each partner.

Table 1. Sample selection information

Partner	District	Total intervention villages	Total non-intervention villages	# intervention villages selected	# non-intervention villages selected
FH	Marsabit	21	237	20	55
	Moyale	29	93	23	25
CRS	Tana River	30	27	30	17
LWI	Butere	5	n/a	5	0
	Kisumu West	14	n/a	14	0
WVI	Kibwezi	20	19	19	14

School survey methods

Organization staff members collected data at every intervention school during June and July 2010. Data were not intended to represent other schools beyond those chosen for the intervention, so statistical sampling was not necessary. The survey respondent was either a head teacher or other teacher who was aware of the WASH activities in the school. The school

[2] In an ideal program evaluation, data are also collected from a similar non-intervention comparison group, to represent changes that would have occurred in absence of the project. Any excess improvement observed in the intervention group is then attributed to the project. This approach was not feasible for other partners due to limited resources.

[3] A location is an administrative area in Kenya that comprises several villages but is smaller than a district

survey was written and conducted in English, as the teachers that responded to questions are fluent English speakers. Questions addressed typical WASH provision by the school, water sources used, enrollment, and WASH-related education. The data collector then conducted structured observations of latrines, hand washing stations, and drinking water facilities. CGSW provided a data entry form in Microsoft Excel, which included the same quality control features as the household data entry form.

Health facility survey

The health facility survey closely resembles the school survey in a shortened format. It assesses WASH conditions to which patients are exposed. An Excel data entry form was also provided. At the time of this report, no data had been collected from health facilities.

Data analysis and presentation

Data were cleaned and analyzed using SAS 9.2 software (SAS Institute, Cary, NC). Percentages and averages, or means, were calculated for key indicators. Binary variables (those with "yes/no" response options) are presented as the percentage of households or schools that meet the criterion indicated. Continuous variables (those with a range of numerous possible values such as distance to water source, measured in meters) are presented as both medians and averages at the request of MWP-K partners. Average values are only valid representations of a characteristic if there are few extreme or 0 values. If extreme values are present, the average is often no longer a true reflection of the population. Readers are encouraged to rely on median values when they appear in the tables.

For all statistics from the household survey a 95% confidence interval is reported to demonstrate the level of precision achieved for each indicator. To explain, when a sample of households is taken to represent the total population, the average value for a given variable will vary depending on who was selected. If one were to randomly select households a second time and thus ask the same question of a different set of people, the average would most likely be slightly different. Within the range presented, we are 95% confident that the true value (if one could visit every single household) for the population lies within that range. In other words, if one were to repeat household sample selection 100 times, the average value would fall within that range 95 out of 100 times. Ideally the confidence interval will be narrow to reflect a high degree of precision. Precision depends upon the degree of variation in the data as well as the sample size. Though it is not common for baseline reports to contain

Box 1. Data table terminology definitions

%: Percentage of respondents that meet a criterion (proportion per 100)

Avg: Average, or mean value (sum divided by number of observations)

Median: Middle number out of all values

n : Number of respondents who answered a particular question

95% CI: 95% confidence interval. The range of values within which the *true* population value lies, at a set confidence level of 95%. If one were to repeat household sample selection 100 times, the value (% or avg.) would fall within that range 95 out of 100 times.

95% LCL, UCL: "lower confidence limit" and "upper confidence limit" of the 95% confidence interval. They are different terms that describe the same two numbers that comprise the 95% CI.

confidence intervals, we believe these statistics are useful for partners to demonstrate possible error in the estimates that is present in all statistics. After the follow-up evaluation, baseline and final values will be compared for each indicator. If the confidence intervals do not overlap, one can say that there is a statistically significant difference between the two numbers. Box 1 serves as a reference to define this and other terms used in the data tables.

The cluster-based design of the evaluation was accounted for in the analysis by including a village cluster term in the SURVEYMEANS procedure of SAS. Cluster terms are included to statistically adjust for the variation of conditions between different respondents in the same village (cluster) and between respondents in different villages. It is common that respondents in the same village will be more similar to each other than to those in different villages.

Sampling weights were also applied to household data analysis for all partners except for Food for the Hungry, from whom this information was not available at the time of this report. Sampling weights are used so that the sample is reflected of the population as whole, ie larger villages are more represented in the final estimate than smaller villages. Sampling weights were calculated by dividing the total number of households in a given village by the number of surveys collected in that village. If 10 surveys were collected in a village of 50 total households, for example, a sampling weight of 5 would be applied so that each of the household surveys represents 5 other households in that village. Weights were not used for school data, as there was no sampling involved for this survey. Rather, all intervention schools were visited.

Results

Household survey

As discussed above, partners determined a series of indicators in the logical framework that would best demonstrate the achievement of the program's intended outcomes. Tables 2a through 2d below present results for each of these indicators at baseline. Full results of the household survey are presented by district in a series of tables that comprise Appendix A, which will be referenced in this section. Statistics from intervention areas are presented for each partner in these tables. For organizations that collected data in non-intervention villages, a second, shaded row is included to depict statistics from the full dataset (both intervention and non-intervention areas combined). Given that the primary focus of the evaluation is the intervention areas, only statistics from intervention villages (non-shaded rows) will be referenced in this report.

Household demographics

Data were collected from 2,147 households in six districts. Tables A, B, and C of Appendix A show basic demographic characteristics in the MWP-K program area. On average, households are comprised of six people, and 20% are headed by a female only, meaning there is no male head of household present due to death or divorce. Forty-five percent of female heads of household and 32% of male heads of household have no education. Education levels are lowest in the FH and CRS program areas, with as many as 88% of women in Tana North and 96% in Marsabit having no education.

Table 2a. Key logical framework indicators																
	2.1.1. % HH using safe water source within 1 km increases (RAINY season)				2.1.1. % HH using safe water source within 1 km increases (DRY season)				2.1.2. % HH using safe water source within 2 km increases (RAINY season)				2.1.2. % HH using safe water source within 2 km increases (DRY season)			
	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)
Butere -intervention villages	76	72.3%	59.6%	85.0%	76	20.7%	6.8%	34.6%	76	77.2%	58.8%	95.6%	76	22.1%	5.8%	38.4%
Kisumu West -intervention villages	206	77.5%	73.4%	81.5%	203	27.5%	14.1%	40.8%	206	82.7%	79.0%	86.4%	203	30.0%	17.7%	42.3%
Kibwezi -intervention villages	258	41.3%	31.2%	51.5%	257	12.4%	6.1%	18.8%	258	62.1%	49.1%	75.1%	257	16.6%	8.5%	24.7%
Kibwezi -all data	482	45.8%	38.1%	53.5%	482	14.3%	9.2%	19.3%	482	63.9%	54.6%	73.2%	482	20.6%	13.7%	27.5%
Marsabit -*intervention villages*	143	29.4%	14.4%	44.3%	141	15.6%	6.7%	24.5%	143	31.5%	15.4%	47.6%	141	22.0%	11.4%	32.6%
Marsabit -all data	439	28.0%	19.7%	36.4%	423	21.0%	15.0%	27.0%	439	30.3%	21.5%	39.1%	423	33.3%	26.5%	40.2%
Moyale -*intervention villages*	218	8.7%	2.6%	14.8%	198	20.2%	9.0%	31.4%	218	14.7%	5.6%	23.7%	198	38.9%	26.1%	51.7%
Moyale -all data	412	10.4%	5.2%	15.6%	385	17.4%	10.5%	24.3%	412	15.3%	8.8%	21.8%	385	28.3%	19.6%	37.0%
Tana North -*intervention villages*	274	8.7%	2.3%	15.0%	256	1.2%	0.0%	3.0%	274	9.8%	2.3%	17.2%	256	1.5%	0.0%	3.9%
Tana North -all data	438	6.0%	1.9%	10.1%	421	0.7%	0.0%	1.8%	438	7.1%	2.3%	11.9%	421	0.9%	0.0%	2.3%
TOTAL -*intervention villages*	**1175**	**47.3%**	**39.2%**	**55.4%**	**1131**	**16.4%**	**10.8%**	**22.0%**	**1175**	**55.6%**	**47.3%**	**64.0%**	**1131**	**19.7%**	**14.2%**	**25.2%**
TOTAL -all data	**2053**	**41.6%**	**34.7%**	**48.5%**	**1990**	**15.3%**	**11.0%**	**19.5%**	**2053**	**49.3%**	**42.0%**	**56.6%**	**1990**	**19.5%**	**15.2%**	**23.8%**

** 95% LCL and UCL refer to the lower and upperlimits of the 95% confidence interval.*

Table 2b. Key logical framework indicators

	2.1.3. Average quantity of water used per person increases					2.1.4. % HH saying the quantity of water they collect is sufficient for their needs increases				2.1.5. Average time to fetch water decreases (Total minutes to fetch water in RAINY season (travel to/from, plus waiting time))					2.1.5. Average time to fetch water decreases (Total minutes to fetch water in DRY season (travel to/from, plus waiting time))				
	n	median**	avg.	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	median**	avg.	(95% LCL*-	95% UCL*)	n	median**	avg.	(95% LCL*-	95% UCL*)
Butere -intervention villages	76	20	27.5	21.8	33.1	76	43.0%	17.6%	68.5%	76	2	25.0	15.4	34.6	75	50	60.1	46.1	74.0
Kisumu West -intervention villages	201	20	23.5	21.3	25.7	208	38.0%	33.4%	42.7%	209	0	33.1	10.4	55.8	201	70	114.0	97.7	130.3
Kibwezi -intervention villages	258	15	17.4	16.1	18.7	260	32.6%	25.2%	40.0%	255	50	82.5	70.3	94.7	152	65	97.8	82.7	113.0
Kibwezi -all data	482	15	17.7	16.7	18.7	486	28.1%	21.8%	34.3%	479	40	83.4	73.2	93.5	224	70	114.6	99.1	130.2
Marsabit -*intervention villages*	149	9	10.1	9.0	11.2	149	24.8%	13.9%	35.7%	99	30	93.1	63.3	122.8	130	175	222.8	183.7	261.9
Marsabit -all data	455	8	9.8	9.1	10.4	455	26.8%	20.7%	33.0%	306	30	75.7	62.2	89.2	391	190	247.2	223.9	270.5
Moyale -*intervention villages*	228	12	13.3	12.3	14.3	227	12.3%	7.3%	17.4%	198	60	124.9	81.2	168.7	189	540	594.7	527.5	661.9
Moyale -all data	440	11	13.7	12.5	15.0	440	15.9%	11.7%	20.1%	381	60	147.2	120.6	173.9	368	520	585.4	538.2	632.5
Tana North -*intervention villages*	271	13	14.3	13.0	15.6	291	33.0%	19.8%	46.2%	279	50	85.1	59.9	110.3	260	80	146.1	103.8	188.4
Tana North -all data	444	13	14.1	13.2	15.0	464	28.8%	19.1%	38.5%	450	60	93.7	77.2	110.3	425	80	140.1	112.9	167.3
TOTAL -*intervention villages*	**1183**	**15**	**19.3**	**18.4**	**20.1**	**1211**	**34.2%**	**30.0%**	**38.4%**	**1116**	**25**	**62.6**	**52.8**	**72.5**	**1007**	**70**	**139.8**	**124.6**	**154.9**
TOTAL -all data	**2098**	**14**	**17.9**	**17.3**	**18.5**	**2129**	**30.7%**	**27.0%**	**34.4%**	**1901**	**30**	**73.0**	**65.8**	**80.2**	**1684**	**80**	**162.1**	**149.8**	**174.4**

** 95% LCL and UCL refer to the lower and upperlimits of the 95% confidence interval.*

*** Due to a non-normal distribution of data, the median value is more appropriate than the average.*

Table 2c. Key logical framework indicators

	2.1.6. % HH with observed latrine in use increases				2.1.7. % HH in which all members >5 years old use a latrine (HH or community latrine) increases				2.1.8. % HH with latrines that are clean (no feces on slab and minimal odor and flies) increases				2.1.9. % HH with observed soap or ash and water for hand washing next to their latrine increases			
	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)
Butere -intervention villages	77	89.0%	79.3%	98.7%	77	74.8%	48.1%	100.0%	76	63.8%	40.9%	86.7%	73	0.0%	0.0%	0.0%
Kisumu West -intervention villages	207	72.8%	63.6%	81.9%	208	69.7%	56.3%	83.0%	205	62.8%	50.8%	74.8%	195	0.5%	0.0%	1.7%
Kibwezi -intervention villages	259	89.9%	83.9%	95.8%	260	89.1%	81.0%	97.2%	254	66.6%	60.3%	72.9%	258	0.6%	0.0%	1.8%
Kibwezi -all data	486	90.1%	86.1%	94.2%	487	88.2%	82.9%	93.6%	477	70.3%	64.9%	75.8%	484	0.7%	0.0%	1.8%
Marsabit -*intervention villages*	150	12.0%	2.4%	21.6%	148	7.4%	1.8%	13.0%	150	10.7%	2.0%	19.3%	145	0.0%	0.0%	0.0%
Marsabit -all data	460	15.4%	9.5%	21.4%	455	12.3%	7.5%	17.1%	459	14.4%	8.7%	20.0%	446	0.0%	0.0%	0.0%
Moyale -*intervention villages*	226	29.6%	20.4%	38.9%	224	21.0%	11.4%	30.6%	225	25.3%	15.9%	34.8%	217	0.5%	0.0%	1.4%
Moyale -all data	439	26.0%	19.3%	32.6%	435	18.2%	12.3%	24.0%	436	21.3%	14.7%	28.0%	426	0.2%	0.0%	0.7%
Tana North -*intervention villages*	296	8.7%	2.5%	14.9%	295	2.9%	0.1%	5.7%	296	8.2%	2.1%	14.2%	296	0.0%	0.0%	0.0%
Tana North -all data	470	5.8%	1.7%	9.9%	469	1.9%	0.1%	3.6%	470	5.4%	1.4%	9.4%	469	0.0%	0.0%	0.0%
TOTAL -*intervention villages*	**1215**	**59.7%**	**51.3%**	**68.0%**	**1212**	**55.2%**	**46.0%**	**64.4%**	**1206**	**47.4%**	**39.9%**	**55.0%**	**1184**	**0.4%**	**0.0%**	**0.8%**
TOTAL -all data	**2139**	**53.5%**	**46.1%**	**60.9%**	**2131**	**49.5%**	**41.6%**	**57.4%**	**2123**	**43.1%**	**36.6%**	**49.7%**	**2093**	**0.4%**	**0.0%**	**0.7%**

** 95% LCL and UCL refer to the lower and upperlimits of the 95% confidence interval.*

Table 2d. Key logical framework indicators

	2.1.10. % HH that report treating their water increases				2.1.11. % HH with safe drinking water storage container (narrow mouth and lid) increases				2.1.12. % HH respondents who do not dip their hands into drinking water containers (observed) increases				2.2.1. % HH that report using water for income generation/productive use such as garden, trees, livestock, irrigation increases				2.3.3. % HH satisfied with the way the water committee is running the water system (among those using a source managed by a committee)			
	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)	n	%	(95% LCL*-	95% UCL*)
Butere -intervention villages	75	48.1%	32.0%	64.2%	73	31.8%	12.4%	51.1%	73	42.4%	25.8%	59.0%	77	67.0%	34.1%	99.9%	5	100.0%	100.0%	100.0%
Kisumu West -intervention villages	208	76.7%	65.0%	88.4%	209	14.3%	7.7%	20.9%	205	18.0%	12.0%	24.0%	209	46.3%	35.2%	57.5%	75	74.2%	63.4%	85.1%
Kibwezi -intervention villages	260	36.5%	27.0%	46.0%	260	44.6%	33.6%	55.7%	257	58.0%	45.7%	70.3%	260	85.7%	80.0%	91.3%	149	70.7%	57.8%	83.7%
Kibwezi -all data	486	42.7%	34.4%	50.9%	487	42.4%	34.7%	50.1%	484	56.9%	48.3%	65.4%	487	84.4%	80.1%	88.7%	242	73.1%	63.0%	83.1%
Marsabit -*intervention villages*	146	20.5%	11.0%	30.1%	146	88.4%	80.5%	96.2%	146	97.9%	95.6%	100.0%	150	67.3%	59.5%	75.2%	78	84.6%	76.0%	93.2%
Marsabit -all data	445	26.1%	20.8%	31.3%	452	88.9%	85.3%	92.6%	453	96.7%	94.6%	98.8%	445	65.2%	60.5%	69.8%	235	84.7%	79.7%	89.7%
Moyale -*intervention villages*	221	47.1%	37.6%	56.5%	221	63.8%	53.7%	73.9%	226	89.4%	84.4%	94.3%	166	59.6%	40.7%	78.6%	178	81.5%	75.3%	87.6%
Moyale -all data	429	45.9%	39.1%	52.8%	427	65.1%	58.2%	72.0%	438	91.8%	88.7%	94.9%	334	59.9%	49.1%	70.6%	346	82.7%	78.4%	86.9%
Tana North -*intervention villages*	296	49.0%	36.3%	61.8%	295	52.4%	40.1%	64.8%	292	77.9%	65.5%	90.4%	295	61.0%	45.8%	76.1%	42	64.1%	24.6%	100.0%
Tana North -all data	470	45.7%	35.7%	55.8%	469	55.4%	46.6%	64.2%	466	81.9%	73.5%	90.2%	469	64.7%	53.0%	76.4%	42	64.1%	24.6%	100.0%
TOTAL -*intervention villages*	**1206**	**53.7%**	**46.9%**	**60.5%**	**1204**	**37.6%**	**31.1%**	**44.1%**	**1199**	**51.0%**	**42.7%**	**59.2%**	**1157**	**63.3%**	**56.5%**	**70.1%**	527	73.4%	66.7%	80.1%
TOTAL -all data	**2113**	**50.9%**	**45.6%**	**56.3%**	**2117**	**43.4%**	**38.0%**	**48.8%**	**2119**	**58.8%**	**51.8%**	**65.7%**	**2021**	**65.9%**	**60.5%**	**71.3%**	945	75.6%	70.2%	81.0%

** 95% LCL and UCL refer to the lower and upperlimits of the 95% confidence interval.*

Water sources

2.1.1/2.1.2: % households using safe drinking water source within one/two kilometers (Table 2a)

Respondents were asked to name the type of water source used most often for drinking in the rainy and dry seasons. For this indicator we considered piped or tapped sources, rainwater, boreholes or deep wells, and protected wells and springs to be relatively safe. Each respondent was then asked to report both the distance to these main water sources and the time required to travel there. Many only reported either distance or time, presumably due to difficulty estimating one or the other; where a question was missing, we imputed values based on an assumed walking speed of 60 meters per minute.

In the rainy season, 47.3% of all respondents used a safe drinking water source within one kilometer. This number drops to 16.4% in the dry season, when options typically become more limited. Figure 2 shows this indicator visually by district along with another key indicator for sanitation coverage. We also examined how many households used a safe source within two kilometers, to provide a less conservative target that is more realistic in some program areas. In the rainy and dry seasons, 55.6% and 19.7%, respectively, meet the two-kilometer criterion. These results are also shown in Appendix A, Table D, along with a separate indicator for the use of a protected source.

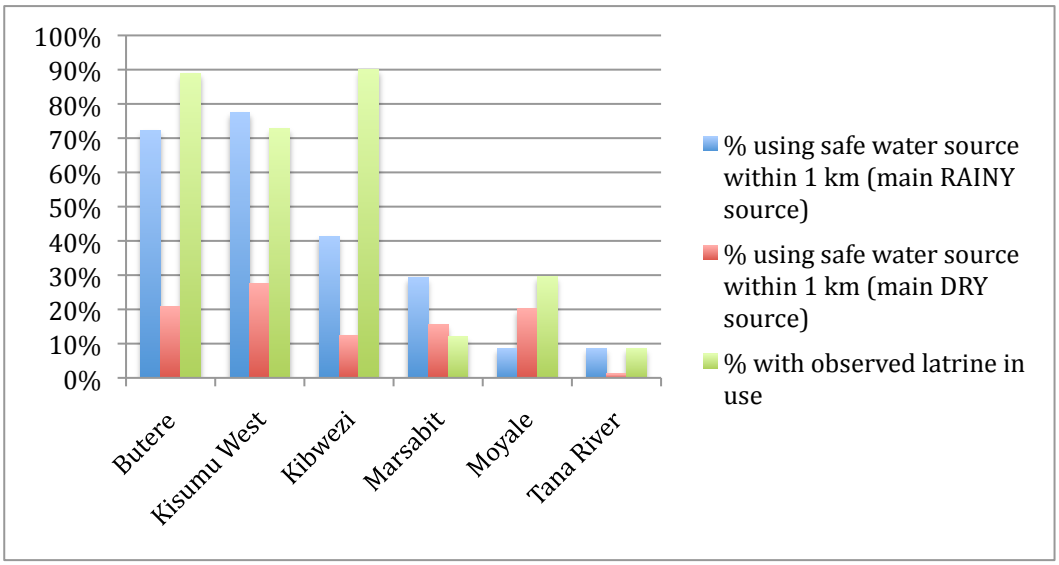

Figure 2 Water access and latrine coverage by district among intervention villages

Appendix A, Tables G, H, and I further depict the types of water sources used in each district. In the rainy season, the most common drinking water source overall is rainwater (35.2%), mostly due to the high availability of this source in the LWI program area. The most common drinking water source in World Vision's area is consistently a public tap, used by 39.6% and 50.1% of households in the rainy and dry seasons, respectively. The majority of households in FH and CRS program areas use surface water as the primary drinking water source in this season, making this the second most common source overall, used by 26.2%. In the dry season, households using a surface source increase to 40.1% overall, driven strongly by the 89.7% in Tana River that use this type of source. Surface water, which is highly unsafe for drinking due to contamination from runoff, was relied upon as a drinking water source by 70.5% of households overall for a

median two months in the past year. The CRS program area stands far above this average, with 98% reporting a median 7 months in which they relied on surface sources in the past year.

2.1.5: Average time to fetch water decreases (Table 2b)

This indicator from Table 2b above is complemented by Appendix A, Tables E and F, which show disaggregated travel time to rainy and dry season water sources as well as waiting time at the source. Distance to the source is also shown in these tables. The median total travel time required to fetch water from one's main drinking water source is 25 minutes in the rainy season and 70 minutes during the dry season. This includes travel to and from the source, plus any time spent waiting in a queue. Rainy season fetching time for LWI districts is near zero, in large part due to the high availability of rainwater in this area. The FH program areas stand in stark contrast to others, with median dry season water fetching time reaching as high as nine hours in Moyale District and three hours in Marsabit District. The FH districts span a very large geographic area, and much of Moyale is in the Chalbi Desert, where water sources are particularly scarce in the dry season.

Water usage

2.1.3/2.1.4: Average quantity of water used per person & % households saying quantity is sufficient for their needs (Table 2b)

Development practitioners seek to increase water quantities used for all household purposes because this allows for better personal and food hygiene. Overall, a median 15 liters of water per person per day are usedby respondents. Those living in LWI's intervention districts collect the mostwater, with 20 liters per person per day, while Marsabit households collect the fewest at 9 liters. The World Health Organization recommends that practitioners ensure 20 liters per person or a minimum of 15 liters in emergency settings to provide for drinking, hygiene, and food hygiene needs (WHO 2010).

Those who reported having sufficient water to meet their needs were 34.2%. Comparing indicators 2.1.3. and 2.1.4, there is no clear relationship between the actual quantity of water used and the perception of having sufficient water. The quantity of water used per person daily is not only a function of the water source characteristics, such as flow rate and distance to the source, but it also depends upon personal preferences and perceptions of how much is needed for things like bathing or washing, socio-cultural adaptations to water scarcity conditions, storage and carrying capacity, and potentially numerous other factors. Improving access to water may not change the average number of liters collected if community members are generally satisfied with the amount of water they currently collect.

Sanitation access, use, and quality

2.1.6/2.1.7/2.1.8: % households with observed latrine, % households in which all members over five years old use a latrine, & % households with clean latrines (Table 2c)

Enumerators observed latrines at 59.7% of households. Household sanitation coverage was lowest in Tana North (8.7%) and Marsabit (12%) and highest in LWI and WVI program areas.

Latrine quality was also observed. Overall, 47.4% have a household latrine with satisfactory cleanliness (no feces soiling the slab and no strong foul odor or swarms of flies).

Additional indicators related to sanitation are presented in Appendix A, Tables R through V. Table R shows the types of latrines observed, the majority of which are traditional pit latrines with low quality materials (46.1% of households overall). Table S shows that 26.1% of households in the MWP-K intervention areas are using a structurally unsafe latrine. This number reaches as high as 55.5% in Kibwezi. Only 2.5% of households overall had a latrine with a lid covering the pit hole at the time of the visit. Table T in Appendix A shows which household members do not use the household latrine, among those who have one. Respondents in 55.2% of households reported that all family members use a household latrine. In Tana North, 12.7% reported that the elderly do not use their household latrine, indicating this might be an important target group for latrine use promotion in this area.

MWP-K partners may be able to better target household latrine promotion activities with the knowledge of what the barriers are in their program areas. These are shown in Table V. Respondents without a household latrine were asked why they did not have one. In Kibwezi, 40.1% said the largest barrier was the lack of manpower, whereas the cost was the most important barrier for households in FH and CRS districts. The top reason for not having a latrine in Butere and Kisumu West was "other". Most who gave this response indicated that the soil quality was too poor or that their previous latrine had collapsed due to the same problem.

Hygiene facilities and behaviors

2.1.9: % households with observed soap or ash and water for handwashing next to their latrine (Table 2c)

Hand hygiene is a major challenge in all program areas, where less than one percent of households had a visible handwashing station near a latrine. Although water was available at some households, soap was not visibly present in almost all. Tables P and Q in Appendix A show additional information about hygiene. Respondents were asked to list the different times that they wash their hands to test knowledge of key hygiene behaviors. Knowledge of two key occasions for handwashing: after defecation and before eating, ranged from approximately one quarter of respondents in FH and CRS program areas to three quarters in the WVI intervention area and LWI's Butere. Reported handwashing before eating was high for all areas; however, it appears more behavior change promotion is needed for handwashing before food preparation, before feeding children, after changing a baby, and after defecation, given the low percentage of people saying they practice these behaviors.

Water treatment

2.1.10: % households that report treating their water (Table 2d)

It is particularly important that those using unsafe sources like surface water treat their water to make it safe for drinking. Even water from seemingly safe sources can be contaminated, or can easily become contaminated by dirty containers or dirty hands entering the container. Overall, 53.7% reported usually treating their water to make it safe. Appendix A, Tables J and K shed

light on the specific water treatment practices in each program area. When asked to specify whether they *always* treat their water, the number drops to 30.2%.

Overall, 33.3% reported usually using a chlorine-based treatment method such as Waterguard or PUR. Three quarters of households in Kisumu West reported usually treating their drinking water, with 63.3% saying they used a chlorine-based product. Natural treatment materials are those most commonly used in Moyale and Tana North. In Moyale 23.3% use alum, and 29.1% use it in Tana North to clarify turbid water. In Tana North, 21.9% also reported using moringa seed, a locally available flocculant. Each household was able to report multiple treatment methods, so percentages in Table K may exceed 100%.

Water storage and handling

2.1.11: % households with safe drinking water storage container & % respondents who do not dip hands into drinking water containers (Table 2d)

During the survey, enumerators asked respondents to fetch them a glass of water in order to observe the storage container and method for retrieving water. Ideal water storage containers have a narrow mouth and lid so that one's hand cannot enter and contaminate the water. Those with containers that allow hands to enter should pour water out or use a long-handled cup to retrieve water rather than dip their hand inside. The proportion of households with a narrow-mouthed storage container with a lid was 37.6%, and the proportion who did not dip their hands into the container when retrieving water was 51.0%. One can see that the numbers slightly correspond between these two indicators, as the type of container somewhat dictates how one retrieves the water. For example, narrow-mouthed water storage containers are used in 88.4% of homes in Marsabit, and nearly 100% practiced proper retrieval techniques during the demonstration. Conversely, only 14.3% in Kisumu West have appropriate containers, and 18.0% practiced proper retrieval techniques.

Productive use of water

2.2.1: % households that report using water for income generation/productive use (Table 2d)

Overall, 63.3% use water for any types of productive purposes. Appendix A, Table L depicts types of productive use activities reported. Livestock watering was the most common use in all program areas and is done by 48.4% of households. Productive use of water is highest in Kibwezi District (85.7%). Besides livestock, water is also commonly used for watering trees here. Each household was able to report multiple productive uses, so percentages in Table L may exceed 100%.

Water management satisfaction

2.3.3: % households satisfied with water management committee (Table 2d)

Households using water sources that are managed by a committee were asked whether they are satisfied with its performance and what specific reasons they have for dissatisfaction. Most were satisfied (73.4%). Table N in Appendix A shows that few expressed dissatisfaction with the amount of fees required to use the water source. Maintenance was the primary complaint by

11.4% of respondents, followed by financial management (7.9%). Respondents were able to report multiple reasons for dissatisfaction.

Results by wealth and vulnerability status

For some development projects, those who are already advantaged in some way may experience better access to program benefits by nature of their mobility, social connections, or financial means. We examined key indicators by wealth and vulnerability status in order to set a baseline to determine whether end-of-program benefits are experienced equitably. All households across all of the six districts were first combined and compared according to their possessions and divided into five wealth groups. The district with the largest proportion of its households falling in the poorest group was Marsabit (57.7%), followed by Moyale (29.2%), Tana North (9.3%), Kibwezi (0.1%), and Kisumu West and Butere, both with 0%. Table 3 displays the distribution of households in each district into each of five wealth quintiles.

Table 3. Percentage of households in each overall wealth quintile by district

	LWI		WVI	FH		CRS
	Butere	Kisumu West	Kibwezi	Marsabit	Moyale	Tana North
1. Poorest	0.0%	0.0%	0.1%	57.7%	29.2%	9.3%
2	1.4%	2.8%	2.4%	22.2%	40.8%	30.3%
3. Middle	21.6%	24.3%	4.6%	9.5%	22.6%	40.7%
4	45.6%	39.8%	36.0%	7.1%	5.6%	18.7%
5. Least poor	31.5%	33.1%	56.9%	3.6%	1.8%	1.1%

We also inquired whether each household had any members who were disabled, chronically ill, or orphaned in order to assess the degree of potential vulnerability of that household. Caring for people in any of these groups might represent an additional financial, time, productivity, or emotional burden. Overall, half of households have a member in at least one of these three groups. Butere and Kisumu West Districts, which will be served by LWI, have the highest proportion of households with vulnerable members, with numbers reaching up to 74.3% in Kisumu West. Particularly in households caring for a chronically ill family member, safe water, sanitation, and hygiene behaviors are of great importance.

Appendix B shows a breakdown of key logical framework indicators according to poverty level and vulnerability status in intervention villages. For this table, three groups are shown to represent the poorest, middle, and least poor groups. Different from the five-group division, these three groups were derived by comparing only households within the same district so that wealth is relative to the local context in that district. Three groups were used rather than five so that there would be a more sufficient number of households in each group to provide more reliable statistics. In Appendix B, vulnerability status refers to whether the household has a member in at least one vulnerable group (disabled, chronically ill, or orphan). This table is provided to help MWP-K partners identify groups that might be at higher risk of inadequate WASH behaviors and conditions and that might be important target groups.

Taking all program areas combined, more households are using safe water sources within one or two kilometers as one moves from the poorest to the middle to the least poor income groups. The overall median time required to fetch water in the rainy season is 30 minutes for the poorest and 10 minutes for the least poor in the rainy season. This difference is most likely driven in part

by the use of rainwater in wealthier households in LWI and WVI program areas. There are no strong trends in water quantity used according to poverty status. In all program districts, the percentage of households with an observed latrine increases moving from the poorest to the middle to the least poor income groups. All data combined depict latrine coverage at 51.2% among the poorest, 58.8% among the middle wealth group, and 70.4% among the least poor. In Butere and Tana North Districts, the percentage of households that treat their water with any method nearly doubles when comparing the poorest to the least poor groups. Other districts except Moyale also see similar, but less pronounced trends. More households in the poorest group overall (44.1%) have safe water storage containers (narrow mouth) compared to the least poor (32.1%). As expected, there was an overall trend in which fewer in the poorest group reported using water for productive uses (57.5%) compared to the middle (63.2%) and least poor (70.7%) groups.

Overall, more households with vulnerable people use a safe water source within one kilometer in the rainy season compared to those with no vulnerable members (58.7% compared to 35.8%). Kibwezi and Marsabit Districts drive this overall value while households in LWI districts have relatively equal access. This trend is weaker in the dry season, with 19.9% of vulnerable households and 12.6% of non-vulnerable households having access. There is no significant difference in the percent that feel their water quantity is sufficient based on vulnerability status, nor is the quantity collected largely different. Slightly more vulnerable households in LWI and WVI districts and Marsabit have latrines while the trend reverses for Moyale and Tana North Districts. Water treatment in Marsabit is twice as common in vulnerable households as it is in non-vulnerable homes (33.3% versus 17.4%). Water treatment is also practiced more in vulnerable Tana North households. The reverse is true of LWI districts and Moyale.

School survey

For the school survey, CARE visited each of its eight intervention schools, CRS collected data in its two schools, FH visited its 12 schools, and LWI and WVI visited five and ten schools, respectively. Although household data are presented by district, school data are presented by organization due to the small number of schools in the dataset. Complete results of the school survey are presented in Appendix C. Key logical framework outcome indicators are also shown in Table 4 below. Sampling was not used for schools, but rather, all intervention schools were visited. Therefore, no precision measures such as 95% confidence intervals are applicable to these data.

Enrollment characteristics

Combining data from all schools, the average enrollment is 492 pupils, made up of 215 girls and 277 boys on average, as shown in Appendix C. The gender balance is almost equal in the FH, LWI, and WVI schools, but in the schools that CARE and CRS will serve, there are half as many girls as there are boys.

Behavior change promotion and education

2.1.14/2.1.15: All schools conduct WASH education activities for pupils & % intervention schools with active health clubs

Even before implementation, all of CARE's schools were already actively engaged in teaching WASH in the past three months, and all have an active health club, which we defined as having done activities within the past month. In other program areas, only some schools already have some WASH education and active health clubs.

Table 4. Key logical framework indicators - School Data

Logical framework indicator	Specific variable	Total		CARE		CRS		FH		LWI		WV	
		n	Avg. or %	n	Avg. or %	n	Avg. or %	n	Avg. or %	n	Avg. or %	n	Avg. or %
2.1.14. All schools in which teachers are trained conduct WASH education activities for pupils	Teacher gave lesson about WASH in past 3 months	37	56.8%	8	100.0%	2	0.0%	12	58.3%	5	40.0%	10	40.0%
2.1.15. % intervention schools with active school health clubs (activities at least once per month) increases	Health club is active (did activity within last month)	36	61.1%	8	100.0%	2	50.0%	11	45.5%	5	40.0%	10	60.0%
*2.1.16. % where latrine cleanliness standard (no feces on slab and minimal odor and flies) is met in enough latrines to meet gov't quantity criteria for that student population increases**	No boys' latrines are of acceptable cleanliness (no feces on slab and minimal odor and flies)	34	32.4%	7	0.0%	2	0.0%	11	27.3%	5	40.0%	9	66.7%
2.1.16	# boys per acceptable latrine (among those with any acceptable latrines - no feces on slab and minimal odor and flies)	23	130.5	7	175.2	2	66.0	8	152.8	3	79.8	3	60.8
2.1.16	No observed girls' latrines are of acceptable cleanliness (no feces on slab and minimal odor and flies)	35	20.0%	8	0.0%	2	0.0%	12	16.7%	4	25.0%	9	44.4%
2.1.16	# girls per acceptable latrine (among those with any acceptable latrines - no feces on slab and minimal odor and flies)	28	134.1	8	93.1	2	66.4	10	176.1	3	106.0	5	159.9
2.1.17. % intervention schools with soap or ash and handwashing water available on a daily basis increases	Reports always providing soap or ash for pupils	37	0.0%	8	0.0%	2	0.0%	12	0.0%	5	0.0%	10	0.0%
Secondary, confirmatory indication of 2.1.17	Soap is observed at school	36	0.0%	7	0.0%	2	0.0%	12	0.0%	5	0.0%	10	0.0%
Secondary, confirmatory indication of 2.1.17	Has *no* hand washing water containers	36	55.6%	7	28.6%	2	50.0%	12	83.3%	5	40.0%	10	50.0%
Secondary, confirmatory indication of 2.1.17	Water observed in at least one hand washing water container	33	27.3%	7	28.6%	1	100.0%	12	0.0%	3	100.0%	10	30.0%
2.1.18. # months intervention schools provide water for pupils increases	# months water is available for pupils in school year	37	4.6	8	6.6	2	0.0	12	4.1	5	3.4	10	5.3
2.1.19. All intervention schools demonstrate improvement in at least one indicator of sustainability as measured by the "Enabling Environment for Sustainability" tool	"Sustainability score" combining one point for each sustainability indicator below	34	2.9	6	3.0	2	1.0	11	2.3	5	3.6	10	3.4
2.1.19	School has budget specifically for WASH	37	24.3%	8	25.0%	2	0.0%	12	16.7%	5	40.0%	10	30.0%
2.1.19	School used its own funds, community funds, or a community labor contribution to do anything related to WASH in past 3 months	35	51.4%	6	66.7%	2	0.0%	12	50.0%	5	40.0%	10	60.0%
2.1.19	SMC or community has been involved in planning, monitoring, or maintaining anything related to WASH in this school in the past 3 months	36	58.3%	7	57.1%	2	0.0%	12	41.7%	5	80.0%	10	80.0%
2.1.19	School has duty roster for latrine cleaning	37	83.8%	8	75.0%	2	100.0%	12	83.3%	5	100.0%	10	80.0%
2.1.19	Latrines are cleaned daily	35	57.1%	7	42.9%	2	0.0%	11	27.3%	5	100.0%	10	90.0%

*When calculating variables depicting number of pupils per *acceptable* latrine, some schools did not have any latrines meeting acceptable cleanliness criteria. Since one cannot create such a ratio with these schools (one cannot divide by zero), the percentage of schools with *no* acceptable latrines are shown on one line, and the pupils per acceptable latrine variable is shown on a separate line, including only those schools with at least one acceptable latrine.

Sanitation access and quality

2.1.16: % where latrine cleanliness standard is met in enough latrines to meet government standard

The Kenyan Government has set a standard for each school to have a maximum 25 girls per latrine and 30 boys per latrine. Appendix C, Table C shows that on average, none of the program areas come close to meeting this goal at baseline. The combined average number of boys per latrine is 102, and there are 99 girls per latrine. Beyond the mere availability of the latrines, actual usage depends in part upon the quality that is maintained by the school personnel and pupils. A school may have latrines that pupils do not use due to dirtiness, odor, insecurity, or lack of privacy. In addition, while some pupils may still use latrines that have been soiled with feces on the floor, using it presents a health risk to them, particularly in areas where not all pupils wear shoes. It may not be accurate to count such latrines in the pupil-to-latrine ratio. The MWP-K logical framework includes both an output indicator to address this basic pupil-to-latrine ratio and an outcome indicator to capture the ratio of pupils per latrine of acceptable cleanliness. The reason for this distinction is that while an implementing organization can control the number of latrines at the school, the cleanliness of school latrines is the responsibility of school personnel and pupils. Outcome indicators are those that measure the behavior of parties outside the implementing organization's direct sphere of control.

Enumerators observed each latrine block and recorded the level of odor, flies, and whether there was feces soiling the slab. They also noted problems with the security of the structure or privacy. Latrines with feces on the slab at the time of the visit, very foul odor, or swarms of flies were considered unacceptable and were excluded from the calculation of pupils per acceptable latrine. Table 4 shows that 32.4% of schools did not have any latrines of acceptable cleanliness for boys, and 20% did not have any acceptable latrines for girls. Taking the remaining schools with at least one acceptable latrine, the pupil-to-latrine ratio increases to 130.5 for boys and 134.1 for girls.

Beyond issues of cleanliness, enumerators also noted several latrine blocks with insecure structures or lack of privacy (holes in the walls or doors that would not close). These are noted in Appendix C, Table C. An average 40% of latrine blocks (i.e. structure with multiple toilet compartments) in the overall program area had at least one insecure stance (i.e. individual cubicle or stall), and 24.9% of latrine blocks had no private stances at all. These issues also affect some pupils' level of comfort in using latrines.

Hygiene materials

2.1.17: % schools with soap or ash and handwashing water available on a daily basis

Handwashing with soap is particularly important in schools, where pupils have numerous opportunities to spread germs to each other as they touch objects and people in the classroom and on the playground. Particularly in schools that do not provide materials for anal cleansing, there can be a higher risk of disease transmission among pupils. While some schools provide water, it is particularly challenging to sustain soap, which is essential for effective handwashing, at schools due to cost and occasional theft. We employed several measures to determine whether schools are providing handwashing materials each day. In the interview portion of the

survey, the head teacher or other respondent was asked whether they always, sometimes, or never provide soap for pupils to wash their hands. Enumerators then directly observed whether soap, water, and handwashing containers were available that day. As shown in Table 4 above, there was not one school in which the respondent said they always provide soap or ash for pupils. Appendix C, Table B further shows that the majority of schools (83.8%) never provide soap or ash. Soap cannot be used without containers and water, which are also lacking in many schools. There were no handwashing water containers in 55.6% of schools. Only 27.3% had at least one container with water in it for handwashing.

Water provision

2.1.8: Number of months intervention schools provide water for pupils increases

Drought conditions, distant sources, low storage capacity, and lack of prioritization are some reasons that schools face challenges providing water for pupils. Out of a nine month school year, the average number of months that program schools provide water for pupils ranges from zero in the two CRS schools to 6.6 in the eight CARE schools. The overall average is 4.6 months of water. Table A of Appendix C helps to explain these numbers. CRS schools, which do not provide water to pupils at all, do not have access to a water source within one kilometer. A high percentage of FH, LWI, and WVI schools have rainwater tanks, which make water provision more feasible. Excluding CRS, access to a water source within one kilometer ranges from 50% of WVI schools to 100% of LWI schools.

Sustainability environment

2.1.19: All intervention schools demonstrate improvement in at least one indicator or sustainability as measured by the "enabling Environment for Sustainability" tool

School WASH programs require continuous provision of water and hygiene materials and education, as well as continuous maintenance and repair of hardware. Several factors can influence the sustainability of these activities including budget, community involvement and support, knowledge of how to perform maintenance and repair, having clearly designated responsibilities, and the personal level of motivation in key leaders. Without an amenable environment for sustaining WASH programs, it is unlikely that benefits seen at the close of the program will continue to be realized long into the future. At the baseline planning workshop, CGSW shared a tool to help partners think about these issues together with school personnel and community leaders during the planning of their WASH programs. The baseline survey as well as future monitoring activities assess whether these factors suitable for sustainability are in place.

Table 3 depicts some of these factors that are theorized to improve sustainability. The two schools in which CRS will work lack several of these components. At present the schools do not have a budget specifically for WASH activities, the community has not been involved with WASH in the past three months, and latrines are not cleaned daily. The latter indicator is present because latrines that are not cleaned daily are more likely to be of unacceptable cleanliness and may not be used regularly by pupils. Most schools have a duty roster to ensure latrines are cleaned. We created a combined score by adding one "point" for each of the five sustainability criteria that the school meets. The combined average was 2.9. Schools were also asked whether their WASH facilities (storage containers, rainwater tanks, or latrines) required repair in the past

three months and whether they made necessary repairs. Appendix C, Table D shows that 29.7% of schools did not make required repairs to their WASH facilities. Nearly all of these schools cited the lack of funds as the reason. While these indicators are not comprehensive or certain measures of future sustainability, they may provide partners with a sense of some factors that could be addressed together with the school and community to help improve the likelihood of sustainability once the organization's support is no longer accessible.

Discussion and application

These baseline data will allow MWP-K partners to reflect on the current status of WASH access and behaviors in their program areas and can provide a basis for determining realistic targets for progress to be made as a result of the USAID SF424 program. Beyond this, data can be used to identify needs that the present and future projects might be able to address and can support future proposals. These baseline values will be compared to the same indicators collected after implementation is complete to determine the amount of progress made for each logical framework indicator. Those partners that collected data in non-intervention areas will be able to see changes in their intervention areas compared to changes in non-intervention areas for a more robust evaluation conclusion. Certain household indicators will also be examined according to poverty and vulnerability status to gain an understanding of whether program benefits were equitably distributed among these groups.

Results shared in this report can also help MWP-K partners reflect on their current program activities to determine whether adjustments could be made to improve outcomes. For example, in areas where lack of knowledge, manpower, or finances were reported as common reasons one has not constructed a latrine, partners may want to assess whether their programmatic approaches will provide a means to overcome the stated barriers. Partners may wish to enhance plans for hand hygiene education in districts where knowledge of key handwashing occasions is low. In areas where unsafe storage containers are common, partners may, for example, consider investigating which alternative, safe containers would be locally acceptable and incorporate a related promotion strategy into their program. Another example can be drawn from the school results section, which showed that one third of schools do not have any boys latrines meeting the program's cleanliness standards, and one fifth have no acceptable girls latrines. Remaining schools had 130.5 boys and 134.1 girls per acceptable latrine, falling far short of government standards. While MWP-K partners will work to construct latrines at intervention schools, they may also want to consider a strategy for bringing unacceptable latrines back in line for use in order to improve ratios of pupils per usable latrines. Since most children use the sanitation facilities for urination, urinals can be another cost-effective way to ease congestion at latrines and lessen maintenance needs. Working with the school to improve their latrine maintenance regime or small structural repairs may be a simple, inexpensive strategy with large benefits for this indicator. The above are merely examples, and each partner must reflect on the meaning and relevance of results for their own programs.

One of the most striking statistics from the household survey is the lack of soap for handwashing and lack of a handwashing station for more than 99% of households overall. This represents a large challenge for partners to overcome to see progress for this important indicator. Further investigation may be needed to understand why hygiene after defecation is not prioritized. It is likely a combination of factors. Some households with poor water access may ration water such

that hygiene is not prioritized. Others may lack education about the importance of soap, among other reasons. Knowing the barriers may help partners focus their efforts on the most effective strategies.

A similar gap in handwashing was also observed in schools, where 84% of headmasters reported never providing soap and handwashing water. This is particularly a concern because children can easily transmit germs to each other at school. If more children are drawn in to use new latrines that are installed as a result of this program, there may be a risk of increasing hand contamination and transmission of fecal pathogens if pupils don't have access to handwashing facilities. Partners should consider how all components of school WASH programs could work in tandem.

Many schools lack some components that may relate to their ability to sustain their WASH programs, such as community involvement, a WASH budget, or daily latrine maintenance. Partners are encouraged to reflect on these and other known elements that could improve the longevity of WASH provision beyond the life of this program and discuss ways to address them together with key school and community figures.

Sampling methods were designed to be sufficiently rigorous to provide statistics that are representative of each partner's program impact area. Due to the sampling and collection of data in non-intervention areas, FH has data that are representative of both Marsabit and Moyale Districts, CRS has data representative of the entire location in which they work, and WVI has data representative of MtitoAndei Division. If the same methods are used to collect data following the completion of program activities, it is hoped that the sample size is sufficient to demonstrate change with statistical significance (i.e. changes that cannot be attributed to chance) for many key indicators such as access to a safe water source within one kilometer and presence of a household latrine.

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