Base Line Survey report for Ngazun and Natogyi Township

International Federation
of Red Cross and Red Crescent Societies

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This Base line survey report is based on a descriptive community survey and highlights important water, sanitation and hygiene issues for the areas and community living in villages. The data was generated by analysis of Baseline questionnaires and observation forms, both being carried out for men and women separately. The survey primarily deals with four main areas:

- Water
- Sanitary situation and defecation habits
- Solid and liquid waste
- Diseases

The survey findings is one of the means which will be used for village selection, setting up monitoring and evaluation benchmark, developing framework for improving hygiene and environmental knowledge of community and type of hardware interventions can feasible for community to run and operate by themselves and based on its findings, several recommendations on fine tuning of the programme can suggest to NS.

Objectives of the Base line survey

The objective of the baseline survey is to collect primary data on a number of indicators related to the Initiative conducted in the rural areas of Ngazun township. There is no updated information available for the township in which the Programme is implemented, on what people know, do and would like to do in relation to water, sanitation and hygiene. However, this information is extremely important for monitoring progress as a result of the Programme. Therefore,
the baseline survey seeks to establish the baseline information and indicators to be used for measuring the progress in water supply, sanitation and hygiene which may be attributed to the implementation of the current Programme in the target districts.

The information collected through this baseline survey will help the Programme to adapt its approaches of hygiene, education and demand creation, in particular for the access to
adequate sanitation in the target villages.

METHODOLOGY

A quantitative Household Survey of water, sanitation and hygiene knowledge, attitudes and practices in 4 villages in Ngazun Township in Mandalay Over 177 Household and 5 officials interviews were performed by trained MRCS volunteers.
The volunteers attended one day intensive training in Ngazun Township and whilst 2ICs selected active volunteers were given additional training as they are nominated as team leaders.

Each household interview was conducted by a group of two volunteers (male & female) considering gender balance, while official's interview was performed by two volunteers.

To supplement the Household survey data, both transect walks and Focus Group Discussions with target beneficiaries were performed to provide qualitative insight to the data set for analysis and comparison with the quantitative findings.

Data entry were rendered by MRCS staff at the HQs; statistical analysis were then performed independently by the IFRC data base team, to ensure reliability through quality control of the data.

Design of Survey:

The baseline survey forms, household and official, were derived from the RCRC PHAST Household baseline survey form, yet adaptations were made to suit programme local context.
The survey form translated into Burmese, then back to English for cross checking technical terminologies (Annexes as attached). Additionally, both forms were introduced to, and filling was rehearsed and practiced thoroughly by volunteers and team leaders.

The survey was planned and discussed with Township Authority and Township 2IC and conducted in last week of January, 2014. Data collected was examined by the WatSan Team; consequently, remedies, additional trainings and close supervision of NHQ- WatSan team..

Simultaneously, a software programme was developed by IFRC Database Officer and tested by WatSan team for analysis of collected data.

SAMPLING METHOD

The survey sample was calculated to cover 15 to 20% of the target populations as indicated in table 1. The sampling plan was developed on advice obtained, with some modifications,

The sample size was calculated using the formula below:

$$n \geq \frac{Z^2 . p . q}{D^2}$$

Therefore, we could survey up to 440 households.
Z = parameter related to the risk of error = 1.96 for a risk of error of 5 percent
p = expected prevalence in the population. This value was estimated at 50 percent (extreme
Value)
q = 1 - p
d = 5% = 0.05, absolute accuracy desired.
The sample consists of 177 households. This sample allows us to draw statistically make significant conclusions from general observations of the targeted communities. The collected data allowed the team to better understand the situation of households in the areas targeted by the study. All of the questions that were asked in the quantitative study have been analyzed. To ensure the effectiveness of the fieldwork, 9 enumerators including Red cross volunteers were completed the survey.

Participants in the focus group discussions on the other hand were selected purposively, given the respondents were selected on the basis of their pre-eminent roles in the community, and, or

their generally acknowledged understanding and custodianship of the community values, norms, heritage and knowledge.

The sampling plan was chosen carefully to represent all community criteria, including poorest people may live on the edge of villages. However, all schools' principal, health workers, and villages' leader within the target area were interviewed without exception.

Survey procedure

During the actual survey enumerators walked in pairs while sampling households. From the starting point identified by the supervisors, they moved in opposite directions. Before commencement of interviews in the villages, while accompanied by the supervisors, they presented themselves to the area chief or village elders. Although the local authorities had been informed, the enumerators explained again the purpose and procedure of the survey sought the consent of these leaders to conduct interviews.

To assure standardization, in the use of language, interviewers read the questionnaire in the language in which it was printed (Myanmari). However, where respondents had problems with either of the languages, the enumerator used the local language.

Possible bias and methodological limitations

1. "No response bias." The fact that household interviews were conducted from 9 a.m. to 4 p.m. meant that some heads of household were not at home during the survey and thus were not included in the study.
2. Despite the high number of surveys that have taken place in the targeted areas, "refusal to participate bias" was not observed in all visited communities and the enumerators were generally well received. This demonstrated the will of the population to work closely with the team during future programs.
3. "Translation bias." Interpretation of questions may be different in Kiswahili or the local language compared to the original question in English. Accordingly, during the training session the survey team took sufficient time to translate the questionnaire into Kiswahili and the local language. The enumerators had the translated text in Kiswahili next to the questions in English.
4. "Enumerator bias." The opinions of the enumerators and their supervisors can skew the results. For example, when enumerators show verbal or non-verbal responses to what is "correct" during the interview. The team tried to minimize this bias during training through role playing.
5. "Respondent bias." Respondents may have an interest in providing incorrect answers because they think that they may benefit later, especially in the event that their responses lead to support from donors. In each household, the enumerators explained the objectives of the study to avoid this bias.
6."Privacy bias." In order to ensure the respondents' confidentiality, the enumerators were advised to make certain that crowds are not present during the interview.

To reduce the risks of bias, the survey coordinator:
Dedicated time and effort to select experienced enumerators.
Started with a pre-survey (pilot test) and supervised enumerators during the study.

Verified the completed questionnaires each day and provided feedback to the enumerators before conducting fieldwork the next day.

SURVEY HIGHLIGHTS OF BASE LINE SURVEY

VULNERABILITY OF THE NGAZUN TOWNSHIP VILLAGES

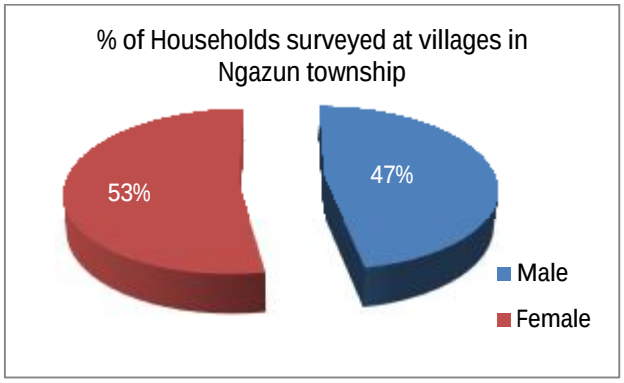
The township have been facing spells of draughts and floods in the recent decades in which tens of villages suffered the consequences. The immediate effects of these onset adversities manifest in shortage of water and irregularity of replenish traditional water sources (ponds, dug and tube wells, rain harvesting systems). The aforementioned phenomena have influenced not only drinking water quality and quantity, but daily hygiene of people through insufficiency of water for domestic usage.

Household Demography

Total 177 households survey in 4 selected villages. 7.3% people surveyed of age more than 60 years old and 12.4% of people surveyed 18 to 21 yrs old. Overall 53% of female headed household and 47% of Male headed households surveyed. The overall sample size was calculated is 17.5% of village populations.

Village	HH	Sample size		Respondent category			
		%	no	M	F	>60 yrs	18-21 yrs
Si Thein	121	20	24	8	10	2	4
Za Lote Ma	128	20	26	10	12	2	4
Sa Pyar Kyin	44	15	52	20	24	3	5
Myo Thar	500	15	75	30	30	6	9
Total	1093	17.5	177	68	76	13	22

Table 1: HH Characteristics	Values	Percent (%)
Gender of HH respondents	Males	47.0%
	Females	53.0%
Distribution of Age of HH respondents	<18 yrs	17.6%
	18-25 yrs	18.5%
	26-35 yrs	26.7%
	36-45 yrs	14.5%
	46-55 yrs	11.7%
	55-65yrs	6.8%
	>65 yrs	4.2%
Household head	Male head of HH	73.2%
	Female head of HH	22.9%
	Child living in HH	1.0%
	Other adult living in HH	2.9%



As in Myanmar societies, most households were male headed (73.2%) but there is a significant proportion of households that have women as the heads. In our analysis of water fetching, assets and decision making regarding livelihood we pay special attention to the significance of gender issues in regard to information, support and livelihoods.

Education:

The household findings revealed that out of every ten female household heads, 5 (50.5%), have Basic or monastery education or are outright illiterate. 33.1% of the male household heads are able to read and write in comparison to 23.0% of the female household heads who are able to do so.

However, 14.2% of the female household heads have been to school between 1-8 years while 16.5% male household heads had been to school for a period ranging between 1-14 years. This finding underscores the general low level of literacy in the larger where the average adult literacy level rate is estimated to be 40-50%. In addition these findings present challenges to the realization of the MDGs of Myanmar and the both of which put emphasis on attainment of education for all.

Household Composition

Typical of the pastoral areas, the household sizes are Normal compared to a national average of about 5. The survey findings revealed that only 22.5% had family sizes in the range of 6-8.

Table : HH Size (Adults and children)				
		Frequency	Percent	Cumulative Percent
Valid	1-2	27	15.2	15.2
	3-5	110	62.1	77.3
	6-8	40	22.5	99.8
	Total	177	99.8	
Missing	System	1	0.2	100.0
Total		177	100.0	

Livestock Holding

Livestock holding is regarded as one of the more important pro-poor livelihoods. More than 40.0% of the poor world wide are dependent on livestock for their livelihoods (Thornton et al, 2002).

All households in this area of study have at least one animal; however the holdings vary widely with by species and by numbers kept. below shows livestock holdings by the surveyed households. Cow's Buffalo, Goat and chicken appear to be the least common livestock species amongst the households with slightly more than quarter of the households holding between 1-2 big animals(Cow or buffalo). Almost 73.0% of the households own at least a goat on the other hand pig ownership is limited by household but for those households with Pigs 9.1% own between 2-3 Pigs. Most households in this area do not consider chicken as an important livestock as is the case with cattle, goats and Pigs; yet chicken farming is an economically viable activity just like goat farming when done in large scale as is the case in other regions.

Asset Holdings

To gauge the level of household asset holdings, we asked respondents about their ownership of various items in working order including, vehicle, motor cycle, refrigerator, television, radio, bicycle, telephone, solar power and electricity. Seldom does any household have any of these items in working order with the exception of the Motor cycle, radio and telephone (mobile phones) albeit with still lower density when compared to other regions

Mobile phone penetration (19.8%) motor cycle (38.2%) (and ownership of the radio/TV (42%) might provide an indication of access to information and social networking which are key to risk management in a dynamic environment.

In general the choice of asset holding in the pastoral situation is dictated by livelihoods. Nomadic and semi-nomadic households would generally not invest in fixed assets. Similarly, they may be more inclined to put in more resources into productive assets like livestock consumption

Participation in Decision making process

Other household characteristics like membership in committees at the village or sub-village committees indicate that an overwhelming, 82.20% do not have any household member in these committees. This clearly indicates that most households do not participate in decision making processes and in many cases ignore activities in the community.

During the survey we realized that women make decisions on the domestic arrangements like what is eaten, fetching water, sleeping arrangements etc. However, when it comes to greater decision making, it is men who call the shots. This presents a challenge to realization of goal three of the MDGs whose aim is to *Promote Gender Equality and Empower Women.*

Other Household Characteristics

2.0% of the households have a member who is disabled (visual impairment, hearing impairment, speech and language difficulties, physical disabilities, mentally retarded, self care difficulties and others), 0.3% of the households have a member who is chronically ill (bed ridden for 3-4 months in the last 12 months.
On the other hand, an overwhelming majority (88.0%) own the houses and land they inhabit. Due to the condition of land in this area, densities are low and most households congregate near water point.

Household Fuel consumption

Three quarters of the households (75.2%) use firewood/ straw/ dung for cooking, 24.8% use charcoal from wood. Typical of pastoralist communities most households use firewood as the main source of fuel. This in some instances has devastating effect on the environment for such sources of energy are not sustainable and they destabilize the ecosystem. The households should be encouraged to use more environmentally friendly energy sources including cow dung and harnessing solar energy.

Observation on the Main Houses

The enumerators were required to make several observations while at the homestead of the sampled participants. 70.6% roofs of the main houses of the surveyed households have been thatched while only 29.3% of the roofs were made of corrugated metals. Other roofs were made of tin roofs. None of the households surveyed had concrete/tiled roof. The floors of the main houses within households were also observed, 80.1% were bamboo/timber, 19.6% (cemented) and 0.2% tiled. Observations made on walls of the main house noted that out of every five households (95.5%), four were made of jungle wood/bamboo/timber, 4.5% (bricks/ block). Some households had walls made of grass reeds, tins or polythene. These observations on the main households are a manifestation of high incidences of poverty in this area.

These findings reiterate design of programs and activities that focus more on the vulnerable and weak in the society in regard to provision of water and sanitation for the numbers are considerably high

Villages HIGHLIGHTS

Village 1: Za Lote Ma Village:

Profile of Village

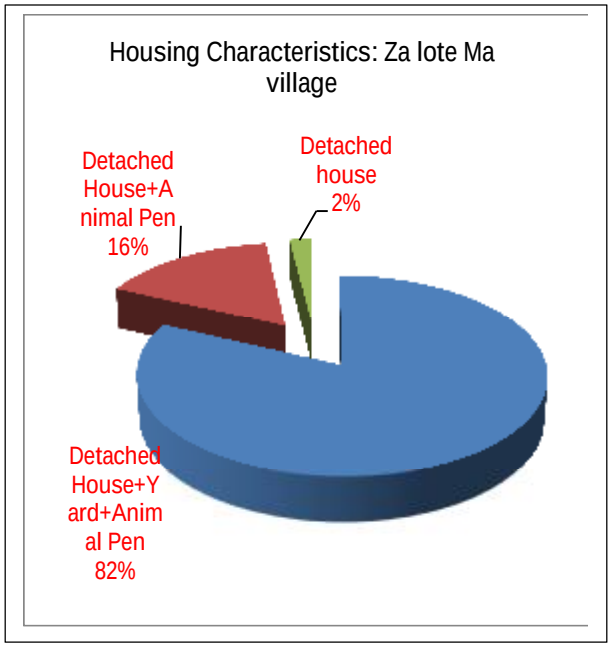
Za Lote Ma village is located 3 miles from Ngazun township in Northern direction. The Village is well positioned in terms of accessibility and connected with main road from Ngazun Township. In eastern side of Si Thein village western Side Sat Pyar Kyin and Za lote ma village is administered by Than Kone village Tract.

Demographic Characteristics:

In village 128 household are living . The total population of village are 580 people's. There are 67 children's (30 Male and 37 female) of aged in range 3 to 8 years.

Housing Characteristics:

From observations of Surveyor it is found that 87% of selected respondent mention have detached house with private yard and Animal pen in the vicinity of house. 16% mention they have only Animal Pen in the vicinity of house and 2% household only detached houses. Most of house are single storied only 1% (13 Household) found double story or G+1 structure.



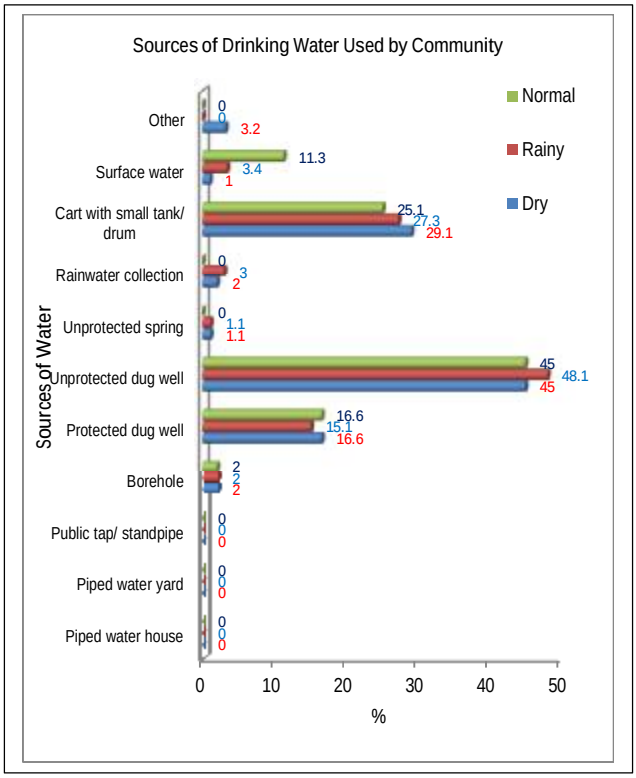
Access to water

Water Sources During the Rainy Season

On sources of drinking water to the households in Za lote ma village, the main sources were unprotected dug well 46% surface water which included rivers, dams, lakes, ponds, streams, canals and irrigation channels (5.2%), followed by 27.2% people procure water during the year .

Table : Sources of drinking water most often used by HH

	Dry	Rainy	Normal	Cumulative	Cumulative%
Piped water into house	0	0	0	0	0
Piped water to yard/ plot of the house	0	0	0	0	0
Public tap/ standpipe	0	0	0	0	0
Borehole	2	2	2	6	2
Protected dug well	16.6	15.1	16.6	48.3	16.1
Unprotected dug well	45	48.1	45	138.1	46
Unprotected spring	1.1	1.1	0	2.2	0.73
Rainwater collection	2	3	0	5	1.7
Cart with small tank/ drum	29.1	27.3	25.1	81.5	27.2
Surface water (river, dam, lake, pond, stream, canal, irrigation	1	3.4	11.3	15.7	5.2
Other	3.2	0	0	3.2	1.1
Total	100	100	100	300	100



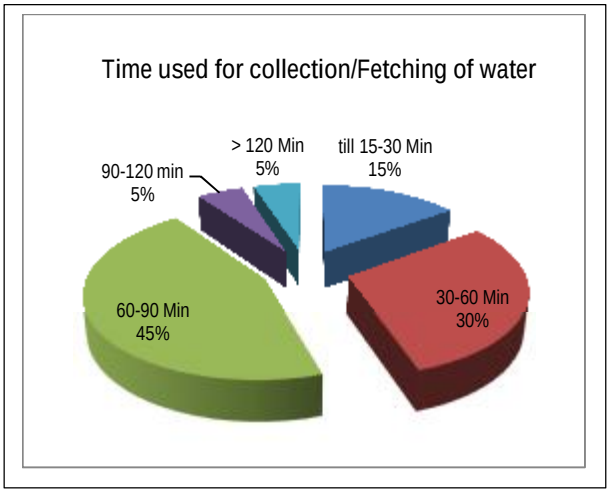
trickling out, and depleted, while 16% people mentioned that they use alternative source of water 8% of Household mentioned that they have water shared by neighbours or monastery but quantity is not sufficient and 6% said they went to other villages for this purposes.

Fetching of Water for drinking and domestic purpose:

In Za lote Ma 69.8% of respondent mentioned that they need to fetch water from current water sources. By gender, the number of female water fetchers is greater than the male. According to Age groups 10-18 age bracket constitute the largest number of (37.1%), followed by those 18-30 (23.7%). The third largest group belongs to 30-40 yrs age group (16.8%) Children (10 or under) and elderly person(60 or above) account for the least percentage 1.3% and 3.7% respectively.

Time used for Collection/ Fetching of Water:

53% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 15 min to 30 min. 43% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 1-2 hrs. 4% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from more than 2 hrs

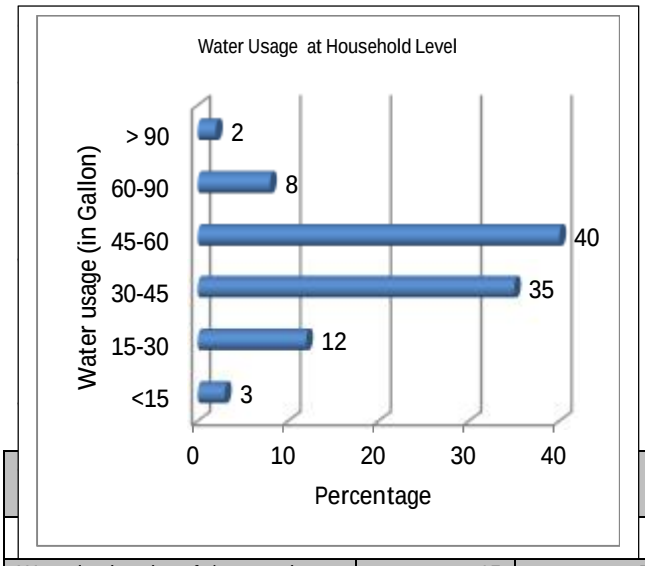


During Dry season most of current water source in village become dry or thewater table level go. Women's mentioned some time in rainy season water quality become worse of some sources and during dry season most of time they go for fetching of water 2-3 times, as some of them are lacking of transportation and they have to carry water on their shoulders. Some of respondent mentioned that during dry season most of villagers faced following issues are:

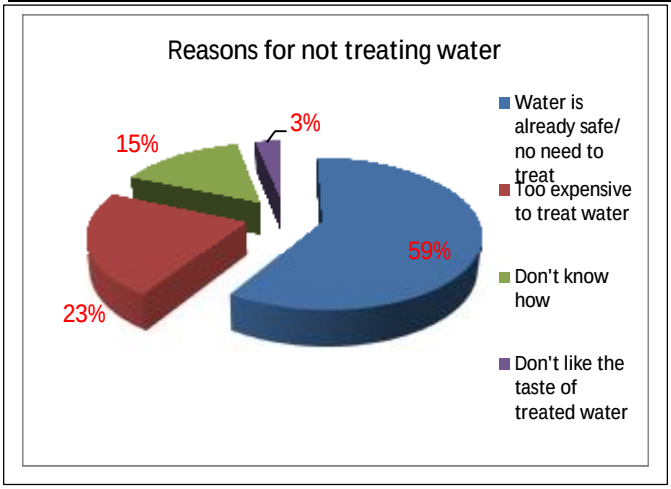
- Sharp Depletion in water table level.
- Water Recharge take long time and quantity is not sufficient
- New source is not sufficient for villagers.
- Travel time to fetch water increase (3-4 times) as compare to normal time.
- Water quality is worse and muddy and yellowish in nature.
- Lack of fuel wood for treating/ boiling of water .

Water usage per Household

At least 47 percent of the household use 30-90 gallon and 46% percent of the household use over 90 gallon of water per day for their domestic and personal hygiene which indicate an average of 12-20 gallon per person per day. Only 7percentage use less than 30 litres of water per family for their daily usage



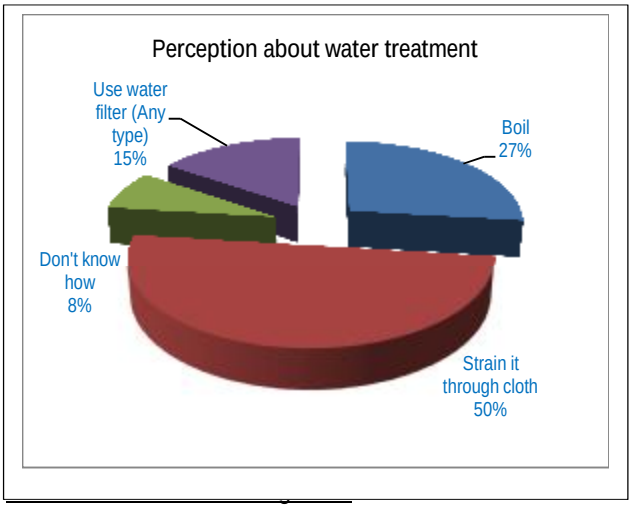
Water is already safe/ no need to treat	15	59
Too expensive to treat water	6	22.5
Don't know how	4	15.3
Don't like the taste of treated water	1	3.2
Other	0	0
Won't give specific answers	0	0
Total	26	100



Perception about treatment of water to make it clean/safe to drink

Table : Main reason for not treating water

	Frequency	Percent
Boil	7	27
Strain it through cloth	13	50
Don't know how	2	7.5
Use water filter (Any type)	4	15.5
Add bleach/chlorine	0	0
Solar disinfection	0	0
Total	26	100



The current problem for current drinking water reported by responded during survey are categorised and summarised.

Water quality	%	Reason
Dirty/ Brackish water	8	village water source installed by Govt /private owners providing brackish water with mild salinity level. During water quality check we find the range are 1000 ppm to 1200 ppm in some of villages. And if the boil, there is not sufficient firewood available
Bad taste	13	Some village beneficiary mention the taste of water is not good due iron presence in water. And some time if they drink they become sick etc. Some of respondent mentioned that during cooking with rice the water turn in yellowish color
Disrupted supply / not enough for fulfilling present needs	43	This is normal problem of respondent , they mention that during dry season the water sources become dry and water scarcity arises
Difficulty to collect		Most of people responded mentioned that they have to travel 30-60 min or more to collect the water during dry

		season and during normal time its 1-2 hrs.
High Water Cost		During dry season the cost of water become high due to unavailability of drinking water ,in normal time 10-15 kyat per gallon become 20-25 kyat, due to vender also has to collect water from far sources and travel time increases
Others		Some people mentioned that maintenance cost of tube well running is high, and some time owner cannot afford to repair.

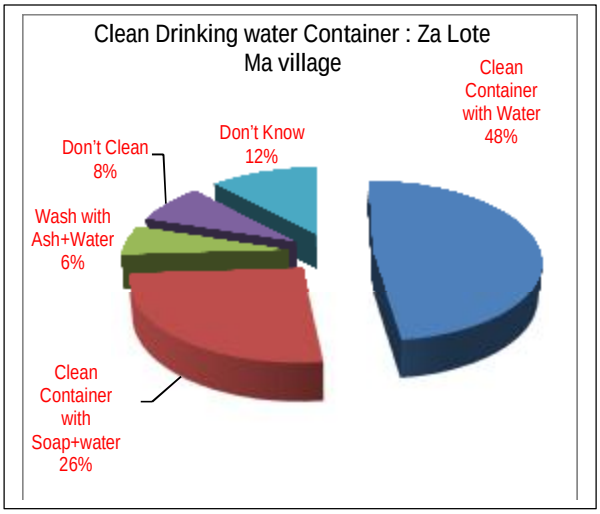
Attitude towards present water supply (only for drinking purpose):

The Attitude of respondent is presented in following ways as per seasonality. The combined response for Za lote Ma are:

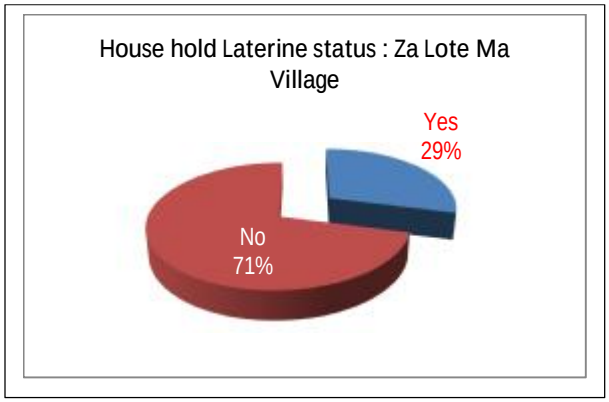
	Dry	Rainy	Normal
Water Quality and Quantity are sufficient	9% agreed that water is available during dry season and quality is good and 91% mentioned that quantityis not enough due to some of sources become dry.	11% agreed that water is available in this season and 45% mentioned quality is not good as the current sources become muddy some times. 32% people mention that they collected water in this season, but they don't have enough pots to collect RWH.	24% mention that water is available in this season and some of water source quality is good and sufficient
Water delivery /Collection is good and enough are available with 10-30 min walk	60-70% of respondent mention that nearest collection point for water become dry ie. well etc. So they have to travel 1-2 hrs to collect water	60% mention that during this season water is available at nearest point.	65% mention that during this season water is available at nearest water sources.
Enough water but quality is concerned.	80-90% responded that water quality is brackish where water is fetched through tube well,.	40-60% mention that Enough water, if good rain, but annual precipitation is decreasing in recent years.	65% respondent mentioned that water is available and quality is good related to wells.

Water storage container cleaning agent

79% of respondent mentioned that they wash container with water, but used the same water which may be mild salinity. No one responded that they wash the container with clean and safe water. 9% respondent mentioned that they clean the container with soap and water.



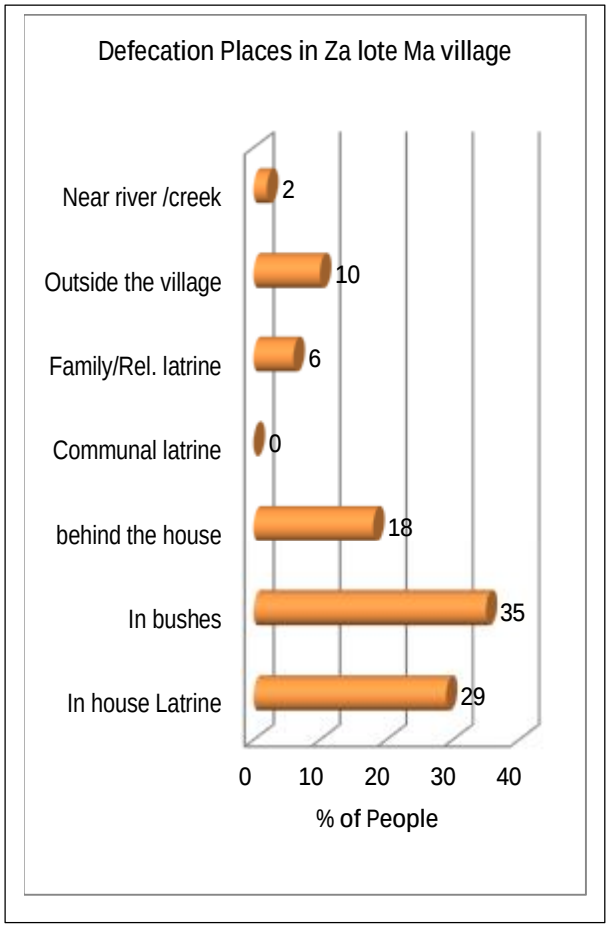
Majority of both men and women own latrine and only29- 30 percent have their own latrine but during the feedback session and focussed discussion on access to latrines they reported the access was lower with only about 20-30 percent having own latrines. What they reported was the most commonly used neighbour and relatives latrines. However the survey data indicates at least 30-35 % use neighbourhood or families sharing latrine. 60-65% of household adopts the open defecation habits



Defecation Places at Za lote Ma Village

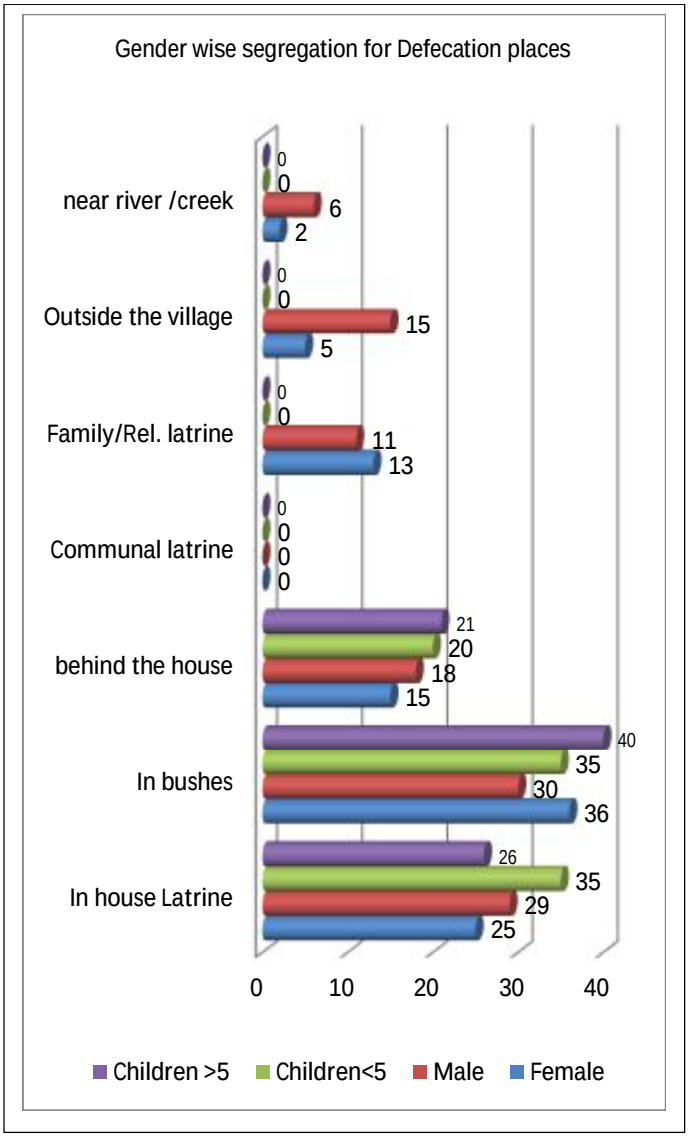
#	Place for Defecation	% of respondent
A	In house Latrine	29
B	In bushes	35
C	behind the house	18
D	Communal latrine	0
E	Family/Rel. latrine	6
F	Outside the village	10
G	near river /creek	2
	Total	100

49% of respondents mentioned they defecate inside the house latrine. 34% people go for open defecation by combining the results B, C,F, and G . 15% of people use their neighbor, relative or family latrine for defecation and% of people use village communal latrine, but this is not available in all survey villages and issue related to cleanliness is major concern of villagers.



The gender and children wise segregation are shown in graph below and percentage wise in table below

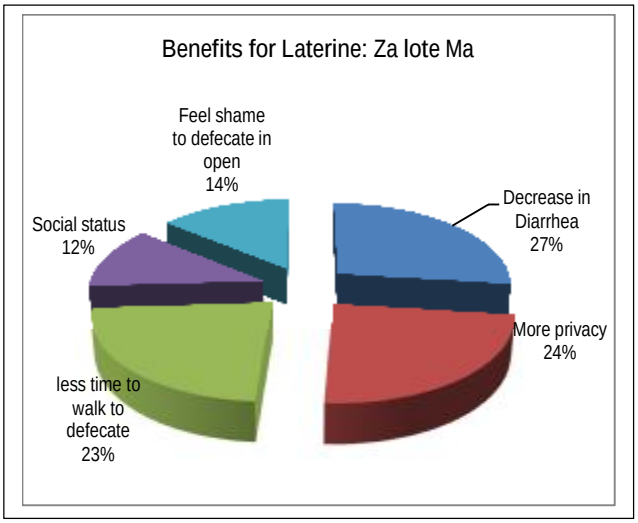
Defecation Place	Female	Male	Children<5	Children >5
	In percentage			
In house Latrine	25	29	35	26
In bushes	36	30	35	40
behind the house	15	18	20	21
Communal latrine	0	0	0	0
Family/Rel. latrine	13	11	0	0
Outside the village	5	15	0	0
near river /creek	2	6	0	0



Benefits of Laterine:

Benefits of laterine questions asked for those respondent who has laterine or owner of laterine. The response are:-

#	Benefits for Latrine	%
A	less time to walk to defecate	24
B	More privacy	23
C	Decrease in Diarrhea	27
D	Social status	12
E	Feel shame to defecate in open	14



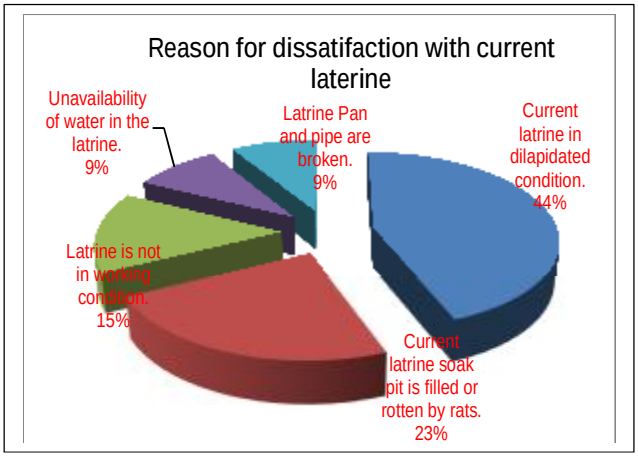
14% of respondent mention they feel shame to defecate in open place. 27% of respondent that not defecating in open mentioned that by having latrine the risk of diarrhea in their family is decreasing.

Nearly all latrine owners reported that adults and children usually use the household latrine for defecation, although children are slightly more likely to continue the practice of open defecation. Almost 95% of latrine owners indicated that they would defecate in the field or forest if they did
not have a household latrine

Satisfaction level with present Latrine

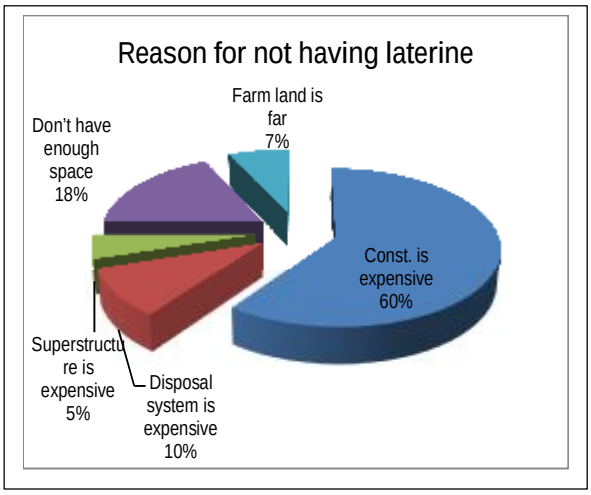
Out of 30% people who had latrine in their house or vicinity of houses .66% respondent mentioned that they satisfy with their latrine and 34% mention that they are not satisfy with present latrine. The reason mention for not satisfy with their latrine are follows:-

a) Current latrine in dilapidated condition.
b) Current latrine soak pit is filled or rotten by rats.
c) Latrine is not in working condition.
d) Unavailability of water in the latrine.
e) Latrine Pan and pipe are broken.



Reason for not Having Latrine

Approximate 60% of respondent mentioned that construction of latrine is expensive and they cannot afford, Some of respondent mentioned that they can afford superstructure by using old material of houses but cannot afford regular disposal system.18%of respondent mentioned that they don't have enough space for construction of latrine in their present land and their farmland is far from their house.

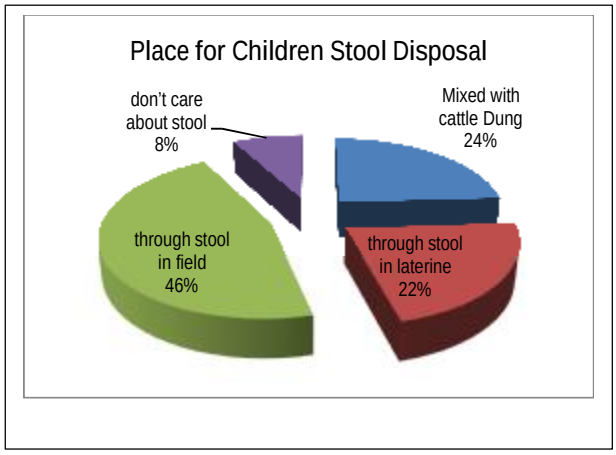


Age group of Children's to start using Latrine

49% of respondent mentioned that their children's start using the latrine at the age of 4-6 yrs.

Place for Children's Stool disposal

24% respondent mentioned that they mixed children stool with cattle dung in same area where they collect cattle dung.22% respondent mentioned that they throw stool in latrine. 46% mentioned that they throw children stool either in behind the house or bushes- forest areas. 8% mentioned they left children stool in courtyard or don't care about stool and when they clean they through outside courtyard



for Sanitations:
The observation are:

		No	%
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1	Pit latrine	38	16.7%
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2	Within 10-20 mts	42	18%
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4	Within 150-250 mts	18	8%
5	250 mts	23	10%
6	500mts	27	12%
D	Laterine Clean(No faecal Matter& urine on the floor)	233	100
1	Is laterine has Smell	115	49%
2	Soakpit full	40	17%
3	Visible waste	24	11%
4	Human faeces visible in yard	9	4%
5	Animal faeces visible in yard	3	1%
6	Open sewage/stagnant water	42	18%

HOUSEHOLD WASTE

There are two types of HH waste categorised are hazardous and non-hazardous waste seen in surveyed villages. Hazardous waste is used battery, fluorescent lamps/bulbs and some insecticide material i.e. Mosquito spray lying at corner of houses. Non- hazardous waste is kitchen waste, leftover food and vegetable, plastic bottles etc. are mixed with hazardous waste and found most of surveyed household. Most of Kitchen wastes are combined with water and humidity more than 50%. These factors produce unpleasant smell and make waste degradable seen in surveyed villages

21% respondent mentioned that they throw HH waste near to village road and 16% mentioned at farm land. A small 14% HH mentioned that they throw HH waste in refuge pit;(if they have) or corner of yard. most of HH mentioned small location called a refuge pit surrounded or vicinity of houses. 18% respondent said that they mixed with animal waste without reusing the plastic material

Disposal of Animal/ cattle Waste and issue

In villages, communities have less choice and techniques to dispose animal waste properly specially in regards to those HHs, who has less land. The villagers are disposal animal and cattle waste in following areas:-

	Location	%	Reason
1	At refuse Pit	7	Respondent mention they owned large courtyard so end of vicinity of house they make refuse pit for waste.
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3	Drying for (fertilizer) at farmland	48	Farm land is nearby so can collect near farm land and when dry use for fertilizer.
4	Drying for (fertilizer) surrounding of house	20	Due to the farm land is far away from house and they collected at surrounding at then transfer to Farm land once in week.
5	Drying and using for cooking purpose	5	Respondent mention they own less quantity of cattle mostly buffalo and goat so they make waste dry and use for cooking purpose.
6	Burying	6	Most of respondent mentioned that they owned goat and they clean vicinity they buryingwaste near house.

Issue related to Animal waste:

31%of respondent (20% drying at surrounding of house, 5%

drying for cooking purpose and 6% are burying) said that animal waste become dirty and give unpleasant smell and
flies always present on waste in all season, the most problem happen during rainy season, area become muddy and flies and mosquito make them sick. They can not throw the waste outside their Farm land due to far from house and they don't have refuse pit. A combined 70-80% respondent mentioned following issue related to Animal waste and HH Garbage are:

- Flies land on garbage and germs cling to its' feet, then the fly lands on food or drinking glass and you pick up another germ.
- Rats get into the garbage- then into house and walk all over everything in home- helping to spread disease. Mice do about the same thing as rats-they are just Smaller and able to enter areas through smaller openings
- Cockroaches breed and feed in the garbage- then spread out from there, infesting the area

Observation for Household Waste:

HHs waste location	Y(%)	N(%)	Reason
Household pit	7	93	Most of HHs dedicated the location in their courtyard and called the refuse pit.
Clean Courtyard	30	70	House wife clean the courtyard once or twice in days.
Unpleasant Smell	82	18	As cattle dung lying on courtyard since morning start giving bad smell in environment.
Flies on Animal waste	92	8	Un-cleaned courtyard and no proper disposal of Animal waste invite flies, ants and cockroaches.

Information on Hygiene Awareness

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44% mentioned that cause of diarrhoea and stomach upset are eating unhygienic dirty foods. 18% out of 44% said primarily they unable to recognise the importance of clean food and sometime they eat uncovered food which may be contaminated and then they suffer from Stomach ache.

Many people do not make the link between poor water quality and diseases such as diarrhoea, intestinal worms and skin diseases. Dirty hands and unsanitary waste disposal perpetuate the cycle of disease and poverty.

Cause of Diarrhoea and Stomach upset

19% of respondent don't know the cause of diarrhoea, which shows lack of knowledge of other vector borne diseases. Risk factors that were associated with persistent diarrhoea and malnutrition included low family income, low education of mothers, unhygienic latrines, flies in the house and on the child, dirty appearance of child and mother, mother not using soap and water when washing child's stools, defecation of child on floor, breastfeeding on demand, child eating food from floor, not feeding recommended weaning foods, and lack of knowledge by mother about causes of diarrhoea and about foods that prevent malnutrition. These results indicated that persistent diarrhoea and malnutrition in surveyed areas are caused by a complex of several interrelated socioeconomic factors, unsanitary behaviour pertaining to personal hygiene, the practice of demand breastfeeding and lack of certain weaning foods, and low education of mothers who showed
less knowledge about causes of diarrhoea and prevention of malnutrition.

Diarrhoea cases in Family in past weeks
10% house hold mentioned that they commonly have problems of stomach upset and loose motion, which may be
diarrhoea, as they don't know symptoms of diarrhoea. 20-30% reported that they not aware about diarrhoea cases in
family. 10-12% reported that their children face some loose
motion problem in current and past weeks also.

About diseases: - MALARIA
Understanding of the aetiology of Dengue, Malaria and Chikengunya is better than that for diarrheal diseases. This
statement is made in light of the comparison of those who correctly identified what causes vector borne diseases 79 percent (mosquito bites) with those who listed germs 12 percent and 9 percent who don't know and those who listed
the correct answer in respect to malaria.

About diseases: - How Malaria Spreads
However, the understanding of how these diseases can be
prevented is majored on environmental actions such as clearing stagnant water and bushes. Notable is the 7 percent who don't know what to do.

About diseases: - How Disease prevented
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About diseases:-Mosquito related Disease Control

Some of Beneficiary has knowledge for prevention of malaria related control methods by hearing the health department information through radio but applicability for using of the information they lacking the skill and resources.

Self-Reported Disease incidence and Health Care Options

The most prevalent diseases are water related, the highest reported household incidence being for diarrhoea at 13 percent, vector borne (12 percent) and skin diseases at 12 percent. Three of the top four diseases affecting households
are therefore water and vector related. Skin diseases, being largely water washed are a reflection of water scarcity while diarrhoea reflects in part the effects of poor water quality, hygiene and sanitation.

AWARENESS OF DISEASE AETIOLOGY

Poor understanding of disease aetiology contributes to poor understanding and practice in hygiene and sanitation thereby perpetuating a disease friendly living environment. Only 68 percent of respondents made the association between dirty food, dirty water and diarrheal diseases, added to the poor association between hygiene and these class of diseases, it is clear that poor awareness on hygiene and disease aetiology make individuals and communities susceptible to disease outbreaks.

HEALTH CARE OPTIONS

There is access to free medical care with an average of 150 patients attended to by MOH2 clinic which are mainly for prenatal and ante natal care. While the District general hospital provides medical care for an average of 350 patients daily. From the Ministry of Health the Public health inspectors conduct community and school health education program reaching approximately 59 percent of the population with 44 percent information on water and sanitation.

AWARENESS AND PRACTICE OF HYGIENE

The survey found that the link between disease and hygiene (hand washing) is very weakly appreciated , asked why it is important to wash hands , only 47 percent of respondents said this helps remove germs , on the other hand 45 percent said it simply removes dirt. While 2 percent didn't know.6 percent was for other reasons such as religious reasons .Further, it was established that consistent hand washing is highest before eating and when hands are dirty , both 22 percent followed by before handling food or cooking 18 percent and after handling infant faeces 12 percent . It is therefore clear there is little regard for the primary barriers to the spread of faecal borne pathogens but most people make observance of secondary barriers to the spread of faecal borne pathogens.

The efficacy of hand washing is further diluted by the cleaning agent used; 65 percent use water only and 31 percent use water and soap, the rest use water and abrasives, mainly ash. The main reason for this is low level is lack of awareness.

To achieve the desired hygiene transformations, PHAST trainers will have to reach over 50 percent of households in the intervention area through direct dissemination of messages on better hygiene behaviour practices and also the link with safe water chain.

Village 2: Si Htain Village:

Profile of Village

Si Htain village is located 5 miles from Ngazun township in North-Eastern direction. The Village is well positioned in terms of accessibility and connected with main road from Ngazun Township. In western side is Za Lote Ma village eastern Side Ywar thit and village is administered by Ta Mar Pin village Tract.

In village 121 household are living . The total population of village are 655 people's. There are 41 children's (18 Male and 23 female) of aged in range 3 to 8 years.

Housing Characteristics:

From observations of Surveyor it is found that 95% of selected respondent mention have detached house with private yard and Animal pen in the vicinity of house. 5% mention they have only Animal Pen in the vicinity of house. Most of house are single story structure.

Water Coverage in village:

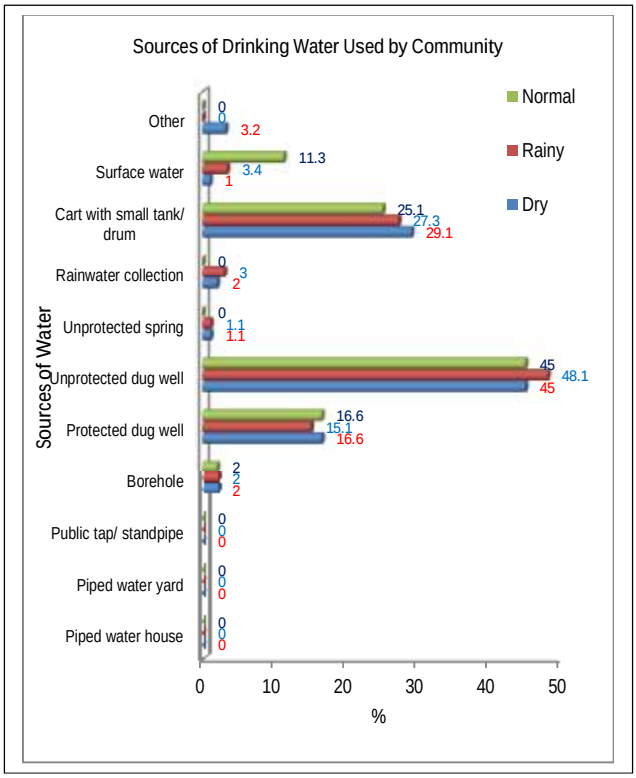
Water Sources During the Rainy Season

On sources of drinking water to the households in Si Thein village, the main sources were unprotected dug well 46% surface water which included rivers, dams, lakes, ponds, streams, canals and irrigation channels (5.2%), followed by 27.2% people procure water during the year .

Table : Sources of drinking water most often used by HH

	Dry	Rainy	Normal	Cumulative	Cumulative%
Piped water into house	0	0	0	0	0
Piped water to yard/ plot of the house	0	0	0	0	0
Public tap/ standpipe	0	0	0	0	0
Borehole	2	2	2	6	2
Protected dug well	16.6	15.1	16.6	48.3	16.1
Unprotected dug well	45	48.1	45	138.1	46

Unprotected spring	1.1	1.1	0	2.2	0.73
Rainwater collection	2	3	0	5	1.7
Cart with small tank/ drum	29.1	27.3	25.1	81.5	27.2
Surface water (river, dam, lake, pond, stream, canal, irrigation	1	3.4	11.3	15.7	5.2
Other	3.2	0	0	3.2	1.1
Total	100	100	100	300	100



E.g. at springs where water is slowly

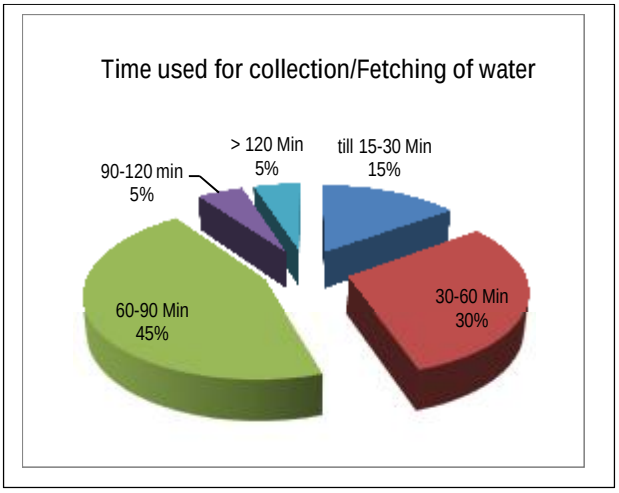
trickling out, and depleted, while 16% people mentioned that they use alternative source of water 8% of Household mentioned that they have water shared by neighbours or monastery but quantity is not sufficient and 6% said they went to other villages for this purposes.

Fetching of Water for drinking and domestic purpose:

In Za lote Ma 69.8% of respondent mentioned that they need to fetch water from current water sources. By gender, the number of female water fetchers is greater than the male. According to Age groups 10-18 age bracket constitute the largest number of (37.1%), followed by those 18-30 (23.7%). The third largest group belongs to 30-40 yrs age group (16.8%) Children (10 or under) and elderly person(60 or above) account for the least percentage 1.3% and 3.7% respectively.

Time used for Collection/ Fetching of Water:

53% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 15 min to 30 min. 43% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 1-2 hrs. 4% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from more than 2 hrs



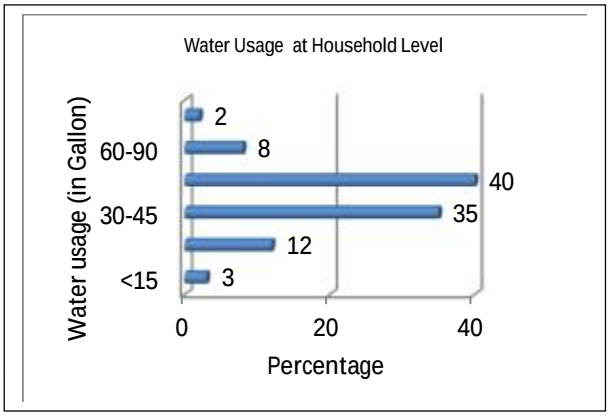
During Dry season most of current water source in village become dry or the water table level go. Women's mentioned some time in rainy season water quality become worse of some sources and during dry season most of time they go for fetching of water 2-3 times, as some of them are lacking of transportation and they have to carry water on their shoulders. Some of respondent mentioned that during dry season most of villagers faced following issues are:

- Sharp Depletion in water table level.
- Water Recharge take long time and quantity is not sufficient
- New source is not sufficient for villagers.
- Travel time to fetch water increase (3-4 times) as compare to normal time.
- Water quality is worse and muddy and yellowish in nature.
- Lack of fuel wood for treating/ boiling of water.

Water usage per Household

At least 47 percent of the household use 30-90 gallon and 46% percent of the household use over 90 gallon of water per day for their domestic and personal hygiene which indicate an

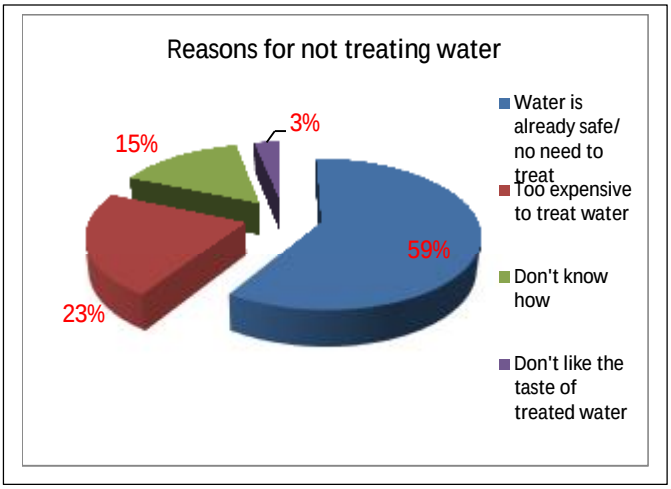
average of 12-20 gallon per person per day. Only 7percentage use less than 30 litres of water per family for their daily usage



Water treatment is considered key in ensuring that water is clean and safe. However, an overwhelming 81.5% of households do not treat their drinking water. The proportion of households that do not treat their drinking water is significantly high suggesting a high level of exposure to water borne diseases. Those households who do not treat their drinking water cited several reasons, notable was that the water is already safe (59.0%), too expensive to treat water (22.5%).

Table : Main reason for not treating water

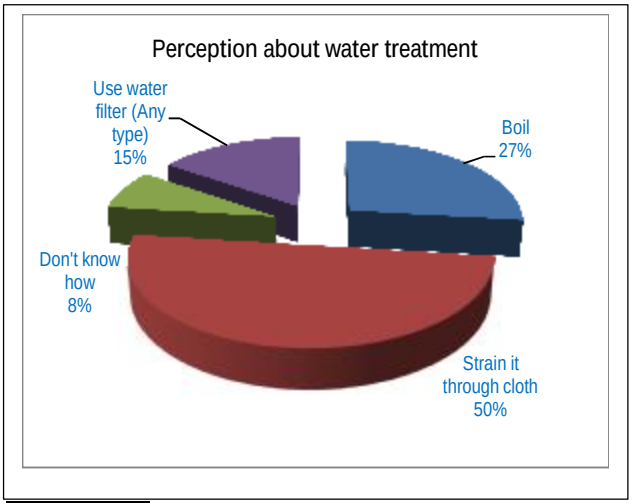
	Frequency	Percent
Water is already safe/ no need to treat	15	59
Too expensive to treat water	6	22.5
Don't know how	4	15.3
Don't like the taste of treated water	1	3.2
Other	0	0
Won't give specific answers	0	0
Total	26	100



Perception about treatment of water to make it clean/safe to drink

Table : Main reason for not treating water

	Frequency	Percent
Boil	7	27
Strain it through cloth	13	50
Don't know how	2	7.5
Use water filter (Any type)	4	15.5
Add bleach/chlorine	0	0
Solar disinfection	0	0
Total	26	100



The current problem for current drinking water reported by responded during survey are categorised and summarised.

Water quality	%	Reason
Dirty/ Brackish water	8	village water source installed by Govt /private owners providing brackish water with mild salinity level. During water quality check we find the range are 1000 ppm to 1200 ppm in some of villages. And if the boil, there is not sufficient firewood available
Bad taste	13	Some village beneficiary mention the taste of water is not good due iron presence in water. And some time if they drink they become sick etc. Some of respondent mentioned that during cooking with rice the water turn in yellowish color
Disrupted supply / not enough for fulfilling present needs	43	This is normal problem of respondent , they mention that during dry season the water sources become dry and

		water scarcity arises
Difficulty to collect		Most of people responded mentioned that they have to travel 30-60 min or more to collect the water during dry season and during normal time its 1-2 hrs.
High Water Cost		During dry season the cost of water become high due to unavailability of drinking water ,in normal time 10-15 kyat per gallon become 20-25 kyat, due to vender also has to collect water from far sources and travel time increases
Others		Some people mentioned that maintenance cost of tube well running is high, and some time owner cannot afford to repair.

Attitude towards present water supply (only for drinking purpose):

The Attitude of respondent is presented in following ways as per seasonality. The combined response for Za lote Ma are:

	Dry	Rainy	Normal
Water Quality and Quantity are sufficient	9% agreed that water is available during dry season and quality is good and 91% mentioned that quantityis not enough due to some of sources become dry.	11% agreed that water is available in this season and 45% mentioned quality is not good as the current sources become muddy some times. 32% people mention that they collected water in this season, but they don't have enough pots to collect RWH.	24% mention that water is available in this season and some of water source quality is good and sufficient
Water delivery /Collection is good and enough are available with 10-30 min walk	60-70% of respondent mention that nearest collection point for water become dry ie. well etc. So they have to travel 1-2 hrs to collect water	60% mention that during this season water is available at nearest point.	65% mention that during this season water is available at nominal cost and at their nearest water sources.
Enough water but quality is concerned.	80-90% responded that water quality is brackish where water is fetched through tube well,.	40-60% mention that Enough water, if good rain, but annual precipitation is decreasing in recent years.	65% respondent mentioned that water is available and quality is good related to wells.

Water storage container cleaning agent

79% of respondent mentioned that they wash container with water, but used the same water which may be mild salinity. No one responded that they wash the container with clean and safe water. 9% respondent mentioned that they clean the container with soap and water.

Access to Sanitation:

Majority of both men and women own latrine and only 54 percent have their own latrine but during the feedback session and focussed discussion on access to latrines they reported the access was lower with only about 20-35 percent having own latrines. What they reported was the most commonly used neighbour and relatives laterines. However the survey data indicates at least 40-45 % use neighbourhood or families sharing latrine

Defecation Places at Villages

#	Place for Defecation	% of respondent
A	In house Latrine	
B	In bushes	
C	behind the house	
D	Communal latrine	
E	Family/Rel. latrine	
F	Outside the village	
G	near river /creek	
	Total	100

49% of respondents mentioned they defecate inside the house latrine. 34% people go for open defecation by combining the results B, C,F, and G . 15% of people use their neighbor, relative or family

latrine for defecation and% of people use village communal latrine, but this is not available in all survey villages and issue related to cleanliness is major concern of villagers.

The gender and children wise segregation are shown in graph below and percentage wise in table below

Defecation Place	Female	Male	Children<5	Children >5
	In percentage			
In house Latrine	56	53	26	60
In bushes	21	21	9	19
behind the house	10	11	10	11
Communal latrine	3	3	1	3
Family/Rel. latrine	3	3	50	3
Outside the village	6	7	2	4
near river /creek	1	2	1	0
Total	100	100	100	100

Benefits of Laterine:

Benefits of laterine questions asked for those respondent who has laterine or owner of laterine. The response are:-

#	Benefits for Laterine	%
A	less time to walk to deficate	24
B	More privacy	23
C	Decrease in Diarrhoea	27
D	Social status	12
E	Feel shame to deficate in open	14

14% of respondent mention they feel shame to deficate in open place. 27% of respondent that not deficating in open mentioned that by having laterine the risk of diarrhoea in their family is decreasing.

Nearly all latrine owners reported that adults and children usually use the household latrine for defecation, although children are slightly more likely to continue the practice of open defecation. Almost 95% of latrine owners indicated that they would defecate in the field or forest if they did not have a household latrine

Satisfaction level with present Latrine

66% respondent mentioned that they satisfy with their laterine and 34% mention that they are not satisfy with present laterine

Reason for not Having Laterine

Approximate 60% of respondent mentioned that construction of laterine is expensive and they can afford, Some of respondent mentioned that they can afford superstructure by using old material of houses but can not afford regular disposal system

18%of respondent mentioned that they dont have enough space for construction of laterine in their present land and their farmland is far from their house.

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Cause of Diarrhoea and Stomach upset

19% of respondent don't know the cause of diarrhoea, which shows lack of knowledge of other vector borne diseases. Risk factors that were associated with persistent diarrhoea and malnutrition included low family income, low education of mothers, unhygienic latrines, flies in the house and on the child, dirty appearance of child and mother, mother not using soap and water when washing child's stools, defecation of child on floor, breastfeeding on demand, child eating food from floor, not feeding recommended weaning foods, and lack of knowledge by mother about causes of diarrhoea and about foods that prevent malnutrition. These results indicated that persistent diarrhoea and malnutrition in surveyed areas are caused by a complex of several interrelated socioeconomic factors, unsanitary behaviour pertaining to personal hygiene, the practice of demand breastfeeding and lack of certain weaning foods, and low education of mothers who showed
less knowledge about causes of diarrhoea and prevention of malnutrition.

Diarrhoea cases in Family in past weeks

10% house hold mentioned that they commonly have problems of stomach upset and loose motion, which may be
diarrhoea, as they don't know symptoms of diarrhoea. 20-30% reported that they not aware about diarrhoea cases in
family. 10-12% reported that their children face some loose motion problem in current and past weeks also.

About diseases: - MALARIA

Understanding of the aetiology of Dengue, Malaria and Chikengunya is better than that for diarrheal diseases. This statement is made in light of the comparison of those who correctly identified what causes vector borne diseases 79 percent (mosquito bites) with those who listed germs 12 percent and 9 percent who don't know and those who listed
the correct answer in respect to malaria.

About diseases: - How Malaria Spreads

However, the understanding of how these diseases can be prevented is majored on environmental actions such as clearing stagnant water and bushes. Notable is the 7 percent who don't know what to do.

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Some of Beneficiary has knowledge for prevention of malaria related control methods by hearing the health department information through radio but applicability for using of the information they lacking the skill and resources.

Self-Reported Disease incidence and Health Care Options

The most prevalent diseases are water related, the highest reported household incidence being for diarrhoea at 13 percent, vector borne (12 percent) and skin diseases at 12 percent. Three of the top four diseases affecting households
are therefore water and vector related. Skin diseases, being largely water washed are a reflection of water scarcity while diarrhoea reflects in part the effects of poor water quality, hygiene and sanitation.

AWARENESS OF DISEASE AETIOLOGY

Poor understanding of disease aetiology contributes to poor understanding and practice in hygiene and sanitation thereby perpetuating a disease friendly living environment. Only 68 percent of respondents made the association between dirty food, dirty water and diarrheal diseases, added to the poor association between hygiene and these class of diseases, it is clear that poor awareness on hygiene and disease aetiology make individuals and communities susceptible to disease outbreaks.

HEALTH CARE OPTIONS

There is access to free medical care with an average of 150 patients attended to by MOH2 clinic which are mainly for prenatal and ante natal care. While the District general hospital provides medical care for an average of 350 patients daily. From the Ministry of Health the Public health inspectors conduct community and school health education program reaching approximately 59 percent of the population with 44 percent information on water and sanitation.

AWARENESS AND PRACTICE OF HYGIENE

The survey found that the link between disease and hygiene (hand washing) is very weakly appreciated , asked why it is important to wash hands , only 47 percent of respondents said this helps remove germs , on the other hand 45 percent said it simply removes dirt. While 2 percent didn't know.6 percent was for other reasons such as religious reasons .Further, it was established that consistent hand washing is highest before eating and when hands are dirty , both 22 percent followed by before handling food or cooking 18 percent and after handling infant faeces 12 percent . It is therefore clear there is little regard for the primary barriers to the spread of faecal borne pathogens but most people make observance of secondary barriers to the spread of faecal borne pathogens.

The efficacy of hand washing is further diluted by the cleaning agent used; 65 percent use water only and 31 percent use water and soap, the rest use water and abrasives, mainly ash. The main reason for this is low level is lack of awareness.

To achieve the desired hygiene transformations, PHAST trainers will have to reach over 50 percent of households in the intervention area through direct dissemination of messages on better hygiene behaviour practices and also the link with safe water chain.

FOOD HYGIENE AND ENVIRONMENTAL HYGIENE

Food Hygiene

There is relative good practice with food being prepared just before eating or the morning before eating this reduces the risk of food poisoning. However as indicated previously, the practice of hand washing with water and soap and more so before handling food is low. While on food storage only 4 percent do not cover the food and this is stored outside.

On environmental hygiene, indicators in this theme are average of 26 percent households had either human or animal defecation in the compound at the time of the survey, increasing the risk of disease transmission within the household. Garbage disposal is predominantly by crude dumping or burning with 34 and 35 percent of households respectively applying these methods thereby creating a favourable environment for vermin and insect vectors. 89 Percent said rats were a problem and the figure was confirmed to be higher. With 20 percent indicating lack of knowledge on what disease rats spread .But even the 80 percent could not mention the specific disease.

Other aspects of sanitation, namely the disposal of infant's faeces are equally poor; only 28 percent of households, put infant are faeces in the latrine .The main disposal method is dumping in the open or drains thus a health hazard.

SANITATION

A majority of both men and women do not own latrine and only 15 percent have their own latrine but during the feedback session on access to latrines they reported the access was lower with only about 5percent having own latrines. What they reported was the most commonly used method was cat method and bushes. However the survey data indicates at least 72 percent use communal latrines which are more of the neighbourhood concept with families sharing one latrine. There is every little gender differentiation on the method or place of defecation. But what is obvious is that there over 500 households indicated they use cat method for the children under five which is a health risk. On latrine usage 18 percent of the latrines were not clean and there were signs of urine or faeces and the main reason cited were low level of awareness. While only 72 percent of the latrine were cleaned daily.

Access to sanitation is not included in the project objective hence no budget allocation made for this. Meaning alternative funding source will have to be identified by households who have no access to sanitary latrines.

Village 3: Sat Pyar Kyin Village:

Profile of Village

Sat Pyar Kyin village is located 5 miles from Ngazun township in North-Eastern direction. The Village is well positioned in terms of accessibility and connected with main road from Ngazun Township. In western side is Za Lote Ma village eastern Side Ywar thit and village is administered by Ta Mar Pin village Tract.

Demographic Characteristics:

In village 121 household are living . The total population of village are 655 people's. There are 41 children's (18 Male and 23 female) of aged in range 3 to 8 years.

Housing Characteristics:

From observations of Surveyor it is found that 95% of selected respondent mention have detached house with private yard and Animal pen in the vicinity of house. 5% mention they have only Animal Pen in the vicinity of house. Most of house are single story structure.

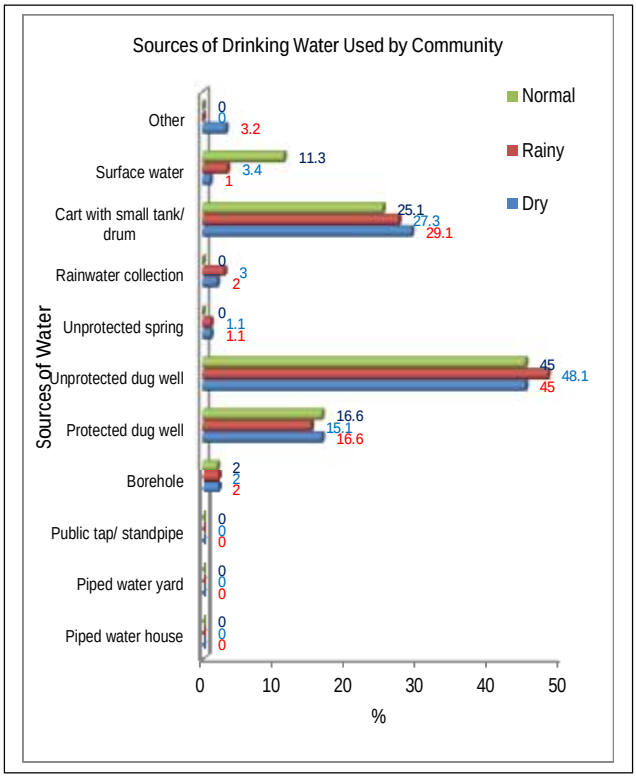
Water Coverage in village:

Water Sources During the Rainy Season

On sources of drinking water to the households in Si Thein village, the main sources were unprotected dug well 46% surface water which included rivers, dams, lakes, ponds, streams, canals and irrigation channels (5.2%), followed by 27.2% people procure water during the year .

Table : Sources of drinking water most often used by HH

	Dry	Rainy	Normal	Cumulative	Cumulative%
Piped water into house	0	0	0	0	0
Piped water to yard/ plot of the house	0	0	0	0	0
Public tap/ standpipe	0	0	0	0	0
Borehole	2	2	2	6	2
Protected dug well	16.6	15.1	16.6	48.3	16.1
Unprotected dug well	45	48.1	45	138.1	46
Unprotected spring	1.1	1.1	0	2.2	0.73
Rainwater collection	2	3	0	5	1.7
Cart with small tank/ drum	29.1	27.3	25.1	81.5	27.2
Surface water (river, dam, lake, pond, stream, canal, irrigation	1	3.4	11.3	15.7	5.2
Other	3.2	0	0	3.2	1.1
Total	100	100	100	300	100



E.g. at springs where water is slowly

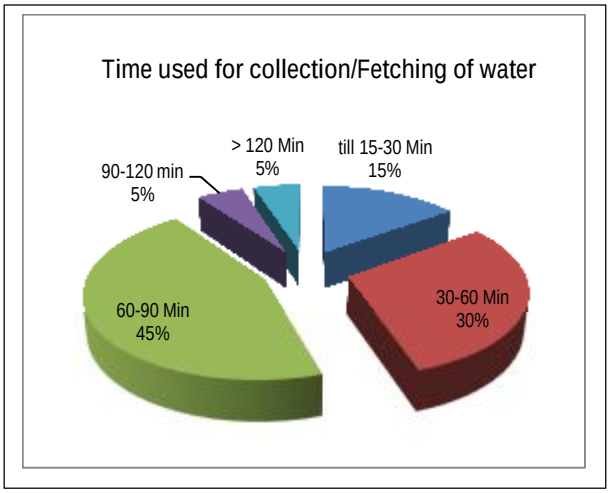
trickling out, and depleted, while 16% people mentioned that they use alternative source of water 8% of Household mentioned that they have water shared by neighbours or monastery but quantity is not sufficient and 6% said they went to other villages for this purposes.

Fetching of Water for drinking and domestic purpose:

In Za Iote Ma 69.8% of respondent mentioned that they need to fetch water from current water sources. By gender, the number of female water fetchers is greater than the male. According to Age groups 10-18 age bracket constitute the largest number of (37.1%), followed by those 18-30 (23.7%). The third largest group belongs to 30-40 yrs age group (16.8%) Children (10 or under) and elderly person(60 or above) account for the least percentage 1.3% and 3.7% respectively.

Time used for Collection/ Fetching of Water:

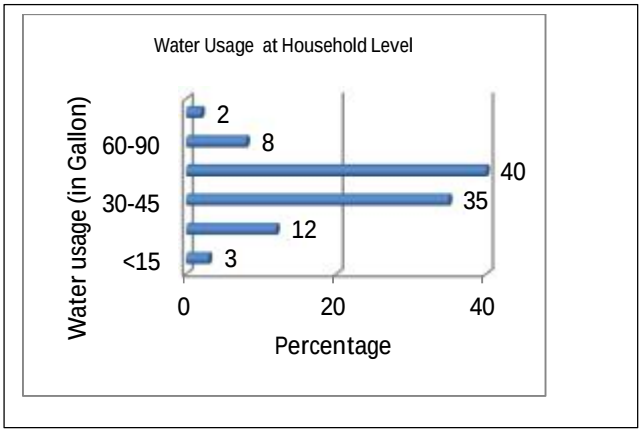
53% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season
is range from 15 min to 30 min. 43% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 1-2 hrs. 4% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from more than 2 hrs



During Dry season most of current water source in village become dry or thewater table level go. Women's mentioned some time in rainy season water quality become worse of some sources and during dry season most of time they go for fetching of water 2-3 times, as some of them are lacking of transportation and they have to carry water on their shoulders. Some of respondent mentioned that during dry season most of villagers faced following issues are:

- Sharp Depletion in water table level.
- Water Recharge take long time and quantity is not sufficient
- New source is not sufficient for villagers.
- Travel time to fetch water increase (3-4 times) as compare to normal time.
- Water quality is worse and muddy and yellowish in nature.
- Lack of fuel wood for treating/ boiling of water.

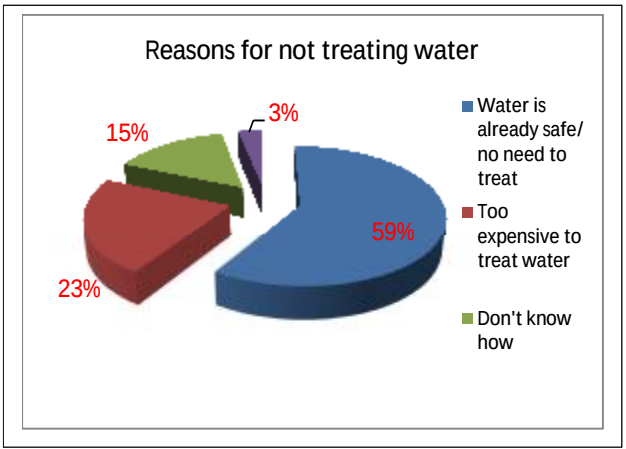
At least 47 percent of the household use 30-90 gallon and 46% percent of the household use over 90 gallon of water per day for their domestic and personal hygiene which indicate an average of 12-20 gallon per person per day. Only 7percentage use less than 30 litres of water per family for their daily usage



Treatment of Water: (Treatment of Water to make it safer)

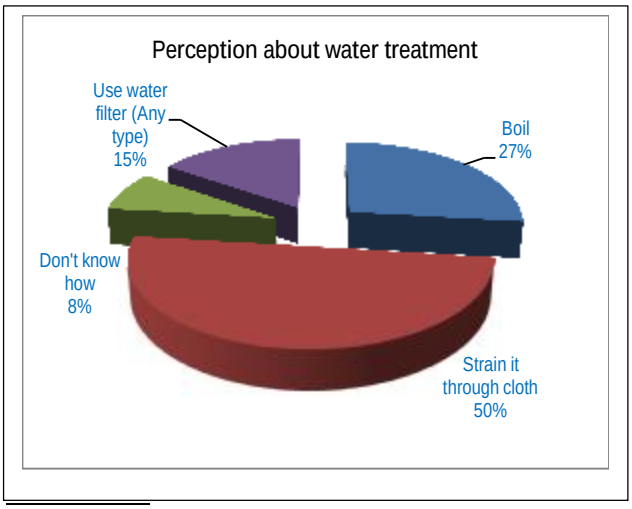
Water treatment is considered key in ensuring that water is clean and safe. However, an overwhelming 81.5% of households do not treat their drinking water. The proportion of households that do not treat their drinking water is significantly high suggesting a high level of exposure to water borne diseases. Those households who do not treat their drinking water cited several reasons, notable was that the water is already safe (59.0%), too expensive to treat water (22.5%).

Table : Main reason for not treating water		
	Frequency	Percent
Water is already safe/ no need to treat	15	59
Too expensive to treat water	6	22.5
Don't know how	4	15.3
Don't like the taste of treated water	1	3.2
Other	0	0
Won't give specific answers	0	0
Total	26	100



Perception about treatment of water to make it clean/safe to drink

Table : Main reason for not treating water		
	Frequency	Percent
Boil	7	27
Strain it through cloth	13	50
Don't know how	2	7.5
Use water filter (Any type)	4	15.5
Add bleach/chlorine	0	0
Solar disinfection	0	0
Total	26	100



The current problem for current drinking water reported by responded during survey are categorised and summarised.

Water quality	%	Reason
Dirty/ Brackish water	8	village water source installed by Govt /private owners providing brackish water with mild salinity level. During water quality check we find the range are 1000 ppm to 1200 ppm in some of villages. And if the boil, there is not sufficient firewood available
Bad taste	13	Some village beneficiary mention the taste of water is not good due iron presence in water. And some time if they drink they become sick etc. Some of respondent mentioned that during cooking with rice the water turn in yellowish color
Disrupted supply / not enough for fulfilling present needs	43	This is normal problem of respondent , they mention that during dry season the water sources become dry and water scarcity arises
Difficulty to collect		Most of people responded mentioned that they have to travel 30-60 min or more to collect the water during dry season and during normal time its 1-2 hrs.
High Water Cost		During dry season the cost of water become high due to unavailability of drinking water ,in normal time 10-15 kyat per gallon become 20-25 kyat, due to vender also has to collect water from far sources and travel time increases

Others		Some people mentioned that maintenance cost of tube well running is high, and some time owner cannot afford to repair.

Attitude towards present water supply (only for drinking purpose):

The Attitude of respondent is presented in following ways as per seasonality. The combined response for Za lote Ma are:

	Dry	Rainy	Normal
Water Quality and Quantity are sufficient	9% agreed that water is available during dry season and quality is good and 91% mentioned that quantityis not enough due to some of sources become dry.	11% agreed that water is available in this season and 45% mentioned quality is not good as the current sources become muddy some times. 32% people mention that they collected water in this season, but they don't have enough pots to collect RWH.	24% mention that water is available in this season and some of water source quality is good and sufficient
Water delivery /Collection is good and enough are available with 10-30 min walk	60-70% of respondent mention that nearest collection point for water become dry i.e. well etc. So they have to travel 1-2 hrs to collect water	60% mention that during this season water is available at nearest point.	65% mention that during this season water is available at nominal cost and at their nearest water sources.
Enough water but quality is concerned.	80-90% responded that water quality is brackish where water is fetched through tube well,.	40-60% mention that Enough water, if good rain, but annual precipitation is decreasing in recent years.	65% respondent mentioned that water is available and quality is good related to wells.

Water storage container cleaning agent

79% of respondent mentioned that they wash container with water, but used the same water which may be mild salinity. No one responded that they wash the container with clean and safe water. 9% respondent mentioned that they clean the container with soap and water.

Access to Sanitation:

Majority of both men and women own latrine and only 54 percent have their own latrine but during the feedback session and focussed discussion on access to latrines they reported the access was lower with only about 20-35 percent having own latrines. What they reported was the most commonly used neighbour and relatives laterines. However the survey data indicates at least 40-45 % use neighbourhood or families sharing latrine

Defecation Places at Villages

49% of respondents mentioned they defecate inside the house latrine. 34% people go for open defecation by combining the results B, C,F, and G . 15% of people use their neighbor, relative or family latrine for defecation and% of people use village communal latrine, but this is not available in all survey villages and issue related to cleanliness is major concern of villagers.

The gender and children wise segregation are shown in graph below and percentage wise in table below

Defecation Place	Female	Male	Children<5	Children >5
	In percentage			
In house Latrine	56	53	26	60
In bushes	21	21	9	19
behind the house	10	11	10	11
Communal latrine	3	3	1	3
Family/Rel. latrine	3	3	50	3
Outside the village	6	7	2	4
near river /creek	1	2	1	0
Total	100	100	100	100

Benefits of Laterine:

Benefits of laterine questions asked for those respondent who has laterine or owner of laterine. The response are:-

#	Benefits for Laterine	%
A	less time to walk to deficate	24
B	More privacy	23
C	Decrease in Diarrhoea	27
D	Social status	12
E	Feel shame to deficate in open	14

14% of respondent mention they feel shame to deficate in open place. 27% of respondent that not deficating in open

mentioned that by having laterine the risk of diarrhoea in their family is decreasing.

Nearly all latrine owners reported that adults and children usually use the household latrine for defecation, although children are slightly more likely to continue the practice of open defecation. Almost 95% of latrine owners indicated that they would defecate in the field or forest if they did not have a household latrine

Satisfaction level with present Latrine

66% respondent mentioned that they satisfy with their laterine and 34% mention that they are not satisfy with present laterine

Reason for not Having Laterine

Approximate 60% of respondent mentioned that construction of laterine is expensive and they can afford, Some of respondent mentioned that they can afford superstructure by using old material of houses but can not afford regular disposal system

18%of respondent mentioned that they dont have enough space for construction of laterine in their present land and their farmland is far from their house.

Age group of Children's to start using Laterine

49% of respondednt mentioned that their childrens start using the laterine at the age of 4-6 yrs.

Place for Children's Stool disposal

34% respondent mentioned that they mixed children stool with cattle dung in same area where they collect cattle dung.28% respondent mentioned that they throw stool in latrine. 36% mentioned that they throw children stool either in behind the house or bushes- forest areas. 2% mentioned they left children stool in courtyard and when they clean they through outside courtyard

Observations for Sanitations:
The observation are:

		No	%
A	Availability of latrine and type	233	100%
1	Pit latrine	38	16.7%
2	Fly-Proof latrine with bamboo Soak pit	184	78.9%
3	Fly-Proof latrine with Con. Ring Soak pit	11	4.4%
B	Condition of latrine (super Structure and soak pit)	233	100%
1	Good Condition	38	16.7%
2	Dilapidated Condition- (Privacy issue)	90	39.8%
3	Bad condition- (Need repair)	101	43.4%
4	Latrine has Concrete slab	4	0.17%
C	Distance of laterine from house	233	100
1	Inside house	75	32%
2	Within 10-20 mts	42	18%
3	Within 20-150 mts	48	20%
4	Within 150-250 mts	18	8%
5	250 mts	23	10%
6	500mts	27	12%
D	Laterine Clean(No faecal Matter& urine on the floor)	233	100
1	Is laterine has Smell	115	49%
2	Soakpit full	40	17%
3	Visible waste	24	11%
4	Human faeces visible in yard	9	4%
5	Animal faeces visible in yard	3	1%
6	Open sewage/stagnant water	42	18%

HOUSEHOLD WASTE

There are two types of HH waste categorised are hazardous and non-hazardous waste seen in surveyed villages. Hazardous waste is used battery, fluorescent lamps and some insecticide material lying at corner of houses. Non- hazardous waste is kitchen waste, leftover food and vegetable, plastic bottles etc. are mixed with hazardous waste and found most of surveyed household. Most of Kitchen wastes are combined with water and humidity more than 50%. These factors produce unpleasant smell and make waste degradable seen in surveyed villages

21% respondent mentioned that they throw HH waste near to village road and 16% mentioned at farm land. A small 14% HH mentioned that they throw HH waste in refuge pit; most of HH mentioned small location called a refuge pit surrounded or vicinity of houses. 18% respondent said that they mixed with animal waste without reusing the plastic material

Disposal of Animal/ cattle Waste and issue

In villages, communities have less choice and techniques to dispose animal waste properly specially in regards to who has less land. The villagers are disposal animal and cattle waste in following areas:-

	Location	%	Reason
1	At refuse Pit	7	Respondent mention they owned large courtyard so end of vicinity of house they make refuse pit for waste.
2	At Bush	14	11% out of14 mentioned that they don't own agriculture land so they throw near bushes. 3 % mention that they throw other people farm land if they agree either they throw nearby bushes or near river area.
3	Drying for (fertilizer) at farmland	48	Farm land is nearby so can collect near farm land and when dry use for fertilizer.

4	Drying for (fertilizer) surrounding of house	20	Due to the farm land is far away from house and they collected at surrounding at then transfer to Farm land one in week.
5	Drying and using for cooking purpose	5	Respondent mention they own less quantity of cattle mostly buffalo and goat so they make waste dry and use for cooking purpose.
6	Burying	6	Most of respondent mentioned that they owned goat and they clean vicinity they buryingwaste near house.

Issue related to Animal waste:

31%of respondent (20% drying at surrounding of house, 5% drying for cooking purpose and 6% are burying) said that animal waste become dirty and give unpleasant smell and flies always present on waste in all season, the most problem happen during rainy season, area become muddy and flies and mosquito make them sick. They can not throw the waste outside their Farm land due to far from house and they don't have refuse pit. A combined 70-80% respondent mentioned following issue related to Animal waste and HH Garbage are:

- Flies land on garbage and germs cling to its' feet, then the fly lands on food or drinking glass and you pick up another germ.
- Rats get into the garbage- then into house and walk all over everything in home- helping to spread disease. Mice do about the same thing as rats-they are just Smaller and able to enter areas through smaller openings
- Cockroaches breed and feed in the garbage- then spread out from there, infesting the area

Observation for Household Waste:

HHs waste location	Y(%)	N(%)	Reason
Household pit	7	93	Most of HHs dedicated the location in their courtyard and called the refuse pit.
Clean Courtyard	30	70	House wife clean the courtyard once or twice in days.
Unpleasant Smell	82	18	As cattle dung lying on courtyard since morning start giving bad smell in environment.
Flies on Animal waste	92	8	Un-cleaned courtyard and no proper disposal of Animal waste invite flies, ants and cockroaches.

Information on Hygiene Awareness

According to the latest WHO data published in April 2011 Diarrhoeal diseases Deaths in Myanmar reached 13,919 or 2.62% of total deaths. The age adjusted Death Rate is 28.97 per 100,000 of population ranks Myanmar 56 in the world.[1]

44% mentioned that cause of diarrhoea and stomach upset are eating unhygienic dirty foods. 18% out of 44% said primarily they unable to recognise the importance of clean food and sometime they eat uncovered food which may be contaminated and then they suffer from Stomach ache.

Many people do not make the link between poor water quality and diseases such as diarrhoea, intestinal worms and skin diseases. Dirty hands and unsanitary waste disposal perpetuate the cycle of disease and poverty.

Cause of Diarrhoea and Stomach upset

19% of respondent don't know the cause of diarrhoea, which shows lack of knowledge of other vector borne diseases. Risk factors that were associated with persistent diarrhoea and malnutrition included low family income, low education of mothers, unhygienic latrines, flies in the house and on the child, dirty appearance of child and mother, mother not using soap and water when washing child's stools, defecation of child on floor, breastfeeding on demand, child eating food from floor, not feeding recommended weaning foods, and lack of knowledge by mother about causes of diarrhoea and about foods that prevent malnutrition. These results indicated that persistent diarrhoea and malnutrition in surveyed areas are caused by a complex of several interrelated socioeconomic factors, unsanitary behaviour pertaining to personal hygiene, the practice of demand breastfeeding and lack of certain weaning foods, and low education of mothers who showed less knowledge about causes of diarrhoea and prevention of malnutrition.

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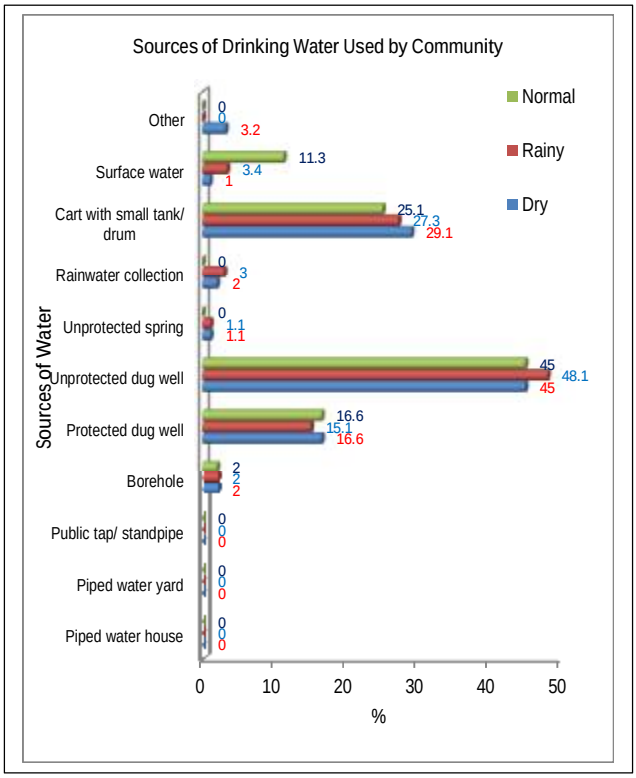
Unprotected spring	1.1	1.1	0	2.2	0.73
Rainwater collection	2	3	0	5	1.7
Cart with small tank/ drum	29.1	27.3	25.1	81.5	27.2
Surface water (river, dam, lake, pond, stream, canal, irrigation	1	3.4	11.3	15.7	5.2
Other	3.2	0	0	3.2	1.1
Total	100	100	100	300	100



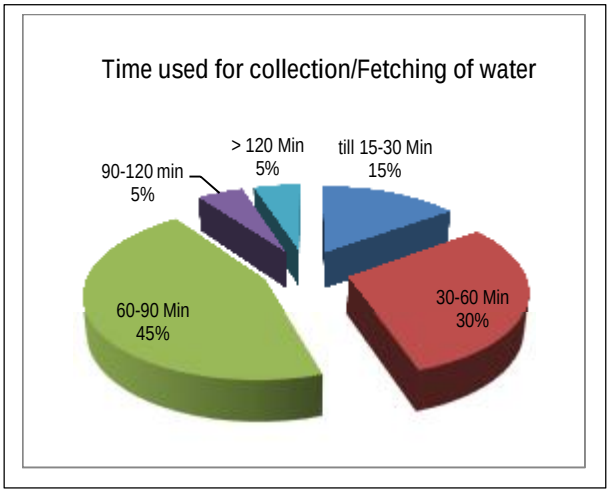
trickling out, and depleted, while 16% people mentioned that they use alternative source of water 8% of Household mentioned that they have water shared by neighbours or monastery but quantity is not sufficient and 6% said they went to other villages for this purposes.

Fetching of Water for drinking and domestic purpose:

In Za Iote Ma 69.8% of respondent mentioned that they need to fetch water from current water sources. By gender, the number of female water fetchers is greater than the male. According to Age groups 10-18 age bracket constitute the largest number of (37.1%), followed by those 18-30 (23.7%). The third largest group belongs to 30-40 yrs age group (16.8%) Children (10 or under) and elderly person(60 or above) account for the least percentage 1.3% and 3.7% respectively.

Time used for Collection/ Fetching of Water:

53% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 15 min to 30 min. 43% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from 1-2 hrs. 4% of respondent mentioned that the average time for collection of water during normal (winter and Rainy) season is range from more than 2 hrs

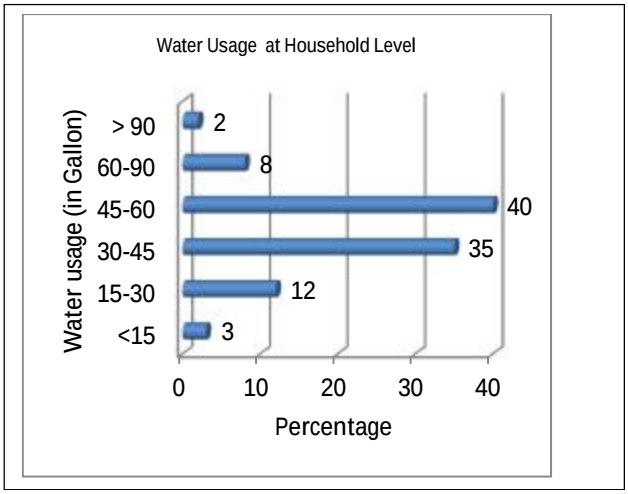


During Dry season most of current water source in village become dry or thewater table level go. Women's mentioned some time in rainy season water quality become worse of some sources and during dry season most of time they go for fetching of water 2-3 times, as some of them are lacking of transportation and they have to carry water on their shoulders. Some of respondent mentioned that during dry season most of villagers faced following issues are:

- Sharp Depletion in water table level.
- Water Recharge take long time and quantity is not sufficient
- New source is not sufficient for villagers.
- Travel time to fetch water increase (3-4 times) as compare to normal time.
- Water quality is worse and muddy and yellowish in nature.
- Lack of fuel wood for treating/ boiling of water.

Water usage per Household

At least 47 percent of the household use 30-90 gallon and 46% percent of the household use over 90 gallon of water per day for their domestic and personal hygiene which indicate an average of 12-20 gallon per person per day. Only 7percentage use less than 30 litres of water per family for their daily usage

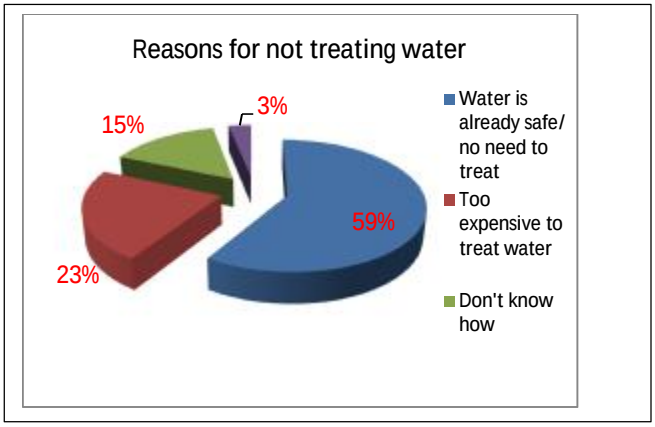


Treatment of Water: (Treatment of Water to make it safer)

Water treatment is considered key in ensuring that water is clean and safe. However, an overwhelming 81.5% of households do not treat their drinking water. The proportion of households that do not treat their drinking water is significantly high suggesting a high level of exposure to water borne diseases. Those households who do not treat their drinking water cited several reasons, notable was that the water is already safe (59.0%), too expensive to treat water (22.5%).

Table : Main reason for not treating water

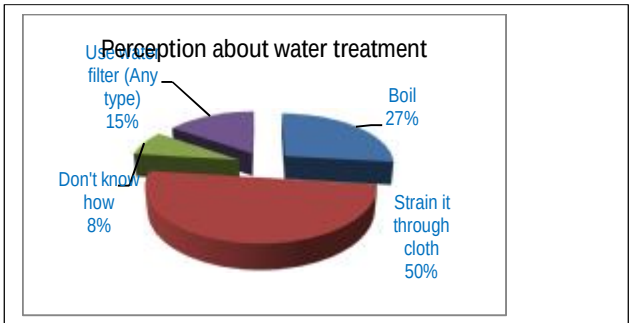
	Frequency	Percent
Water is already safe/ no need to treat	15	59
Too expensive to treat water	6	22.5
Don't know how	4	15.3
Don't like the taste of treated water	1	3.2
Other	0	0
Won't give specific answers	0	0
Total	26	100



Perception about treatment of water to make it clean/safe to drink

Table : Main reason for not treating water

	Frequency	Percent
Boil	7	27
Strain it through cloth	13	50
Don't know how	2	7.5
Use water filter (Any type)	4	15.5
Add bleach/chlorine	0	0
Solar disinfection	0	0
Total	26	100



Problems

The current problem for current drinking water reported by responded during survey are categorised and summarised.

Water quality	%	Reason
Dirty/ Brackish water	8	village water source installed by Govt /private owners providing brackish water with mild salinity level. During water quality check we

		find the range are 1000 ppm to 1200 ppm in some of villages. And if the boil, there is not sufficient firewood available
Bad taste	13	Some village beneficiary mention the taste of water is not good due iron presence in water. And some time if they drink they become sick etc. Some of respondent mentioned that during cooking with rice the water turn in yellowish color
Disrupted supply / not enough for fulfilling present needs	43	This is normal problem of respondent , they mention that during dry season the water sources become dry and water scarcity arises
Difficulty to collect		Most of people responded mentioned that they have to travel 30-60 min or more to collect the water during dry season and during normal time its 1-2 hrs.
High Water Cost		During dry season the cost of water become high due to unavailability of drinking water ,in normal time 10-15 kyat per gallon become 20-25 kyat, due to vender also has to collect water from far sources and travel time increases
Others		Some people mentioned that maintenance cost of tube well running is high, and some time owner cannot afford to repair.

Attitude towards present water supply (only for drinking purpose):

The Attitude of respondent is presented in following ways as per seasonality. The combined response for Za lote Ma are:

	Dry	Rainy	Normal
Water Quality and Quantity are sufficient	9% agreed that water is available during dry season and quality is good and 91% mentioned that quantityis not enough due to some of sources become dry.	11% agreed that water is available in this season and 45% mentioned quality is not good as the current sources become muddy some times. 32% people mention that they collected water in this season, but they don't have enough pots to collect RWH.	24% mention that water is available in this season and some of water source quality is good and sufficient
Water delivery /Collection is good and enough are available with 10-30 min walk	60-70% of respondent mention that nearest collection point for water become dry ie. well etc. So they have to travel 1-2 hrs to collect water	60% mention that during this season water is available at nearest point.	65% mention that during this season water is available at nominal cost and at their nearest water sources.
Enough water but quality is concerned.	80-90% responded that water quality is brackish where water is fetched through tube well,.	40-60% mention that Enough water, if good rain, but annual precipitation is decreasing in recent years.	65% respondent mentioned that water is available and quality is good related to wells.

Water storage container cleaning agent

79% of respondent mentioned that they wash container with water, but used the same water which may be mild salinity. No one responded that they wash the container with clean and safe water. 9% respondent mentioned that they clean the container with soap and water.

Access to Sanitation:

Majority of both men and women own latrine and only 54 percent have their own latrine but during the feedback session and focussed discussion on access to latrines they reported the access was lower with only about 20-35 percent having own latrines. What they reported was the most commonly used neighbour and relatives laterines. However the survey data

indicates at least 40-45 % use neighbourhood or families sharing latrine

Defecation Places at Villages

49% of respondents mentioned they defecate inside the house latrine. 34% people go for open defecation by combining the results B, C,F, and G . 15% of people use their neighbor, relative or family latrine for defecation and% of people use village communal latrine, but this is not available in all survey villages and issue related to cleanliness is major concern of villagers.

The gender and children wise segregation are shown in graph below and percentage wise in table below

Defecation Place	Female	Male	Children<5	Children >5
	In percentage			
In house Latrine	56	53	26	60
In bushes	21	21	9	19
behind the house	10	11	10	11
Communal latrine	3	3	1	3
Family/Rel. latrine	3	3	50	3
Outside the village	6	7	2	4
near river /creek	1	2	1	0
Total	100	100	100	100

Benefits of Laterine:

Benefits of laterine questions asked for those respondent who has laterine or owner of laterine. The response are:-

#	Benefits for Laterine	%
A	less time to walk to deficate	24
B	More privacy	23
C	Decrease in Diarrhoea	27
D	Social status	12
E	Feel shame to deficate in open	14

14% of respondent mention they feel shame to deficate in open place. 27% of respondent that not deficating in open mentioned that by having laterine the risk of diarrhoea in their family is decreasing.

Nearly all latrine owners reported that adults and children usually use the household latrine for defecation, although children are slightly more likely to continue the practice of open defecation. Almost 95% of latrine owners indicated that they would defecate in the field or forest if they did not have a household latrine

Satisfaction level with present Latrine

66% respondent mentioned that they satisfy with their laterine and 34% mention that they are not satisfy with present laterine

Reason for not Having Laterine

Approximate 60% of respondent mentioned that construction of laterine is expensive and they can afford, Some of respondent mentioned that they can afford superstructure by using old material of houses but can not afford regular disposal system

18%of respondent mentioned that they dont have enough space for construction of laterine in their present land and their farmland is far from their house.

Age group of Children's to start using Laterine

49% of respondednt mentioned that their childrens start using the laterine at the age of 4-6 yrs.

Place for Children's Stool disposal

34% respondent mentioned that they mixed children stool with cattle dung in same area where they collect cattle dung.28% respondent mentioned that they throw stool in latrine. 36% mentioned that they throw children stool either in behind the house or bushes- forest areas. 2% mentioned they left children stool in courtyard and when they clean they through outside courtyard

Observations for Sanitations:
The observation are:

		No	%
A	Availability of latrine and type	233	100%
1	Pit latrine	38	16.7%
2	Fly-Proof latrine with bamboo Soak pit	184	78.9%
3	Fly-Proof latrine with Con. Ring Soak pit	11	4.4%
B	Condition of latrine (super Structure and soak pit)	233	100%
1	Good Condition	38	16.7%
2	Dilapidated Condition- (Privacy issue)	90	39.8%
3	Bad condition- (Need repair)	101	43.4%
4	Latrine has Concrete slab	4	0.17%
C	Distance of laterine from house	233	100
1	Inside house	75	32%
2	Within 10-20 mts	42	18%
3	Within 20-150 mts	48	20%
4	Within 150-250 mts	18	8%
5	250 mts	23	10%
6	500mts	27	12%
D	Laterine Clean(No faecal Matter& urine on the floor)	233	100
1	Is laterine has Smell	115	49%
2	Soakpit full	40	17%
3	Visible waste	24	11%

4	Human faeces visible in yard	9	4%
5	Animal faeces visible in yard	3	1%
6	Open sewage/stagnant water	42	18%

HOUSEHOLD WASTE

There are two types of HH waste categorised are hazardous and non-hazardous waste seen in surveyed villages. Hazardous waste is used battery, fluorescent lamps and some insecticide material lying at corner of houses. Non- hazardous waste is kitchen waste, leftover food and vegetable, plastic bottles etc. are mixed with hazardous waste and found most of surveyed household. Most of Kitchen wastes are combined with water and humidity more than 50%. These factors produce unpleasant smell and make waste degradable seen in surveyed villages

21% respondent mentioned that they throw HH waste near to village road and 16% mentioned at farm land. A small 14% HH mentioned that they throw HH waste in refuge pit; most of HH mentioned small location called a refuge pit surrounded or vicinity of houses. 18% respondent said that they mixed with animal waste without reusing the plastic material

Disposal of Animal/ cattle Waste and issue

In villages, communities have less choice and techniques to dispose animal waste properly specially in regards to who has less land. The villagers are disposal animal and cattle waste in following areas:-

	Location	%	Reason
1	At refuse Pit	7	Respondent mention they owned large courtyard so end of vicinity of house they make refuse pit for waste.
2	At Bush	14	11% out of14 mentioned that they don't own agriculture land so they throw near bushes. 3 % mention that they throw other people farm land if they agree either they throw nearby bushes or near river area.
3	Drying for (fertilizer) at farmland	48	Farm land is nearby so can collect near farm land and when dry use for fertilizer.
4	Drying for (fertilizer) surrounding of house	20	Due to the farm land is far away from house and they collected at surrounding at then transfer to Farm land one in week.
5	Drying and using for cooking purpose	5	Respondent mention they own less quantity of cattle mostly buffalo and goat so they make waste dry and use for cooking purpose.
6	Burying	6	Most of respondent mentioned that they owned goat and they clean vicinity they buryingwaste near house.

Issue related to Animal waste:

31%of respondent (20% drying at surrounding of house, 5% drying for cooking purpose and 6% are burying) said that animal waste become dirty and give unpleasant smell and flies always present on waste in all season, the most problem happen during rainy season, area become muddy and flies and mosquito make them sick. They can not throw the waste outside their Farm land due to far from house and they don't have refuse pit. A combined 70-80% respondent mentioned following issue related to Animal waste and HH Garbage are:

- Flies land on garbage and germs cling to its' feet, then the fly lands on food or drinking glass and you pick up another germ.
- Rats get into the garbage- then into house and walk all over everything in home- helping to spread disease. Mice do about the same thing as rats-they are just Smaller and able to enter areas through smaller openings
- Cockroaches breed and feed in the garbage- then spread out from there, infesting the area

Observation for Household Waste:

HHs waste location	Y(%)	N(%)	Reason
Household pit	7	93	Most of HHs dedicated the location in their courtyard and called the refuse pit.
Clean Courtyard	30	70	House wife clean the courtyard once or twice in days.
Unpleasant Smell	82	18	As cattle dung lying on courtyard since morning start giving bad smell in environment.
Flies on Animal waste	92	8	Un-cleaned courtyard and no proper disposal of Animal waste invite flies, ants and cockroaches.

Information on Hygiene Awareness

According to the latest WHO data published in April 2011 Diarrhoeal diseases Deaths in Myanmar reached 13,919 or 2.62% of total deaths. The age adjusted Death Rate is 28.97 per 100,000 of population ranks Myanmar 56 in the world.[1]

44% mentioned that cause of diarrhoea and stomach upset

are eating unhygienic dirty foods. 18% out of 44% said primarily they unable to recognise the importance of clean food and sometime they eat uncovered food which may be contaminated and then they suffer from Stomach ache.

Many people do not make the link between poor water quality and diseases such as diarrhoea, intestinal worms and skin diseases. Dirty hands and unsanitary waste disposal perpetuate the cycle of disease and poverty.

Cause of Diarrhoea and Stomach upset

19% of respondent don't know the cause of diarrhoea, which shows lack of knowledge of other vector borne diseases. Risk factors that were associated with persistent diarrhoea and malnutrition included low family income, low education of mothers, unhygienic latrines, flies in the house and on the child, dirty appearance of child and mother, mother not using soap and water when washing child's stools, defecation of child on floor, breastfeeding on demand, child eating food from floor, not feeding recommended weaning foods, and lack of knowledge by mother about causes of diarrhoea and about foods that prevent malnutrition. These results indicated that persistent diarrhoea and malnutrition in surveyed areas are caused by a complex of several interrelated socioeconomic factors, unsanitary behaviour pertaining to personal hygiene, the practice of demand breastfeeding and lack of certain weaning foods, and low education of mothers who showed
less knowledge about causes of diarrhoea and prevention of malnutrition.

Diarrhoea cases in Family in past weeks

10% house hold mentioned that they commonly have problems of stomach upset and loose motion, which may be
diarrhoea, as they don't know symptoms of diarrhoea. 20-30% reported that they not aware about diarrhoea cases in
family. 10-12% reported that their children face some loose motion problem in current and past weeks also.

About diseases: - MALARIA

Understanding of the aetiology of Dengue, Malaria and Chikengunya is better than that for diarrheal diseases. This statement is made in light of the comparison of those who correctly identified what causes vector borne diseases 79 percent (mosquito bites) with those who listed germs 12 percent and 9 percent who don't know and those who listed
the correct answer in respect to malaria.

About diseases: - How Malaria Spreads

However, the understanding of how these diseases can be prevented is majored on environmental actions such as clearing stagnant water and bushes. Notable is the 7 percent who don't know what to do.

About diseases: - How Disease prevented

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About diseases:-Mosquito related Disease Control

Some of Beneficiary has knowledge for prevention of malaria related control methods by hearing the health department information through radio but applicability for using of the information they lacking the skill and resources.

Self-Reported Disease incidence and Health Care Options

The most prevalent diseases are water related, the highest reported household incidence being for diarrhoea at 13 percent, vector borne (12 percent) and skin diseases at 12 percent. Three of the top four diseases affecting households
are therefore water and vector related. Skin diseases, being largely water washed are a reflection of water scarcity while diarrhoea reflects in part the effects of poor water quality, hygiene and sanitation.

AWARENESS OF DISEASE AETIOLOGY

Poor understanding of disease aetiology contributes to poor understanding and practice in hygiene and sanitation thereby perpetuating a disease friendly living environment. Only 68 percent of respondents made the association between dirty food, dirty water and diarrheal diseases, added to the poor association between hygiene and these class of diseases, it is clear that poor awareness on hygiene and disease aetiology make individuals and communities susceptible to disease outbreaks.

HEALTH CARE OPTIONS

There is access to free medical care with an average of 150 patients attended to by MOH2 clinic which are mainly for prenatal and ante natal care. While the District general hospital provides medical care for an average of 350 patients daily. From the Ministry of Health the Public health inspectors conduct community and school health education program reaching approximately 59 percent of the population with 44 percent information on water and sanitation.

AWARENESS AND PRACTICE OF HYGIENE

The survey found that the link between disease and hygiene (hand washing) is very weakly appreciated , asked why it is important to wash hands , only 47 percent of respondents said this helps remove germs , on the other hand 45 percent said it simply removes dirt. While 2 percent didn't know.6 percent was for other reasons such as religious reasons .Further, it was established that consistent hand washing is highest before eating and when hands are dirty , both 22 percent followed by before handling food or cooking 18 percent and after handling infant faeces 12 percent . It is therefore clear there is little regard for the primary barriers to the spread of faecal borne pathogens but most people make observance of secondary barriers to the spread of faecal borne pathogens.

The efficacy of hand washing is further diluted by the cleaning agent used; 65 percent use water only and 31 percent use water and soap, the rest use water and abrasives, mainly ash. The main reason for this is low level is lack of awareness.

To achieve the desired hygiene transformations, PHAST trainers will have to reach over 50 percent of households in the intervention area through direct dissemination of messages on

better hygiene behaviour practices and also the link with safe water chain.

FOOD HYGIENE AND ENVIRONMENTAL HYGIENE

Food Hygiene

There is relative good practice with food being prepared just before eating or the morning before eating this reduces the risk of food poisoning. However as indicated previously, the practice of hand washing with water and soap and more so before handling food is low. While on food storage only 4 percent do not cover the food and this is stored outside.

On environmental hygiene, indicators in this theme are average of 26 percent households had either human or animal defecation in the compound at the time of the survey, increasing the risk of disease transmission within the household. Garbage disposal is predominantly by crude dumping or burning with 34 and 35 percent of households respectively applying these methods thereby creating a favourable environment for vermin and insect vectors. 89 Percent said rats were a problem and the figure was confirmed to be higher. With 20 percent indicating lack of knowledge on what disease rats spread .But even the 80 percent could not mention the specific disease.

Other aspects of sanitation, namely the disposal of infant's faeces are equally poor; only 28 percent of households, put infant are faeces in the latrine .The main disposal method is dumping in the open or drains thus a health hazard.

SANITATION

A majority of both men and women do not own latrine and only 15 percent have their own latrine but during the feedback session on access to latrines they reported the access was lower with only about 5percent having own latrines. What they reported was the most commonly used method was cat method and bushes. However the survey data indicates at least 72 percent use communal latrines which are more of the neighbourhood concept with families sharing one latrine. There is every little gender differentiation on the method or place of defecation. But what is obvious is that there over 500 households indicated they use cat method for the children under five which is a health risk. On latrine usage 18 percent of the latrines were not clean and there were signs of urine or faeces and the main reason cited were low level of awareness. While only 72 percent of the latrine were cleaned daily.

Access to sanitation is not included in the project objective hence no budget allocation made for this. Meaning alternative funding source will have to be identified by households who have no access to sanitary latrines

SELF REPORTED DISEASE INCIDENCE AND HEALTH CARE OPTIONS

The most prevalent diseases are water related, the highest reported household incidence being for diarrhoea at 13 percent, vector borne (12 percent) and skin diseases at 12 percent. Three of the top four diseases affecting households are therefore water and vector related. Skin diseases, being largely water washed are a reflection of water scarcity while diarrhoea reflects in part the effects of poor water quality, hygiene and sanitation.

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HEALTH CARE OPTIONS

There is access to free medical care with an average of 150 patients attended to by MOH1 clinic which is mainly for prenatal and ante natal care. While the District general hospital provides medical care for an average of 350 patients daily.

ON SCHOOL WATER, SANITATION AND HYGIENE SUITATION

On school water, sanitation and hygiene situation all the eight schools (with total population of 4408) within the target area were surveyed. On access to safe water, three school use shallow communal wells and the quality of the water is not guaranteed. The water is saline. It is clear there is need for more connections since there are only 15 functional taps available for the entire 4408 population. On latrine coverage one school has zero access. Where latrines are available they were not cleaned and it was not clear who was responsible. In addition there was no soap available for hand washing except in one school and even there the soap was not used.

While on waste disposal five schools have dustbins while the other schools either dump or burn. Although 6 schools have fences, animals roam inside 7 schools' compounds. Only five schools have health clubs but all the schools indicated their willingness to be involved in school hygiene promotion program.

CONCLUSIONS

The survey concludes that residents in the target area are exposed to multiple paths of infection, some of which are opened by poor infrastructure and others by poor knowledge and hygiene practice. The following are the main findings of the survey;

RISKS EMANATING FROM THE STATE OF WATER SUPPLIES

Contamination of water at source and within the household is exposing residents to water borne transmission and measures to prevent both are required .To prevent contamination at source , it is necessary to improve sanitation and conservation measures , while at the household level , improvements in storage and handling are required , coupled with the household treatment to ensure safe drinking water. In promoting household treatment, provision of low cost options will be critical to sustained uptake of the safeguard.

Although water usage per capita is fair, the sources are polluted thus placing individuals and communities at risk of water washed diseases. Increasing safe water supplies will reduce this risk coupled with better personal hygiene, which nevertheless has to be actively promoted.

RISKS EMANATING FROM POOR SANITATION

Poor sanitation is posing a threat to water supplies and its presence in the domestic arena especially that of infants is presenting additional risk, including encouraging insect vectors. Low levels of overall sanitation are also putting households that have invested in proper sanitation at risk because vectors move

[1] Medical Officer of Health

freely between compounds as cited with the rats, mosquito and flies problem. Improved sanitation for individual households will have to be matched by much wider coverage for full benefits to accrue.

RISKS EMANATING FROM POOR HYGIENE

Poor hygiene is as much a product of poor awareness as it is a result of lack of necessary facilities. Hygiene promotion will have to be matched by provision of better sanitation and water services. On a balance of probabilities, primary barriers, namely proper sanitation and hand washing after defecation or handling infant's faeces are more critical to the control of diarrheal disease.

MONITORING AND EVALUATION CONSIDERATIONS

To track the effect of improved water and sanitation and enable the use of disease patterns in fine tuning the intervention, it is necessary to collect disease incidence data at health centres, and also using PHAST trainers record sheets.

DESIGN CONSIDERATIONS

Much greater impact will be achieved if available resources are allocated for subsides for water connections since the majority of the expected beneficiaries are poor estimated to be over 65 percent by Pradeshiya Sabah existing data and may not afford to connect up to the water supply system within the lifespan of the project. However for those households which cannot still connect up, alternatives may be sought such as introduction of ceramic water filters to maximise on their efficacy.

On sanitation the project has no component to fully address access to sanitary latrines yet hygiene promotion benefits can only be realised if access to sanitary latrines is addressed. Efforts will be made through hygiene promotion to encourage the households without access to look for alternative donors since this is a glaring gap which by all means needs to be addressed to add value to the existing project and the beneficiaries' lives.

RECOMMENDATIONS

Based on the findings, the following recommendations are made to target actions at areas which have the comparative impact in reducing water related diseases, improve access to safe water and key hygiene practices.

FACILITATING HEALTH THROUGH IMPROVED WATER SUPPLY

Development of water supply system focusing on improving per capita water consumption, and ensuring water supply is acceptable quality. This will require;

The construction of the water supply system is intended to reach at least 35 per cent of the population of Pottuvil .This will stabilise, and increase the capacity and quality of the water.

For the households who will not have access or will prefer to use the existing traditional water sources actions will include installation of conservation measures to stop water contamination at source thus sustain safe water chain. Communities shall also be encouraged to use protected water supplies in preference to other sources

For sustainability in improvements to water supply, the National Water Supply Drainage Board will be trained on management issues, and provided with technical capacity through training of local technicians to carry out maintenance and repair work. To ensure availability of funds for maintenance and repair the board shall be trained on the need of cost recovery and in the management of these funds .Care shall be taken to ensure subsides in relation to water connection so that the poorer households can afford water.

To prevent water contamination in the household, safe water handling, treatment and storage shall be promoted among the target communities.

IMPROVING HEATH THROUGH BETTER SANITATION

Although the project has no component on provision of sanitary latrines, safe sanitation shall be promoted so that in conjunction with good hygiene, pathogens shall be prevented from entering the living environment and spreading to new hosts. The project will partner with the Pradeshiya Sabah, the MOH and DHO and other stakeholders together with the local communities in conducting periodic clean up campaigns and community health awareness promotions using various multi media channels and also the conventional ones such as use of religious places.

IMPROVING HEALTH THROUGH HYGIENE

Hygiene promotion shall be carried out through the PHAST methodology and shall place particular emphasis on primary barriers to disease spread i.e. safe sanitation and hand washing after contact with faeces. Emphasis will also be placed on domestic hygiene, food and water handling through encouraging cleanups, safe water storage, construction of dish racks and food cupboards etc.

CHAST (Children Hygiene and Sanitation Training) shall be carried out at schools to address risk factors manifest there. CHAST training shall be undertaken using the Child to Child (CTC) and whenever possible, shall be integrated into school Red Cross Clubs (where applicable) to provide continuity of activities .Further , the intervention shall take measures to ensure all schools in the intervention area are provided with safe and sanitary facilities

MONITORING AND EVALUATION

To demonstrate the impact on improved hygiene health outcomes, PHAST and CHAST trainers shall maintain records on disease incidence among beneficiary households and schools, including the extent to which households are adopting various counter disease measures. The intervention shall also work with clinics to maintain aggregated community level disease incidence data. This data shall be used to gauge the efficacy of various measures and adjust intervention as appropriate.

In totality, these recommendations, if implemented with other project components will provide protection from most routes of infection and therefore reduce the incidence of water elated disease.

DEMOGRAPHIC CHARACTERISTICS

Females constituted 78 percent of the survey sample, while the survey protocol selected respondents on the criteria of adult residents in household with preference for the household head. The larger number of female respondents is due to the greater likelihood of finding women in the household during daytime hours as women spend more time in the homestead performing domestic chores.

DISCUSSION OF FINDINGS

This discussion focuses on the bearing of the findings to the project's objectives, and more importantly, to the control of disease and the provision of water supplies of acceptable quality. It is therefore necessary to lay a brief background to the project, and the methods that will be used in its implementation.

The project will be implemented with the goal: To improve health of the target population in Pottuvil by improving sustainable water supply system and hygiene within the beneficiaries. Interventions to increased access to and use of safe water in target community has three components which are (i) water is transmitted from treatment plant to water tower without significant leaks or contamination (ii) adequate clean water storage capacity (water tower + pumps) exists to supply distribution network (iii) clean water is consistently supplied to households via distribution network and household connections.

These hardware components will be supported by a software component with an objective of improved hygiene practices related to safe water usage and vector control in target communities comprising of sanitation and hygiene training for SLRC volunteers in PHAST and CHAST methodologies to carry out community and school hygiene promotion using multimedia channels apart from household visits .The third objective of the project will involve enhancing the capacity of the NWSDB to operate and maintain the Pottuvil water supply system through training to operate and maintain the new infrastructure and equipping by tools and equipment to carry out their O&M function.

The findings of this baseline survey indicate there is great need for these interventions, particularly for safe water supplies and better understanding of the aetiology of disease to create demand for better hygiene behaviour. The provision of these water services on a sustainable basis will require supporting institutional infrastructure such as that planned under the NWSDB components. The baseline also finds there is demand for these components, particularly capacity building in maintenance and operations. The need for O&M capacity will become even more critical with the construction of distribution network and the treatment and storage plant. Strict management for cost recovery will be required.

The findings of the survey in respect to the three core components i.e. water, hygiene and management capacity are as follows;

WATER SUPPLIES

The state of water supplies is characterised by a high degree of use of unsafe water sources which are also seasonal, with pronounced water shortages in the dry season. These shortages are exacerbated by the increased cost of water in the dry season. The seasonal patterns consist of high usage of generally cost free surface water in the wet season. Protected and unprotected shallow wells are therefore the main water supplies in the dry season, used by 30 and 29 percent of households respectively. The number of households purchasing water from vendors (trucks and vendors) 6percent increases during the dry season. This creates incentive to reduce consumption especially during the dry season. The 27 percent of households using boreholes also increases while the ones using household taps does not change.

Reducing seasonal shocks as well as ensuring safety in water supplies is therefore a priority transformation. These seasonal changes are not only damaging to health and welfare, but they also threaten the benefits of any hygiene and sanitation training carried out among the communities; The practice of hygiene will definitely be impacted by dry season water shortages and the recovery with increased availability of water in the next water season will definitely be to a lesser degree. Further water supply needs to be stabilised to reduce the risk of water washed diseases, which comprise a substantial part of the morbidity burden.

Another parameter of importance to the implementation of the project is user preference in water supplies. The unprotected shallow wells, protected wells and communal boreholes are the most preferred water supplies in that order. The strongest preference criteria parameters are time, safety, distance and improved health. While cleanness is the strongest preference criteria, the second and third criteria proximity and time imply that households will use whatever water is available simply because there are no choices. This means that for water supply improvements to have the desired impact, they must be available within reasonable distance and cost, and be available all year round.

As the project intends to address households connections (output 3.1 Clean water is consistently supplied to households via distribution network and household connections) The proportion of households that have to pay for water all year round rises dramatically by at least 50%.It will be important to examine the willingness to pay for water as the need for user fees through billing will become more critical to ensure sustainable operation. The current cost of water ranges between 400 and 800 Sri Lanka rupees; Further, it is important to take note that households try avoiding paying for water when it can be accessed for no cost, therefore, the number of households using water from vendors and water tankers is very low in the wet season. Therefore for piped system, to succeed, it has to be priced to ensure that water is affordable, but also generate sufficient revenues for O&M. Considering the price sensitivity of water consumers, they must also offer other tangible benefits such as safety, consistency, proximity and cost. The sustainable management of water points sought by the intervention will very much depend on good

financial management as much as technical measures. The charging of water by monthly billing must balance the need for cost recovery and the need to ensure that cost does become a barrier to access. The current tariffs are set in such a way for water consumption below 200000 litres the cost is lower than 300 rupees but beyond 20000 litres the cost ratio is much higher. The tariff setting also caters for the Samurdhi domestic users who are given a much lower rate. The NWSDB intends to revise the current tariffs upwards.

In terms of water consumption, quality and quantity are the primary factors in terms of health outcomes. It established that quality of most water is poor. In terms of quantity, there is need to maintain the mean daily per capita consumption of over 20 litres per person per day benchmark of consumption levels which are needed to meet basic hygiene and consumption needs . Water availability has implications on the ability of individuals to practice proper hygiene, creating especially conducive conditions for the spread of water washed diseases such as skin diseases, which are quite prevalent. However, at the current low levels of awareness on certain aspects of hygiene, lack of water is not the only reason hygiene standards are poor. The quantity of water supply must be increased in tandem with hygiene promotion to ensure there is enough water for individuals to practice what they learn. While there are strong indications, there other reasons for poor hygiene, the lack of sufficient water compounds the problem by constraining hygiene when and if demand for it is present.

DOMESTIC WATER HANDLING

Domestic water handling and storage is critical in the safety of drinking water supplies, if done unhygienic ally, it can contaminate water that was previously safe, negating the benefits of developing safer water sources. Efforts to improve water therefore need to be simultaneously undertaken both at the point of use and supply.

Only 31 percent of households consistently treat their drinking water, and the main reasons cited by those who don't were that it's too expensive 43 percent and don't know how to 6percent. 51 percent said it is not important, illustrating an opportunity for substantial changes through awareness creation which would also address those who don't know how to treat. The cost impediment has to do with the need to purchase fuel for boiling, or treatment tablets ,even where wood fuels is used , there is an expense in the time used to collect it and boil the water . A water filter option would address these issues, but for a filter to effectively substitute boiling or chemical disinfection, it must meet the relevant safety standards. For a sterile water filter the standard is an effective pore size between of .01 micron and .45 microns. Filters with effective pore sizes between .45 micron and 1.0 micron are considered to be bacteriologic ally safe. This can be an option to be explored by the project for those families that will not be able to afford to connect up to the water supply system despite subsidization. Further, as ceramic filters can leave residual levels of bacteria it is imperative that filtered water be stored very safely to reduce multiplication of these residual pathogens to infectious levels.

Interventions that manage to improve water quality at source will have their impact diluted by contamination in transit and storage, with a concomitant reduction on their impact in reducing diarrhoeal diseases. Regarding these, the survey found that water storage and handling in the house are poor. While 67 percent of households store their drinking water in a metallic pot or jerry can which being narrow necked container reduces the possibility of in house contamination, with 17 percent of these containers were observed to be uncovered and not clean. There are numerous opportunities for contamination of water in storage or handling, a risk amplified by the poor hand washing behaviour enumerated in this survey.

In any case, only 31 percent of households consistently treat their drinking water, the main some of these methods such as filtration and sedimentation have negligible impact in reducing micro organic pathogens, but can remove some larger pathogens.

The main impediments cited in this regard were the expense and lack of knowledge on how to do it. Therefore, considering the water sources used by households, supplies are very likely to have been contaminated at source let alone within the household.

WATER MANAGEMENT STRUCTURES

The survey indicates that existing water management structures are weak and poorly supported by the community. The main complaint was being delays in repairing water points (there are very many broken wells), and failure to keep the water point clean. Operational and maintenance weaknesses are of specific concern, considering the water supply proposed to be implemented by the project. Failure to keep water points clean may well negate the benefits of increased water supplies. The management structures in place are predominantly community elders and water committees, and they may very well lack the technical capacity to implement their mandate. Community support for these structures and O&M at water points is also weak.

HYGIENE AND SANITATION INDICATORS

FOOD HYGIENE AND ENVIRONMENTAL HYGIENE

The handling of food related items is critical to the prevention of faecal oral diseases, by either water washed or water borne transmission paths. Hand washing has a bearing to food hygiene; persons with unwashed hands can contaminate dishes leading to household members ingesting pathogens. Only 28 percent of compounds were observed to be clean at the time of the survey, the possibility of contamination is high. There is need to enforce proper food storage (inside and covered).

SANITATION

Sanitation standards in the surveyed areas are poor; less than 16 percent of households have own latrines, and not all of them are inside the house. 18 percent of the latrines observed were not clean. Dirty latrine might cost more in terms of health by attracting vermin than in its value in safe sanitation.

The project has no component for access to sanitary latrines yet there is a glaring need despite efforts made by different agencies such as IFRC ,World Vision, ADRA and the local council .The local authority has made a written request to the project for assistance in construction of 500 latrines with 35 percent in the target area. The cost of putting up a latrine is between 35000 and 50 000 rupees and looking at the income bracket of the beneficiaries it means they will need to be facilitated and encouraged to construct at least 1200 latrines. This will require strong emphasis on building community demand for safe sanitation and matching this with local capacity to construct latrines of acceptable quality at accessible cost. Further, even after these latrines are installed, there is a large challenge in ensuring they are properly maintained, this will require close tying of efforts to increase sanitation coverage with the PHAST training to emphasise the importance of keeping latrines clean.

Garbage is also mainly disposed by dumping in the open and in the environ of the house, with 34 percent of households applying this method, the environment around the house is conducive for vermin and disease vectors, its no wonder then that only 66 percent of households had clean compounds, and even those who keep their compounds clean cannot fully enjoy the benefits of this if their neighbours do not reciprocate. This also applies to the installation of household latrines, households cannot fully benefit from proper sanitation unless all households in their neighbourhood install and use safe sanitation. It is therefore imperative that sanitation improvement be a community wide endeavour. The biggest impediment to households putting up latrines is the associated cost; in 44 percent of households, infant's faeces are disposed of by dumping in the open. Considering that children , being the main victims of faecal- oral disease , are most likely to have infected stool , the risk of disease spreading from this aspect of unsafe sanitation is very high .

AWARENESS AND PRACTICE OF HYGIENE

In considering the practice of hygiene, it is beneficial to approach the matter from how well individuals understand the risk between hygiene and disease, and how much this informs their decisions on hygiene. It is also important to appreciate that individuals may practice hygiene behaviours, not necessarily from disease avoidance motivations, but also from visceral and social ones.

Regarding the latter, the survey found that the link between disease and hygiene (hand washing) is very weakly appreciated , asked why it is important to wash hands , only 47 percent of respondents said this helps prevent disease , on the other hand 45 percent said this is simply to keep clean while the 6 percent said for religious reasons . Irrespective of the motivation, persons who consistently wash hands will enjoy the benefits, but when the link between hygiene and health is explicitly in the conscious, there is greater consistency in practice. This idea is an important undying idea behind hygiene promotion.

Moving on to practice, the survey found that consistent hand washing is after handling dirt and eating 22 percent respectively followed by cooking or handling food 18 percent, followed by after defecation16 percent and after handling infant faeces at 12percent . Only 18 percent consistently wash hands before cooking.

Examining these instances by their importance in preventing disease, it is clear there is little regard for primary barriers to the spread of faecal borne pathogens; those that along with proper sanitation ensure that faecal borne pathogens do not enter the living environment. These are hand washing after defection and after handling infant faeces. This distinction is important because; faecal borne pathogens enter the living environment; they can spread by a wide variety of ways, and can easily infect people within and beyond the household, even if they themselves practice proper hygiene.

As for secondary barriers, those that prevent pathogens once in the environment from reaching new hosts, there is greater regard, with most people washing hands before eating, and for this there is a strong visceral compulsion. However, the small number who washes their hands before preparing food is cause for particular concern, considering the risk of infection to all those who consume the food refer to DHO data on food poisoning prevalence.

The efficacy of hand washing in removing pathogens is heavily influenced by the cleaning agent used , while using water alone is better than not washing at all , proper hand washing with soap and water give the most certainty in removing dirt and pathogens from the hands . In this respect, the majority, 65percent use water only, 31 percent use water and soap, the rest use water and abrasives, mainly ash.

SELF REPORTED DISEASE INCIDENCE AND HEALTH CARE OPTIONS

By this point, it is quite possible what diseases to anticipate among the population in the survey area given the status of water supplies, sanitation and hygiene. These expectations are borne out in the diseases self reported by respondents.

However what is interesting that is despite the poor sanitation and water status there is comparative low water borne or vector borne diseases in general. The fact was acknowledged by the MOH and

the DHO as a case of either under reporting, though the DHO has relatively higher cases of water and food related diseases such as dysentery and typhoid. There is practically no vector borne disease recorded in the health centres. From the self reporting data, Diarrheal cases are 13 percent followed by skin diseases at 12 percent and Chickengunya at 7 percent and Respiratory infections are 5 percent. Notable is 51 percent respondents were recorded as having no diseases in the family within the last 3 months of the survey period. There other reason has bearing on genetics which explains the high immunity and resilience translating into low disease incidence.

AWARENESS OF DISEASE AETIOLOGY

The vulnerability of individuals and communities to water related diseases is increased by the poor understanding of their aetiology, which means health seeking behaviour is not informed by knowledge of what infection paths to block.

21 percent of respondents couldn't correctly tell what causes Malaria and 7 did not know how to prevent Dengue, Malaria or Chicken gunya. Further only 67 percent of households have mosquito nets and these were given out 2 years ago under the Tsunami program and the users said the nets are now old and tattered. The RMO/RMC expounded on the proper use of the nets otherwise their efficacy in Malaria control is lowered.

Regarding diarrhoeal diseases, only 27 percent of respondents made the association between dirty food and dirty water and diarrheal diseases , added to the poor association between hygiene and these class of diseases , it is clear that individuals and communities have ill informed health seeking behaviour.

Schools

The school survey clearly depicts the need for a hygiene promotion in the schools since there are glaring gaps in access to safe water, use of sanitary latrine and personal hygiene.

HEALTH CARE INFORMATION

There is also considerable good community outreach on health care matters; with 77 percent of the respondents reached with information on water and sanitation. And 59 percent of this outreach is by the public health inspectors. Considering that the intervention intends to raise the proportion of households that have been reached with health messages by 50 percent with messages on water conservation and vector control it means then PHAST trainers will need to apply diverse methods beyond house to house employed in PHAST. Communication channels that can reach a significantly larger audience will also be applied such as use of banners, loud speakers and media. This will be reinforced by the PHAST process which will monitor hygiene and health transformations within households. Hence a robust monitoring system together with dynamic communication strategy will be applied.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The survey findings clearly illustrate the demand for safe water, access to sanitary latrines and sound hygiene practices focusing on all the five hygiene domains. To minimise health risk and maintain health of the community there is need for linking individual interventions to the wider goal of disease prevention. As such, the conclusions have been presented to highlight the link between the parameters measured into survey and health outcomes.

RISKS EMANATING FROM THE STATE OF WATER SUPPLIES

- Although there is good per capita water consumption there is need to break the cycle of water borne and washed transmission of disease through encouraging personal hygiene practices. The poor quality of water is contributing to water borne diseases. Increasing water supplies alone however, will not automatically address water washed disease transmission, the point of focus is providing sufficient water for proper hygiene. There are very strong indications there is poor understanding and appreciation of the value of hygiene, realising the benefits of increased water availability will require hygiene promotion to be undertaken in tandem. Increasing the quantity of water available to households and hygiene promotion will also address water washed diseases, specifically skin diseases which are also prevalent.
- Water that is available is of poor quality, facilitating water borne transmission of disease. Polluting activities at water points, poor handling and storage, as well as the very small number of people who treat their drinking water exposes individuals and entire communities to this risk. Poor sanitation contributes greatly to this risk, with defecation in the open posing particularly great risk to sub surface water sources which are widely used. Poor management is also a factor in this respect, specifically the failure to prevent contamination of water sources. Poor domestic handling of water further increases the risk of water borne contamination, not only from non treatment, but also from inadvertent contamination from dirty hands, poor handling and dirty storage containers.
- This requires actions to increase water safety at source and point of use. There are several opportunities for increasing safety at source, through conservation works and better sanitation primarily but also through stricter enforcement of management rules to stop polluting activities. Even so, these measures cannot yield full microbiological safety of drinking water. This requires domestic treatment, and safe storage and handling. Considering that cost is currently a major impediment to water treatment, the promoted treatment method will have to be low cost.

RISKS EMANATING FROM POOR SANITATION

- The primary risk from this end is unsafe disposal of faeces, posing risk to water sources and introducing contamination risk to the living environment especially in the domestic space. Improving sanitation will help reduce water source contamination, prevent parasitic diseases and insect vectors particularly flies. Improved sanitation will be particularly effective against bacterial diarrhoeal diseases such as Dysentery and Typhoid, which are the most common diseases of this type.
- The current project has no provision for latrines but beyond the project set objectives, the community has to match improved sanitation with the promotion of hygienic use of latrines and other sanitation facilities. Further, it is important to note that better sanitation is most effective when there is full coverage in a neighbourhood, people, livestock, vermin and vectors move across domestic boundaries and households which don't have latrines imperil those that do the same situation is existing in the schools. Current sanitation coverage is low with a larger number sharing and a significant number practising open defecation and cat method. Other approaches to increase sanitation coverage will be needed. There is also a need for safer garbage disposal and infant faeces to discourage vermin and insect vectors.

RISKS EMANATING FROM POOR HYGIENE

Hygiene behaviours observed by the study are inimical to poor health, and are a result of a number of reasons which can conceptually be divided into two. On one hand either for lack of formal education, community outreach or simply the attrition of knowledge, most individuals do not appreciate the link between hygiene and good health. On the other hand, lack of facilities and infrastructure such as safe water supply, latrines, garbage pit pits and so on makes it difficult for people to practice these behaviours even if they were motivated to do so.

Providing the infrastructure and facilities such as through the construction of water supply and distribution network and latrines will not automatically result in individuals practicing the full retinue of proper hygiene, nor will promote hygiene without facilitating access to the requisite infrastructure make headway in maintaining the health of the target community.

There is a need for hygiene promotion to provide the knowledge and demand for healthy behaviour, and commensurate investment in the requisite infrastructure.

However , there is a delicate balance to be made here ; the range of behaviours that need to be improved is large, from hand washing , domestic hygiene , water storage and handling , hygienic use of latrines and conservation of water sources to mention a few . The focus of hygiene promotion therefore needs to be on those practices that have the most impact in reducing the targeted diseases, in this case Diarrhoea. Further, practising the full range of hygienic practices while desirable is in reality

impractical in low resource contexts, the amount of water required for this is often unavailable, and soap is often inaccessible for poor households.

It is important to recognise that most infections occur in the domestic arena, and if the choice has to be made as to what measures to concentrate on, the obvious choice is on improving hygiene and sanitation in the domestic space. As faecal borne pathogens can spread in a variety of ways once released, it is most effective to concentrate preventing release in the first instance.

IMPORTANCE OF MANAGEMENT SYSTEMS

Poor performance of existing management systems threatens the safety of water supplies by failing to ensure conservation of water points. Proposed infrastructure under the intervention will require more robust and skilled management to ensure correct operation and maintenance and cost recovery. Building management capacity will be central to the sustainability of the intervention. In particular, all management structures must be provided with skills in elementary financial management, and supported with suitably qualified water technicians. And overall must remain accountable.

MONITORING AND EVALUATION CONSIDERATIONS

Observing patterns of disease spread can help focus intervention on the paths posing the most risk (i.e. water quantity or water quality) further as the overall goal of the entire intervention is to reduce disease, it is important to measure the actual trends in disease prevalence. Considering the inaccuracy of self reported disease data, it will be necessary to incorporate health data from health centres, but as these have very limited coverage of the population, the intervention will have to develop internal methods of collecting this data .The intervention is also challenged to try increase the coverage of formal healthcare to achieve full and prompt remission for infected persons and therefore limit transmission.

RECOMMENDATIONS

The recommendations from the survey are broadly structured to refine implementation by addressing weaknesses in existing setup in reference to the project goal of improving health of the target population.

FACILITATING HEALTH THROUGH IMPROVED WATER SUPPLIES

The development of water supply system shall be undertaken with the focus of improving per capita water consumption, and also ensuring that available water supplies are of acceptable quality.

To this end;

§ The intervention will intercede to make water supply throughout the year. This will be achieved by constructing water the water supply system and water tower storage in the intervention area. Selection of settlements to benefit from this action will be on the basis of those settlements that have the most constrained water supplies. The system will be designed to serve the communities to ensure communities have access through the year. To ensure sustained operation of the piped water system the intervention will train NWSDB staff and sensitise communities on the need for cost recovery. Management capacity to oversee operations and management shall be supported by the training of local technicians from NWSDB in the O&M of the installed water supply. To ensure equity in water supplies, the intervention shall explore the option of giving subsidies for the poor (Samurdhi) and Tsunami affected households considering the seasonal nature of some households' incomes, and the large number of unemployed. To maximise on the impact of actions to improve water supply safety, the intervention shall conduct community sensitisation on the importance of using water from safe sources in preference to other supplies. This will be incorporated into PHAST training and community outreach. These actions to increase the quantity and stability of water supplies will support improved hygiene; improvements in quality will contribute to the multiple barrier process of water safety.

The following actions will in contribute to drinking water safety at point of use

§ The intervention shall carry out a comprehensive exercise to improve water storage and handling at household level. This will focus on water treatment and handling, particularly fetching of drinking from storage water for consumption. Regarding the latter, households shall be sensitised on the need to use narrow necked containers, covering them and decanting to reduce opportunities for water contamination within the household.

§ To increase the number of households that treat drinking water, the intervention shall train on different methods of water storage, and the need for safe storage of treated water. Households without the means to buy the filters will be encouraged to use other treatment methods.Special focus will also be given to water conservation.

Actions to improve safety of water at point of use will further reduce water borne transmission of disease.

IMPROVING HEATH THROUGH BETTER SANITATION

§ Latrines and other sanitation options shall be ineffectual if they are not maintained in a hygienic manner, in this respect, PHAST training shall emphasize proper use, maintenance and cleaning of latrines. To eliminate the high risk posed by infant faeces in the domestic space, PHAST training shall pace emphasis on this respect and local trainers shall target households with infants for messages in this respect.

§ The intervention shall also work to ensure all households have proper garbage disposal pits, situated at an appropriate distance from the house, and kept free of vermin by periodic burning. To remove garbage in communal spaces, PHAST trainers shall organise households to carry out periodic communal cleanups. 10.2.3 IMPROVING HEALTH THROUGH HYGIENE

Hygiene practices are the convergence point for the availability of safe and more water and sanitation to determine health outcomes. Better hygiene awareness also creates demand for safe water and sanitation, supporting actions in this respect. The extent to which they will be adopted will determine the success of the entire intervention in achieving the overall goal of improving health.

§ PHAST training will in the first instance focus on primary barriers to the spread of diarrhoeal disease. This includes hand washing after defecation and handling infant faeces. While the whole range of hand washing retinues is to be promoted, these two should receive the most emphasis because they have greater efficacy, and where water is scarce it is better to concentrate on these two.

§ PHAST training shall also place strong emphases on the domestic hygiene, specifically, keeping the compound and latrine clean to discourage insect vectors and flies and also to reduce the risk of infection for young children.

§ To reduce the risk from contaminated food, the intervention shall encourage through training the construction of dish racks, and safe storage of food within the household. For the latter, simply keeping food covered should have substantial impact in reducing the contamination risk.

§ To reduce the risk of infection of children while at school, the intervention shall implement training for children and teachers within all target schools and supported by the subsidies in the provision of water supply for schools and latrines rehabilitation , and promotion of a clean school environment through clean ups conducted by CHAST groups. Focus will be given child friendly methods in addressing behaviour change.

§ Overall, in promoting hygiene, the intervention shall maintain that poor hygiene is as much a result of poor awareness as it is a consequence of lack of facilities. Therefore, in all instances, PHAST and CHAST trainers shall work with those local authorities involved in the improvement of latrines and water supplies to ensure communities that are trained are also facilitated / provided with the infrastructure they need to practically adopt the training.

MONITORING AND EVALUATION

To clearly demonstrate the effect of the intervention on health, the following measures shall be added to the monitoring and evaluation of the project:

§ PHAST trainers shall be instructed on the collection of disease incidence in each of their beneficiary households. This will focus on the incidence of water related diseases and shall be collected monthly to gauge the level of adoption of various measures, and also demonstrate the differential health outcomes for households adopting interventions and those that haven't. PHAST trainers shall also collect data on the adoption of various measures such as latrine cleanliness, proper food and personal hygiene and shall also identify factors hindering households that are not responsive to training. The same data collection measures shall be adopted for CHAST.

§ The intervention shall also work with the man health clinics available to monitor disease trends by season and therefore help in identifying seasonal risk factors. PHAST trainers shall also work with public health inspectors to provide periodic dissemination sessions at clinics and also target households that have suffered an incidence of water related disease for follow-up.

It is expected that by reducing contamination of water at source, reinforcing its safety by domestic treatment, handling and storage, coupled with the promotion and facilitation of better hygiene, there will be substantial reductions in water related diseases and this shall be demonstrated by reduced household incidence of these diseases. The project will endeavour to increase access to health information through the use of multimedia communication channels based on the need for each target group.

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