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Children's Experience With Water Scarcity In Rural Rakai, Uganda

Abstract

This article presents findings on children's experience in accessing and utilizing water in two sub-counties of Kagamba and Lwanda; one extremely water-scarce and the other relatively water plenty in Rakai district, Uganda. We answer the following question: How do children in a water-scarce context experience water and what does it mean for their wellbeing? A survey was conducted among school-going children aged 11-17 years (N=405), combined with focus group discussions with children and women. Access to adequate safe water was the fifth most frequently mentioned component of wellbeing. A majority of the children affirmed that water scarcity was the biggest threat to their wellbeing. Water scarcity posed both direct and indirect threats; the direct threat resulting from long distances and risks at the water point. Indirectly, the poor quality of water increased susceptibility to water-related illness. A majority of the children experienced a water problem in their home and were unhappy living in such a situation. Unhappiness also resulted from reduction of playing time, punishment and body aches. Fetching water made up the bulk of the chores performed by children, making it a drudgery due to using heavy water vessels, long distances covered and the number of trips to the water point per day. Childhood, in the context of domestic water scarcity encompasses vulnerability. It hence requires protection through the improvement of domestic water access, both in terms of quantity and quality.

Keywords

water scarcity, child wellbeing, children, Uganda, Rakai

Cover Page Footnote

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Children's Experience with Water Scarcity in Rural Rakai, Uganda

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KEY WORDS

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ABSTRACT

This article presents findings on children's experience in accessing and utilizing water in two sub-counties of Kagamba and Lwanda; one extremely water-scarce and the other relatively water plenty in Rakai district, Uganda. We answer the following question: How do children in a water-scarce context experience water and what does it mean for their wellbeing? A survey was conducted among school-going children aged 11-17 years (N=405), combined with focus group discussions with children and women. Access to adequate safe water was the fifth most frequently mentioned component of wellbeing. A majority of the children affirmed that water scarcity was the biggest threat to their wellbeing. Water scarcity posed both direct and indirect threats; the direct threat resulting from long distances and risks at the water point. Indirectly, the poor quality of water increased susceptibility to water-related illness. A majority of the children experienced a water problem in their home and were unhappy living in such a situation. Unhappiness also resulted from reduction of playing time, punishment and body aches. Fetching water made up the bulk of the chores performed by children, making it a drudgery due to using heavy water vessels, long distances covered and the number of trips to the water point per day. Childhood, in the context of domestic water scarcity encompasses vulnerability. It hence requires protection through the improvement of domestic water access, both in terms of quantity and quality.

1 INTRODUCTION

Globally, it has been estimated that one-third of the total population lives under physical water scarcity even though some people also experience social water scarcity. The United Nations (UN) has set, as one of its goals¹, to increase the supply of safe water globally to address water scarcity and substantially reduce the number of people suffering from water scarcity (WHO & UNICEF, 2017). Africa is the

world's second driest continent, with 38% of the population living in water-scarce environments. In sub-Saharan Africa, 32% of the population lacks access to an improved source of water (UNICEF & WHO, 2015). This water scarcity situation is more likely to impact children.

Physical water scarcity can either be demand or supply-driven (Kummu et al., 2010; Sorenson et al., 2011). It has, however, been argued that there is enough water in the world to provide people with their basic water needs and that the

¹ Sustainable Development Goal Six; Target 6.4(United Nations, 2020).

shortage of water for primary purposes is attributed to life-style, poor management and the lack of financing (Savenije, 2000).

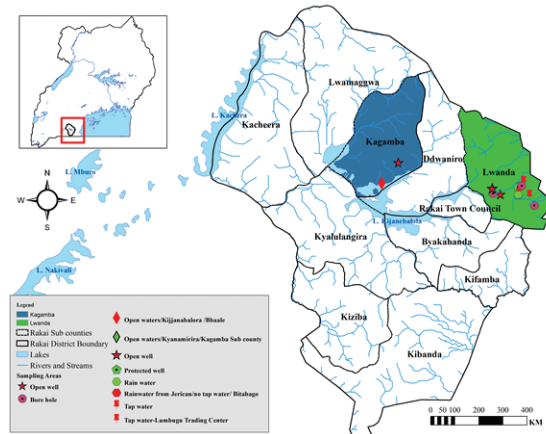
In Uganda, 68% of the population is estimated to have access to a safe water source, with variations from 33% to 95% in some areas (Ministry of Water and Environment, 2019); in the Financial Year (FY) 2018/19, the access rate stood at 69% for the rural areas and 79.1 % for the urban areas (GoU, 2019). The figures from the UN-Joint Monitoring Programme (JMP), based on the water service ladder², indicate that 42.03% of Ugandans have a basic water service level; 31.7% limited service; 7.1% have a safely managed service level; 6.7% use surface water and 12.5% use an unimproved source [(no service level) (Joint Monitoring Programme, 2020)]. Households in rural areas travel an average of 0.8 km to the main water source (GoU, 2015). This burden disproportionately falls on women and children who are the primary water collectors. Approximately, 22% of the country's children obtain water from unimproved water sources, while 24% of them are severely deprived, having to travel long distances or wait in long queues for safe water (UNICEF, 2019).

This study sought to document children's encounters with water in the context of scarcity. The questions that are answered include: What are the experiences of children with water as a resource in water-scarce rural environments? What is the implication of the scarcity on child wellbeing?

2 THE STUDY AREA

The study was conducted in Rakai district in Southwestern Uganda. The district is situated in the cattle corridor³ in the southwestern part of the central region of Uganda (Global Water Partnership Eastern Africa, 2016) and has 3 counties, 19 sub-counties and 3 town councils (Figure 1). In the district, 36% of the population has access to safe water⁴ (Ministry of Water and Environment, 2020), the biggest source of water are shallow wells, and this is followed by deep boreholes. Water from many groundwater sources in the district is saline (Andersson & Johansson, 2002; Ssentaba, 2009). The safe water sources that are functional in the district range between 78 and 83% (GoU, 2016). The district has a population of 518,008, which is predominantly rural with subsistence livelihoods.

Figure 1: Area boundaries of Kagamba and Lwanda Sub counties in Rakai District



3 METHODS

The study⁵ used a cross-sectional research design applying both qualitative and quantitative methods. The quantitative data was collected through a survey of school-going children and the qualitative data was collected through focus group discussions (FGDs) with children and women within the villages where the schools of the survey participants are located. The data was collected from two sub-counties, namely, Kagamba, an extremely water-scarce area (7% safe water access) and Lwanda sub-county that is considered water plenty (87% safe water access) (Ministry of Water and Environment, 2019). The children's survey was conducted in twelve public schools; six in each of the sub-counties. Ten out of the twelve were primary schools and two were secondary schools. The primary schools were randomly selected from all the public schools within each sub-county, taking half of them. Each of the sub-counties had only one public secondary school, which was selected by default. In each of the selected schools, a list of children aged 11-17 years was constructed. The list comprised of children from grade five to grade seven for primary school, and grade one to grade three for secondary schools. Twenty-five pupils were chosen from each of the primary schools and one hundred chosen from each of the two secondary schools. A sample of 405 children were interviewed at their respective schools upon consent from their parents and school administrators. The focus group discussions were disaggregated by sex. For these, eight to ten children were purposively selected for a group discussion

2 According to the Joint Monitoring Programme, the safely managed water service is at the top of the ladder, this is where drinking water is obtained from an improved water source, located on the premises, available when needed and is free of faecal and priority chemical contamination. The next is the basic service level, where drinking water is from an improved source where the collection time is not more than 30 minutes for a round trip including queuing. The next is the limited-service level where drinking water is from an improved source where collection time exceeds 30 minutes for a round trip to collect water including queuing. The next level, Unimproved service- drinking water is from an unprotected dug well or unprotected spring. At the bottom of the ladder, is the no service level where drinking water is collected directly from a river, dam, lake, pond, stream, canal or irrigation channel.

3 This refers to Uganda's dry land area that stretches along a broad swath across the country from the southwest to the northeast encompassing 84,000 square kilometres. The dry lands cover more than a dozen of the country's 110 districts. They include Ntungamo, Mbarara, Rakai, Sembabule, Mubende, Kiboga, Nakaseke, Luwero, Nakasongola, Kamuli, Soroti, Katakwi, Nakapiripirit, Moroto, and Kotido Districts. The area receives irregular and low rainfall, experiences periodic and extreme drought and is considered to encompass some of the country's most fragile ecosystems(Stark, 2011).

4 This is water that is free from pathogens and elevated levels of toxic substances at all times(Joint Monitoring Programme, 2020).

5 The study was cleared for ethical appropriateness by the Makerere school of social sciences research ethics committee (MAKREC). It was further cleared by the Uganda National Council of Science and technology. Before the survey, the study participants' parents consented, the children also assented before the face to face structured interviews, that were conducted by well-trained social sciences graduates.

within a village. Half of the children's groups were for girls and another half for boys; a total of twenty-four discussions were conducted, four of which were with women. The survey data was entered in EpiData and analyzed using the Statistical Package for Social Sciences (SPSS) software. The independent samples T-test was carried out on some of the data analyzed. The data from the focus group discussions were analyzed using NVivo 12 software.

4 RESULTS

There were slightly more female respondents to the survey than males; more from the older age category and most of them were from secondary school. Most children were from midsized households.

Table1: Selected background characteristics of the survey respondents

Respondents' Characteristics		%	n
Subcounty	Kagamba	49.6	201
	Lwanda	50.4	204
Sex	Male	47.7	193
	Female	52.3	212
Age	11-13 years	38	154
	14-17 years	62	251
School-level	Primary School	48.1	195
	Secondary school	51.9	210
Size of household	Small (1-5 people)	34.8	141
	Medium size (6-10 people)	61.5	249
	Big (11+ people)	3.7	15

Water provisioning: The Water Sources

Most children in Kagamba sub-county fetched water from the lake (90.4%) whereas in Lwanda sub-county most children fetched from the borehole (83.5%).

Table 2: Showing the main household water source

Source	Kagamba (%)	Lwanda (%)	n	Overall (%)
Valley Dam	52	48	123	30.4
Lake	90.4	9.6	104	25.7
Borehole	16.5	83.5	79	19.5
Unprotected spring	46.7	53.3	60	14.8
Protected spring	-	100	20	4.9
Gravity flow/water tap	12.5	87.5	16	4.0
Swamp	-	100	3	0.7

Besides the borehole, some children collected water from the protected springs, and for most of these, the water was considered to be of acceptable quality except for the distance and the long queues at these points.

In terms of water sources, most children that fetched from the **open-sources** (unprotected springs, valley dams, the lake) were from Kagamba. These were greatly disadvantaged in terms of access and experiencing associated risks. The open sources are susceptible to drying up, contamination and hence the poor quality of water. These children also faced a bigger risk of drowning. The majority of children in Lwanda compared to Kagamba accessed water from improved water sources, and hence experienced no risk of drowning and collecting contaminated water. These children, however, faced a higher likelihood of bullying while at the waterpoint because of the long waiting time. Nonetheless, they accessed better quality water and hence had a reduced risk of contracting water-related illnesses.

Photograph 1: Comparison of water source types.



Point water source (Borehole) in Lwanda



Open water source water (dam) in Kagamba

Rainwater harvesting was an additional source of water during the rainy season for many households. However, one half of the sampled children reported supplementing the harvested water even on a good rainy day with water from other sources. This implies that some children fetched water daily no matter the season. This was because many households did not have storage tanks or big storage containers for the water from the rain harvest. Additionally, whereas some houses had artificial, permanently fixed water harvesting systems, other households had a temporary/improvised system. The improvised system, used by several households is not as efficient as the permanent one in harvesting the water. Photograph 2 shows both systems.

Photograph 2: Domestic water harvesting systems.



Permanent



Improvised

The review of the local safe water access figures as shown in Table 3 revealed a big disparity between the two sub-counties, in terms of water sources and their functionality.

Table 3 Indicating available safe water sources and functionality status in the study sub-counties⁶

Source of Water	Kagamba			Lwanda		
	Tot. number of points	Functional ⁷	Nonfunctional	No. of points	Functional	Nonfunctional ⁸
Shallow wells	04	04	-	62	42	20
Deep boreholes	02	02	-	17	11	06
Rainwater harvesting tanks	135	131	04	34	30	04
Protected springs	-	-	-	13	12	01
Valley tanks	-	-	-	01	01	-
PSP kiosk/tap stands	-	-	-	06	06	-

Source: Uganda Water Supply Atlas (Ministry of Water and Environment, 2019)

Table 4: Chores mostly performed by children

Reported Chores by Children	Gender		Subcounty		Overall	
	Boys	Girls	Kagamba	Lwanda	%	n
Fetching water	47.5	52.5	50.3	49.7	98.3	398
Washing utensils	40	60	46.4	53.6	65.4	265
Cooking food	32.3	67.7	48	52	64.9	263
Farm work/digging	56.4	43.6	52.3	47.7	53.8	218
Washing clothes	29.3	70.7	48	52	48.9	198
Collecting wood	46.1	53.9	51.7	48.3	44.4	180
Cleaning the compound	35.6	64.4	46.2	53.8	32.6	132
Cleaning the house	30.7	69.3	43.3	56.7	31.4	127
Looking after animals	72	28	64	36	18.5	75
Taking care of the young	20	80	50	50	4.9	20
Attending to the shop	60	40	20	80	1.2	5
Watering plants	25	75	25	75	1	4
Cleaning the toilet	100	-	-	100	0.5	2

⁶ The figures in the table must be taken with some hindsight because it is possible that even the water points that have been indicated as functional in the national figures, may, in reality, be nonfunctional. Naiga & Penker (2014) in their study *Determinants of Users' Willingness to Safe Water Provision in Uganda*, found evidence to this effect.

⁷ A water source is functional if at any given time (t) the water is available from the source when a user attempts to draw it (Fisher et al., 2015).

⁸ A non-functional water source is one from which water is not available for any reason at any time when a user tries to draw water (Fisher et al., 2015).

Fetching Water

Fetching water vis-à-vis other child chores.

The access to water for domestic use was central to this study and therefore, information was gathered from the primary participants about their experiences with water at home and within the community. To appreciate the centrality of water in their daily lives, the children mentioned the chores they performed within the home, and fetching water was the most frequently mentioned chores for both boys and girls.

Most children fetched water two times on a non-school day (37.8%) and a slightly smaller proportion went to water point three times in a day. During school days, the majority of the children (56.7%) reported fetching water in the evening after school and 29.1% fetched water both before and after school. Only 5.7% of all the children did not to fetch water during the school days.

Most of the children (70.6%) fetched water using the 20-litre jerrycan with slightly more children in Kagamba using this container. In terms of gender, there were more boys using the 20-litre jerrycan compared to girls who reported carrying the 10-litre jerrycan [this is the equivalent of 10 kg in weight]. Other studies have also shown that when it comes to fetching water, the males are more likely to carry heavier water vessels compared to the females (Macri et al., 2015). Over half of the respondents that fetched water (n=397), 51.8% felt that the vessel which they carried to the water point was heavier than what they could comfortably carry. Of the children complaining about the weight of the vessel (n=205), 54.4% were girls.

Additionally, of all the children that fetched water (n=397), 83.4% carried the vessel on their head (head portorage), and more of these were from Kagamba. Only 10.1% of all these children used a bicycle in the process, and a bigger proportion of these came from Lwanda. A small proportion of the children said that they carried the water by suspension in the hands; the majority of these were from Lwanda. This is possibly because the distances to the water points are shorter in Lwanda.

Table 5: Reported means of water carriage from the source

	Means of Carriage			Overall	
	Head portorage (%)	Bicycle (%)	Suspension by hands (%)	%	n
Sex					
Boys	41.9	87.5	57.7	47.5	189
Girls	58.1	12.5	42.3	52.5	209
Subcounty					
Kagamba	54.5	27.5	30.8	50.3	200
Lwanda	45.5	72.5	69.2	49.7	198

By gender, the majority of those that fetched water by head portorage were girls (58.1%), 87.75% of those reporting the use of bicycles were boys. Most of the respondents (76.1%) said that they did not enjoy fetching water with a bigger proportion of these living in Kagamba. The evidence from the qualitative data also indicated that boys did not enjoy participating in other chores at home, and therefore some of them were happy to fetch the water and leave the rest of the chores for the girls. According to some of the boys, they did not want chores that restricted them to their homes.

Fetching water was, for many children, a drudgery because of the long distances that it entailed, the heavy water vessels used to fetch water, and the numerous trips that children had to make to the water point daily. This drudgery impacted the children's physical health. For example, some of the children experienced body pains and backache from fetching water. Carrying a bigger water vessel is in some cases children's response mechanism to reduce the number of trips made. Some children also thought that carrying heavy water vessels on their heads compromised their physical growth by causing stuntedness. The heavy vessel, combined with a long-distance covered can be an indicator of exposure to sustained *compressive loading*, a risk factor for spine injury (Geere et al., 2010).

Additionally, for some school-going children, fetching water had an implication on their education. It resulted in reporting late for school when children fetched water before school; missing school in order to fetch water as demanded by the parents or on their own decided not go to school on a particular day when they felt they would be too late for school, which attracts punishment. It also reduces the amount of time that children have to accomplish schoolwork while at home or for private study. Children also said their concentration in the classroom was affected as they always got worried about fetching water when they go home.

At the water source, there was verbal abuse, especially for younger children. This was perpetrated more by the older ones but also some adults engaged in this. There was, also, physical abuse while at the water source attributed partly to the long queues at point water sources. Some children had to endure adults jumping the queue, thereby spending more time to draw the water.

There are life risks to the children in the process of fetching the water including going to the water points in the evening after dark or leaving after dark. There is also the risk of drowning for the children that fetched from the open water sources like the lake, dams, and unprotected springs.

There were, however, some children (23.9%) that enjoyed fetching water and the majority in this category were from Lwanda. Most of the children that reported enjoying fetching water were boys (61.1%); fewer boys, compared to girls reported not enjoying the fetching of water; 43% and 57% boys and girls respectively. One of the reasons the boys enjoyed fetching water was because of the use of the bicycle as a means of fetching the water. The qualitative evidence also

indicates that fetching water using a bicycle was enjoyable and comparatively less tedious; this finding mirrors that of a study by Macri et al., (2015).

Over 60% of the children that enjoyed fetching water were from Lwanda. Some of the reasons for enjoying or not, which they attributed to the interaction that takes place at the water point especially for the adolescents. Whereas some of the boys liked being at the water points especially in the evening when there was a big number of girls with whom they could acquire friendships, other boys did not like fetching water just in case their girlfriends at school found them at the water point shabbily dressed. See Table 6.

Qualitative data from focus group discussions with boys corroborates the quantitative data as the following voices illustrate:

I enjoy fetching water because of one reason: in the evening when you go to the water dam you find that there are so many children at the Water Point and as you also know.... you may be able to get a “friend” from a long time ago... of primary seven and you are in senior four, if you have a girlfriend then at the water point is the opportunity for you to talk and catch up.

Participant, Boys FGD, KGB_06_Kigayaza

I do not enjoy fetching water because you might go to the water point and you find your girlfriend and when you get to school the next day then

they will tease if you have always bragged that you do not carry water on your head but use a bicycle... they find out the truth. Sometimes you are all shabby, you have not bathed yet, and it is shaming.

Participant, Boys FGD, KGB_06_Kigayaza

Even when fetching water was such a drudgery, there was something enjoyable about it. The fact that children could find some playing time while at the water point was a factor to be happy about for those that enjoyed fetching water. Some children, especially those in Lwanda, enjoyed fetching water because they did not have to move long distances. In gender terms, the girls that enjoyed fetching water, it was because they wanted to ensure the availability of water in the home, which in turn enabled them to complete the other water related household chores. This corroborates another finding that the girls participated more in the domestic chores that require water.

Point water sources: some reliability issues

In Lwanda, although many children fetched water from point water sources, they mentioned some reliability issues that affected water access. There were commercial water tap points from the gravity flow system [Public Stand Pipes], from which some households bought water daily. There was a quality concern in the villages connected to the gravity flow system. All the children who mentioned fetching water from the water tap, said that the water contained black flaky particles. This concern was also voiced in the group discussions in

Table 6: Showing the reasons for not enjoying fetching water

Reasons for not enjoying the fetching of water	Sub-county		Gender		Overall	
	Kagamba	Lwanda	Female	Male	%	Freq
Long-distance to the water Point	60.1	39.9	58.9	41.1	54.3	163
Getting water from the water point is tedious	51.4	45.9	58.7	41.3	36.3	109
The risks that are involved like accidents, snake bites, hippos, being harmed along the way	56.8	43.2	58	42	29.3	88
Heavy water vessel	61.7	38.3	45	55	20	60
Boys that bully me at the water point	48.9	51.1	68.1	31.9	15.7	47
Long queues at the water point	15.8	84.2	47.4	52.6	12.7	38
Reduces my time for play/private study	86.4	13.6	45.5	54.5	7.3	22
Interrupts my other chores	52.6	47.4	42.1	57.9	6.3	19
Chest/physical body pains	61.1	38.9	50	50	6	18
Fetching water many times a day	72.2	27.8	38.9	61.1	6	18
Hilly terrain	68.8	31.3	68.8	31.3	5.3	16
Going to the water point late	36.4	63.7	72.3	27.3	3.7	11
The risk of drowning	44.4	55.6	44.4	55.6	3	9
Other Reason	54.5	45.5	77.3	22.7	7.3	22

*Percentages and totals based on Respondents

Lwanda sub-county where children expressed concern about the impact of these flaky particles on their health. Responding to whether they had a water problem in the community, a child observed:

We do not have a big problem because we do have tapped water, however, the problem is that the water contains some black particles and we do not know what these particles are, we may get cancer from them, besides the water also is hard it wastes a lot of soap when you are washing the clothes. When it does not flow in the tap, some people have to fetch from open water sources, and the water in such is not very hygienic, and also some people defecate around such open sources, so this makes the water unsafe for drinking, some people might drink the water without boiling and suffer from diarrhea.

Participant, Girls' group discussion, LWD_19G_Sserinya



A Public Stand Pipe [PSP] in Lwanda Trading Centre, Lwanda Subcounty, Rakai district.

According to the children, in several cases, the boreholes also broke down resulting into long lines exacerbated by the weak flow of the water. Some of the boreholes had mineralized (salty) water, which made it difficult to accomplish certain tasks especially the washing of the clothes since it would take longer to lather and more soap. The boreholes in some locations run dry, especially in the prolonged dry seasons, while other boreholes, at times, did supply colored water in the rainy season. The low water yield or the sediment in the water of the borehole can result from improper water point design and construction (Alberta Agriculture and Rural Development, 2013). In sub-Saharan Africa, up to one-third of boreholes are nonfunctional at any given time (Fisher et al., 2015).

When the boreholes break down in one village, the alternative is to go to the neighboring village with a functioning borehole. Accessing water from the neighboring village was reported not to be guaranteed. It was reported that children from the village with a dysfunctional borehole would at times be restricted from collecting water on account that their households were not contributing the operation and maintenance (O&M) fees. The following statement from one of the participants illustrates the problem:

The problem we have is that the borehole breaks down... though not so often but that in the next village breaks down more often and when this happens people from that village come to our village and vice versa, so when you go to their borehole because you do not belong to that village everyone would want to fetch water before you.

Table 7: Water sources: the pros and cons

Type of water source	Pros and Cons of source	
	Advantage	Downside
Boreholes	Water is clean in appearance No daily payment to access	Frequent breakdown Some of the boreholes have salty water Long queues Long distances to source
Protected spring	Water is clean and safe No daily payment for access	Long queues Long distances to source
Unprotected Spring	No queuing get water No daily payment for access	Susceptibility to contamination Unsafe water Long-distance to source
Water dam	No queuing No daily payment for access	Poor quality water (greenish/brownish) Risks of drowning Susceptibility to contamination Long-distance to source
Lake	Water availability all year round No queuing No payment required for access	Poor quality of water Susceptibility to contamination Risk of drowning Injury from hippos Long-distance to the source
Public Stand Pipes/tap water	Clean water in appearance Safe water	Payment for access Black flaky particles in the water

Now when you go home, they will not believe that someone jumped the queue, such a scenario would be avoided if we had our water source. If we could be helped to get water, it reduces the workload for the children.

Participant, Girls’ FGD, LWD_15G_Kiganda

The analysis from the qualitative data revealed that each of the main sources of water had disadvantages and advantages. These are presented in the table 7.

Fetching Water and the Associated Risks

A number of risks associated with collecting water from different sources were enumerated by children. One of the risks was the long distance to water points, as indicated by children in Kagamba. During the dry months, the water points(mini-dams) nearest to their homes dry up since they are very small reservoirs. Therefore, the children walk to the largest and almost permanent dam-*Kyanamirira*. The children said that they fetched several times in a day and they carried heavy vessels. For the whole of Kagamba sub-county, the most reliable source was Lake *Kijjanebalola*, where some children had to walk for more than two kilometres. It was also mentioned, for example, that if a child went to the lake at 6 pm, they would get back home at around 8pm, this increased the risks encountered on the way. A focus group participant observed:

The first thing with water, during the dry season when the dams have dried up, we go to a further water point called *Kyanamirira*, during the rainy season the dams are nearer the home, the water is not clean, the colour is bad. If you are not from the community, you cannot believe that people draw and use that water. For us, the dam we use is next to a school, school children draw water from there and they drink it without boiling it. The water is very dirty so it would make you sick if you drink, in the dry season we walk a long distance to get water.

Participant, Girls’ Discussion group, KGB_09G_Kigayaza

Since the study sought to compare the children’s experiences with water, two study sites on the extreme sides of the water plenty-scarcity continuum (see the selection criteria of the study sub-counties in the methodology), the analysis of the survey data included statistical tests to detect any similarities or differences. For example, an independent samples T-test indicated differences in the time spent waiting to draw water at the water source. As reported by the children, the difference was significant. There was a significant difference in the waiting time between Kagamba and Lwanda ($t=-2.362$, $p<0.019$). The children in Lwanda waited eight minutes longer to draw water. The difference in the waiting time is attributed to the borehole as the main water source from which most children in Lwanda fetched. The borehole, being a point water source, requires queueing. Comparatively, the children in Kagamba fetched water from open sources such as dams/

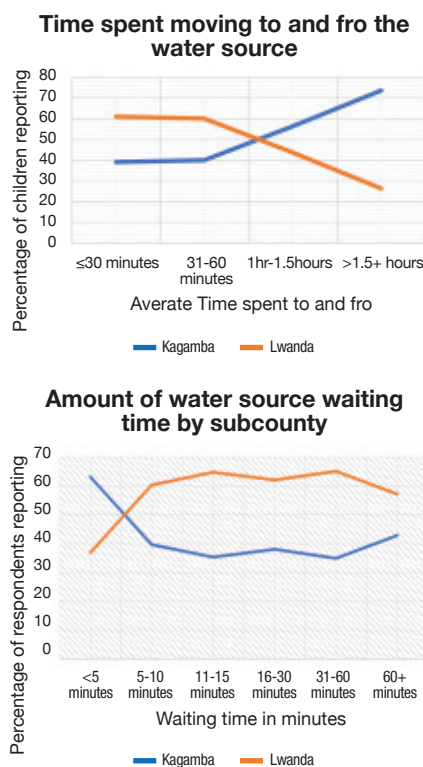
lake where there is no queueing. This finding is similar to the findings of Macri et al., (2015) in rural Uganda where congestion at the water points was the major problem for water access in communities with point water sources (see also Mugumya et al., 2017).

An independent samples T-test conducted on the amount of time for a round trip indicated that the children in Kagamba sub-county spent a significantly higher amount of time compared to those from Lwanda. There was a significant difference in the reported time to and from the water point for children in Kagamba and Lwanda ($t=5.275$, $p<0.001$). The average time for children in Kagamba was 28 minutes longer than that of the children in Lwanda. See Table 8 and Figure 1.

Table 8: Mean time spent on the water provisioning process

	Overall	Kagamba	Lwanda	Boys	Girls
Mean time spent (minutes) to and from the water point	82.7	96.7	68.6	76.6	88.5
Mean time spent (minutes) waiting to draw water	8.8	7.5	10.2	10.1	7.7

Figure 1: Comparative Time Graphs



For most of the children, the time spent for a round trip including queuing exceeded thirty minutes; the standard parameter set in the Sustainable Development Goals (WHO & UNICEF, 2017). The children in Kagamba had the least waiting time at the water point. On the other hand, the children in Lwanda spent more time queuing for water since they fetched from point water sources. They also spent comparatively less time moving to and from the source. This is explained by the fact that Lwanda has a bigger number of water sources, and therefore homesteads are at comparatively shorter distances than where the sources are fewer.

The long distance to the water source was the most mentioned indicator of the water problem in the household as well as the biggest reason for children not enjoying the fetching of water. The long distance, therefore, results in a negative experience for the children that fetch water, this further confirms distance to water source as a key dimension of water access. Whereas improved water sources deliver safe water, the amount of time spent getting to those sources must be considered. The best scenario for water access is where the water is on the premises; it is available when it is needed and is free from contamination (UNICEF, 2019; WHO & UNICEF, 2017).

The longer distance potentially increased exposure to accidents along the way. A study by Geere et al (2010) established that the long distance to the water sources was a big concern for children and they indicated that if the distance were reduced, it would reduce the tiredness, increase time for al-

ternative activities, increasing food production and economic benefit. Whereas Gordon (2003) argues that distance to the water source is of special significance to the children since they may help in collecting and carrying water, this gives the impression that the children play a marginal role in water provisioning. The findings from this study indicate that the children play a central role in fetching water.

Risks at the water point

Children encounter different risks at the water point depending on the type of the source. Children that fetched water from open water sources faced some dangers, for example, the children that fetched from Lake Kijjanebalola reported that hippos at times chased them. There were also two cases of drowning that were mentioned in focus group discussions that resulted from attempting to draw cleaner water further inside the lake instead of that on the edges.

Provisioning for water also sometimes meant being bullied at the waterpoint, especially when the children waited in the long queues. The queues were more evident in the places where the water was from *point water sources* such as the boreholes and protected springs. The children also had to endure delays because the adults and the older children sometimes jumped the queue. This was apparently because the adults perceived children as having comparatively fewer chores to perform at home, so they had to draw after the adults. The children observed in the discussions that they were not happy about this but could not do anything to change the situation.

Table 9: What Happens at the Water Point

While at the water point.....	Kagamba	Lwanda	Girls	Boys	N=397
Sometimes I have to fight to draw water	50	50	47.2	52.8	27.3%
Sometimes other children physically abuse me	56.6	43.4	48.5	51.5	24.9%
Sometimes adults physically abuse me	50	50	43.8	56.3	12.1%
Sometimes adults verbally abuse me	57.1	42.9	59.2	40.8	37.2%
Sometimes other children verbally abuse me	56.6	43.4	53.3	46.7	53.4%
Sometimes, older people draw water before me even when I arrive before them	50.9	49.1	55.4	44.6	44.1%

It is evident that both physical and verbal abuse of the children occurred at water points. The girls experienced more verbal abuse from other children as well as adults while the boys experienced more physical abuse from fellow children and adults. Qualitative evidence indicates that the girls also experienced bad touches while at the water source. Talking about the challenges that they face at the water point, a child observed:

One of the challenges here is that you might find some boys at the water point and they begin touching you (bad touches) and yet they are stronger than you, you cannot fight them. So, the boys disturb us a lot at the water point.

**Participant, girls group discussion,
KGB_09G_Kigayaza**

Water as an indirect threat to Children's wellbeing: the quantity and quality

The indirect threat to the children emanated from the poor quality of water that sometimes resulted in ill-health. Water, therefore, for many children was experienced as problematic due to the poor quality and inadequate quantity. With regard to the quantity of water, most of the survey respondents (60.7%) noted that, sometimes, they did not have enough water in their homes. The Pearson chi-square test indicates that there is a strong association between the respondent's sub-county and not having enough water in the home.

Table 10: The water quantity situation in the home

We do not have enough water in our home	Subcounty		Overall	
	Kagamba	Lwanda	%	n
Every time	12	03	3.7	15
Most Times	61	52	27.9	113
Some times	119	127	60.7	246
Never	09	22	7.7	31

$$X^2=11.807, P=0.008<0.05$$

The majority of the respondents, 80%, said that the quality of the water from the household's main source was poor. A bigger proportion of the respondents (56.8%) who said this was from Kagamba and 43.2% was from Lwanda. A Pearson chi-square test indicated a significant association between the respondent's sub-county of residence and their perception of the water quality as poor ($X^2=33.227, P<0.001$). For those who said that the quality of the water was good, 79% were from Lwanda; more girls perceived the water quality as poor.

The difference in the respondent's perception of the quality of water can be explained by the differences in the water supply technologies dominant in each of the study sites [see **Table 3**]. Research has indicated a link between the quality of water and the water supply technology that is used (Naiga & Penker, 2014). The children in Kagamba perceived in bigger proportions the quality of the water as poor compared to those in Lwanda. The evidence for the main source of water for households indicates that the lake and the valley dam (*open water sources*) were mentioned more in Kagamba whereas the borehole and the protected spring (*point water sources*) were mentioned more in Lwanda. The point water sources provide safer and aesthetically better quality water.

The children also revealed the indicators of the poor quality of the water that they obtained from the sources. These indicators include water color (brownish/greenish), existence of sugar cane husks, polythene bags and other physical waste in the source or the vicinity, water being salty, washing clothes from around the water source, and open defecation within the catchment of the water sources. The children that fetched water from the lake complained that the water was smelly (i.e., smelt like fish).

The biggest proportion of the reported indicators of poor water quality were from Kagamba. This poor quality was mostly due to the open nature of the water sources; the greenish colour indicating the presence of high concentrations of *algae bloom*. There is also ease of animals drinking from open sources, dirt is sometimes thrown into the source, and those drawing the water directly step into it because of the absence of any physical structure around the water source to enable proper and safer drawing. Some children said that tomato farmers cultivated within the vicinity of the water sources to ease irrigation. These farmers litter the water source surroundings with the empty chemical tins. The

poor water quality, the children said, was a risk to their health since it causes them illnesses like diarrhea and typhoid that can lead to their death if they do not get proper medical attention. See Table 11.

Table 11: Indicators of poor water quality at the source

Indicator of the poor quality of water at the source level	Subcounty		Overall	
	Kagamba %	Lwanda %	%	n
Presence of small black Particles/organisms/ tadpoles/snails	44.2	55.8	13.5	43
Colored water (brownish/greenish)	51.0	49	48.6	115
Water source shared with animals	62.7	37.3	23.5	75
Mineralized/salty water	74.5	25.5	14.7	47
People step into the water source as they draw it	68.6	31.4	11.0	35
Washing clothes around the water source	88.9	11.1	2.8	09
People excreting in the water source	75	25	12.5	40
Throwing dirt into the water source	55.7	44.3	30.4	97
The fishy smell of the water	52.9	47.1	5.3	17
Water source not cleaned	100	-	0.3	01

Water and interpersonal relations

Most of the children (88.1%; n= 357) participating in the study said that the water situation in their households affected their happiness. One of the reasons was that it affected their interaction with other people in the house. For some children, water constrained their interaction with their parents especially if they did not fetch water as expected of them, the reasons for this notwithstanding. There were quarrels that ensued between children in the home over prioritization in the use of the available water as well as on who should fetch water. Talking about how the situation of inadequate water affects the interaction between siblings in the household, a child observed:

When you have siblings at home and some of them do not want to fetch water, if you fetch your water the older siblings might bully you and take away the water for personal use, so when the older children do not want to fetch, but they use the water, this creates friction. Also, these same older siblings they might not want to use the water sparingly, this brings quarrelling at home, fighting, abusing each other.

Participant, Girls' Group discussion, KGB_03G_KagambaKiyamba

Children's interaction with other people pivoted on the water as a resource is important as Camfield et al., (2009) acknowledged that the quality of interactions and relationships matter as much to people's wellbeing as the quality of their assets.

Wellbeing can be about what an individual thinks or feels about his/her life in the present but also what they think their life will be in future (Bradshaw et al., 2007). Some children perceived the prevailing water situation in their community as a threat to their future lives. The perception was based on the impact that water can have on their school performance, which sometimes entails dropping out of school. Also, the situation resulted in the distortion of the health of children due to over fetching water, using heavy vessels resulting in chronic chest pain that may hamper future performance of manual tasks. The following are two illustrative quotes on the ways the water situation in the children's community can affect their future:

For example, when the child fetches water from a distance, they may be late for school, miss some lessons, this might affect their performance. Such a child might not continue longer with school due to poor class performance. Also, in the community when the children especially, girls, go to the water point in the evening they might find boys that will tempt them into sexual activity, they might end up pregnant and drop out of school since no parent can pay school fees for someone pregnant. This means that for such a child, their future dreams might not be fulfilled.

**Participant, Girls' discussion group,
LWD_17G_Lumbugu**

For me, I think that when a young child is asked to take a very heavy vessel to the water point, they may get chronic chest pain, you can never be sure that everyone will succeed in education; when such a child drops out of school, they get back to the village but they cannot even do manual labour for survival, this makes life extremely hard, this affects their future life.

**Participant, Boys' discussion group,
KGB_06B_Kigayaza**

The negative experience for some children related to poor body hygiene because of the quality and quantity of water available, this tended to affect more the girls than boys. There was almost total consensus that the hygiene of the girl child is more affected because of the physiology of their bodies and the biological processes such as menstruation that necessitate high hygiene levels. The evidence from the qualitative findings indicates that even the boys affirmed to taking longer without bathing due to the unavailability of water at home.

5 DISCUSSION OF THE RESULTS

Whereas much of the literature indicates that the burden of collecting water lies with the women and the girls (Agesa & Agesa, 2019; Asaba et al., 2013; Hemson, 2015; UNESCO, 2019), in this study, most of the respondents said that in their homes, children, compared to adults participated more in the fetching of water. This finding is in line with that from another study by Mugumya et al., (2017) about domestic water collection.

Some of the children reported fetching water on school days, some, both in the morning and in the evening. This implied that for some households, the children must fetch the water, even when they have to go to school. The qualitative evidence also shows that the women depended so much on the water fetched by the children with some of them noting that if the children did not fetch water for whatever reason, then food would not be prepared. The misperception of women as bearing the biggest burden of water collection, we argue, may be a consequence of two scenarios; first, it may be a result of the fact that many studies on domestic water provisioning focus on women, who also answer questions about children and water. The evidence from this study indicates the children participated more in fetching water; differing with other studies that depend on adult respondents for information about children's participation. Such studies, it has been argued by other scholars (Ben-Arieh, (2010); de Leeuw & Borgers, (2004); Gordon, (2003) may underrepresent or underreport the magnitude of child participation in water collection. Secondly, it may result from the attribution of most domestic chores to the women, and because water is very central to these chores, the women do take a bigger credit for water collection.

The children largely experienced water as a problem in terms of the quantity and quality. The energy expended in obtaining it (workload), the cost in terms of time spent on water collection, the risks involved in collection of water, the actual and potential impact on intrahousehold interactions [*relational wellbeing*], the effects on children's happiness, education and health all combine to impact on the children's wellbeing. All the various ways in which the children experienced water has an implication for their growing up as well as the way that society views them as they aspire and transition into adulthood.

Aggregately, the water situation in the study area posed a big threat to children's wellbeing. The long distances have implications for children. It resulted in, for some children, having to fetch water in the early evenings (after dark) with increased risks of getting involved in accidents and sexual abuse for the girl children. There was also less or no time for playing, private study, a big workload, limited amount of water available for use. For many, also, the situation meant

physical punishment from their parents; both direct and indirect for delays at the water point or failure to fetch the water. The other sanctions given also posed a risk to the lives of the children. The children's attendance at school and concentration in class get affected by their experience with water.

The poor quality of water, mainly resulting from the open nature of the water sources, has implications for the health wellbeing of the children. It results in water-related illnesses like diarrhea, bilharzia, and others resulting from constrained body hygiene. The long distances resulted in carrying heavy water vessels and subsequently led to headache, chest pain and back pain. A different study about children suggested a potential relationship between water carrying and symptoms of musculoskeletal disorders like pain and movement dysfunction (Geere et al., 2010). For the study site that had gravity flow taps, the black flaky particles in the water were an issue of concern since this is indicative of a quality of water that is less than what is prescribed in the UN's human rights framework. The water must be safe and free from microorganisms, chemical substances and radiological hazards that constitute a threat to a person's health. It should also be of acceptable color, odor and taste (UNESCO, 2019).

The threat that the water situation portended for the wellbeing of children is to some extent gendered as it is more skewed towards the girl child. The girls, in slightly bigger proportions participate in fetching water as a domestic chore. Girls' bigger actual participation in water provisioning is based on being socialized into the gendered *wifely/womanly/motherly* role. Qualitative findings indicate that one of the reasons why girls participated more in fetching water was due to their being more obedient to parents than the boys.

The problems that children faced in relation to water form part of their encounter with the resource and ultimately their experience. Reflecting specifically on the problems mentioned, there are only subtle differences across the study sites. However, a closer look at these differences gives a comparative picture about the differences in the water situation in both sites when juxtaposed (See Table 3). The water point being far is a bigger concern for children in the water-scarce sub-county due to water points being very few and being located very far between each other. The hilly terrain in the sub-county also means a less likelihood of using the borehole as a water supply technology. The problem of spending a long time in the queue is indicative of a high user to water point ratio, which, sometimes is exacerbated by the intermittent water flow from the borehole or the protected spring.

A comparison between three aspects of water provisioning that is: i) *what worries children about fetching water*; ii) *the problems that are encountered in fetching water* and iii) *the reasons for not enjoying the fetching of water was made*. This comparison revealed that the long distance to the water point was the biggest problem mentioned and also encountered across both study sites. This makes distance the biggest concern in terms of water access and the children's experience. This is closely followed by the concern with the quality and quantity of water available for households.

6 CONCLUSION

This study indicates that the lives of most children are impacted by water scarcity and their encounter with water as a resource is relatively a negative experience. Those children in the more water-scarce subcounty experience this in greater magnitude. In gender terms, the girls bore a slightly bigger proportion of the experience. For most of the children, theirs is a childhood variegated with difficulties rotating around water. Their socialization, childhood life chances and interpersonal relations are variously impacted by the water scarcity in their households and the community. This kind of childhood, requires protection through resource access and utilization, specifically through the improvement of water access, quality and quantity.

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