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Baseline Survey Water, Sanitation and Hygiene



**Nyiragongo Territory, North Kivu Province
Democratic Republic of the Congo (DRC)**

October 2008

**Survey for Mercy Corps
Conducted by MDF Afrique Centrale***

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*Original report produced in French.



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(DRC)**

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MDF Afrique Centrale, Training & Consultancy

243 Avenue de la Paix, Goma, Democratic Republic of the Congo
Email: mdfac@mdfac.org, Web: <http://www.mdf.nl/mdf-ac>
Telephone: +243 81 1717 808, Fax: +31 847 183 754

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- All the surveyors who dealt with difficult conditions during the data collection.
- The surveyed population who welcomed the survey teams and responded openly to their questions.
- USAID for its financial support to complete this study.

Summary

The water, sanitation and hygiene baseline survey conducted in Nyiragongo Territory in October 2008 was done to inform indicators for Mercy Corps' Multi-Year Assistance Program (MYAP) in North Kivu Province in the Democratic Republic of the Congo. This population-based study focused on households' current health, nutrition and socio-economic status in addition to information about household water use, water storage, and sanitation. Moreover, this study provided a baseline for household knowledge and practices concerning waterborne diseases.

The situation in Nyiragongo Territory reveals a vicious cycle in which numerous factors contribute to ongoing poverty. Living conditions are difficult as witnessed by low purchasing power, low levels of education, lack of access to information, overcrowded households, houses made of mud bricks, latrines in poor condition, poor access to safe drinking water, etc. These factors lead to inadequate hygiene and basic sanitation, resulting in a prevalence of waterborne diseases in the community. As there is a lack of awareness about waterborne diseases and preventative measures are not widely known or practiced by the local population, preventable common illnesses play a toll on households. High health care costs and reduced productivity are just two consequences of preventable illnesses. Without an improvement in basic living conditions, households in North Kivu are at risk of plunging deeper into poverty.

The baseline survey shows that:

Nearly seven in ten (69 percent) households in Nyiragongo Territory are poor as they live below the poverty line of \$1 per person per day as set by the World Bank.

The average number of people per household is 5.83. Only 21 percent of households have between one and three people.

Only 24 percent of those surveyed said that they had participated in at least one meeting about health awareness.

Agriculture is the main source of income for 56 percent of households.

21 percent of households have experienced at least one case of malaria during the two weeks preceding the baseline study. Half of households have experienced at least one episode of diarrhea in the same period. Another common waterborne affliction, intestinal worms, was observed in 42 percent of households visited.

A large proportion of households face problems due to a lack of hygiene: 17 percent of households have lice, 29 percent have cockroaches and 37 percent have bugs in bed. The survey also shows that only 69 percent of respondents use soap to wash their hands and 8 percent use ash.

The surveyors observed that few household plots are clean and sanitary. Household garbage is collected in waste pits (21 percent), but it was noted that many households (44 percent) dispose of garbage by throwing it on the ground outside the house and 35 percent dump garbage in the countryside or in abandoned lots.

The average quantity of water used by household members is seven liters per person per day. This quantity is far below the WHO standard of 20 liters per person per day.

Six out of ten households (60 percent) take more than 30 minutes to reach a water source. Only 33 percent have access to a sufficient quantity of water. It was noted that households that spend more than 10 minutes to reach a water source are 2.4 times more susceptible to intestinal worms compared to those who spend less than 10 minutes to reach a water source.

In 89 percent of cases, women are responsible for transporting household water.

The risk of contamination of water collected is very high. Sixty five percent of drinking water containers are not covered. Only 22 percent of households store their drinking water in jerry cans.

49 percent of households do not know how to treat contaminated water.

40 percent of households know that it is necessary to observe proper food and drinking water hygiene to prevent diarrhea. However, 49 percent of those surveyed do not know how to prevent diarrhea.

To prevent malaria, 16 percent agree that sleeping under a mosquito net is effective, but only 4 percent of respondents actually sleep under mosquito nets treated with insecticide.

Based on results of the baseline survey, the following actions are recommended:

- Implement activities to prevent waterborne diseases.
- Educate the community about waterborne disease prevention and how to treat contaminated water.
- Increase access to water.
- Strengthen and support behavior change for improved sanitation and hygiene.
- Construct latrines.

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1 INTRODUCTION

1.1 Background and Justification

North Kivu Province has six million inhabitants and an area of 47,250 km², representing 127 inhabitants per square kilometer. The main urban centers of North Kivu are Goma, Masisi, Mweso and Kirotshe in the southern part of the province and Rutshuru, Lubero, Butembo and Beni in the north. The main ethnic groups are the Hunde, Hutu, Nande and Tutsi.

Armed conflict in eastern DRC has routinely disrupted everyday life for thousands of inhabitants for more than a decade. This conflict has had serious humanitarian consequences, including millions of conflict-related casualties, violence against women and girls, a growing HIV/AIDS rate, high rates of global acute malnutrition, recurrent outbreaks of cholera, a high rate of internal displacement and increased poverty.

In addition to the legacy of conflict, a critical underlying cause of food insecurity in North Kivu is lack of access to clean water. Nationwide, 54 percent of Congolese lack access to sufficient quantities of clean water. A Mercy Corps assessment in 2007 found that this figure is even higher in North Kivu, particularly in the targeted communities of Kibati, Lac Vert, Mudja, Mugunga, Munigi, Ndosho and Rusayo. A small percentage of the population has access to piped water in Goma. A volcanic eruption in 2002 destroyed many water systems, including much of the piped water network, which has further aggravated the population's ability to access potable water. The lack of access to water has led to a high incidence of waterborne diseases, such as diarrhea and intestinal worms.

Mercy Corps is striving to overcome limited water access and sanitation facilities in its three-year Multi-Year Assistance Program, awarded by USAID's Office of Food for Peace. This program will improve health, hygiene and food security conditions in urban and peri-urban communities of Goma through its WASH activities. The baseline survey conducted in October 2008 is the first in a series of evaluations that will enable Mercy Corps to evaluate the outcome of its interventions.

1.2 Objectives of the Study

Conducted in Nyiragongo Territory from October 16-25, 2008, the baseline survey had the following objectives:

Main objective: Identify water, sanitation and hygiene problems in urban (Ndosho) and peri-urban areas of Goma (Kibati, Lac Vert, Mudja, Mugunga, Munigi and Rusayo).

Specific objectives:

- Assess the quantity of water used in households.
- Assess how water is stored and used at the household level.
- Assess the level of sanitation and hygiene for individuals and households.
- Analyze household knowledge and practices about waterborne diseases and malaria.
- Identify different methods of household waste removal and treatment.

1.3 Methodology

1.3.1 Target Population

This study targeted households (both displaced and local) in the seven communities covered by this program. Only heads of household or their spouses responded to the questionnaires.

During focus group discussions, adult males and females from the communities where the study took place took part in the discussions.

This study was conducted in collaboration with the North Kivu provincial health authorities, Mercy Corps, MDF Afrique Centrale (MDF AC) and local administrative authorities.

1.3.2 Sample Size

Random Selection

The survey covered a representative sample size of 420 households. The study was done through systematic random sampling of the seven targeted communities located on the outskirts of the city of Goma. At the entrance of each community, the first house to be surveyed was drawn at random from among the first three houses. Thereafter the surveyors went to every third house until they had surveyed 60 households in the community. It should be noted that the survey team was unable to compile a list of all of the households in the targeted communities, nor is a general census of the population available. Thus, the survey team used the same principles for sampling as it would have if they had a list of households. With this approach, the survey team ensured that each household in the community had a chance of being selected.

The sample size was calculated using the formula below:

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

$$n \geq \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.05} = 384.16$$

Therefore, we could survey up to 420 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 420 households. This sample allows the team to draw statistically 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 have been analyzed.

To ensure the effectiveness of the fieldwork, one supervisor, one field coordinator and 12 surveyors were needed.

Three directions were selected:

- Axis 1: Ndosho, Mugunga and Lac Vert
- Axis 2: Munigi and Kibati
- Axis 3: Mudja and Rusayo

Map of Goma and Surveyed Areas



1.3.3 Data Collection, Coding, Entry and Analysis and Production of Report

The surveyors underwent a two-day training prior to conducting the survey so that they were able to prompt and record appropriate responses. Data collection was done on the basis of a household questionnaire.

The survey was conducted by passing from home to home, using the methodology described above. Surveyors were recruited based on their intellect, knowledge of fieldwork and previous experience. The selection of surveyors was done by MDF-AC through an individual interview. The training was followed by a pre-survey test in a community not targeted in the baseline study. Jean-Claude Balolebwami and Isabelle Katungu of MDF-AC coordinated the study.

The data collected were standardized and encoded by MDF-AC in SPSS. The analysis of data was done by Jean-Claude Balolebwami in SPSS 12.0.1. The report was written by Jean-Claude Balolebwami under the supervision of Dr. Jannes van der Wijk, both from MDF-AC.

For the comparison of averages, MDF used the variance analysis test (ANOVA) for homogeneous variances and used the Kruskal Wallis non-parametric test when the Bartlett test showed that the variances were significantly different.

The means comparison was done by the Student Test for small samples and proportion comparisons were done with the Chi-square test.

Possible bias and methodological limitations

1. "No response bias." The fact that 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 surveyors 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 compared to the original question written in French. Accordingly, during the training session the survey team took sufficient time to translate the questionnaire into Kiswahili and the surveyors had the translated text in Kiswahili next to the questions in French.
4. "Investigator bias." The opinions of the surveyors and their supervisors can skew the results. For example, when surveyors 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 surveyors explained the objectives of the study to avoid this bias.
6. "Privacy bias." In order to ensure the respondents' confidentiality, the investigator makes 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 surveyors.
- Started with a pre-survey (pilot test) and supervised surveyors during the study.
- Verified the completed questionnaires each day and provided feedback to the surveyors before conducting fieldwork the next day.

2 RESULTS OF THE STUDY: QUANTITATIVE DATA

The overall results are presented without referring to the values found by section (in this case, each community). For some indicators, the survey team adds a confidence interval of 95 percent.

2.1 General Information – Quality of Sampling

2.1.1 Surveyed Communities

The survey was conducted Nyiragongo Territory, in the communities shown in the following table:

Table 1: Surveyed households by community

Community	Number of Surveyed Households	% of Sample
Kibati	60	14.3
Lac Vert	60	14.3
Mudja	60	14.3
Mugunga	60	14.3
Munigi	60	14.3
Ndosho	60	14.3
Rusayo	60	14.3
Total	420	100.0

2.1.2 Characteristics of Surveyed Households

Percentage of males and females

The table below shows the percentage of men and women in the surveyed households:

Table 2: Percentage of men and women in surveyed households, by community

Community	Male		Female		Total
	Number of People	Percentage	Number of People	Percentage	
Kibati	163	52%	148	48%	311
Lac Vert	158	44%	202	56%	360
Mudja	157	47%	179	53%	336
Mugunga	200	48%	219	52%	419
Munigi	147	46%	173	54%	320
Ndosho	175	50%	185	50%	351
Rusayo	176	51%	169	49%	345
Total	1176	48%	1275	52%	2442

Overall, the sex ratio was 48 percent male compared to 52 percent female.

Average number of people and children under five

Table 3: Average number of people per household

Community	Number of Households	Number of People in Households	Children Under Five	
			Number	Average
Kibati	60	311	95	1.58
Lac Vert	60	360	89	1.48
Mudja	60	336	80	1.33
Mugunga	60	419	114	1.90
Munigi	60	320	80	1.33
Ndosho	60	351	102	1.70
Rusayo	60	345	108	1.80
Total	420	2442	668	1.59

In the 420 households surveyed, there were 2,442 people. The average number of people per household is 5.83. The variance analysis test (ANOVA) shows that there is no significant difference in the average number of people per community. The results are almost equal to the national average of six people per household.

The average number of children under five years of age is 1.59 per household. Children under five constitute 27 percent of the population in Nyiragongo Territory. This percentage is well above the national average of 20 percent of the total population.

Male and female survey respondents

As in most African households, the head of household is usually male. This is also the case in Nyiragongo Territory; nevertheless it was frequently women who responded to the survey questions. Seventy four percent of those surveyed were women.

Table 4: Male and female survey respondents, by community

Community	Number of Households	Male		Female	
		Freq.	%	Freq.	%
Kibati	60	23	38%	37	62%
Lac Vert	60	11	18%	49	82%
Mudja	60	15	25%	45	75%
Mugunga	60	19	32%	41	68%
Munigi	60	14	23%	46	77%
Ndosho	60	12	20%	48	80%
Rusayo	60	15	25%	45	75%
Total	420	109	26%	311	74%

Length of Time in the Community

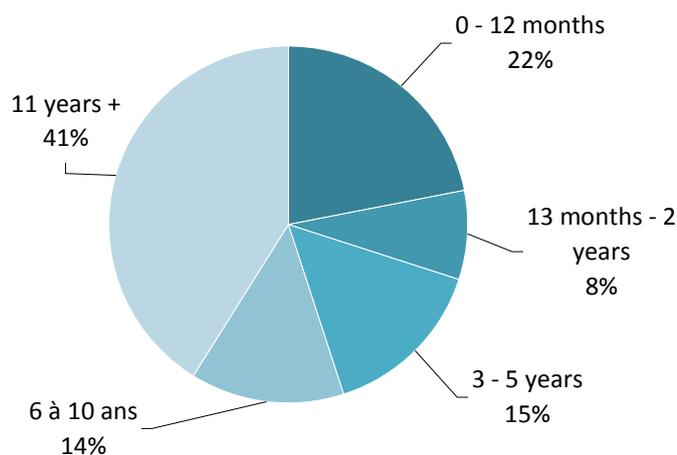


Figure 1: Representation of households according to the length of time spent in the community

The chart below represents answers given to the question "How long have you lived in this community?"

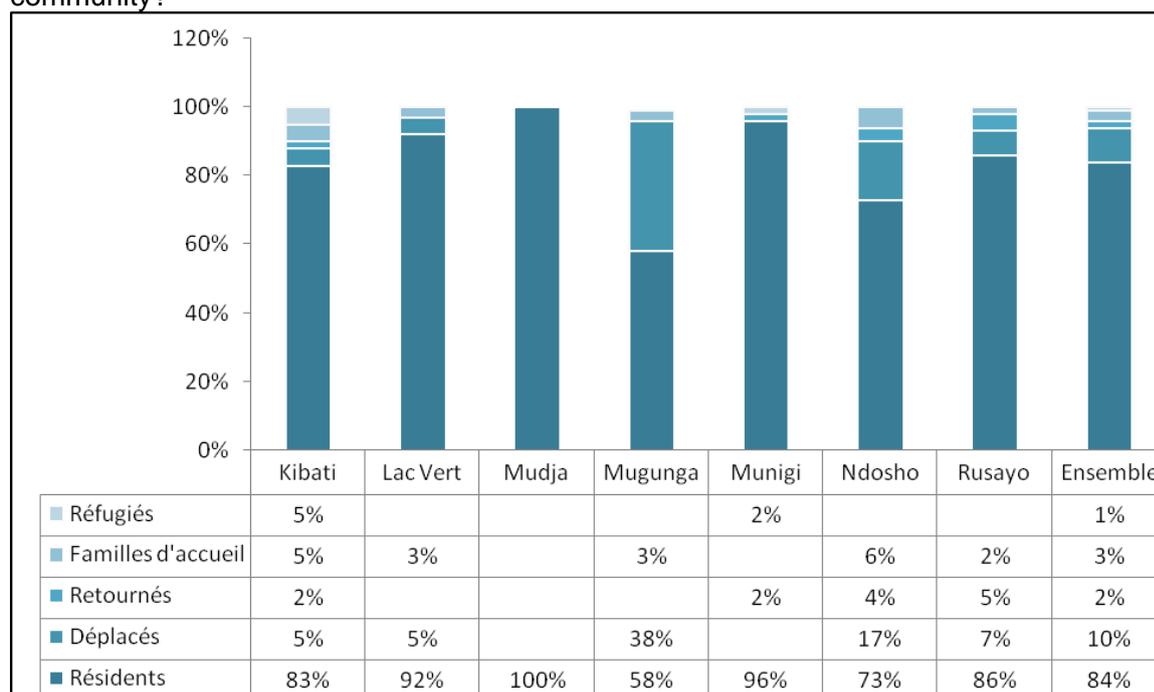


Figure 2: Households by category

Of all households surveyed in Nyiragongo Territory, more than eight in ten households surveyed (84 percent) are residents (not IDPs or refugees), one in ten households (10 percent) is internally displaced, 3 percent are host families (hosting a displaced family) and 3 percent are either returnees or refugees.

Displaced households come from Masisi, Ngungu, Sake and Kichanga. Nearly five in ten (46 percent) displaced households plan to stay in Goma. The 54 percent that do not plan to stay in Goma gave the following reasons:

- They would like to return to their fields;
- They do not have a permanent home in Goma (they have to pay rent);
- There is no motivation to stay in Goma when the conflict ends;
- “Goma is not our home.”

Table 5: Home ownership by community

Community	Number of Households	Own		Rent	
		Freq.	%	Freq.	%
Kibati	60	56	93%	4	7%
Lac Vert	60	49	82%	11	18%
Mudja	60	60	100%	0	0%
Mugunga	60	37	62%	23	38%
Munigi	60	55	92%	5	8%
Ndosho	60	39	65%	21	35%
Rusayo	60	52	87%	8	13%
Total	420	348	83%	72	17%

In Nyiragongo Territory, more than eight in ten (83 percent) of those surveyed own their homes and 17 percent are tenants.

2.2 Household Income

2.2.1 Sources of Income

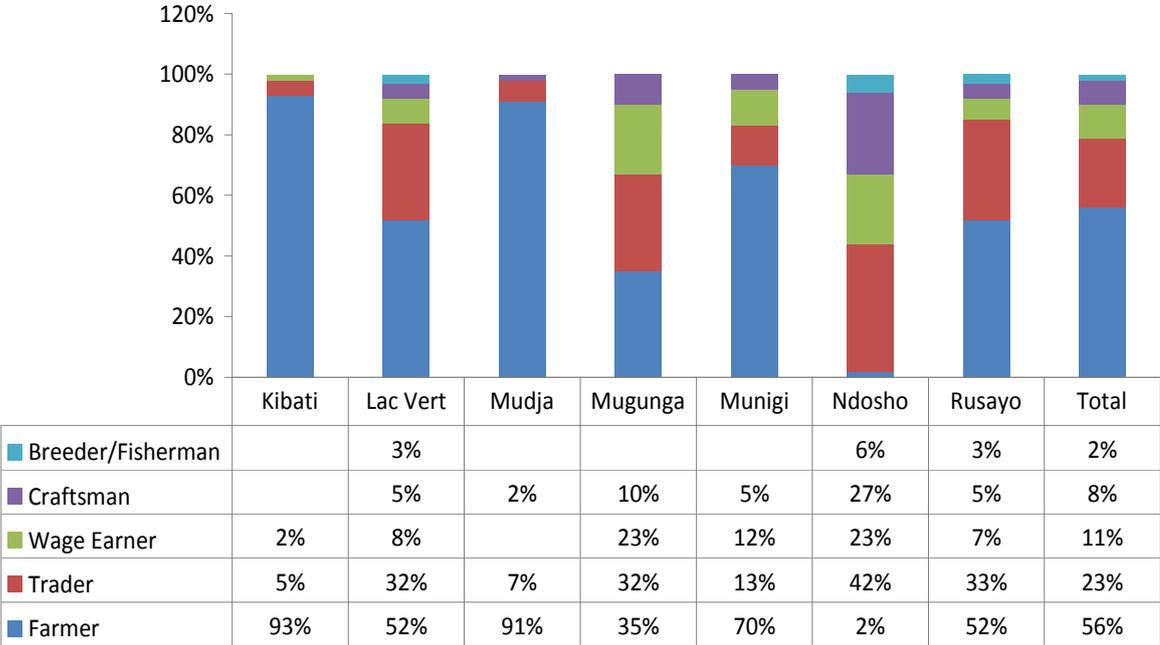


Figure 3: Primary source of household income by community

Agriculture is the main source of income for 56 percent of households, as shown on the above graph. Kibati and Mudja are mainly agriculture-based communities (93 percent and 91 percent respectively).

2.2.2 Average Household Income

In the surveyed communities monthly household income varied between \$5.63 and \$498.93. The average yearly income per person is \$327.60. Income level varies significantly ($p < 0,01$) from one community to another.

The average income per person per day is \$0.91. It can be safely stated that the population in the surveyed communities lives below the poverty line set by the World Bank of \$1 per person per day.

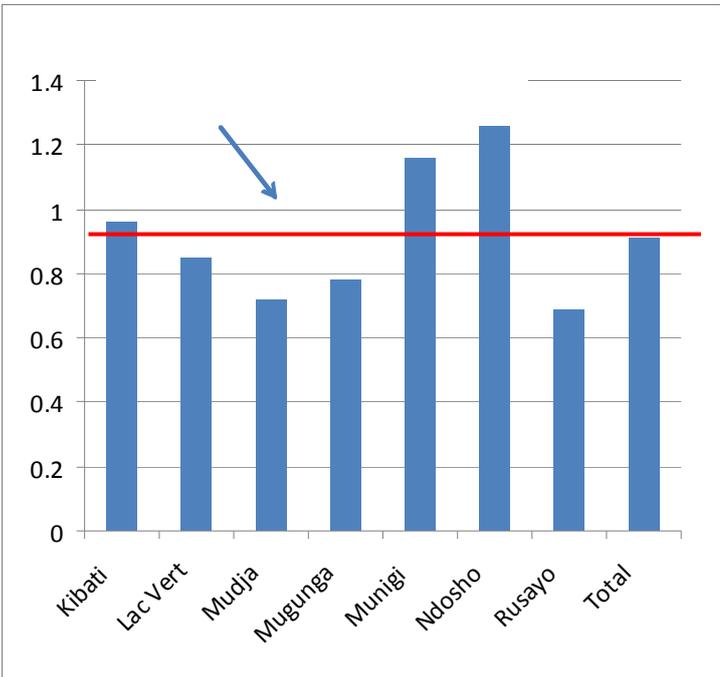


Figure 4: Average income (in \$US) per person per day, 2008

The typical household (defined as a household between the poorest and least poor) has a monthly income (median) of \$105.00 (\$0.60 per person per day or \$216 per person per year). In Rusayo and Mudja, the average income per person per day is \$0.69 and U.S. \$0.72, respectively.

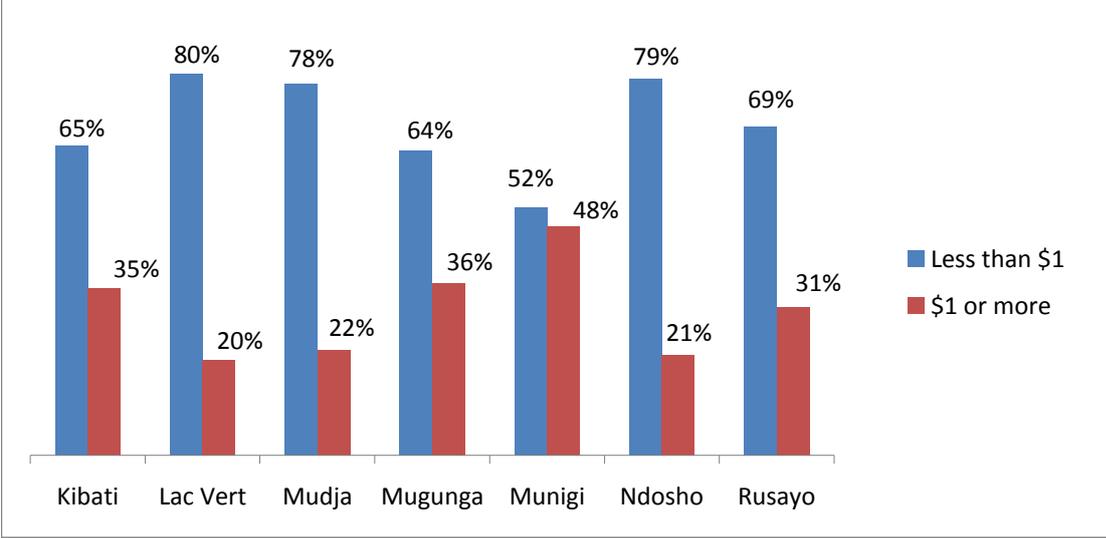


Figure 5: Proportion of households living on less than \$1 per person per day.

69 percent of surveyed households live on less than \$1 per person per day and 31 percent live on \$1 or more per person per day.

2.2.3 Household Dietary Diversity Score (HDDS)

The household dietary diversity score helps to measure household food access and is calculated as follows:

HDDS (0 – 12) =	Total number of food groups consumed by household members. The values for A to L are either '0' or '1.' Sum (A+B+C+D+E+F+G+H+I+J+K+L)
-----------------	--

Equation 1: Household Dietary Diversity Score (HDDS) used to measure household food access

Secondly, the HDDS average is calculated for the sample population.

HDDS Average =	$\frac{\text{Sum (HDDS)}}{\text{Total Number of Households}}$
----------------	---

Equation 2: Average HDDS

An increase in the average number of different food groups consumed gives a quantifiable measure of improved household food access. In general, any increase in household dietary diversity reflects an improvement in the diet of the household. If one wants to use this indicator to measure improvements in a food security context, one must compare HDDS changes to a significant targeted diversity level.

The dietary diversity of wealthier households may be used as the target on the assumption that poorer households purchase food when they have enough money, and consequently they reflect consumption patterns of richer households. Projects using the HDDS indicator typically include interventions aiming to increase household incomes and, therefore, the baseline surveys collect general information on income or economic status in addition to dietary data.

With the available income data, the sample population was divided into three income groups and the team calculated the average dietary diversity for the wealthiest group. The average HDDS of the wealthiest 33 percent of households in the baseline survey is 3.81, which can serve as the target for performance monitoring.

The results are below. Note that the analysis excluded households that spent more than \$500 per month (n = 403).

Table 6: HDDS according to income bracket

Income Bracket	Number of Households	HDDS (0-12)	Average HDDS
Poorest 33%: (Less than \$78.4369)	134	400	2.98
Middle 33%: (Greater than or equal to \$78.4369 but less than \$137.3214)	134	437	3.26
Wealthiest 33%: (Greater than or equal to \$137.3214)	135	514	3.81

2.2.4 Percentage of Households that Consume Fruit and Vegetables Rich in Vitamin A

The percentage of households that consume fruit or vegetables rich in vitamin A is calculated by quantifying the proportion of households that consume these specific foods. This is calculated as follows:

% of households consuming fruits and vegetables rich in vitamin A	$\frac{\text{Number of households with B, D or F = 1}}{\text{Total number of households}} \times 100$
---	---

Equation 3: Percentage of households that consume fruit or vegetables rich in vitamin A

Table 7: Number of households with B, D or F = 1

Code	B	D	F	Number of households with B, D or F=1
0	211	323	402	273
1	192	80	1	

Calculation:

$$\frac{273 \times 100}{403} = 67.7\% \text{ of households that consume fruit or vegetables rich in vitamin A}$$

2.2.5 Months of Adequate Household Food Provisioning (MAHFP)

The months of adequate household food provisioning which measures household food accessibility is calculated as follows:

MAHFP (0 – 12)	Twelve months minus the total number of months during the past 12 months that the household could not meet its food needs. Values for A to L are either '0' or '1.' (12) - Sum (A+B+C+D+E+F+G+H+I+J+K+L)
----------------	---

Equation 4: Months of Adequate Household Food Provisioning used to measure household food access

Secondly, the average MAHFP indicator is calculated for the same population. The denominator includes all households interviewed, even those who did not have months of adequate food provisioning.

Average MAHFP	$\frac{\text{Sum (MAHFP)}}{\text{Total number of households}}$
---------------	--

Equation 5: Average MAHFP

The months of adequate household food provisioning of the wealthiest 33 percent of households is used as a target. Projects using the indicator MAHFP typically include interventions to increase household incomes and therefore baseline studies usually collect some information on income or economic status.

With income data available, the sample was divided into three income groups and the team calculated the average number of months of adequate household food provisioning for the wealthiest 33 percent of households. The average MAHFP of the 33 percent wealthiest households is 7.82, which can serve as the target for performance monitoring.

The results are below. Note that the analysis excluded households that spent more than \$500 per month (n = 403).

Table 8: MAHFP according to income bracket

Income Bracket	Number of Households	MAHFP (0-12)	Average MAHFP
Poorest 33%: (Less than \$78.4369)	134	959	7.16
Middle 33%: (Greater than or equal to \$78.4369 but less than \$137.3214)	134	1008	7.52
Wealthiest 33%: (Greater than or equal to \$137.3214)	135	1055	7.82

2.3 Water, Sanitation and Hygiene

2.3.1 Water Supply

The importance of water in sustaining life and preventing disease is clearly demonstrated. There are recommendations on the quantity and quality of water that must be available to the population. These recommendations serve as benchmarks in establishing water supply systems.

Quantity of water

Without water, life is impossible. A lack of water will result in increased morbidity due increased transmission of germs and poor hygiene. To maintain good health, the standard norm for water use/consumption is 20 liters per person per day. In extreme circumstances, this amount can be lowered to five liters per person per day.

Table 9: Proportion of households with access to a sufficient quantity of water

Community	Number of Households	Households with access to a sufficient quantity of water	
		Frequency	%
Kibati	60	4	7%
Lac Vert	60	57	95%
Mudja	60	15	25%
Mugunga	60	46	77%
Munigi	60	7	12%
Ndosho	60	6	10%
Rusayo	60	2	3%
Total	420	137	33%

Only one third of the surveyed households claim to have access to a sufficient quantity of water. It is noted that in Lac Vert, 95 percent of families have enough water because an international NGO has fixed the water supply (public taps). There is a similar situation in Mugunga where 77 percent of those surveyed have access to a sufficient quantity of water. In Kibati, some families fetch water in neighboring Rwanda.

Households that do not have access to sufficient quantities of water cited the following reasons:

- Lack of public taps.
- Water points are far away.
- Rely on vendors to get water.
- People use rainwater when it is available.

Table 10: Average amount of water consumed per household/day and per person/day

Community	Number of HH	% of households that spend more than 30 minutes to reach a water source		Average number of people per household	Average amount in liters per household per day	Standard deviation in liters	Average amount of water consumed per person per day (in liters)
		Freq.	%				
Kibati	60	12	20%	5.18	38.67	28.25	7.5
Lac Vert	60	39	65%	6.00	51.33	25.34	8.6
Mudja	60	15	25%	5.60	24.33	32.33	4.4
Mugunga	60	55	92%	6.98	51.67	25.05	7.4
Munigi	60	22	37%	5.33	32.00	19.90	6.0
Ndosho	60	20	33%	5.95	54.33	29.02	9.1
Rusayo	60	7	12%	5.75	39.33	19.12	6.8
Total	420	170	40%	5.83	41.67	27.81	7.1

There is a significant difference ($p < 0.001$) between the daily quantity of water consumed per household per day in the surveyed households. Similarly, there is a significant difference ($p < 0.001$) between the average quantity of water consumed per person per day in the surveyed communities. It is estimated that the average daily water consumption of one person is 7.1 liters. This value is far below the standard recommended by WHO which is a minimum of 20 liters per person per day. Therefore, there is a high risk of waterborne disease in the targeted communities.

In Nyiragongo Territory, the average amount of water collected per household per day is 12.66 liters (2.2 liters per person per day) for drinking water and 33.75 liters for other household purposes.

Four out of ten (40 percent) households take 30 minutes or less to reach a water source. Therefore, 60 percent of households take more than 30 minutes to reach a water source. Geographic accessibility is poor, but the biggest problem is water quality in the targeted areas.

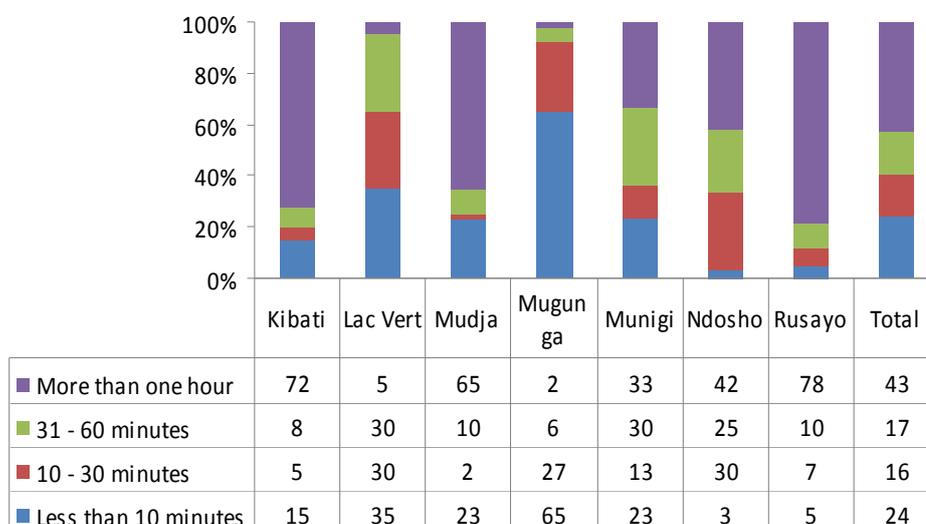


Figure 6: Representation of time households take to reach a water source

43 percent of households take more than an hour to reach a water source. Seventeen percent take between 31 and 60 minutes. Sixteen percent take between 10 and 30 minutes. Twenty-four percent of households take less than 10 minutes to reach the nearest water source.

Source of drinking water

Table 11: Source of drinking water (n=420)

Source of water	Frequency	%
Tap	234	56%
Rainwater	186	44%
Lake	81	19%
Water Truck	17	4%
Water Vendor (by bicycle)	6	1%

Fifty-six percent of households in the surveyed communities get their water from taps. Water taps are most commonly found in Lac Vert, Mugunga and Ndosho. Families in Rusayo often travel to Mugunga to collect drinking water from taps.

Forty-four percent of surveyed households use rainwater for drinking. In Kibati, Mudja and Rusayo, rainwater is the main source of drinking and household water.

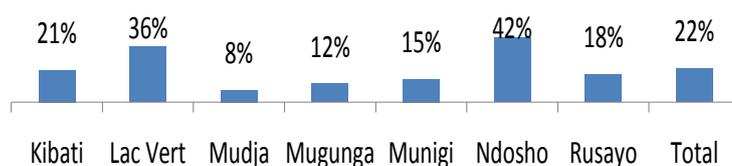


Figure 7: Percentage of households with a container for drinking water

The figure above shows the percentages of households with a container designated for drinking water. Of all households, only 22 percent claim to have a container for drinking water. Among households with 20 liter jerry cans for fetching water, 65 percent say these jerry cans are not covered.

Number of water points per community

Table 12: Number of households shown by the number of water points per community

Community	Number of households by the number of water points per community				
	0	1	2	3	4
Kibati	86%	12%	-	2%	-
Lac Vert	25%	25%	23%	12%	15%
Mudja	100%	-	-	-	-
Mugunga	12%	13%	28%	42%	5%
Munigi	71%	25%	2%	2%	-
Ndosho	100%	-	-	-	-
Rusayo	100%	-	-	-	-
Total	70%	11%	8%	8%	3%

Based on the surveyed households' statements, there are not any water points in Mudja, Ndosho and Rusayo. The team confirmed this fact while working in these communities. In Lac Vert and Mugunga, some water pumps are present, but they are not sufficient in terms of the population size. In Kibati and Munigi there are reservoirs made by the population which are used to collect rainwater (the population considers these reservoirs as water points).

Several NGOs were cited as having installed water points. These include Oxfam GB, GTZ through two local NGOs (MPA and ICG) and Mercy Corps.

Quality of Water

In terms of public health terms, a key factor is the biological quality of water, that is, the absence of pathogens. The indicator of biological contamination of water is based on research of Escherichia Coli (E. coli), which is a sign of fecal contamination. In emergencies, it is estimated that if the number of colonies of E. Coli in a culture after 24 hours at 42 ° is greater than 10, the water should not be consumed as is.

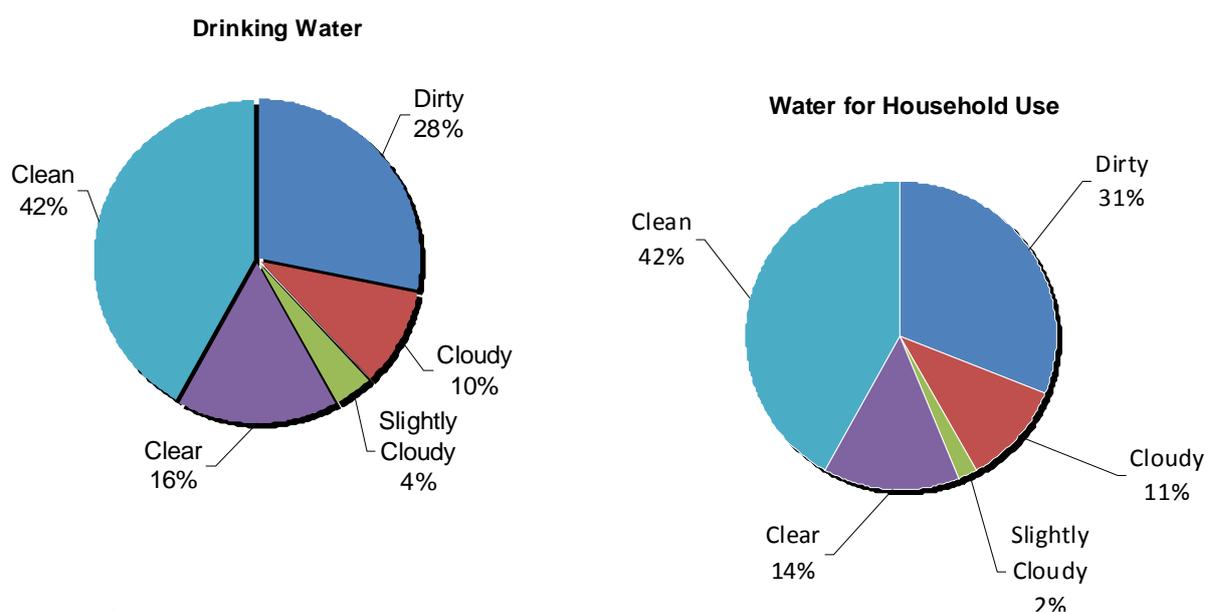


Figure 8: Ranking of quality of water by households

During this survey, it was not possible to measure the coliforms found in water used in Nyiragongo Territory.

Water Treatment

Table 13: Proportion of households treating drinking water

Community	Number of Households	Households treating drinking water	
		Frequency	%
Kibati	60	13	22%
Lac Vert	60	58	97%
Mudja	60	2	3%
Mugunga	60	53	88%
Munigi	60	36	60%
Ndosho	60	30	50%
Rusayo	60	21	35%
Total	420	213	51%

Slightly more than half (51 percent) of families cite that they treat their drinking water. For households that do treat their drinking water, 87 percent use chlorination, 9 percent use filtration and 4 percent boil their water, as shown below.

Table 14: Methods of treating drinking water

Community	Number of Households	Boil Water		Filter Water		Water Chlorination	
		Freq.	%	Freq.	%	Freq.	%
Kibati	13	2	15%	5	39%	6	46%
Lac Vert	58	2	4%	6	10%	50	86%
Mudja	2	0	0%	0	0%	2	100%
Mugunga	53	3	6%	0	0%	50	94%
Munigi	36	1	3%	4	11%	31	86%
Ndosho	30	2	7%	0	0%	28	93%
Rusayo	21	1	5%	2	9%	18	86%
Total	213	8	4%	20	9%	185	87%

There are still considerable efforts required to treat water in the communities of Kibati, Munigi, Mudja and Rusayo where households capture rainwater and store it in tanks constructed of wood and plastic sheeting. This water is stored for a long time without treatment and is used for drinking and other household purposes. Similar efforts are also required for Ndosho.

The task of collecting water is mainly attributed to females. In 89 percent of the surveyed households, women and girls are responsible for collecting water.

2.3.2 Personal Hygiene and Household Cleanliness

Availability of Latrines

Availability of latrines in good condition remains a key concern in the targeted communities. Twenty-one percent of households visited have a latrine in poor or very poor condition. Fifty-six percent of households visited have either a hole or a designated area for defecation. Twenty-three percent of households do not have a latrine, of these 2 percent use their neighbors' latrines.

While there is a general lack of latrines, the problem is greater in Kibati, Mudja and Rusayo.

Forty-four percent of households with a latrine say their toilet is reserved only for their household. However, other households frequently use neighboring latrines, as shown in the table below.

Table 15: Number of households using neighboring latrines

Number of Households	Frequency	%
1	2	4%
2	14	29%
3	13	27%
4	16	32%
5	2	4%
6	2	4%
Total	49	100%

Eighty-eight percent of families possessing a latrine share it with two, three, or four neighboring families. Eight percent of families having one latrine share it with five or six neighboring families and only 4 percent of households with a latrine share it with only one neighbor.

Cleanliness of Latrines

Table 16: Ranking of latrine cleanliness

Community	n	Very Dirty	Dirty	Fairly Clean	Clean	Very Clean
Kibati	15	33%	53%	7%	7%	0%
Lac Vert	0	-	-	-	-	-
Mudja	34	18%	53%	20%	6%	3%
Mugunga	12	8%	17%	67%	8%	0%
Munigi	17	53%	29%	6%	12%	0%
Ndosho	7	29%	14%	43%	14%	0%
Rusayo	3	67%	0%	0%	33%	0%
Total	88	28%	39%	23%	9%	1%

The team found that 67 percent of surveyed families have a dirty or very dirty latrine, 23 percent have fairly clean latrines and 10 percent of families have clean or very clean latrines.

Where households dispose of children’s feces

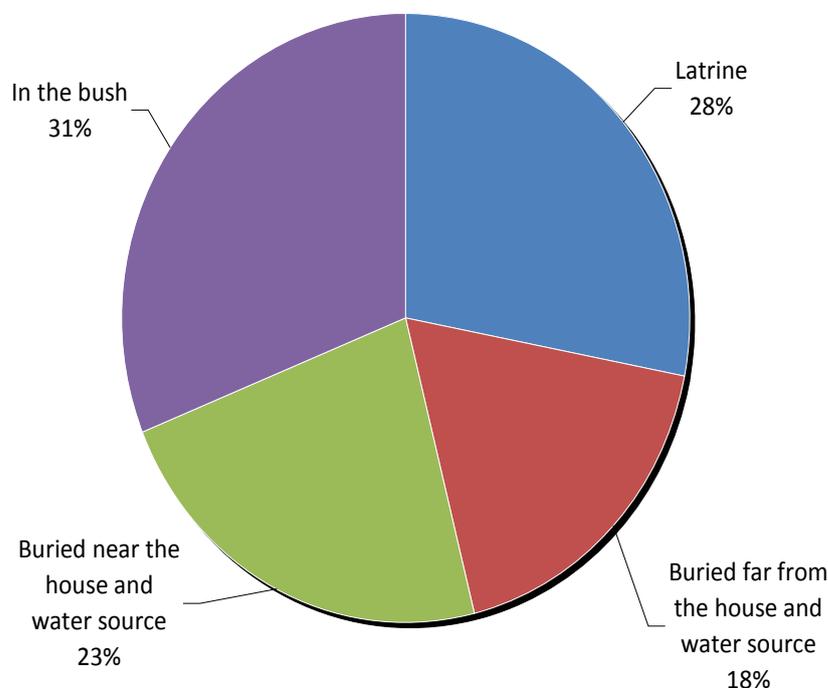


Figure 9: Where households dispose of children’s feces

It should be noted that almost all of the surveyed households are located within 10 meters of a latrine or a space designated as a toilet.

Hand-washing

In response to the question “When do you wash your hands?”, households responded as follows:

Table 17: Responses to the question “When do you wash your hands?”

When do you wash your hands?	Frequency	%
Before and after eating	181	43%
When hands are dirty	97	23%
After going to the bathroom	78	19%
Before preparing food	38	9%
Never or rarely	13	3%
Before and after feeding children	13	3%
Total	420	100%

More than four in ten respondents (43 percent) wash their hands before and after eating, almost two in ten respondents (19 percent) does so after using the toilet, 9 percent of women say they wash their hands before preparing food.

In response to the question "What do you wash your hands with?" 69 percent of respondents said that they use soap, 8 percent use ash and 24 percent of respondents use water only.

Waste disposal

Table 18: Disposal of household waste

Disposal of household waste	Frequency	%
On the ground around the house	185	44%
In the bush	147	35%
Waste pit	88	21%
Total	420	100%

Nearly eight in ten respondents (79 percent) dispose of waste on the ground around the house or throw waste into the bush and 21 percent of respondents dispose of waste in a designated pit.

2.4 Sanitation and Waterborne Diseases

2.4.1 Morbidity related to water and sanitation

Pathology by community	Simple Diarrhea	Bloody Diarrhea	Cholera	Typhoid Fever	Acute Conjunctivitis	Skin Problems	Intestinal Worms	Malaria
Kibati	27%	3%	0%	5%	0%	8%	25%	18%
Lac Vert	35%	7%	0%	7%	3%	17%	15%	30%
Mudja	42%	5%	0%	5%	0%	27%	40%	33%
Mugunga	45%	10%	3%	12%	2%	22%	37%	27%
Munigi	37%	0%	3%	8%	8%	10%	13%	30%
Ndosho	20%	0%	0%	3%	0%	0%	0%	0%
Rusayo	32%	15%	7%	5%	0%	15%	37%	10%
Total	34%	6%	2%	6%	2%	14%	24%	21%

There was at least one case of malaria in more than 1/5 of households (21 percent) during the two weeks preceding the survey. Of all the waterborne diseases, diarrhea and intestinal worms are the most common. While the respondents reported these illnesses during the survey, this should not be regarded as an official diagnosis. Therefore, these responses correspond simply to the perception of the population.

Waterborne Diseases

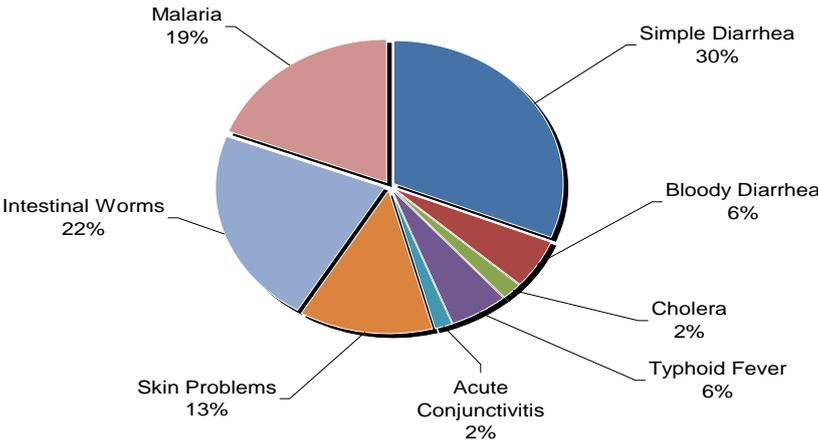


Figure 10: Reported waterborne diseases

Simple diarrhea, intestinal worms and malaria remain the most common diseases, as shown in the figure above.

Table 19: Incidence of waterborne diseases

Community	# / %	Simple Diarrhea	Bloody Diarrhea	Cholera	Typhoid Fever	Conjunctivitis	Skin Problems	Intestinal Worms	Malaria	Total	
										Freq.	% total
Kibati	# de cases	24	2	0	3	0	7	23	13	72	12%
	%	33%	3%	0%	4%	0%	10%	32%	18%	100%	
Lac Vert	# de cases	22	4	0	4	2	11	9	18	70	12%
	%	31%	6%	0%	6%	3%	16%	13%	26%	100%	
Mudja	# de cases	32	3	0	6	0	25	45	21	132	23%
	%	24%	2%	0%	5%	0%	19%	34%	16%	100%	
Mugunga	# de cases	19	10	2	9	1	20	36	21	118	20%
	%	16%	8%	2%	8%	1%	17%	31%	18%	100%	
Munigi	# de cases	24	0	1	5	5	5	13	23	76	13%
	%	32%	0%	1%	7%	7%	7%	17%	30%	100%	
Ndosho	# de cases	17	0	0	0	0	0	0	0	17	3%
	%	100%	0%	0%	0%	0%	0%	0%	0%	100%	
Rusayo	# de cases	29	9	4	3	0	14	27	6	92	16%
	%	32%	10%	4%	3%	0%	15%	29%	7%	100%	
Total		167	28	7	30	8	82	153	102	577	100%

In all surveyed households, there were 577 cases for the various ailments mentioned. The highest proportion of these illnesses was observed in Mudja (23 percent), Mugunga (20 percent) and Rusayo (16 percent). The areas with the most cases of malaria were in Munigi (30 percent), Lac Vert (26 percent), Kibati (18 percent) and Mugunga (18 percent). The areas with the highest number of cases of intestinal worms were Mudja (34 percent), Kibati (32 percent), Mugunga (31 percent) and Rusayo (29 percent).

2.4.2 Percentage of Children Under 5 With Diarrhea

This indicator refers to retrospective prevalence (two weeks preceding the survey) of diarrhea in children under five years of age. This was calculated by taking the number of children under 5 years old who had diarrhea (145 in all) divided by the total number of children under five in the surveyed households (668 in total).

$$\% \text{ Children w/ Diarrhea } < 5 \text{ yrs} = \frac{\text{Children under five in the surveyed households with diarrhea in the last two weeks}}{\text{Children under five in the surveyed households}} \times 100$$

Equation 6: Percentage of children under five with diarrhea in the two weeks prior to the survey

Calculation:

$$\% \text{ Child. w/ Diar. } < 5 \text{ yrs} = \frac{145}{668} \times 100 = 22\%$$

Among children under five in the surveyed households, 22 percent suffered from diarrhea in the two weeks preceding the survey.

Table 20: Percentage of children under five with diarrhea in the two weeks prior to the survey

Community	Children under 5	Children under 5 with diarrhea in the last 2 weeks	Percentage
Lac Vert	89	27	30%
Mugunga	114	28	25%
Rusayo	108	27	25%
Mudja	80	16	20%
Ndosho	102	19	19%
Munigi	80	14	18%
Kibati	95	14	15%
Total	668	145	22%

Lac Vert, Mudja, Mugunga and Rusayo are the communities with the highest numbers of children under 5 children suffering from diarrhea two weeks before the survey.

2.4.3 Household Knowledge and Practices about Waterborne Diseases

How to prevent diarrhea?

Table 21: Ways to prevent diarrhea

How to prevent diarrhea? (n=420)	Frequency*	%
By consuming uncontaminated food and water	168	40%
By washing hands regularly	80	19%
By boiling potentially contaminated water	17	4%
Do not know	207	49%

*Multiple responses were possible.

Table 22: Ways to prevent malaria

Ways to prevent malaria	Freq * (n=420)	%
Sleep under a mosquito net	66	16%
Drain standing water	22	5%
It is not possible to prevent malaria	28	7%
Cut bushes around the house	31	7%
Sleep under a mosquito net treated with insecticide	16	4%
Take malaria prophylaxis (pills)	90	21%
Take Fansidar treatment	7	2%
Take herbal remedies	20	5%
Spray insecticide inside the house	9	2%
Keep skin covered, wear long sleeved clothing and long pants	2	0%
Put screens on windows and doors	2	0%
Do not know	195	46%

* Multiple possible responses

In response to the question about preventing malaria, 16 percent of respondents cited sleeping under a mosquito net as an effective method of malaria prevention. However, only 4 percent gave the answer "sleeping under a mosquito net treated with insecticide." Forty-six percent of respondents do not know how to prevent malaria.

How to prevent intestinal worms?

Table 23: Ways to prevent intestinal worms

Ways to prevent intestinal worms	Frequency (n=420)	%
By consuming uncontaminated food and water	122	29%
By washing hands regularly	63	15%
By boiling potentially contaminated water	19	5%
Do not know	237	56%

More than half (56 percent) of respondents do not know how to prevent intestinal worms. Of all waterborne diseases, apart from simple diarrhea, intestinal worms are most common in the surveyed households. The presence of this disease is directly linked to water scarcity and the distance of water points from households.

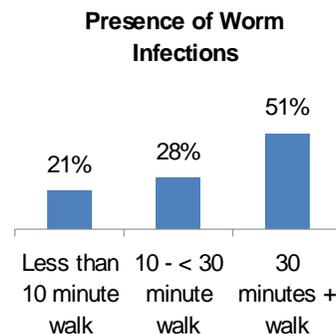
Correlation between the time it takes to reach a water point and the presence of intestinal worms

Table 24: Correlation between the distance of a water point and the presence of intestinal worms

Time to walk	No cases of worm infections	Presence of worm infections	Total
< 10 minutes	89	21%	110
10 - < 30 minutes	115	28%	143
>=30	116	51%	167
Total	320	76%	420

In all households with at least one case of intestinal worms, 79 percent of households are located 10 minutes or more from a water source. The presence of intestinal worm infections in a household depends largely on the time from the water point ($p = 0.001$). As the time to a water source increases, so do cases of intestinal worms.

Figure 11: Proportion of households with a case of intestinal worms depending on time to a water source



2.4.4 Problems with overcrowding and hygiene

Other problems associated with overcrowding and poor personal hygiene are scabies, lice, bedbugs, chiggers and ringworm.

Table 25: Problems related to poor hygiene

Problems related to overcrowding and poor hygiene	Frequency (n=420)	% of households with the problem
Bed bugs	154	37%
Cockroaches	123	29%
Tinea capitis (fungal infection of scalp)	91	22%
Lice	72	17%
Chiggers	71	17%
Parasites on domestic animals	61	15%

It is noted that bed bugs exist in nearly 4 in 10 households. Nearly three in ten households reported that they have cockroaches. In 22 percent of cases, children are affected by tinea capitis.

Table 26: Households reporting health problems

Community	Tinea capitis	Chiggers	Lice	Bed bugs	Parasites on animals	Cockroaches
Kibati	17%	15%	13%	37%	3%	5%
Lac Vert	22%	15%	5%	30%	30%	23%
Mudja	13%	22%	38%	37%	23%	35%
Mugunga	27%	3%	2%	35%	0%	18%
Munigi	17%	23%	23%	33%	7%	37%
Ndosho	23%	8%	7%	38%	8%	43%
Rusayo	33%	32%	32%	47%	30%	43%
Total	22%	17%	17%	37%	15%	29%

The presence of lice, tinea capitis, etc. is due to a lack of hygiene. It should be noted that nearly two in ten (17 percent) of households reported that there are members of their household who have problems with lice and 22 percent for tinea capitis. In Mudja especially households reported problems with lice (38 percent), followed by Rusayo (32 percent).

2.4.5 Health Sensitization

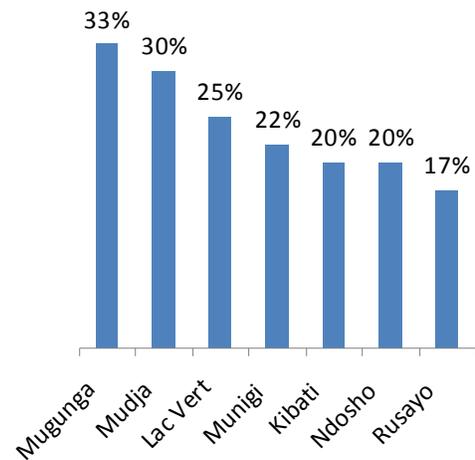
Participation in a health sensitization session

Table 27: Participation of respondents in a health awareness session

Community	Number of Households	Attended awareness sessions on health		Average number of times they have participated
		Frequency	%	
Kibati	60	12	20%	2.00
Lac Vert	60	15	25%	2.07
Mudja	60	18	30%	1.47
Mugunga	60	20	33%	2.63
Munigi	60	13	22%	2.15
Ndosho	60	12	20%	3.00
Rusayo	60	10	17%	1.90
Total	420	100	24%	2.12

Almost one-quarter of respondents (24 percent) have participated in a health awareness session. There is not a significant variance in the number of people who have participated in health awareness sessions by community. The average number of times people have attended health sessions is 2.12 with a standard deviation of 1.27.

Figure 12: Respondents who have participated in a health awareness session



Topics covered in health awareness sessions

Table 28: Main topics for health awareness meetings

Topics	Frequency, n=100	%
Disease prevention	43	43%
Hygiene and sanitation	40	40%
Use of health services (CPS, curative activities, maternity etc.)	22	22%
Nutrition	21	21%

The topics covered most frequently in health awareness sessions are disease prevention and hygiene and sanitation, which were cited by 43 percent and 40 percent of

respondents who attended at least one health awareness meeting. Another common theme that was cited is HIV/AIDS.

Locations of health awareness sessions

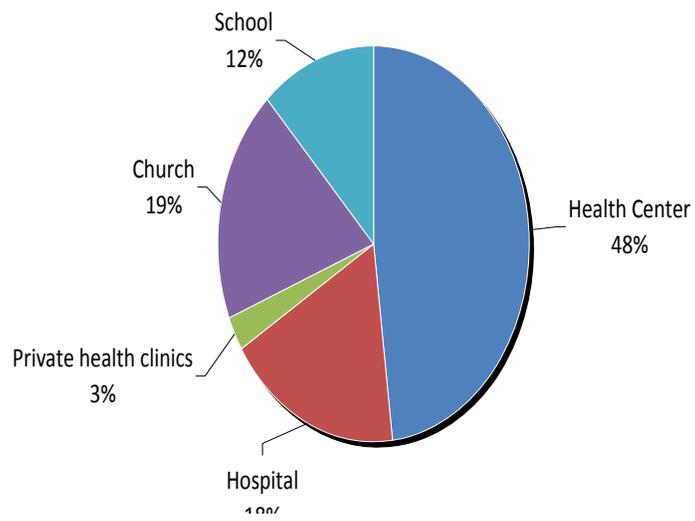


Figure 13: Locations of health awareness sessions

3 QUALITATIVE DATA (FOCUS GROUPS)

3.1 Introduction

This section presents the results of focus group discussions organized in different communities: Kibati, Lac Vert, Mudja, Mugunga, Munigi, Ndosho and Rusayo.

3.2 Participants in focus group discussions

Seven focus groups were organized. They were composed of:

- Local administrators;
- Religious personnel;
- Medical personnel;
- Heads of households;
- Members of local associations.

Goal of Discussions

The purpose of these discussions was to understand participants' feelings, attitudes and opinions about the following topics:

1. Access to potable water and water quality
2. Transmission of waterborne diseases
3. Community perceptions about waterborne diseases

This study enabled the survey team to find out if there are water points available for use by the community, the accessibility of potable water (distance, availability, and cost), different methods of water treatment, water storage, and appreciation of water quality.

The study also looks at the level of knowledge of the population about the transmission of waterborne diseases.

3.3 Methodology

To better understand the difficulties present in the communities, the survey team selected key informants in the different areas it visited. In each session, a moderator and an observer were designated. The following steps were followed:

- Form focus groups with a total of 6 to 12 people.
- The moderator facilitates a conversation based on previously developed questions.
- The observer takes notes.
- The observer produces a report after the discussion has ended.

The focus group discussions lasted between 45 and 60 minutes.

For each session, the moderator, after greeting the participants, explained the reasons for the discussion and presented the general operating rules of the group, listed below:

- Speak clearly and only one participant may speak at one time.
- It is important that everyone is involved.
- There are no wrong answers.
- Anyone can express an individual opinion.
- Anonymity and confidentiality are guaranteed.

3.4 Presentation of Results

Results are presented by topic:

Theme 1: Water accessibility and quality

a. Accessibility to drinking water.

All of the communities were concerned about the accessibility of potable water. All seven communities have difficulty accessing drinking water. Participants noted the presence of reservoirs to capture rainwater.

Participants stated that if each household could have a storage tank, then the population would be able to store rainwater until the next rainy season. However, the fact that water is also used by neighboring households that do not have storage tanks means that there is not enough water to go around.

b. Geographic accessibility

The villages of Rusayo and Mudja raised the problem of the long distances they must travel to access water. The population walks between 5 and 15 km to reach the closest water source. Participants in all focus group discussions talked about the problem of geographic accessibility.

c. Water quality

Regarding the quality of water, focus group participants from Kibati (more precisely Kishek), Mudja, Munigi and Rusayo talked about the lack of potable water in their communities; as a result they frequently consume rainwater. Apart from the lack of drinking water, problems with transportation and water storage are also relevant. The lack of suitable storage containers has been noted in the surveyed communities.

d. Water treatment

Residents in two of the seven communities, Mugunga and Ndosho, are knowledgeable about treating contaminated water, namely boiling water. Unfortunately this method is hardly applied. Mothers in other communities deemed it unnecessary to boil water and they consider boiling water as hard work. In Kibati, Mudja, Munigi and Rusayo, people recognize that water is not potable, but they are powerless to do anything to change the situation because of poverty.

e. Recommendations given for water quality

- In the villages of Kibati, Mudja, Munigi and Rusayo: Ask if the NGO community can help with plastic sheeting as well as nails. Local contribution could be the provision of wood so that each household has a reservoir to capture rainwater.
- In all of the targeted communities: Request for the construction of new water points and rehabilitation of existing water points.

Theme 2: Vectors and diseases related to hygiene

A large part of the population is uninformed about the causes of transmission of hygiene-related diseases and vectors, but participants said that the population is unable to protect itself due to:

- Unsanitary conditions due to the presence of plants around houses, lack of toilets, or poorly maintained latrines
- Houses in disrepair

The population is aware, but is very poor, and is unable to solve the problem of hygiene and sanitation. People interviewed in Mudja and Rusayo expressed ignorance about diseases related to water, sanitation and hygiene. Nevertheless, they recognize that failure to practice good hygiene promotes transmission and propagation of diseases such as diarrhea, malaria and schistosomiasis.

Theme III: Community perception of hygiene-related diseases

The population is aware of the danger posed by diseases related to hygiene. Diseases that were cited include diarrhea, malaria, bilharzia, scabies and intestinal worms. Respondents were not sure how to stop these diseases.

Hygiene and habitat

The community recognizes the importance of one's habitat and its positive or negative influence on health. But decent living conditions are out of reach for many in the targeted communities due to a lack of means.

Some requests to NGOs have been made, especially in Kibati, Mudja and Rusayo for improvements

4 CONCLUSIONS

The baseline survey carried out in October 2008 shows that the targeted population is in need of assistance.

The situation in Nyiragongo Territory reveals a vicious cycle in which a number of factors interact and living conditions are difficult. As a result, there is an increased prevalence of waterborne diseases in the targeted communities. As there is a lack of awareness about waterborne diseases and preventative measures are not widely known or practiced by

the local population, preventable common illnesses play a toll on households. High health care costs and reduced productivity are just two consequences of preventable illnesses. Without an improvement in basic living conditions, households in North Kivu are at risk of plunging deeper into poverty.

Fifty-six percent of households rely on agriculture as their livelihood. Families use little water, on average seven liters per person per day. Six households out of ten (60 percent) spend more than 30 minutes to reach a water source. One third of households (33 percent) have access to a sufficient quantity of water, but water is often not of good quality. Households experienced numerous cases of malaria, intestinal worms and diarrhea, which are directly linked to scarcity of water and lack of hygiene.

The lack of hygiene in households is manifested by the presence of lice (17 percent), cockroaches (29 percent) and bed bugs (37 percent). Note that the households visited had no means to ensure cleanliness, in particular many households lacked soap altogether (31 percent). Latrines in poor condition are close to houses, drinking water is not always stored properly which can lead to contamination.

By observation plots aren't cleaned and technical for collecting kitchen waste are not used, the hygiene promotion initiatives to be carried out should be based essentially on water supplying furniture equipment and sanitation based on water treatment and conditioning supported by hand wash.

Initiatives to promote hygiene should focus on sanitation, methods of water storage and treatment and hand-washing.

Local communities should be involved in all phases of water resource management. The participation of women is particularly important as women are largely responsible for water collection.

ANNEXES

Annex 1: Scope of Work

Mercy Corps DRC Scope of Work for Baseline Assessment

GENERAL POSITION SUMMARY

Mercy Corps was recently awarded a three-year USAID/Office of Food for Peace funded PL480 Title II program focusing on water, sanitation, and hygiene (WASH) in urban and peri-urban Goma. The Food Security for Goma (FSG) Program aims to reduce waterborne disease by 25 percent among children under five through improved access to sustainable sources of water and improved sanitation and hygiene practices. This program will target vulnerable households in seven urban and peri-urban communities in Nyiragongo Territory: Ndosho, Mudja, Munigi, Rushayo, Lac Vert, Mugunga, and Kibati.

Mercy Corps will hire an external evaluator to lead the FSG baseline evaluation. The baseline will perform a population-based survey in the seven targeted program areas, gathering information on households' current health, nutrition and socio-economic status. Program indicators largely reflect data related to households' food access and utilization. While some baseline information, based on provincial or national data, has been filled in on the Indicator Performance Tracking Table (IPTT), the majority of the baseline figures will be provided once the baseline evaluation has been conducted. The external evaluator may be assisted by the FSG Program's M&E staff and field agents. The baseline will be conducted in the first quarter of program implementation.

In order to compare results of the baseline with the eventual endline survey, both the baseline and endline surveys will take place during the main hungry season, which usually occurs between October and December every year. By timing the two evaluations to take place during the same time of year, Mercy Corps will ensure that the results of each are comparable, genuinely reflecting the changes that occurred during the implementation of the FSG Program. Further, the hungry season is an optimal moment for evaluating this type of programming, since both challenges and positive effects stand in greater relief during this time of year. However, it is also true that this period is the main growing season, when staple crops are produced. Mercy Corps will organize its evaluations so as not to unduly disrupt the field work of participants while still ensuring that representative participation is achieved.

ESSENTIAL JOB FUNCTIONS

- Review MYAP documents and meet with MYAP Coordinator to discuss timetable of baseline assessment.

- Provide leadership in design of baseline survey for MYAP Program, in coordination with MYAP Coordinator and Mercy Corps' Design, Monitoring and Evaluation team (based in US and London). Baseline should focus on beneficiaries' status, behavior and knowledge.
- Design plan for baseline survey implementation, in coordination with MYAP Coordinator.
- Train survey team on administering surveys.
- Conduct focus groups with potential beneficiaries.
- Lead pilot of baseline, analyze results and adjust survey as needed.
- Conduct baseline in target areas and with "control groups" (people in areas that will not be targeted by this program).
- Code and analyze data.
- Conduct restitution workshop to review results of the baseline.
- Provide leadership in design of monitoring plan, in coordination with MYAP Coordinator.

DELIVERABLES

- Baseline survey tool for household interviews and focus groups.
- Final report with data collected from baseline survey.
- Monitoring plan.

Annex 2. Additional Tables of Questionnaire Results

Table 29: Average Income

Community	Average number of people	Average monthly household income (in USD)	Median monthly household income (in USD)	Average income per person per day (in USD)	Average income per person per year (in USD)
Kibati	5.18	\$ 27.22	\$ 90.89	\$ 0.96	\$ 345.60
Lac Vert	6.00	\$ 124.31	\$ 111.97	\$ 0.85	\$ 306.00
Mudja	5.60	\$ 107.68	\$ 79.28	\$ 0.72	\$ 259.20
Mugunga	6.98	\$ 133.48	\$ 115.97	\$ 0.78	\$ 280.80
Munigi	5.33	\$ 143.96	\$ 105.05	\$ 1.16	\$ 417.60
Ndosho	5.95	\$ 173.76	\$ 175.80	\$ 1.26	\$ 453.60
Rusayo	5.75	\$ 102.60	\$ 82.46	\$ 0.69	\$248.40
Total	5.83	\$ 129.91	\$ 105.00	\$ 0.91	\$ 327.60

Table 30: Average amount of water per household (drinking water and for other household purposes)

Community	Average number of people	Average amount of water per household			
		Drinking Water		Water for Other Household Purposes	
		Average	Standard Deviation	Average	Standard Deviation
Kibati	5.18	9.90	9.07	34.16	21.26
Lac Vert	6.00	18.08	10.78	29.58	14.59
Mudja	5.60	15.08	18.03	21.92	22.10
Mugunga	6.98	13.52	12.37	38.97	18.87
Munigi	5.33	8.80	6.28	34.06	30.36
Ndosho	5.95	8.55	5.91	45.94	22.23
Rusayo	5.75	10.81	9.88	33.36	20.87
Total	5.83	12.66	11.93	33.75	22.81

Table 31: Responses to the question "What do you wash your hands with?"

What do you wash your hands with?	Frequency	%
Water only	100	24%
Soap and water	288	68%
Water and ash	32	8%
Total	420	100%

Annex 3: List of Survey Personnel

Survey Coordinator

Jean Claude Balolebwami Amuli, MDF-AC

Survey Supervisors

Jean Claude Balolebwami Amuli, MDF-AC

Isabelle Katungu, MDF-AC

Table 32: Survey Team

N ^o	Name	Sex
1	Kwitonda Ruriho Carine	F
2	Kalumuna René	M
3	Bigarura Shamamba Damas	M
4	Kasongo Ruciko Roger	M
5	Messi Kakule	M
6	Cecile Nyenyezi	F
7	Diwa Mukata Kambale	M
8	Mufungizi Don Charles	M
9	Kambale Vyakanya	M
10	Christine Muhashirwa	F
11	Paluku Mateso	M
12	Paulin Baderhakuguma	M

Coding Team

Jeanine Sikwambere

Karlos Kasole Balole

Bahati Aimé

Fiston Cigoho