



Impact of water scarcity on sanitation and hygiene in low-income urban areas

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Abstract

This study investigated the impact of water scarcity on sanitation and hygiene in low-income urban areas. It was carried out in an urban township at ward level. The research employed a qualitative research design. Interview guides and focus group discussion guides were used as data collection instruments. There were 45 participants in the study and these comprised of the Housing Officer, Resident Association Chairperson, the Councillor, 2 focus groups consisting of 6 participants each from 30 households. Purposive and convenient samplings were preferred for this study. The study found out that the Madumabisa urban township is affected by water shortages especially when it comes to sanitation and hygiene. The study revealed that water scarcity has led people to practice open defecation which pollutes the environment and pose as a threat to their health. the study state that, water shortages in Madumabisa is due to water pump failure, pipe bursts, low rains among some. The researcher therefore recommended drilling of boreholes in Madumabisa including other communities in urban areas or bringing water bowsers on a daily basis. The service providers should construct toilets and bathrooms in each and every house to eliminate the sharing of toilets and bathrooms by different families.

Keywords: water, sanitation hygiene, urban, rural, health, community

INTRODUCTION

Shared and communal toilets have largely remained an urban phenomenon in some developing countries and it makes it difficult for residents to maintain high standards of hygiene when water is scarce. According to Schmidt (2014) accessible water and adequate sanitation as well as good hygiene for communities is vital for better livelihood. This helps people to maintain good hygiene especially on sanitation. The United Nations (2013) report on water for life state that there are more than 1.1 billion people lacking access to clean water and 2.5 billion lack improved sanitation. The cost and effort to build or even maintain access to water increases due to ever increasing demand on existing water resources. UN (2013) report goes on to add that, currently the consumption rate shows that two-thirds of the world's population may face water shortages by 2025. WHO (2012) postulate that lack of water in the developing world has led to approximately three billion people to suffer from a plethora of infectious diseases. Hence, effects of diarrhea diseases such as cholera, dysentery and typhoid are dominant in less developed countries that consist of Zimbabwe, Democratic Republic of Congo, Tanzania among others.

According to UN (2018) the universal and equitable access to safe and affordable drinking water and adequate sanitation and hygiene can be increased if the Sustainable Development Goal (SDGs) related to water and sanitation are achieved. Provision of safe drinking water and adequate sanitation facilities would help to complement this goal. In developing countries, local authorities, mainly for rural areas have progressively failed to provide access to improved sanitation facilities and enhance positive hygiene practices in the country. While in urban areas safe sanitation and adequate hygiene facilities decreased. The declining sanitation and hygiene services in Zimbabwe contributed to the 2008/2009 cholera outbreak which killed more than 4 300 people (Government of Zimbabwe, 2009). The government and development partners deployed mitigation measures to curb cholera outbreak in different communities through public health promotion interventions which included water safety promotion, improved household and community sanitation and hygiene change. Throughout that period there were huge investments that were made in support of safe

water in the form of borehole drilling, water point protection, rehabilitation and repairs of boreholes (Government of Zimbabwe, 2009). Hence, this helped to improve access to water and improved sanitation in some communities.

In addition to the above, Zimbabwe continuously faced health challenges that was caused by disasters like floods (IFRC, 2013). Such disasters destroyed infrastructure including sanitation infrastructure in some places in the country and triggered some policy inconsistencies. For instance, National policy articulates that the country will use Community Health Clubs for health promotion but big organisations oppose that and experimented with other strategies and methodologies. The situation is exacerbated by poor management of resources in the country. For instance, in Zimbabwe, the government adopted a National Sanitation and Hygiene Strategy (Government of Zimbabwe, 2011) and the National Water Policy (Government of Zimbabwe, 2013). These approaches were used to help curb water and sanitation challenges.

The households in Madumabisa ward 11 solely depend on the Hwange Colliery Company for purified water which is sourced from the Zambezi River for basic services. The water shortage referred to in this study was crucial for basic households needs such as washing, cooking and sewage system. Before 2017 water used to reach all houses and communal toilets in Hwange urban through pipes to the taps. However, currently people were seen carrying water containers up and down in some parts of Hwange Urban like Madumabisa ward 11 to draw water from other areas that has water. This situation portrays scarcity of water supply in Madumabisa ward 11, which encouraged the researcher to investigate the impact of water scarcity on sanitation and hygiene in this community.

Statement of the problem

There has been continuous deterioration of water and sanitation situation in Madumabisa Hwange that has resulted in perennial diarrhoeal diseases. Water scarcity in Madumabisa Ward 11 (eleven) was not reliable and the researcher wanted to bring out the cause and impact of water shortages on sanitation and hygiene in the community. This was attributed to water shortages and population growth in the past 20 years. The situation may have been exacerbated by COVID-19 situation within which the situation continues to be worse thereby prompting this study to ascertain the situation using empirical evidence. Therefore, the research seeks to examine the effects of water scarcity on sanitation and hygiene practices in Madumabisa Ward 11 where most people use communal toilets. The problem of water shortage was not just a local, provincial or national phenomenon but a global issue that affects individuals, industries as well as the economies at large. This was extinguished by the fact that both people and companies or mines need water for their survival. Madumabisa ward 11 was not an exception as many households did not receive a regular supply of water. The problem was escalating at an alarming rate as the numbers of companies in the surrounding area were increasing rapidly. These developments therefore, call for an investigation of the causes and impact of water scarcity on sanitation and hygiene among people using communal toilets.

Purpose of the study

The study sought to investigate the impact of water scarcity on sanitation and hygiene in low-income urban areas particularly Madumabisa Ward No. 11, Hwange from 2017 to 2020.

Research objectives

- To assess the causes of water scarcity in Madumabisa Village in Hwange between 2017 and 2020
- To explore adaptive solutions of water scarcity on sanitation and hygiene situation for Madumabisa people in Hwange District between 2017 and 2020.
- To draw recommendations that informs duty bearers on possible long-lasting strategies to curb water scarcity in Madumabisa Urban Centre

Literature review

Garland and Herzer (2009) articulate that the fast-growing population has employed unbearable pressure on water which was a limited and susceptible resource due to the demand for domestic consumption, industrial use, power generation among some. The population was investigated to bring out the causes of water shortages in the community, the impact it has on sanitation and hygiene and the strategies that can be used to cope with water shortages. Water scarcity has a number of negative effects since they result in stringent water rationing, which further causes an increase in diseases such cholera, dysentery, typhoid, diarrhea among others and people are unable to bath or flush their toilets (Nyoni, 2007). The sanitation facilities were left dirty such that people opted to use the bush (open defecation) which pollutes the environment. Shortage of water also caused frequent sewage blockages in the system as a result of reduced water flow in the system (Nyoni, 2007). By so doing, this caused a bad odor in the community and pools of sewage water from the blocked communal toilet covers the open space which made it difficult for people to move around or children to play around in the area.

UN-Water (2012) state that, at the present time, water was becoming scarce not only in arid and drought prone areas, but also in regions where rainfall was relatively abundant. Water scarcity was not only observed under the perspective of the quantities available for economic and social uses, as well as in relation to water requirements for natural and man-made ecosystems. UN-Water (2012) adds that the concept of water scarcity also embraces the quality of water since degraded water resources are unavailable or at best only marginally available for use in human and natural systems. Worldwide, 96% of the world's urban population had access to safe clean water versus 84% in rural areas. But nowadays, water has become very scarce in most regions in the world.

Globally, 946 million people still practice open defecation that is 9 out of 10 live in rural areas, 2.4 billion people lack access to basic sanitation (7 out of 10 in rural areas), 663 million lack access to basic water sources (WHO/UNICEF JMP, 2015). Hygiene was stated as a categorization of practices accomplished to preserve health. The health of individuals depends on the healthiness of their environment. A healthy environment allows an individual to attain complete physical, emotional and social potential and devoid of risky elements. Hygiene was articulated in the efforts of an individual to safeguard, sustain and enhance health status (WHO, 2014). WaterAid's Sanitation framework defines hygiene as a personal and household practice such as handwashing, bathing, and management of stored water in the homes, all aimed at preserving cleanliness and health.

The global water and sanitation state has been a challenge. There were 946 million people who still practiced open defecation, 2.4 billion people lacked access to basic sanitation, 663 million people lacked access to basic water sources in the world (WHO, 2017). Population is growing at an alarming rate globally; water and sanitation infrastructure were aging without any repairs and maintenance. Water scarcity around the globe was exacerbated by climate change in some locations. In addition, climate change had increased precipitation in some areas around the world and people who live near rivers and streams had the most to lose as there were in danger (United Nations Development Fund (UNDP), 2006). UNDP (2006) goes on to add that, there were at least 21 million people worldwide who were at risk of river flooding each year since they lived near rivers. The least developed countries and the developing countries are exposed to river floods which made them even more vulnerable to climate change and natural disasters. For instance, UNDP (2006) confirm that extreme flooding submerged over a third of Bangladesh, claiming over 115 lives and affected 5.7 million citizens in 2013. United Nations Children's Fund (UNICEF) (2015) adds that over half a billion children lived in extremely high flood occurrence zones which puts their lives at risk. People moved to such areas only to be near water sources which was become a scarce commodity.

Research methodology

A research design denotes plans of action on a certain problem. Creswell and Clark (2007) articulate that research design was the procedures for collecting, analysing, interpreting and reporting data in connecting the conceptual research problems with pertinent (and achievable) empirical research. This study set to collect data on water scarcity in Madumabisa the impact it has on sanitation and hygiene and recommend solution that duty bearers can employ to curb water scarcity. In other words, the research design sets the procedure on the required data, the methods to be applied to collect and analyse the data on water scarcity, and how all of this was going to answer the research question (Grey, 2014). The study will research on the impact of water scarcity on sanitation and hygiene in low-income urban areas. Welman, Kruger and Mitchell (2005) articulate that, in research design the researcher describes what she or he was going to be able to reach a conclusion about the research problem. In other terms a research design illustrates a plan on how water scarcity impact sanitation and hygiene in low-income urban areas to the writing of the final narrative. Design implies on putting together various components of research study to enhance the validity of the study. For the purposes of this study, a qualitative research design was used.

The study opted for qualitative research which is applicable to study since, it generates data which is necessary for a comprehensive understanding of a problem in this case which is water scarcity, provided deeper insight of the causes and impact of water scarcity on sanitation and hygiene in low-income urban areas and also encourages the researcher to access data on difficult issues.

Population of the study

According to ZIMSTAT (2012), the population of Hwange Urban was 37 522 consisting of 18 501 male and 19 021 females. The population of Madumabisa ward 11 according to the Census 2012 was 3622 consist of a total of 1739 males and 1883 females. There are 981 households and 10 enumeration areas in Madumabisa ward 11 (ZIMSTAT, 2012).

Sample size

The study sample size of 45 comprising 30 households, 3 key informants and 12 people from FGDs was used. Out of a total population of 3622 people in Madumabisa the study focused on the sample respondents using convenience sampling or snowballing or the qualitative technique that is appropriate for the study. When dealing with people it can be

defined as a set of respondents (people) selected from a larger population for the purpose of the survey (Mugo 2002). Frey, Carl and Gary (2000) define a sample as a subgroup of a population.

Sampling procedure

The researcher used the community register which was obtained from the Housing Department of Hwange Colliery which helped in the selection of 30 households through convenient sampling, also selected 12 individuals for the FGDs using convenient sampling and Key informants including the Councillor, Housing Officer and Resident Association Chairperson. When a researcher decides on who to study, the researcher needs to select a sample from the target population. Mouton (2006) describes sampling in qualitative research as being relatively limited based on saturation not representative size and not statistical determined involving low cost and less time. Spring and Lathan (2007) posits that using correct sampling methods allows the researcher's ability to reduce research costs, conduct the research more efficiently (speed), have greater flexibility, provide for better accuracy. The researcher selected the community of Madumabisa Ward 11, in Hwange Urban as the area of interest. This was because the researcher was familiar with this area and the area was faced with water and sanitation problems.

Instrument for data collection

Face to face interviews were used for the specific purpose of obtaining relevant information for the research. This face-to-face-interview are applicable to this study since, they allowed for probing so as to gather more information on the causes and impact of water scarcity and recommendations on strategies to cope with water shortages in Madumabisa. The researcher interviewed households and key informants to gather information on the causes of water shortages and the impact it has on sanitation and hygiene which allowed her to probe further so as to gather relevant data. Open ended questions were written in the interview schedule. This type was preferred to closed question in order to allow the respondents to express their feelings about the impact of water shortages on sanitation and hygiene in their community.

A focus group discussion was used to collect data. In this study, the participants in focus group discussion were free to talk with other group members; unlike other research methods it encouraged discussions with other participants. Participants were allowed to discuss on the water situation in their community to come to a consensus on the causes and impact of water scarcity in their community, the impact of water scarcity and come up with strategies to curb water shortages. FGDs were applicable to the study since the researcher wanted to get information from people's discussions so as to better analyze the data on the causes and impact of water scarcity.

The Key Informant Interviews were carried out so that the study can solicit information from the Housing Officer, Councillor and Resident Association Chairperson. In-depth interviews were carried out so as to gather concrete information on the causes and impact of water shortages on sanitation and hygiene in Madumabisa Village where most people use communal toilets. The researcher was taking notes during interviews and was solely responsible for data analysis.

Data collection procedure

Data gathering is the precise, systematic gathering of information relevant to the research sub-problems, using methods such as in-depth interviews, focus group discussions and participant observation (Burns and Grove 2003:373). Therefore, in this research data collection procedure was done through in-depth interviews, focus group discussions and site observation so as to come up with information on the impact of water scarcity on sanitation and hygiene in low-income urban areas. In-depth interviews, focus group discussions and site observations were used for data gathering since interviews are the effective way of communication and are good ways of accessing people's perceptions, meanings, definition of terms and reality constructions (Punch 2004). This improves the response quality of any given subject in the process (Gray et al 2007). Kitchin and Tate (2000) assert that the interview method allowed the researcher to produce a rich, deep and varied data set in an informal set. It also provided a thorough examination of experiences, feelings or opinions that closed questions could never hope to capture.

These tools were designed in consideration of the social status of the respondents. The subject of the study was Madumabisa Ward 11 from Hwange District Matabeleland North, Zimbabwe. The researcher will conduct the interviews. The researcher selected the respondents that consist of 30 households from the 90 households found in one of the Enumeration Areas (EA) in Madumabisa using convenient sampling. The researcher also administered the 3 interviews with Key Informants that include the Housing Officer, Resident Association Chairperson and the Councillor to gather information on the causes of water shortages in Madumabisa and the impact it has on sanitation and hygiene. The researcher went on to draw recommendations that inform duty bearers on possible long-lasting strategies to curb water scarcity in Madumabisa urban area.

Data was collected through individual interviews, 2 focus group discussions consisting of 6 people each and 3 informants. Data was collected over a period of two weeks and this included notification of local leadership, respondents

(Housing Officer, Councillor, Resident Chairperson, individuals and Focus group discussions). A total of 12 respondents were invited for FGDs, these groups had 6 respondents each include women, men and youths. Focus Group Discussion (FGD) 1 had respondent labelled as 1,2,3,4,5 and 6 while FGD 2 had respondent labelled A, B, C, D, E and F and 6 respondents had discussions on the causes of water shortages, the impact of water shortages on sanitation and hygiene and the recommendations that should be addressed to duty bearers to come up with coping strategies to curb water shortages.

Research findings

The study managed to interview the target respondents consisting of 45 respondents that include 30 households, 2 focus groups of 6 participants each, Housing Officer, Resident Association Chairperson and the Councillor. Every selected respondent participated very well since there were assured of confidentiality of their responses and the study used convenient sampling on data collection.

Water shortages were caused by pump failure, broken pipes, illegal tap connections and unfair distribution of water in the community of Madumabisa. The key informants said water shortages were due to pump failure, broken pipes and population growing in the community making water resource a scarce commodity. The housing Officer mentioned that the community of Madumabisa now has almost twice the population due to people coming in search of jobs. Many people sort to find their accommodation in Madumabisa which makes the population to grow high and water demands to become a problem. He went on to add that, one of the three pumps is no-longer functional leaving the 2 pumps failing to pump enough water in the Colliery concession area where we find Madumabisa Village.

Both FGDs 1 mentioned the causes as pumps failure, pipe burst or leaking pipes, less rains in the past years and unfair distribution of water in the community of Madumabisa since people who use toilets in their houses get different water source which is a bit reliable.

One participant stated that *“the causes of water scarcity are that pipes are leaking along the Zambezi Road to Zambezi River and more water is lost before reaching the communities which has caused water shortages. The other is, the two pumps in Kabuyu and Summit pump stations are not functioning also”*.

The other participant mentioned that *“service providers seem not to care about the quantity of water lost every day since they get enough water from a different source”*.

The frequency of water supply in the community of Madumabisa was very low especially for people using communal toilet. All of the participants in the study said they access water in the morning at different times in some days for about 3 hours or less. Some participants said they sometimes do not get the water at all if the pumps are experiencing some faults since there are now too old and one water pump was not functioning at all which makes them go for days without water in the community. The Housing Officer also confirmed that those sections that use purified water from the Zambezi, including the section under study get water for about 3 or less hours in a day while those who source borehole water (those with toilets inside their houses) get the water for longer hours of about 6 hours since the connection is still new. The participant said that the pumps used by service providers are now too old and the other pump is not functional at all which contributes to water rationing. Water rationing affects the frequency of water supply since water was supposed to be available all the time.

All the members in FGD 2 pointed that, there was favouritism from service providers since the frequency of water supply in the community is different. On the area under study, the source of water was the Zambezi which was not enough due to different reasons that include damaged pipes, pump failure, low rainfall among some. The water was rationed by service providers to reduce the water lost by damaged pipes that bring water to the community. They also added that, service providers were failing to fix the broken pipes that bring water to the community of Madumabisa but provides water in a neighbouring community called Lusumbami Ward for longer hours of about 6 hours in the morning and 3 to 6 hours in the evening. While on FGDs 1, all respondents said almost the same thing with FGDs 2 for favouritism done by service providers. The findings show that the frequency of water in the community of Madumabisa was inconsistent.

According to the research’s findings it was found that pump failures contributes as the cause of water shortages in the community of Madumabisa. There was a water pump that is no-longer functional because they were no longer repaired or maintained and they were too old because of lack of maintenance. The Councillor mentioned that

“The water pump at Summit Pump Station is now dysfunctional which makes water supply inadequate for the population in Hwange, which includes the area under study, Madumabisa Village”.

Illegal tape connection was mentioned as a cause to water shortages in the community of Madumabisa. They probed further stating that people were illegally connecting pipes along the Zambezi-road to their homesteads and some in the

urban areas were doing the same if the pipe passes through their yards. This reduced the pressure of water making some people to get less water when water comes in the morning.

Participant B in FGD 2 stated that *“we are fetching water from licking pipes and some people who can afford to buy taps and are connecting them so that they can easily fetch water.”* One respondent said, *“people staying in houses where the water pipes passes are illegally connecting taps and not allow anyone else to fetch water from those taps, this makes some us to end up without enough water”*

Respondent E from FGD 2 mentioned that the other cause of water shortages was due to the water which was contaminated by chemicals from one mine near the Deka River and also illegal tap connections along the Zambezi Road. Also, some people in the community of Madumabisa were illegally connecting taps to their yards without the consent of the service providers. The Housing Officer revealed that the other causes were due to a water pump which was no-longer functional at Summit Pump Station. This has affected water provision in some parts of Hwange urban areas. Maluleke et al. (2005:9) mentioned that insufficient capacity was the cause of water problems. Initially the community of Madumabisa was using piped water from Zambezi River as mentioned above but was not adequate for the whole community due to the pump failure and other reasons. According to the research’s findings this community also had insufficient capacity because its water was diverted to other neighbouring community as a result this was the reason for water shortages.

The interview had a question which triggered the provision of water supply before 2017 compared to the previous years. Some respondents cited that the situation was even worse before 2017. Other respondents mentioned that, the water supply situation before 2017 was better since it reached communal taps. They also pointed out that the water supply trend between 2017 and 2020 was worse compared to previous years. One person from face-to-face interviews responded that their particular section which was the C-Section and other neighbouring sections were the hardest hit by the impact of water shortage as they sometimes did not get even a drop but collect from a few sections that use borehole water. Generally, in 2017 to 2020, water supply seemed to be worse than the previous years which also contributed to the outbreak of cholera. One respondent from FGDs 2, respondent C added that currently, water supply was worse which was not good for COVID 19, which had ravaged the lives of millions in the whole world.

The question on the impact of water scarcity in the community of Madumabisa sort to bring out the impact water shortages has inflicted on sanitation and hygiene. Participants said that the water shortage situation has put their lives at risk of the COVID-19 pandemic. During the lockdowns people were moving around in search of water in some days instead of staying home and observe COVID 19 restrictions. This at some point led to the spread of COVID 19 in the community since people did not observe social distance and putting on face masks. Lack of adequate water also caused unnecessary stress to community members.

The findings of the research showed that lack of water supply had a negative impact on sanitation and hygiene. Water shortages in the community of Madumabisa have great impact on domestic use too. Participants also said that all communal toilets flush systems are no-longer functional which tempt people to leave the toilets dirty since water is not enough. Observations were made by the research to check the state of toilets in the community and also around the houses in C-Section. The toilets were always dirty and smelly due to lack of water which was a threat to their health. This also facilitates open defecation in the community since some people could not stand the dirty in the toilets. The environment was polluted again as a result of not getting enough water for flushing. Other observations were that, there was no running water for people to wash their hands after using the toilet. On the other hand, some people in the community decided to make backyard temporal bathrooms made of plastic papers or thatching grasses since the communal bathrooms were left dirty after others have bathed first. The researcher observed the bathrooms and the yards that were left dirty with stagnant dirty water. Hence, the findings showed that lack of water has a negative impact on sanitation and hygiene as almost all the respondents said that lack of water impacts negatively on sanitation and hygiene.

Recommendations

The study recommended that the service providers should construct more water infrastructure that will supply the whole community with water for the whole day. They could use water infrastructure that include installation of boreholes, taps and dams. More water sources reduce the burden of open defecation in the community since water for flushing will be available, having dirty sanitation facilities and a well vegetated area. In the community of Madumabisa, people had a few hours of about 3 hours to get water from communal taps leaving other households without water or less water.

Public participation action was needed to remedy water and sanitation problem, but it must be based on clear policy which was premised on the rights of all people to determine their own future. The community members should be involved by way of informing them on water problems and educating them on conservation measures and on sustainable utilization of water. The community was supposed to be given the opportunity to identify, implement, monitor and

evaluate community water projects. They should have been given the opportunity to select the appropriated water technologies they wanted and the location of water sources.

The water pumps should be maintained and serviced always to reduce water shortage. Existing water infrastructure, such as pipes and pumps should be checked regularly, maintained and refurbish if necessary.

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