Baseline Survey Findings

Svay Leu, Cambodia
August 10, 2016

I. BACKGROUND

In April 2016 Lifewater began a project in the Siem Reap province of Cambodia. Over 3 years the program will operate in 26 villages across 3 communes in Svay Leu District: Kon Tout, Svay Leu, and Taseam. Lifewater will reach all households in the 26 villages, as well as 6 primary schools in the district, for a total of approximately 28,000 people. Lifewater will use its Vision of a Healthy Village strategy to reach vulnerable children and families with improved WASH access and WASH-related behavior change. Major planned activities for the project are as follows:

- Construct or rehabilitate water points including 18 ponds and 52 wells in communities and 6 wells at schools
- Provide access to treated drinking water through 1,898 household ceramic filter rebates for the poorest
- Construct 6 school latrine blocks (of 6 doors each) and provide access to HH sanitation through 1,898 latrine rebates
- Install 6 handwashing stations at schools
- Implement CLTS triggering campaigns in each target community
- Train and activate WASH facilitators to visit all HHs in village monthly for training and monitoring in progress toward Healthy Home certification
- Train water committees and school support committees (SSCs) in WASH/VHV
- Support local government leaders in holding commune-wide awareness-raising activities and prioritizing WASH

Table 1: Planned Activities

	Community		Household			School		
Year	**Well repairs**	**Ponds**	**Ceramic filters**	**Latrines**	**Ball tanks**	**Wells w/ elevated tanks**	**Latrine doors (6/school)**	**Handwashing stations**
2016	8	6	219	219				
2017	25	6	803	803	20	3	18	3
2018	19	6	876	876	75	3	18	3
Total	**52**	**18**	**1,898**	**1,898**	**95**	**6**	**36**	**6**

II. METHODS

The purpose of this baseline report is to learn about WASH behavior, knowledge, and attitudes/beliefs of the population in the program target areas. This will inform program activities and behavior change messaging. In addition, the baseline will be compared to an endline survey to determine whether the program achieved its objectives. For this baseline analysis, the following data were used:

- ***Household survey*** conducted in July 2016: Lifewater staff surveyed 384 households, capturing data electronically through mobile phones and uploading the data into the Akvo system. Sample households were selected from the 3 target communes, with the number of samples

determined using probability proportional to population size. Which communities to sample and how many from each location was determined prior to conducting the survey, and households were selected randomly at the time of the survey using the "spin a bottle" method. There were 144 households sampled in Kon Tout Commune, 149 in Svay Leu Commune, and 91 in Taseam Commune. Lifewater HQ analyzed the survey data using Excel. Lifewater HQ drafted the baseline report and received feedback and contextual information from field staff.

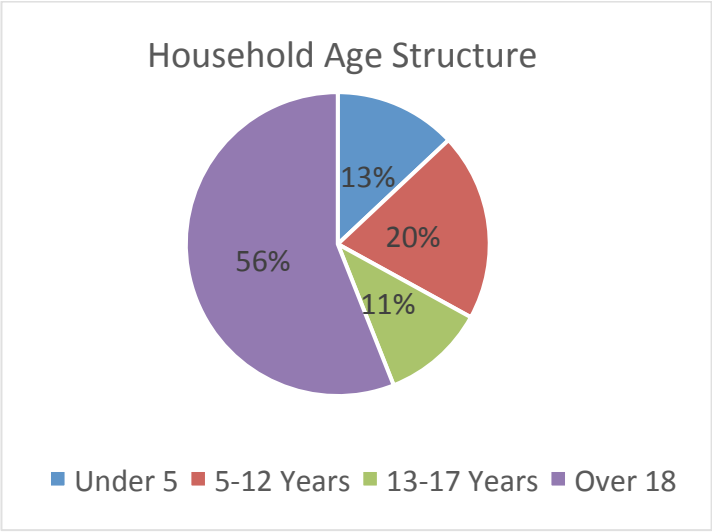
- ***Focus group discussions*** conducted in July 2016: Lifewater Svay Leu District staff completed 12 focus group discussions (FGDs): 4 groups of men, women, male students and female students in each of the 3 project communes. Relevant information has been integrated into this baseline report.
- ***NOTE***: In July 2016 Lifewater staff also completed a survey of 8 potential target primary schools in the communes. A separate report has been written that details the WASH situation at each of these schools.

III. RESULTS

A) Respondent Characteristics and Household Age Structure

- *Respondents:* Of total respondents, 63% are female. The average age of respondents is 42 years. Overall, 35% are designated ID Poor 1 and 39% are ID Poor 2 for a total of 74%. The poorest commune is Kon Tout with 78% saying their household is ID Poor, compared to 76% in Svay Leu and 67% in Taseam.
- *Respondent Education Levels:* Education levels are very low, with 60% of respondents saying they have had no formal education. 24% have attended some primary school, just 8% have completed primary, and 8% have had some secondary school or more. Males are more likely to have received some formal education, with 46% having attended at least some primary compared to 36% of females. Education levels are the lowest in Svay Leu, with 65% of females and 68% of males having never attended school.
- *Family structure:* The average family size is 5.0 people. Households have an average of 0.7 children under 5 years old, 1.6 youth ages 5-17, and 2.8 adults 18 and older. Overall, 13% of the population is under 5 years old, 44% is under 18, and 56% is over 18. See Figure 1 below.

Figure 1: Household Breakdown by Age



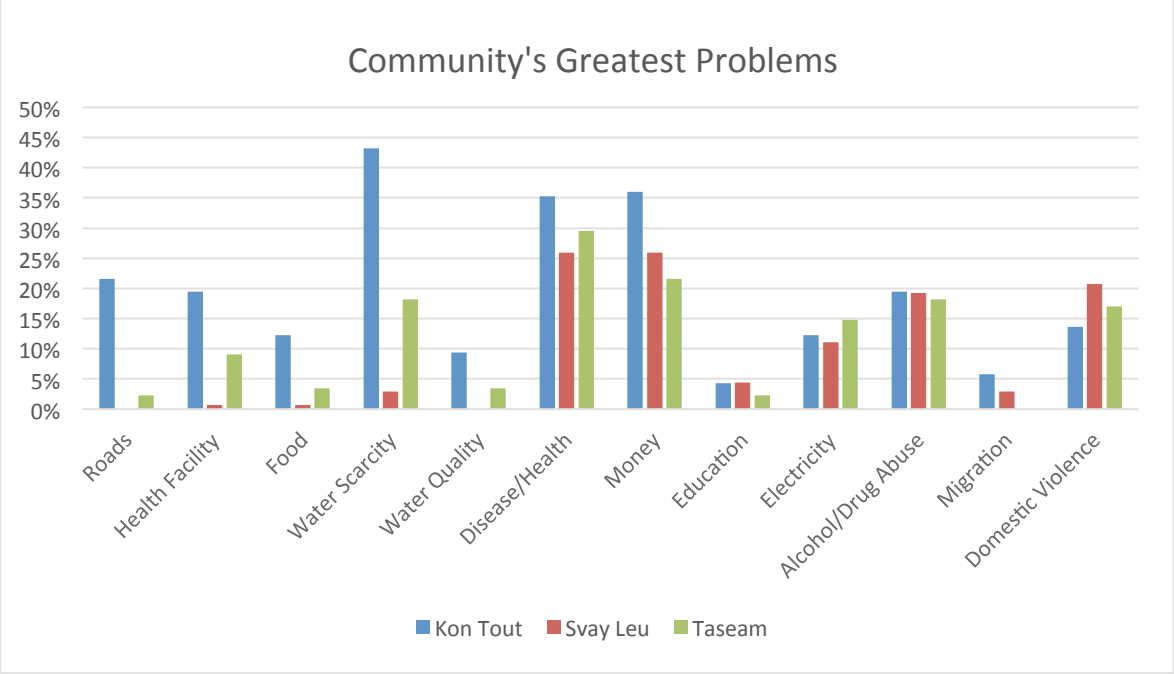
B) Education and Economic Activity

- *Enrollment:* Overall, 89% of children age 5-12 and 75% of those age 13-17 are enrolled in school. Younger children are more likely to be enrolled, and males are more likely to be enrolled, especially in the 13-17 year old category (77% of males compared to 72% of females age 13-17). When asked why their child/children are not enrolled in school, the most common reason was the child is supporting family with labor (74%). 36% said there are not enough funds and 28% said the child is engaged in daily labor.
- *Female economic activity:* 89% of women are engaged in some form of economic activity, primarily smallholder crop cultivation (49%) and day labor/plantation (46%). 25% are working with livestock/animals.
- *Household wealth:* When asked how their household wealth has changed since last year, nearly half said it decreased (48%), 14% said it increased, and 37% said it stayed the same. Nearly two-thirds (63%) said they did not have enough income for living during the past year and the average number of months of income shortage was 4.2.

C) Community Resources and Challenges

- *Greatest resources:* When asked to name the greatest resources of the community, the most common responses were agriculture/crops (33%), water (19%), and infrastructure (15%). In Svay Leu 30% said water, compared to just 8% in Kon Tout. Respondents were only able to provide one response to this question because of a mistake in the data collection system.
- *Greatest problems:* When asked about the community's greatest problems, the most common responses were disease/poor health (30%), money/poverty (29%), and water scarcity (22%). Concern about water scarcity varied by commune, with 43% in Kon Tout, 18% in Taseam, and only 3% in Svay Leu saying it is one of the community's greatest problems. Water quality is less of a concern than scarcity at just 4% overall. Notably, 19% said alcohol/drug abuse and 17% said domestic violence. Respondents were allowed multiple responses to this question.

Figure 2: Greatest Problems in the Community

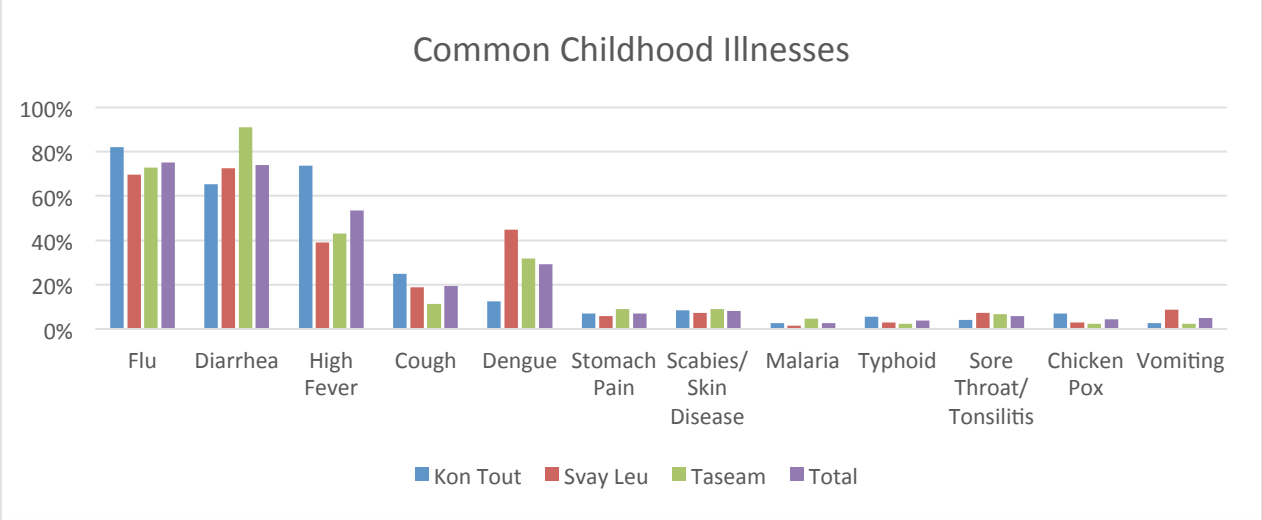


- *Most significant change:* When asked the most significant change in the community in the past year, 63% of respondents said roads. 24% said no change, 20% said pond, and 18% said school construction.

D) Health and Diarrhea

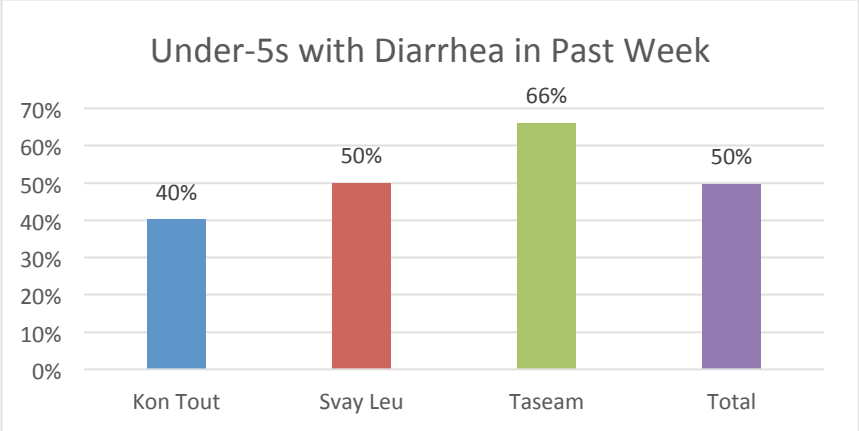
- *Child health:* Respondents reported that the most common illnesses among children under 5 in their household are flu (75%), diarrhea (74%), high fever (54%), and dengue (29%). Diarrhea was of most concern in Taseam, where 91% said it is a common illness among their children. When asked how the health of their children has changed in the past year, 34% said it declined, 33% said it improved, 33% said it stayed the same. Responses were less positive in Svay Leu, where 23% said it improved and 38% said it declined. Focus group participants agreed that the children in their communities are not healthy.

Figure 3: Most Common Illnesses in Under 5s (Perceived)



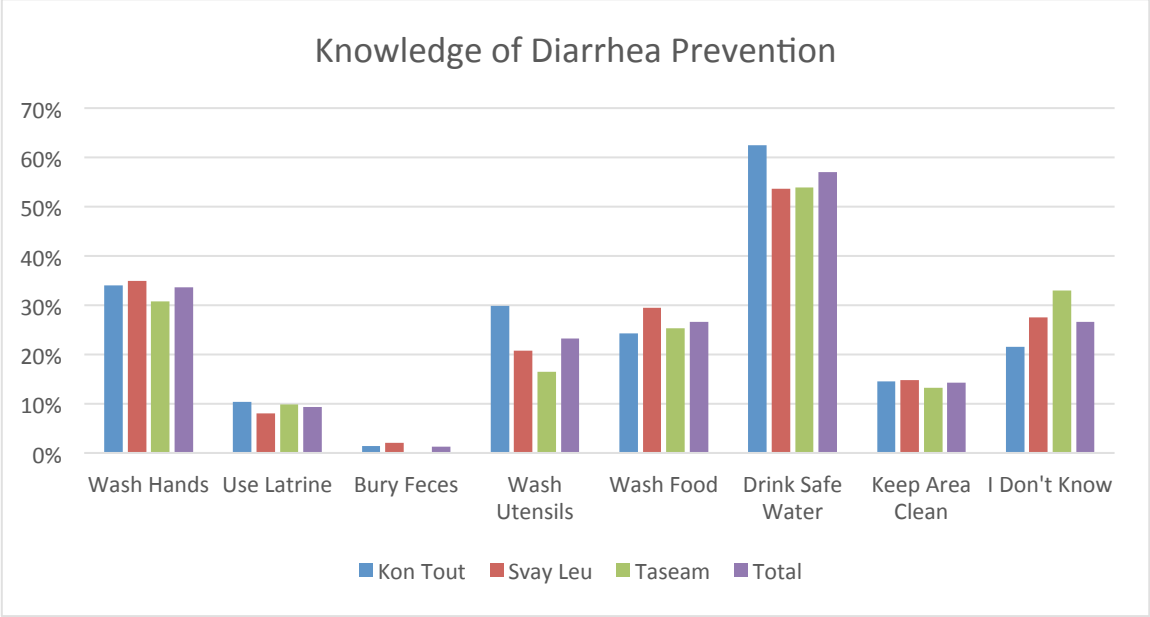
- *Child diarrhea:* Diarrhea prevalence was very high in all communes. Overall, 50% of children under 5 had diarrhea in the 7 days prior to the survey (a measure of point prevalence). The rate was highest in Taseam at 66%, compared to 40% in Kon Tout and 50% in Svay Leu.

Figure 4: Diarrhea Incidence in Children



- *Careseeking and treatment:* When the child had diarrhea, 44% said they gave the child ORS (oral rehydration solution) and 3% gave a homemade ORS (sugar-salt solution). Overall, 76% gave the child the same or more to drink and eat, which is recommended for home treatment of diarrhea. Of those with diarrhea who are breastfeeding, 91% continued to receive breastmilk during their diarrheal episode. In focus group discussions, participants said caregivers often take children to the hospital/clinic and offer traditional Khmer medicines.
- *Missed school:* Overall, children in the household missed 1.9 days of school in the 2 weeks prior to the survey due to illness (all children in the household combined). This number was highest in Svay Leu at 2.1, compared to 1.8 in Kon Tout and 1.4 in Taseam.
- *Respondent health:* When asked how their health has changed in the past year, 43% said it declined, 21% said it improved, and 36% said it stayed the same.
- *Medical expenses:* The average amount of medical expenses in the 4 weeks prior to the survey was 140,079 riels ($34.20 USD) per household. The amount was highest in Kon Tout at 155,529 riels ($37.97 USD).
- *Diarrhea prevention:* When asked how to prevent diarrhea, 27% overall said they do not know. Most respondents know that drinking safe water can prevent diarrhea (57%), but knowledge about hygiene- and sanitation-related prevention methods is low. Just 9% said using a latrine, 34% said washing hands, 27% said washing food, and 23% said washing utensils.

Figure 5: Knowledge of Ways to Prevent Diarrhea



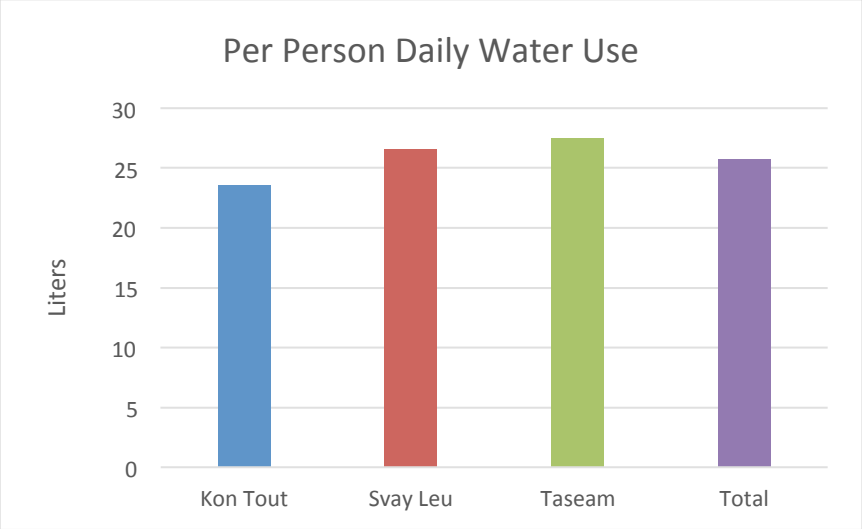
E) Water Usage

- *Daily water usage:* The average household uses 6.4 20-liter containers/jerry cans per day, which means 128.4 liters per household. Considering average household size, this is 25.7 liters per person per day. This amount is greater than the 20 liters/person/day minimum for consumption and basic hygiene recommended by WHO.[1] Average per person daily water use is highest in Taseam at 27.5 liters, followed by Svay Leu at 26.6 liters and Kon Tout with 23.6 liters. Overall, 87% of respondents said they had a shortage of water during the past year, and the average

[1] http://www.who.int/water_sanitation_health/emergencies/qa/emergencies_qa5/en/

number of months was 5.6. The shortage was longest in Svay Leu at 6.9 months, followed by Taseam at 5.1 months and Kon Tout at 4.5 months.

Figure 6: Daily Water Usage



- *Water fetching:* Adults, both male and female, are the most likely to fetch water for their families. 84% of respondents said adult men fetch the water, 83% said adult women, 7% said female children, and 4% said male children.
- *Water as income:* 11% of respondents said they use one of their water sources for income. The type of source most commonly used for income is a constructed pond (54%). The water is used for raising animals (94%), vegetable gardens (62%), and alcohol brewing (10%).

F) Drinking Water Sources

Table 2: Drinking Water Sources

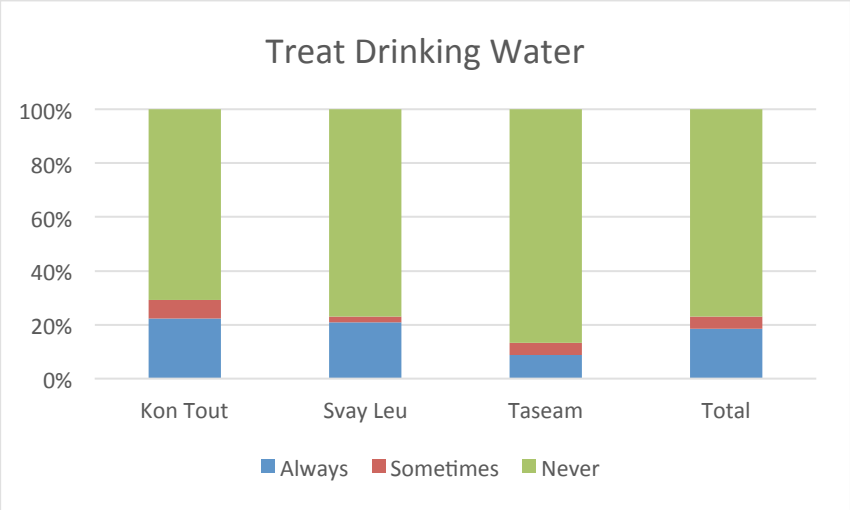
		Dry Season		Rainy Season	
		Primary	Secondary	Primary	Secondary
Drinking Water Sources	Constructed Pond	**41%**	**33%**	10%	18%
	Drilled Well	16%	20%	7%	10%
	Unprotected Spring	13%	19%	7%	13%
	Surface Water	13%	11%	3%	7%
	Cart/Truck with Tank Drum	7%	8%	1%	1%
	Unprotected Well	4%	3%	1%	3%
	Protected Spring	3%	1%	1%	1%
	Rainwater Jars	1%	5%	**64%**	**41%**
	Bottled Water	1%	2%	1%	1%
	Rainwater Tank	0%	0%	4%	5%
Why This Source	Convenient	**28%**	3%	**52%**	**54%**
	Clear/Good Color	23%	**31%**	**43%**	**30%**
	No Smell	22%	**30%**	**32%**	**34%**
	Abundance of Water	**25%**	**32%**	10%	13%
	No Other Options	**26%**	9%	6%	9%
	Good Taste	17%	**26%**	**42%**	**37%**
	Health/Avoid Illness	1%	3%	4%	7%
	Doesn't Take Long Time	6%	9%	**28%**	**29%**
	Tradition	12%	9%	3%	9%
Average Time to Source (Minutes)		31	38	9	11
Average Distance to Source (Meters)		1270	1028	175	302
Have a Secondary Source			52%		73%
How Often Use Secondary Source	Always/Daily		44%		26%
	Often/Few Times Per Week		17%		21%
	Sometimes/Every Week		35%		49%
	Rarely		4%		5%
Treat Water Before Drinking		28%	20%	20%	21%
Pay for Use		12%	10%	3%	3%
Average Paid (Riel)	Upon Fetching	10,093	10,100		
	Per Month	14,625	20,833		

- *Dry season:* During the dry season, constructed ponds are the most common source of drinking water, followed by drilled wells and unprotected springs. Just 12% pay for their water source and 28% treat the water before drinking. The average distance is more than 1000 meters and it takes about a half hour to get there. Svay Leu has the highest use of protected sources during the dry season (primary source) at 35%, compared to 23% in Kon Tout and 25% in Taseam. In Kon Tout, the most common sources during the dry season are constructed ponds, surface water, and drilled wells. In Svay Leu, common sources are unprotected springs, constructed ponds, drilled wells, and surface water. In Taseam, common sources are constructed ponds and drilled wells.
- *Rainy season:* During the rainy season, most people use rainwater jars. Just 3% pay for their water and 20% treat the water before drinking. The average distance to the source is 175 meters and it takes about 10 minutes to get there. If you exclude those who use rainwater jars, since those are typically located at a person's house, then average distance is 421 meters and average time to get there is 19 minutes. Svay Leu has the highest use of protected sources during the rainy season (primary source) at 23%, compared to just 10% in Kon Tout and 16% in Taseam.
- The most common reasons for choosing the dry season sources are convenience, clear/good color, no smell, abundance of water, taste and no other options. In the rainy season, the most common reasons are convenience, taste, clear/good color, no smell, and doesn't take a long time. All of these reasons are related to convenience/opportunity, appearance, and taste. Very few people choose their source for health/avoiding illness.
- Few people pay for their water source, but those who do pay about $3.50-$5.00 per month or around $2.50 upon fetching. Payment is more common during the dry season.

G) Water Treatment and Storage

- *Treatment frequency:* Overall, 19% of respondents said they always treat their drinking water before consumption, 4% said they treat it sometimes, and 77% said they never treat their drinking water. Among those who do not treat their water, the most common reasons were time/laziness (52%), belief that the water is safe (33%), treatment products are unavailable (31%), and tradition (26%).

Figure 7: Frequency of Water Treatment

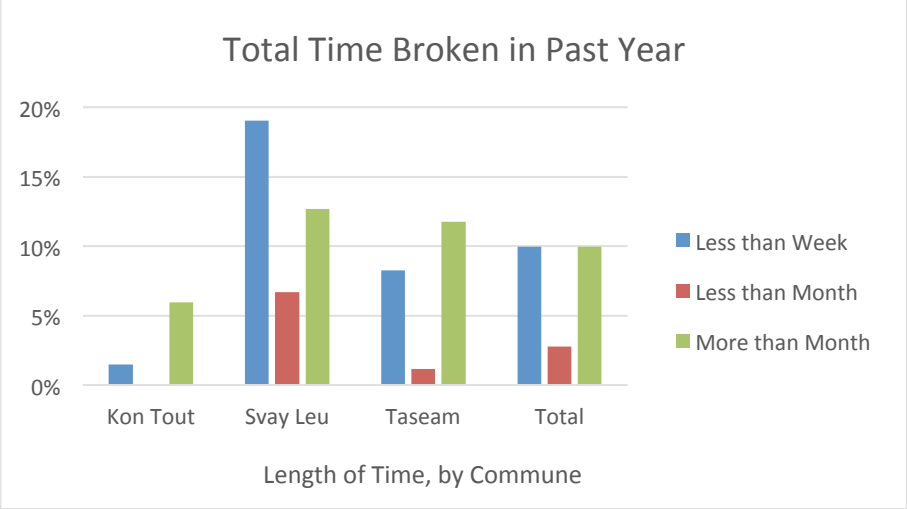


- *Treatment methods:* Boiling is the most common treatment method (81%), followed by ceramic filters at 17%. Ceramic filters are most popular in Svay Leu (31%).
- *Water containers:* Enumerators observed containers that households use to transport and store their drinking water. Few households practice safe water transport and storage. Of all containers used for transporting water, 18% were covered and narrow-mouthed. Of containers used for storing water, just 4% were covered, narrow-mouthed, and clean. (Cleanliness was not asked about the containers for transport.)

H) Water Source Management, Functionality, Treatment

- *Source management and performance:* Just 20% of respondents said their community has a water committee. This was highest in Svay Leu at 38%. In Kon Tout, just 6% said they have a committee. Of all those who said their community had a committee, 57% said the committee is for a specific source while 35% said it is community-wide. When asked which sources the committee is supposed to manage, the most common responses in Kon Tout and Taseam were constructed pond and drilled well. In Svay Leu, respondents said unprotected and protected springs.
- *Committee performance*: Of those with a committee, 57% said its performance is good, 35% said it is fair, 4% said it is poor, and 3% said it is not active. The primary reasons for a good performance rating were that the committee performs proper maintenance and repair (65%), there is good community participation (65%), and the source is kept clean (30%).
- *Functionality:* 22% of respondents said one of their drinking water sources broke down during the past year (8% in Kon Tout, 21% in Svay Leu, and 37% in Taseam). Of total people surveyed, 10% had their drinking water source broken for less than a week during the year, 3% had theirs broken for less than a month, 10% had theirs broken for more than a month, and 78% did not have theirs break down at all.

Figure 8: Water Source Functionality



- *Repairs:* Among those who had a water source break during the past year, one-third said no one repairs the source when it breaks (33%) and another 32% said it is repaired by the water committee. 21% said repairs are done by the community. In Svay Leu, 46% said the water

committee performs repairs while this response was 9% in Kon Tout and 6% in Taseam. In Kon Tout, 82% said no one performs repairs.

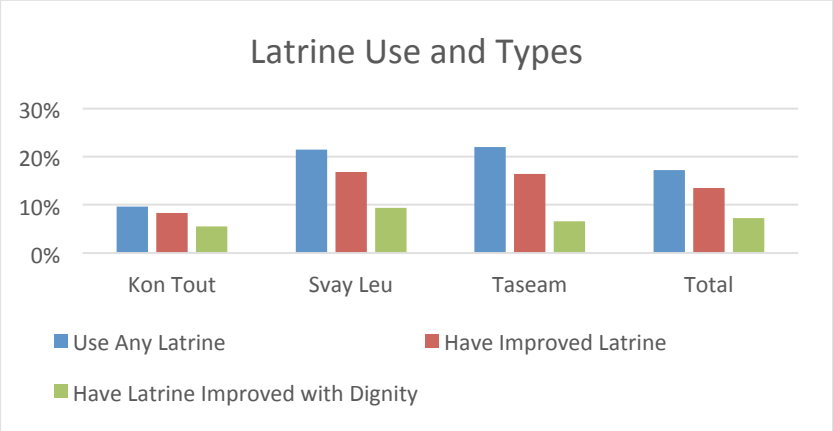
I) Compound Cleanliness

- *Trash disposal:* The most common methods of trash disposal are burning (58%) and scattering/littering on the ground (55%). Just 2% of households use a rubbish pit/pail and 7% use a community garbage pit.
- *Feces/rubbish around compound:* 64% of households had feces and/or rubbish visible around the compound. This was highest in Taseam at 75%, compared to 53% in Svay Leu and 69% in Kon Tout. Those who do not use latrines were more likely to have feces and/or rubbish around the compound (67% vs 52% of latrine users).
- *Child feces:* When asked what happens with the feces of children under 5 years old, 63% of respondents said the children practice open defecation. 23% said the children dig and bury their feces. Just 11% said all children use the latrine and 4% said they put the feces in the latrine. 23% of respondents think child feces is less dirty than adult feces, 60% think it is the same level of dirtiness, and just 14% think child feces is dirtier.

J) Latrine Use, Types, Maintenance

- *Latrine use:* Overall, 17% of respondents said those in their household defecate in a latrine and 83% said they do not use a facility for defecation. Of total people surveyed, 16% said their household *always* uses a latrine for defecation. Of those who said their household uses a latrine, 97% said it is used by the women, 95% said men, 72% said children, and 57% said the elderly. Of those who use a latrine, 17% said it is shared with other households. Among those who share, the average number of households using the latrine is 5.1. The average is highest in Svay Leu at 7.2, compared to 2.0 in Kon Tout and 3.3 in Taseam.
- *Latrine types:* Enumerators observed 65 total latrines (representing 17% of households surveyed). Of all surveyed households, 14% had an improved latrine (i.e., pour-flush to an enclosed tank, not shared between households). Just 7% had latrines that are "improved with dignity" (an improved latrine that also has whole walls, a whole roof, and complete privacy). In Kon Tout, just 8% had an improved latrine and 6% had one that is improved with dignity. Svay Leu is the highest, with 17% improved and 9% improved with dignity. All observed latrines were pour-flush and 71% had water available. The bowl was ceramic in 69% of latrines and cement in 31%. Most floors were made from tile and cement (37%), followed closely by cement (34%) and natural material (29%).

Figure 9: Latrine Usage and Latrine Types

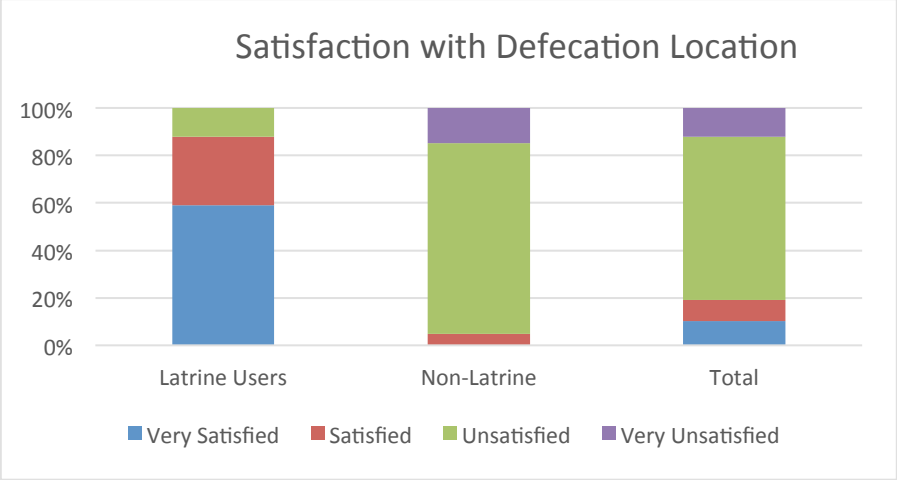


- *Latrine location:* Of observed latrines, 69% were located less than 10 meters from the household. Another 25% were within 10-30 meters. Most latrines were elevated: 26% elevated less than ½ meter, 37% at ½ meter, 6% at 1 meter, and 26% more than 1 meter. In this area, elevating latrines is important to reduce damage caused by flooding.
- *Latrine maintenance*: Latrines were generally well maintained. Of all observed latrines, 77% were clean, 74% had no smell, and 55% had no flies. Most had whole walls (68%), a complete roof (63%), and complete door/privacy (65%). 88% appeared to be used regularly.

K) Latrine Attitudes

- *Reasons for having or not having latrine:* Of those who do not have their own latrine, 99% said it is because latrines are too expensive. Of those with a latrine, 64% said they bought/constructed one because they became aware of the importance. Others said they were motivated by visitors coming into town (35%), a program offering a subsidy (24%), and a program offering training on how to construct one (18%).
- *Difficulty to build:* Almost half of respondents think it is very difficult to build your own latrine (46%). 28% of respondents said it is easy to build a latrine, 25% said it is moderately difficult, and just 1% said it is very easy. Whether someone currently uses a latrine did not make a difference in perceived difficulty.
- *Satisfaction:* When asked how satisfied respondents are with their place of defecation (both latrine users and non-latrine users), 10% said very satisfied, 9% said satisfied, 69% said unsatisfied, and 12% said very unsatisfied. This differed greatly between latrine users and non-latrine-users. Of those who use a latrine, 59% are very satisfied and 29% are satisfied, while 96% of non-latrine-users are either unsatisfied or very unsatisfied.

Figure 10: Defecation Location Satisfaction



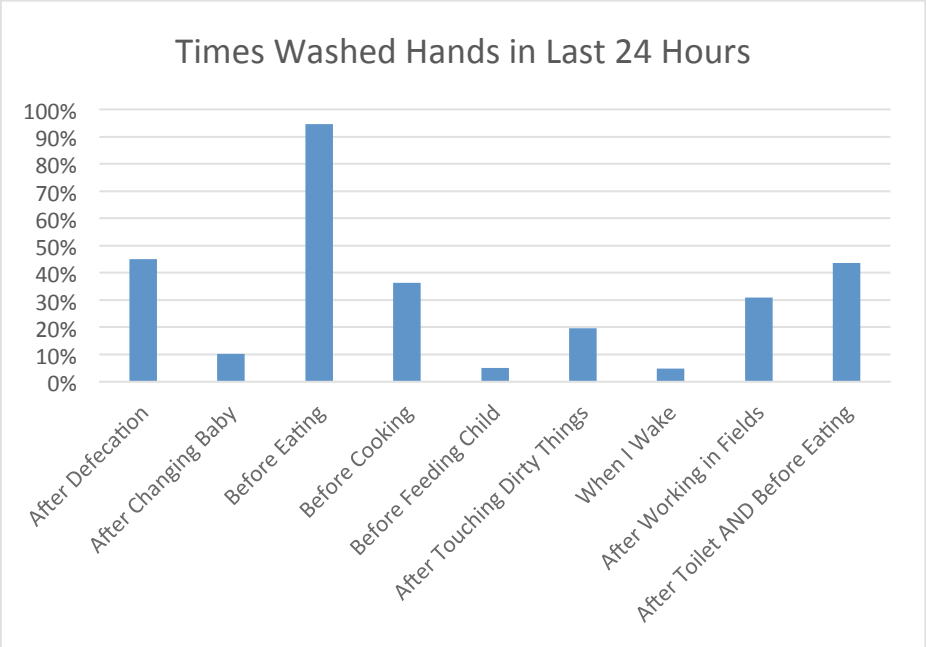
- *Latrine benefits:* The most common perceived benefits of using a latrine are safety (55%), health/disease prevention (47%), cleanliness (46%), comfort (37%), and privacy (27%). Those who use a latrine gave more benefits than those who do not. Latrine users were more likely to say that health/disease prevention is a benefit (61% vs 44% of non-latrine-users), and they were also more likely to say comfort (42% vs 36%), safety (62% vs 54%), and providing for guests (12% vs 3%).

- *Disadvantages of defecation location:* Among latrine users, the most common perceived disadvantages include bad smell (30%), attracts flies (23%), and work/effort to maintain (17%). However, 38% of latrine users said there are no disadvantages. Among non-latrine-users, the disadvantages include bad smell (70%), attracts flies (53%), safety (47%), brings shame (31%), and lack of privacy (28%). Just 1% said there are no disadvantages.

L) Hygiene

- *Handwashing station observation:* Of all households surveyed, just 1% had an appropriate device with necessary supplies (i.e., soap or ash and water) that they showed to enumerators. Enumerators observed a total of 134 handwashing stations, reflecting 35% of the total households surveyed. Of the observed stations/devices, 72% had soap or ash and water, but 95% reused water (i.e. bowl, basin) and would thus not be considered an appropriate device. The most frequent number of devices per household was 1 in Svay Leu and 2 in Kon Tout and Taseam. Most were located inside or near the cooking area (61%) and just 10% were close to the latrine.
- *Handwashing practice (reported):* Overall, 77% of respondents said they washed their hands in the 24 hours prior to the survey and 49% said they used soap or ash. 27% said they used soap/ash and washed at the 2 most critical times for disease prevention (after defecation and before eating). This was the highest in Svay Leu at 30% and lowest in Taseam at 22%.
- *Times for handwashing (practice):* 34% of those surveyed said they washed their hands at the 2 most critical times (with or without soap). Among those who washed their hands, the most common times were before eating (95%), after defecation (45%), and before cooking (36%). Among those who care for children, just 8% said they washed their hands after handling child feces/changing the baby and 5% washed before feeding or breastfeeding their child. Among those who prepare food, 27% said they washed before cooking or handling food.

Figure 11: Times for Handwashing

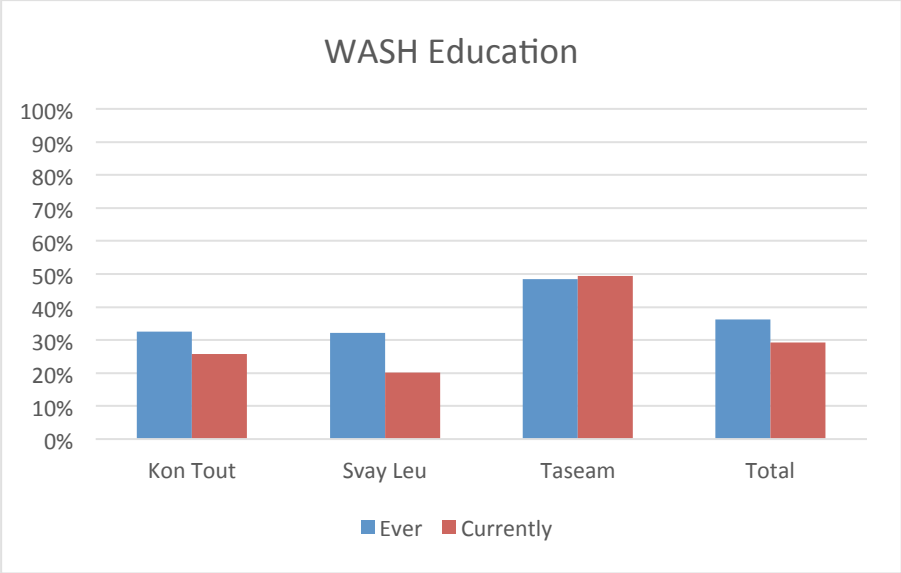


- *Handwashing benefits*: The most commonly reported benefits of handwashing were removes dirt/makes hands clean (79%), removes germs (61%), and prevents disease/diarrhea (34%).

Those who washed their hands in the past 24 hours were more likely to say that handwashing removes germs and is good for health/wellbeing than those who didn't wash. 14% of non-washers don't know any benefits of handwashing, compared to just 3% of washers.

- *Handwashing difficulties:* When asked what makes handwashing difficult, half of respondents said there are no difficulties (51%). 26% said they are too busy/not enough time, 21% said they lack water, 18% said the cost of soap, and 17% said they forget. Just 6% said handwashing is not important/there is no need. Interestingly, 64% of non-washers said there are no difficulties compared to 48% of washers.
- *Bathing:* Nearly everyone reported washing their body every day (99.7%). The most common sources of water for bathing are constructed ponds (42%) and drilled wells (26%).
- *Dish washing and drying:* 24% of surveyed households have a dish drying rack and 85% of those are raised off the ground and out of reach of animals. Overall, 20% of households had a raised drying rack. When asked where the household members dry dishes, 73% said in a basin/bucket/basket, 18% said a drying rack, and 7% said on a table. 76% of respondents said they use soap and water to wash their dishes and utensils, and 23% use water only.
- *WASH education:* Just over one-third of respondents (36%) said they have ever received hygiene/sanitation education and 29% said there is currently someone teaching hygiene/sanitation in their community. Among those who said there is WASH education happening in their community currently, 79% said it is being taught by another NGO and 22% said the education is provided by community health workers.

Figure 12: Received Education in WASH



IV. DISCUSSION

Education/Economic Activity

Communities in the target communes are very poor, with three-quarters saying they are ID Poor 1 or 2. The average respondent age was 42, which is higher than might be expected. This might be due in part to younger adults going to cities, factories, or Thailand for work. Respondents have low levels of education, with 60% never receiving any formal education. Children are attending school at higher rates than their parents, but one-quarter of those 13-17 years old are not in school with the majority instead working to support their families. Still, households are struggling to meet their needs. Nearly two-thirds of respondents said their household did not have enough income for living during the past year and half said their income decreased over the past year.

Health

Childhood diarrhea is very common in all target communes. One-half of all children under age 5 had diarrhea during the week before the survey, and the prevalence was highest in Taseam Commune (66%). In all focus groups, participants agreed that the kids in their community are not healthy. Flu, diarrhea, and fever were the most common childhood illnesses reported. Diarrhea is closely related to a community's WASH situation, and though it is not clear exactly what illnesses participants are describing with "flu" and "fever," it is possible that improvements in handwashing could have a positive impact on these as well.

Knowledge is very low about the causes of diarrhea and ways it can be prevented. One-quarter of survey respondents do not know any ways to prevent diarrhea. The most common response was drinking safe water, though responses to other questions showed that water quality is not much of a concern. Few know the importance of handwashing and latrine use for diarrhea prevention. Many people know how to care for diarrhea in the home, including continuing to offer food and water to the child and providing ORS. However, focus groups said it is common for caregivers to take the child to the hospital/clinic and to offer traditional Khmer medicine. Medicine is not recommended during a bout of diarrhea, unless prescribed by a doctor.

Monthly household medical expenses are quite high, with the average household spending 140,079 riels ($34.20 USD) in the past 4 weeks. Decrease in WASH-related illnesses should also decrease the amount of money spent on illness by households.

Water

Access to safe water is a serious issue in the target communes. There are many opportunities for water to become contaminated prior to consumption: most people get their water from unsafe sources, few people treat the water before consumption, and most people are not transporting and storing their water safely. Drinking unsafe water is a major cause of disease and a threat to the health and wellbeing of children and families.

The majority of people get their drinking water from unprotected sources during both the dry and rainy seasons, and they rely on multiple sources in the community to meet their water needs. Many are drinking from constructed ponds during the dry season and rainwater jars during the rainy season, both very likely to be contaminated. Rainwater jars are open containers that household members typically dip into using a small bowl or cup. The main reasons people choose these sources are related to convenience and appearance/taste, not for health reasons.

Water scarcity is of greater concern to respondents than water quality, with 87% of households saying they had a shortage of water during the past year. Despite the high risk of contamination, just 4% of people consider water quality to be one of the community's greatest problems. When scarcity is an issue, getting any water at all can take precedence to the quality of the water.

Water treatment is not common, despite the frequent use of unprotected water sources. The reasons people are not treating their drinking water reflect a lack of concern for the quality of the water and a lack of understanding of the harm unsafe water can cause rather than because they do not know how or do not like the taste. When water is treated, it is usually boiled. Some households use ceramic filters (17%), particularly in Svay Leu Commune (31%). Few households practice safe water transport and storage -- water is typically stored and transported in wide-mouthed jars that are dirty and not covered.

There seems to be a low level of awareness about germs and disease transmission via unsafe water. When asked the meaning of "dirty water," focus group participants said water than has chemicals or garbage/leaves. Very few people said dirty water is unsafe to drink, has germs, or is otherwise contaminated. When asked the meaning of "clean water," the most common response was water that has been treated. Very few people mentioned the source of the water or the safety of the water for drinking. Together, these data suggest that there is a lack of understanding about what makes water safe and the impact of water quality on health.

Most water sources are not managed by a committee. However, in general, the committees that do exist are viewed favorably by community members. Some committees are community-wide while others are for individual sources.

Sanitation

Latrine use is very low, with just 17% of people saying those in their household use a latrine for defecation. Of these, 17% are shared with other families. Focus group participants said adults defecate near their homes or on the farm, and feces are visible around their community. Most children practice open defecation and very few use a latrine or have their feces put into a latrine. As a child's feces is even more dangerous than adult feces, this represents a significant health problem for communities.

Though latrine ownership and use are low, dissatisfaction about the situation appears high. Those who don't use a latrine are unsatisfied with this practice and recognize many disadvantages, including smell, flies, safety concerns, shame, and lack of privacy. Nearly everyone without a latrine said they don't have one because they are too expensive, and almost no one said there is no need and/or there are no benefits to having a latrine. Those who use a latrine were more likely that others to say that latrines can improve health/prevent disease, indicating that an increase in knowledge about the health benefits of latrine use might be a motivator.

Most people think it is difficult to build your own latrine, though perceived difficulty is the same among both latrine users and non-users, suggesting this is not the greatest barrier to having a latrine. Many who bought/constructed a latrine did so because they became aware of the importance of having one, others did so for out-of-town visitors, and others because a program was offering a subsidy or training.

The latrines that do exist are all pour-flush to an enclosed tank and are considered improved sanitation. Most of the existing latrines have structures that provide privacy and are well maintained. Svay Leu Commune had the highest percentage of households with improved latrines.

Hygiene

Handwashing is a very serious issue in the communes. Most people practice some handwashing, but just half use soap or ash and very few use an appropriate handwashing device (i.e., one that does not reuse water). Generally, people wash before eating but less than half wash after defecation. Very few of those who care for children wash their hands before feeding the child or after handling the child's diaper/ feces, and only one-quarter of those who prepare food for the household wash their hands before cooking or handling food. Taseam Commune had the lowest percentage of people washing with proper supplies at the 2 most critical times for disease prevention (i.e., after defecation and before eating). When asked the benefits of handwashing, most people said it removes dirt and makes hands clean, but just one-third said it prevents disease. This suggests a lack of understanding about disease transmission.

The majority of household compounds are not kept clean of trash and/or rubbish. Rubbish pits are very rare and trash is most often burned or scattered/littered. Less than one-fifth of households have dish drying racks, preferring instead to let their dishes dry in a basin/bucket/basket. Having a clean compound and drying dishes on a raised rack are Healthy Home requirements because they both have an impact on the spread of disease in a household.

V. CONCLUSION

All of the target communes face significant threats to their health due to poor WASH knowledge and behaviors. Almost no one has a proper handwashing device with necessary supplies, very few people own and use an improved latrine, and most households get their water from unprotected sources and do not treat it before consumption. Beyond the behaviors, knowledge about disease transmission and prevention is very low. Consequently, childhood diarrhea rates are exceptionally high.

The water situation is the worst in Kon Tout Commune, where very few people use protected sources, water scarcity is a chief concern, and households have the lowest per person daily water use. Kon Tout also has the lowest latrine use and ownership as well as the highest household medical expenses. The burden of the medical expenses is compounded by the fact that 78% of people in Kon Tout are registered ID Poor.

Diarrhea rates are highest in Taseam Commune. Those in Taseam also have the worst handwashing habits, the lowest proportion of water treatment, and the highest proportion of household compounds with visible feces and/or rubbish. Surprisingly, those in Taseam have had the most WASH promotion/education (historically and currently).

Svay Leu Commune has the highest proportion of households getting their water from protected sources, yet those in Svay Leu Commune also reported the longest period of water shortage throughout the year. Svay Leu has slightly higher latrine ownership/use and slightly better handwashing habits than the other communes. However, diarrhea is still very high and many feel as though their health and the health of their children are declining.

The current WASH situation in these communes is putting vulnerable children and families at great risk of disease and suffering. All 3 communes are in need of WASH interventions.