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Water Insecurity In High Density Suburbs, A Case Study Of Rimuka, Kadoma City.

By

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The undersigned certify that they have read and recommend to Bindura University of Science Education for acceptance of this dissertation entitled 'WATER INSECURITY IN HIGH DENSITY SUBURBS, A CASE STUDY OF RIMUKA, KADOMA CITY.' submitted to the Disaster Risk Reduction Department in partial fulfilment of Bachelor of Science Honours Degree in Disaster Management Sciences.

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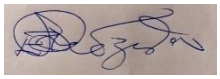

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DEDICATION

This piece of work is dedicated to my father for his unconditional love and support towards my academic achievements. I also dedicate this thesis to all the Rimuka residents, Kadoma who are experiencing water insecurity their daily lives.

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ABSTRACT

Water insecurity is a major challenge in many metropolitans globally, including Rimuka suburb of Kadoma City Zimbabwe. This thesis identifies the unique issues that inhabitants of the Rimuka area experience in terms of access to clean and dependable water sources. The aim of this study was to assess the water security situation in Rimuka high density suburb in Kadoma. Alternative solutions like rainwater harvesting and water conservation strategies are underexplored which is the gap in literature in which this study will address. Rimuka the high-density suburb of Kadoma which is characterised by over crowdedness, poor waste management, poor raw sewer disposal, few safe water sources, high unemployment rate of youths, and high drug abuse cases. The population target of the research included both male and female residents of Rimuka and workers from ZINWA and Kadoma Council to make 30 participants. The study adopted purposive sampling and random sampling for reliable data. The study adopted key informant interviews, participant interviews, and questionnaire survey. A pilot study was undertaken initially to assess the effectiveness of the tools of choice. Data was analysed using thematic content analysis and statistical package for social sciences which help interpret results in visuals like graphs. The results show that population growth is the most cause of water insecurity carrying 30% of the proportion with inadequate infrastructure being the least cause of water insecurity in Rimuka with 10%. Water insecurity drives communities to consume water from unsafe and unprotected sources which directly can lead to waterborne diseases like cholera resulting in loss of life in most cases. Sustainable solutions may be devised to improve Rimuka suburb's resistance to future water crises by addressing structural flaws and socioeconomic variables as well as invest in climate action that contribute to water insecurity such as water conservation and rainwater harvesting. The study recommends that water supply institution, risk reduction sectors, and development institutions collaborate and take a holistic approach in reducing water insecurity and its impacts to communities, as well as aware, emphasize and encourage communities of sustainable alternatives such as rainwater harvesting and other water conservation methods to reduce their risk to water insecurity.

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LIST OF ACRONYMS

FAO	Food and Agriculture Organization
GB	General Barracks
IPCC	Intergovernmental Panel on Climate Change
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal
SQ	Single Quarters
UN	United Nations
UNEP	United Nations Environment Programme
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
ZINWA	Zimbabwe National Water Authority

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Water uncertainty could be a basic issue in most parts of the world (Joined together Countries World Water Advancement Report, 2022). Water uncertainty can be felt from household level to universal level. This issue could be a result of diverse variables however it is related with a few impacts counting wellbeing dangers. As such, a case study that centered on causes, impacts and essential moderation measures of water insecurity was basic. In this manner, this chapter introduces the think about by showing a brief foundation on the causes of water deficiencies, conjointly their impacts on the individuals and the environment. Water frailty can be ascribed to characteristic or man-made for occurrence deficiently stores for water chemicals, climate alter, small or no precipitation, water contamination, and increment in water request. Additionally, this chapter presents the issue articulation, point of the ponder, as well as investigate goals.

1.2 Background of the Study

Water is portion of the environment and the arrangement, availability, reasonableness and accessibility of secure water is vital for human advancement. Water frailty happens when communities cannot satisfy their water needs whether since of small or no precipitation, supplies are inadequately or the foundation is insufficient among other variables. Concurring to Matchawe et al. (2022) the causes of water deficiencies may contrast in different locales of the world with regard to varieties in climatic conditions and socio-cultural substances. Matchawe et al (2022) states that the inadequately scope of versatile water in urban ranges is especially credited to the populace development that has nearly multiplied

Increment in population is one of the causes of water uncertainty and this debilitates the wellbeing and improvement of communities around world. Fast population development causes increment in competition and request for water. The Joined together Countries World Water Advancement Report (2020) highlighted that worldwide water utilization has expanded six times over the past 100 years and proceeds to develop. Matchawe et al (2022) shows that insufficient precipitation remains a hazard for communicable diseases such cholera and typhoid. The issue of water uncertainty in Zimbabwe as an African country is further aggrevated by urbanization. Due to urbanization, there's stress on resources like water, this makes the nearby individuals powerless and increments their dangers to wellbeing dangers

Climate alter has been a boundary to secure, open, drinkable and accessible water. Concurring to Hendrix and Salehyan (2012) expanded water push is an expected result of climate alter. In most cases climate alter causes the increment in temperatures and alter in precipitation designs. Hence, this will result in small or no precipitation and expanded vanishing in water bodies coming about in drying of a few water sources. Wheeler and von Braun (2013) state that temperature deviations too have auxiliary impacts past fair the climate, and are one of the contributing components to water stretch. Agreeing to Drake (2018) climate changes raises security questions for both developing and developed nations. Climate change is one of the driving causal components of water deficiencies in Africa particularly in Sub saharian Africa among other parts of Africa

1.3 Problem Statement

Customarily, most of the financing for activities that offer assistance to realize water security have come from the open division (UN, 2013). As the populace develops the request for water for household, mechanical, and rural purposes too rise (Makoni, 2018). Concurring to Zimbabwe National Water Specialist (ZINWA) (2019) the maturing dispersion arrange and out-dated water treatment offices contribute to spillages, wastage, and lacking in water supply framework. ZINWA (2019) too states that water borne maladies such as cholera, typhoid and the runs ended up more predominant due to the utilization of sullied water. Climate change has had antagonistic impacts on water accessibility in Kadoma. Changes within the precipitation designs, expanded temperatures, and drawn out dry seasons have diminished water accessibility in adjacent water sources such as waterway, dams, and boreholes (UNDP, 2019). For illustration, the 2023-2024 El Nino initiated dry spell expanded water stretch in Rimuka. Agreeing to Sibanda et al. (2020) mechanical and chemical squanders, agrarian runoffs and dishonourable squander transfer hones have sullied water sources, making them unfit for human utilization. Constrained get to water for every day exercises such as cleaning, individual cleanliness disturbs ordinary schedules and compromises fundamental human needs (UNDP, 2019). The burden of getting water from far off sources falls excessively on ladies and children, affecting their lives and instruction.

1.4 Aim of the Study

- The aim of the study was to assess the water security situation in Rimuka high density suburb in Kadoma.

1.4.1 Objectives of the Study

1. Identify the causes of water insecurity in Rimuka high-density suburbs, Kadoma.
2. Assess the impact of water insecurity on water resources in Rimuka, Kadoma.
3. Evaluate sustainable alternatives to water insecurity in Rimuka, Kadoma.

1.4.2 Research Questions

1. Which are the key factors contributing to water insecurity in Kadoma's high-density suburbs?
2. What are the impacts of water insecurity in Rimuka high –density suburb, Kadoma?
3. Which are the possible sustainable alternatives applicable to address water insecurity in Rimuka, Kadoma?

1.5 Justification of the Study

Water frailty has influenced most citizens of Zimbabwe in so numerous ways and has driven to drinking of risky water for survival. Rimuka is one of the foremost packed areas in Kadoma hence making it uncovered to the impacts of water deficiencies. For numerous a long time the inhabitants walk long distances to bring water due to water deficiencies. This has thus come about in wellbeing issues, and passing in a few extraordinary cases. This may moreover offer assistance in capacitating the focused on populace appropriately. This study might offer assistance in academic researches on water security. Fabric from this think about may too include information on the significance and viability of honing measures to diminish dangers from water frailty. This ponder can too be critical for the scholarly community purposes in understanding what are the causes and impacts of water deficiencies, and as well uncover maintainable options.

1.6 Delimitation of the Study

The investigate is covering the causes and impacts of water uncertainty in Rimuka and feasible options to address water frailty. The current consider is kept to the boundaries Rimuka, Kadoma city. The city is found around 141 km southwest of Harare the country`s capital city. The ponder will center on a long time 2014 to 2024 to evaluate changes within the accessibility and availability of water.

1.7 Definition of Key Terms

1.7.1 Water insecurity

Is the inability to access and benefit from affordable, adequate, reliable, and safe water (Jepson et al., 2017)

1.7.2 Water scarcity

Water scarcity refers to a condition where water demands exceed over available water supply (Kumari, 2021).

1.8 Organization of the study

The study is comprised of five chapters. Chapter two checked on significant writing to the causes and impacts of water frailty and highlights the conceivable feasible choices to the impacts of water frailty in writing from worldwide to neighbourhood level. At that point chapter three presents the consider range, investigate plan, inquire about rebellious, testing method, information collection strategies and strategies and information investigation strategies and strategies utilized in this specific consider. Moreover, Chapter four presents the comes about from the think about and talks as relating to the targets. In conclusion Chapter five presents a rundown, conclusion and suggestions based on the discoveries of the think about.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The audit of related writing is displayed in this chapter. The chapter scrutinizes both experimental and hypothetical writing on the appraisal of causes, impacts as well as feasible options to water insecurity. It primarily checked on existing work especially on the causes, impacts and relief on water frailty. This chapter moreover divulges the crevice within the writing which this consider looked for to fill.

2.2 Theoretical Framework

This study utilized the driving forces-pressure-state impacts reactions (DPSIR) system. This system makes a difference to distinguish the causes, impacts and economical options to the impacts of water uncertainty by considering the driving powers that lead to expanded request of water, such as populace development or financial improvement. Concurring to Beukering (2012), a chain of causal linkages starts with driving strengths like financial divisions and human exercises. It moreover takes into consideration the strengths that compound water uncertainty, such as urbanization and industrialization, which create poisons and squander. The state of water counting quality and amount of accessible water is at that point dissected, this at that point lead to the evaluation of the impacts of water deficiencies on environment, human wellbeing, vocations. This system goes on to see at the reactions to water uncertainty such as approach changes, water preservation measures or modern directions, mechanical developments such as water treatment advances and financial motivating forces (Joined together Countries, 2020). These reactions can offer assistance decrease affect or moderate the impacts of water deficiencies and guarantee a economical supply of water for future eras.

2.3 Conceptual Framework

A conceptual system characterizes the pertinent targets for the investigate handle and maps out how they come together to draw coherent conclusions.

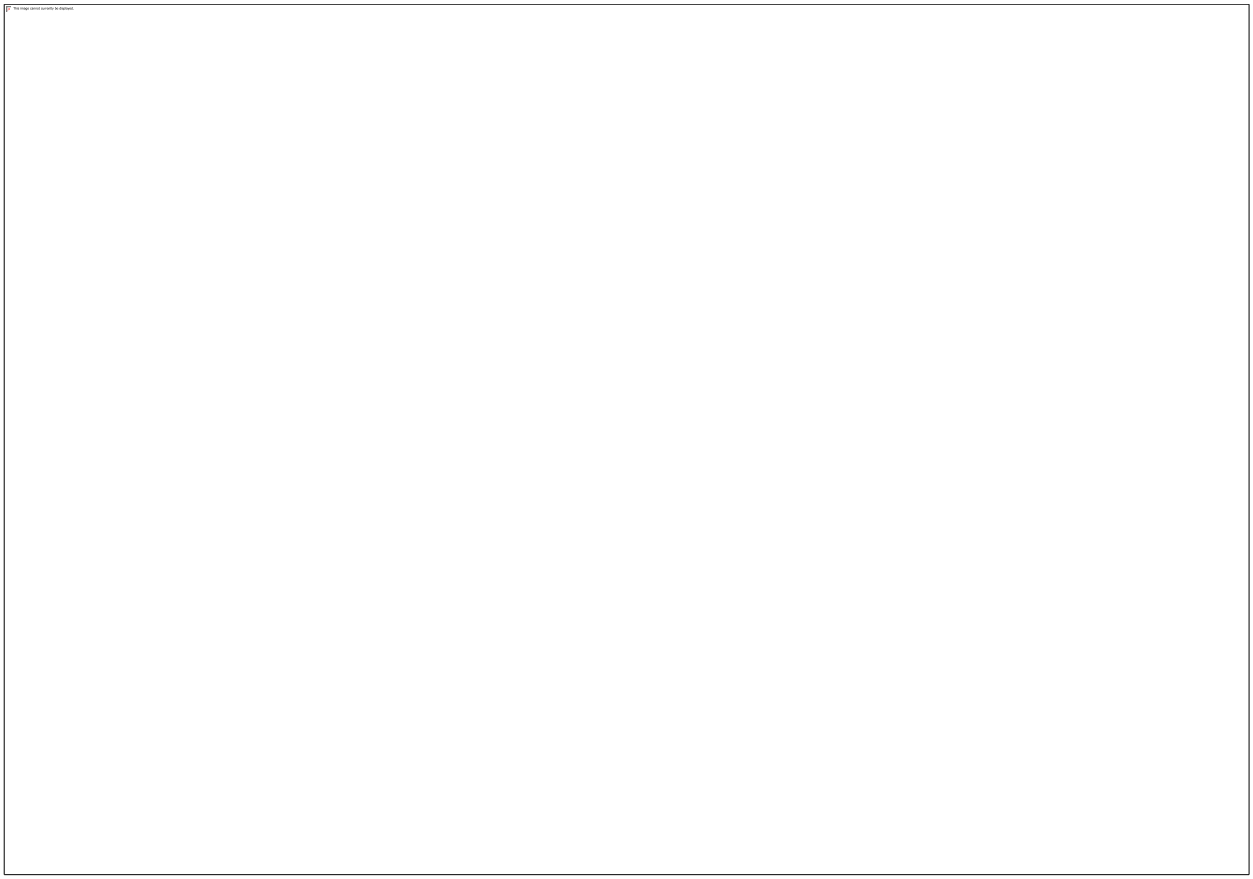


Figure 2.1: Pressure and release model (Source: Wisner et al., 1994)

Agreeing to Wisner et al. (2014) Standard show states that dangers = danger Ã— helplessness, which suggests that some time recently a calamity happens like cholera there are pushing components which are the root cause, energetic weights, and hazardous conditions which at that point meet with water frailty which could be a danger and shape a calamity which are the impacts of water insecurity.

Within the setting of water uncertainty, the Study can assist in distinguishing the elemental causes of water-related vulnerabilities and comprehending how energetic weights heightening these vulnerabilities over time. Concurring to Kelman et al. (2010) the developing urbanization may result in expanded request for water assets without comparable foundation costs, putting strain on existing frameworks and raising the chance of water deficiencies. In a comparable way natural weakening can decrease water quality and accessibility, debilitating community strength to groundwater-related potential risks.

By applying the Standard show to water uncertainty challenges, policymakers and specialists might come up with more compelling strategies for tending to fundamental vulnerabilities and moderating catastrophe chance related with water emergencies. This approach underlines

the forbid nature of social frameworks and natural instruments in deciding defenselessness to water uncertainty (Wisner et al., 2004).

The study demonstrate a difference to know the driving weights such as fast populace alter and climate alter, and this will advance to perilous locations and as a result there may well be endemic infections such as tall rate of cholera cases which might lead to misfortune of life. The Standard show makes a difference to recognize root causes or fundamental causes why that specific area like Rimuka is facing water shortages. Concurring to Pound et al. (2019) the Standard model is apparently the most excellent known and most acknowledged demonstrate for conceptualizing hazard within the setting of catastrophe and crisis and gives a exhaustive and persuading worldview for comprehending how social helplessness influences hazard.

2.4 Causes of Water Insecurity

Water is a basic asset for survival for all living life forms and its accessibility is vital for maintaining life and supporting different human exercises. Be that as it may, water deficiencies have gotten to be a critical concern from worldwide to neighbourhood level. As the populace proceed to develop the request for new water assets is expanding and this can be exacerbated by the quick urbanization which puts weight on water foundation and supplies, (Joined together Countries, 2019). Other causes incorporate climate alter, contamination, inadequacy of arrangements and need of framework speculations.

2.4.1 Causes of Water Insecurity Globally.

Water deficiencies have ended up a noteworthy concern universally. Accomplishing all-inclusive and impartial get to secure and reasonable drinking water for all by the year 2030 is considered principal in accomplishing the Maintainable Improvement Objective 6 (Satterthwaite, 2016). It was famous in any case that 4 billion of individuals, who spoken to about two-thirds of the populace of the world, confronted serious water shortage (Mekonnen and Hoekstra 2016) and over 2 billion individuals living in countries with extreme water shortage (UN, 2018). The issue of water shortage has been connected to need of water administration foundation for the reason of capacity, conveyance, and for moved forward drinking water and sanitation administrations (FAO, 2016). The exhaustion of a few aquifers and climate changes are assist dangers to water accessibility (NESCO World Water Evaluation Program, 2019).

One of the components that lead to water deficiencies is the quick increment in populace. Concurring to Yang et al (2017), populace boom and enormous financial development have contributed to ceaselessly expanding water request. Populace development is more often than not caused by fast urbanization. Quick populace development has driven to expanded water request for household, mechanical, and agrarian purposes. Up to 4 billion individuals right now dwell in zones where there's intense water push for at slightest a few parcels of the year. (World Bank, 2017). Concurring to Boretti and Rosa (2019), the request for vitality, nourishment, and water rises in couple with populace development and GDP per capita. Populace development plays a major part in this increment in water shortage since it diminishes per-capita accessibility indeed with unaltered assets (Schewe et al., 2014).

Another cause of water deficiencies at worldwide level is climate alter. Climate alter, concurring to Schewe et al, (2014), offers a assist chance to water security since varieties in precipitation and other climatic components may result in eminent shifts within the accessibility of water in numerous districts. As a result, water sources are lessening, driving to deficiencies and expanded competition constrained water assets. Climate alter has numerous impacts to the community, climate designs as well as precipitation designs. Climate alter is expected to have numerous impacts, counting rising ocean levels, sea fermentation, desertification, soil debasement, expanded fierce blazes, and expanded storm recurrence, seriousness, and duration to name fair a couple of (NASA, 2017).

2.4.2 Causes of Water Insecurity in Africa

Africa is generally known for dry season, dryness, and water deficiencies, particularly in Southern Africa, a circumstance which moreover contributes to water deficiencies for both household and mechanical utilize. Concurring to the Joined together Countries, (2018) water accessibility is declining in numerous nations in Africa, water deficiencies in Africa is credited to numerous components both normal and human-induced.

Climate alter has driven to unpredictable precipitation designs, delayed dry seasons, and expanded vanishing rates, coming about in water shortage. Cases of nations that have experienced dry spell are Somalia, Ethiopia, and Kenya driving to water deficiencies and nourishment frailty.

Agreeing to the Interval Board on Climate Alter (IPCC, 2014), climate alter is anticipated to lead to diminished precipitation and expanded inconstancy in precipitation designs in Africa,

which seem result in more visit and extreme dry spells. Moreover, changes in temperatures and precipitation designs are anticipated to have an effect on water assets such as lakes and waterways, driving to a diminish within the accessibility of new water. Be that as it may, Fishman, (2016) established that what matters isn't fair the whole level of precipitation, but too its changeability and conveyance all through the year, which can have a much bigger affect.

Another causal figure to water uncertainty is Populace development which is generally caused by quick urbanization. Concurring to Roux et al. (2016) African nations have put gigantic weight on constrained water assets. Most Africans are escaping from their local nations to remote ones in look of greener pastures, subsequently fast urbanization is expanding due to individuals attempting to decrease destitution and increment their strength. For case, most Zimbabweans are moving from Zimbabwe to The Republic of South Africa among other African nations as a result of destitution intolerable living conditions, and need of work in Zimbabwe, and this at the conclusion of the day has come about in monstrous weight on assets such as water in South African.

Moreover, another cause of water uncertainty in Africa is insufficient water framework and destitute administration of water assets. Concurring to Bekker (2017) insufficient capacity offices, maturing pipelines, and deficiently water dissemination frameworks lead to critical water misfortunes The need of get to secure and clean water and sanitation offices was a major emergency within the city of Cape Town, Republic of South Africa in 2018 when the city confronted the risk of day zero a day when the civil water supply would be closed off due to serious dry spell and fumble.

2.4.3 Causes of Water Insecurity in Zimbabwe

According to Hope et al, (2014), water uncertainty happens when communities canâ□™t fulfill their water needs whether since of small or no precipitation, supplies are inadequately or the framework is insufficient among other calculate. Climate alter has driven to an increment in temperatures expanding vanishing of water sources as well has caused dry spell driving to water deficiencies. Zimbabwe is helpless to dry seasons, which have gotten to be more visit and serious due to climate alter.

Concurring to Brown et al. (2019) quick populace development is another causal calculate to water uncertainty in Zimbabwe. Populace development is caused by an expanded birth rate, industrialization, and urbanization. For illustration, the foundation for channeled water in Harare was created within the 1950s, sometime recently Zimbabwe's freedom in 1980, and outlined for a populace of 300,000 individuals. There are presently 4.5 million individuals living within the more extensive metropolitan locale of Harare, more than half of whom need get to to clean water and are at peril of contracting sicknesses such as cholera and typhoid. The populace of Zimbabwe has developed quickly in later decades, putting too strain on the country's restricted water assets. In expansion, financial insecurity and need of foundation have made it troublesome to oversee water assets effectively (Smith, 2020). As a result, numerous Zimbabweans got to depend on risky water sources, which can lead to ailment and indeed passing.

Maturing foundation and need of support cause water frailty in Zimbabwe. The water framework in Zimbabwe counting dams, pipelines, and treatment plants, has endured from lacking upkeep and maturing foundation. Agreeing to Smith, (2020) the disappointment to contribute within the upkeep and substitution of water foundation has led to a decay within the quality and amount of accessible water, with genuine results for open wellbeing. This comes about in water spillages, wasteful aspects in water dissemination, and decreased water accessibility for shoppers.

Among other causes of water uncertainty, insufficient water capacity is one of the variables. Inadequately water capacity compounds water frailty amid dry seasons. Zimbabwe`s major dams, such as Lake Kariba and Manyame Dam, have experienced diminished water levels, influencing water accessibility for both urban and rustic ranges. The nation incorporates a constrained number of dams and supplies, which suggests that it is incapable to store sufficient water to meet the requirements of the populace amid times of dry season (Madzikanda, 2017). Subsequently, moo dam levels and lacking water capacity framework lead to proportioning and water supply disturbances.

Financial challenges and subsidizing limitations have driven to water deficiencies in Zimbabwe. Constrained monetary assets and financial challenges posture deterrents to water framework advancement, upkeep, and overhauls. Zimbabwe`s financial challenges have influenced speculation within the water division, coming about in lacking resources for

framework changes. This may lead to a need of stores for fundamental repairs and updates to guarantee a solid water supply (Karumbidza, 2018).

It can be taken note that the causes of water frailty from worldwide, territorial to national are very the same with diverse force and they are associated. The causes of water frailty may vary a small due to the distinction in nations whereby others are created nations while others like Zimbabwe are creating nations and are taking after the steps taken by created nations to create agreeing to the modernization hypothesis.

2.5 Impacts of Water Insecurity

Impacts of water uncertainty can be extreme and significant. Water uncertainty has numerous impacts to individuals, creatures and to the environment. A few of the impacts are open wellbeing related dangers, arrive corruption, nourishment frailty, movement, struggle, environment debasement

2.5.1 Impacts of Water Insecurity Globally.

The failure to supply sufficient new water to fulfill the normal request for water is known as water deficiency. Precipitation designs may move or there may be no precipitation at all. Physical and financial water deficiencies are the two categories of water shortage. The World Bank Gather, (2020) states that there's not sufficient water to fulfill all needs, counting the water required for ecosystems to function, this is often alluded to as physical water deficiency. Parched locales, such as those in North Africa, West Asia, and Central Asia, habitually confront a physical water deficiency. On the other side, concurring to Joined together Countries Office of Financial and Social Undertakings, (2018) financial water shortage comes about from a need of financing for the innovation or foundation required to extricate water from aquifers, waterways, and other sources. It is additionally a result of humans' lacking capacity to fulfill their water needs. Financial water deficiency influences a expansive parcel of Sub-Saharan Africa. Various coordinate and backhanded impacts of water deficiencies incorporate insufficient sanitation, wellbeing concerns, nourishment destitution, misfortune of hydropower power, and expanding movement driving to stuffing.

People can get sick more easily if they don't have clean water to drink and keep clean. Not having enough water has many bad effects. It doesn't just hurt the environment, but it also affects how people grow and develop. According to Water Aid Bangladesh in 2016, the most

common water-related illnesses are typhoid, diarrhoea, and cholera. Many kinds of illnesses can make young people and old people very sick or even cause death.

Water problems also make it hard to get enough to eat. Water is really important for growing crops. If there's not enough water, the crops won't grow well, and there won't be as much food. That can make the prices go up. In 2019, the World Bank said that when there isn't enough water, farmers in Afghanistan have to grow crops on less land. This can make it harder to grow enough food and cause prices to go up. This can cause big problems for making sure there is enough food to eat, because when food prices are high, people might not be able to afford enough food to stay healthy. This is happening in countries like Afghanistan and India. This can also be bad for the variety of living things in an area, because some species that need water to live might die if there is not enough water.

Because there's not enough water, there will be less stuff made that uses a lot of water. This will make it harder for workers to do their job and for families to make money. Water shortages are bad for the economy. Industries that need a lot of water, like making things and producing energy, can have problems and may have to lay off workers. This can make the economy worse. For example, in Ukraine, not having enough clean water can make it harder for the country to grow its economy. It can also make more people live in poverty. This could make it hard to find a job or make money, and slow down the economy.

Because there isn't enough water, wetlands, ecosystems, habitats, and different kinds of animals are in danger. This is causing harm to the environment. In 2014, IPCC said that not having enough water can harm the environment. When water levels are low, plants and trees can die, which can turn the land into a desert and make it less healthy. Low water levels can change the way water moves around, which can impact the weather and cause droughts and floods. This can also impact people's ways of making a living because some communities need forests and other parts of the environment to survive.

Lack of clean water makes poverty worse, especially in poor countries that are still developing. Kayser (2019) said that when people don't have clean and safe water, their hygiene suffers and they get sick more often. This can make them even poorer. Being sick can make it harder for people to make money and pay for things they need to live. This cycle

of being poor and unhealthy makes it hard for people to develop and have better lives. This is important for the overall well-being of people. It's hard to be healthy without clean water and a toilet.

Additionally, water insecurity affects women and young girls a lot because they are a group that is very easy to harm. The United Nations Children's Fund says that in many families, girls and women have to go get water, even if it's far away. This means that families without water make life harder for girls and women. This task takes up a lot of time and stops women and girls from going to school or working. Also, women and girls have to walk far to get water, which can make them more likely to experience violence and sexual assault.

According to Wutich and others. In 2020, feeling worried, sad, or emotionally uncomfortable is closely linked to feeling like there isn't enough water. In the U. S, people who lived there a long time ago suffer a lot mentally and emotionally because they don't know when they will have clean water, it costs a lot of money, and it's bad for their health. In a study in Texas, White (2017) found that people felt worried, disgusted, uneasy, fearful, and unsatisfied about water and had conflicts with others over it. For instance, Ortega and others. In 2017, it was found that families with undocumented members are 1. 2 times more likely to have problems with access to clean water compared to families with all documented members. This suggests that worries about immigration status may also affect a family's ability to have enough clean water.

2.5.2 Impacts of Water Insecurity in Africa

Health Impacts

Life-threatening consequences can arise from water insecurity, especially in urban areas where access to clean water is scarce. People who don't have access to clean water are forced to rely on tainted sources, which promotes the spread of illnesses including diarrhea, cholera, and typhoid. Therefore, the municipality's planning for an effective and dependable water distribution system is essential for improving lives, promoting human health, achieving Sustainable Development Goal 6 (SDG 6), and fostering economic growth. The health implications of these illnesses can be disastrous, especially for young individuals, the elderly, and those with weakened immune systems. In Africa, waterborne illnesses account for around 80% of all illnesses, according to the (WHO, 2019).

Social Impacts

Water insecurity can also have big effects on society. In many African villages, it can be hard work for women and children to get water. Their ability to do other things like going to school or working might be limited because of this, which can make poverty and inequality between genders continue (Kim et al., 2018).

Environmental Impacts

The ecosystem may be significantly impacted by water insecurity as well. Drought-related problems can be made worse by deforestation and land degradation, which can result in soil erosion and biodiversity loss. Lowering the number of trees that can absorb carbon dioxide, not only has an impact on the nearby ecology but also accelerates climate change (WWF, 2020). Approximately 70% of Africa's land deterioration is attributed to deforestation and land degradation, according to the United Nations Environment Programme (UNEP, 2018).

2.5.3 Impacts of Water Insecurity in Zimbabwe

Zimbabwe has been experiencing a steady decline in access to safe and reliable water sources over the past decades to present day. (WHO and UNICEF, 2021), this has led to increased reliance on unsafe water sources like unprotected wells, rivers, and streams, hence raising the risk of waterborne diseases like cholera, dysentery and typhoid. WHO (2018) states that the lack of access to clean water proper sanitation has contributed to diseases outbreaks including periodic cholera epidemics.

2.6 Sustainable Alternatives to Water Insecurity globally

According to the Australian Government, (2020) putting water conservation measures into practice is one of the best strategies to deal with water insecurity. Water-efficient technologies like low-flow showerheads and toilets can be used for this, as well as water-saving techniques like cutting back on water consumption in industry and agriculture. Australia, for instance, has reduced water use by 20% since 2001 by implementing a variety of water conservation initiatives, such as using grey water for reuse and installing water-efficient appliances.

Another environmentally friendly way to combat water scarcity is through rainwater collection. This is gathering and preserving rainwater for use in cleaning, toilet flushing, and irrigation, among other uses. To cut water use by 20%, for instance, Germany has installed a variety of rainwater harvesting devices, such as rainwater collecting and storage tanks (Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety, 2020).

Lastly, According to Mission Aviation Fellowship, (2020) addressing water insecurity can also be aided by sustainable water management techniques. This covers the use of water-saving techniques like crop selection and soil conservation as well as the use of water-efficient technology like drip irrigation. For instance, Morocco has increased the amount of water available in the nation by 10% via the implementation of several sustainable water management techniques, such as drip irrigation and soil conservation.

2.7 Sustainable Alternatives to Water Insecurity in Africa

In Egypt, they are using farming methods that don't use too much water and help crops grow better. This is important because Egypt does not have a lot of water. Drip irrigation systems help save water and produce more crops by giving water directly to plant roots. Drip irrigation uses less water than regular flooding, possibly saving up to 50%, according to the Food and Agriculture Organization of the United Nations

Water-sensitive urban design has been used in Windhoek, the capital city of Namibia, a nation with a very varied climate. Urban wetlands, parks, and green areas are all part of the city's green infrastructure strategy. In addition to serving as a habitat for urban animals, these green areas also aid in lowering storm water runoff. The University of Namibia found that the implementation of the green infrastructure plan has resulted in a 50% decrease in the likelihood of flooding inside the city (University of Namibia, 2018).

Rainwater harvesting has been pushed as a means of lessening the strain on ordinary water supplies in Ghana. To encourage people and companies to install rainwater-collecting equipment, the government has put in place a program. A World Bank (2018) research found that, in certain places, rainwater collection could reduce the need for conventional sources of water by as much as 30%.

2.8 Sustainable Alternatives to Water Insecurity in Zimbabwe

People in Zimbabwe should be trained and encouraged to collect rainwater. Offer money and help to build rainwater storage tanks and systems. Some parts of the country have received water alternatives through the means of boreholes. Moreover, invest in the sustainable management and protection of groundwater resources, including aquifer recharge and monitoring programs. Implement policies and regulations to control groundwater extraction and prevent over-exploitation (Mapfumo et al., 2013). There have been Implementation of public awareness campaigns and education programs to promote water conservation and responsible water use (Jayne et al., 2019). The GWP (2020) strengthen the capacity of government agencies and local authorities to plan, implement, and monitor water-related programs and policies.

2.9 Gap in Literature

Not enough people have looked into using rainwater harvesting to save water. People do not know much about the good things that come from collecting water and how to do it. Not many people know how to design, install, and maintain rainwater harvesting systems because it requires a lot of technical knowledge and skills. The legal and institutional frameworks for rainwater harvesting are not well defined, leading to uncertainty and lack of investment. Again, lack of access to affordable financing options and subsidies hinders the widespread adoption of rainwater harvesting. The focus on expanding centralized water supply infrastructure, such as dams and borehole may have overshadowed the potential of decentralized rainwater harvesting systems.

2.10 Chapter Summary

In conclusion, this chapter has been looking at the reasons for water insecurity and its effects, as well as ways to manage it on a global, regional, and local scale. This chapter also helps us understand what other researchers have found about the research topic, and the differences in the reasons and effects of water shortages around the world. Chapter two not only looks at what other scholars have written, but also shows where their research is missing and where this study can add new information.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the way researchers do their study. It includes how they find, choose, and study information. It is a method to help us understand the problem we are dealing with. It has different steps that the researcher follows to study the research problem. To meet the goals of the study, the study used different tools, ways, and techniques for the research. This chapter talks about different parts of the study like where the study took place, how the study was designed, who the study is for, how many people were involved, how they were chosen, what tools were used for the study, how the data was analyzed, and any ethical concerns. Then it gives a summary of the chapter.

3.2 The Study Area

Kadoma is a city in Zimbabwe that is famous for digging up gold, nickel, and copper. Sometimes, mining can make the water dirty. The area under study is called Rimuka, and it is the largest neighborhood with a lot of people in Kadoma. Before Rimuka became independent in 1980, some areas were given to single men. These areas were called Single Quarters (SQs) and General Bachelors (GBs). Workers were supposed to live alone and share a room with three to four other people. The SQ and GB were made with toilets that were shared by everyone. Married people brought their families to the town in 1980, the year it became independent. Now, they live in these rooms, with often two families sharing one room. Because of the large number of people moving from the countryside to the city due to a drought, Rimuka's population has increased a lot. The population in Rimuka has been growing because more people are moving there from 2012 to 2022. This means that more water is needed. The high-density suburb of Single Quarters is facing problems with too many people living in a small area, bad water systems, old and broken sewage systems, trash that hasn't been picked up, and really old and run-down homes. Rimuka has bad roads, dirty sewers in the streets, not very clean conditions, and no safe water.

i)

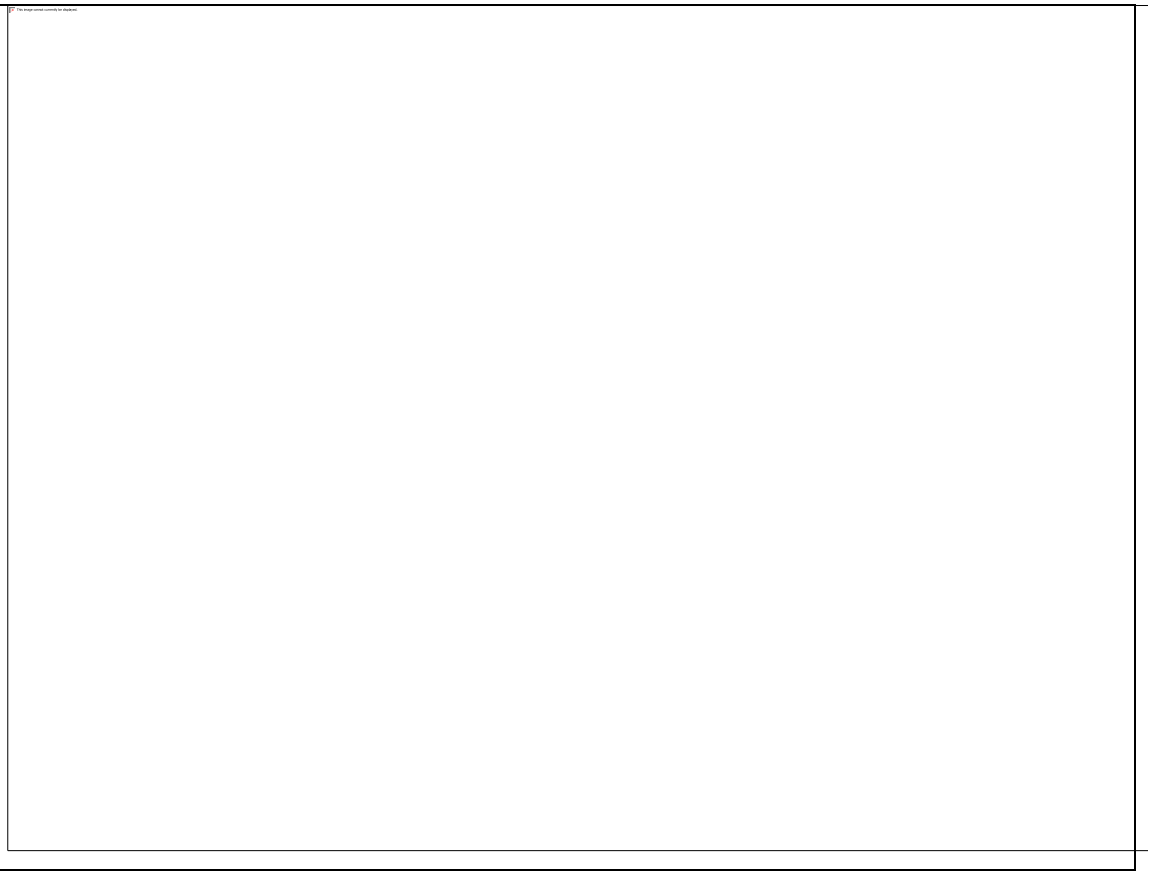


Figure 3.1: Study area map for Rimuka Suburb, Kadoma suburb located in Kadoma, Zimbabwe (Source: fieldwork 2024).

3.3 Research Design

A research design is a plan for how the study will be done and how the findings will be understood. Research design is how a study is planned and organized, according to Aggarwal et al. In 2018, a framework was created to gather and analyze data for a research topic. It uses different methods and processes to study specific variables. This study looked at Rimuka, the biggest neighborhood in Kadoma, using a case study design.

Yin (2019) says that a case study is strong because it uses a lot of evidence from different sources to double-check the results. A case study is when we gather lots of information about a specific thing to help us come up with new ideas and do more research. This is because it shows us the real-life situation of the people involved. This study used both qualitative and quantitative research methods to be more effective. We used a type of research that focused on gathering details to get information. We needed to use a quantitative research method to collect statistical information on different factors. To make sure the information was accurate

and reliable, and to fully understand the topic, the study used both qualitative and quantitative research methods.

3.4 Data

Data is the input into analysis to yield information for decision and policy making has a major role in the interpretation of statistics. Both primary data and secondary data were important sources of information collected.

3.4.1 Primary Data

This can be defined as the first-hand data that the researcher collects through field research directly from the respondents using data collection instruments such as questionnaires and interview guides (Pandey et al., 2015).. The data was collected using a questionnaire survey that was administered to the respondents for the study.

3.4.2 Secondary Data

Virgillito et al. (2017) defined secondary data as second-hand data such as journals, internal organizational records, and manuals. Also, Virgillito et al. (2017) added that secondary data is simple, fast, and cheap to collect and assures a compelling comparison with primary data.

3.5 Data Collection

Taherdoost (2016) said that collecting data is very important for research. If the data is not accurate, it can affect the results of the study and make them biased and wrong. The way data is collected for research is influenced by the research philosophy, strategy, variables being studied, and when the research is happening. To do this, we collected information by asking a few quick questions in a survey and using a form with specific questions.

3.6 Data Collection Instruments

This research adopted three research instruments which are interview guide, observation guide and questionnaire which are primary data, and also documentation review which is secondary data. The purpose of triangulation on research instruments is to avoid research bias and also increase the credibility and validity of research findings.

3.6.1 Interview Guide

In the quest to capture technical data, one interview guide was prepared and designed hinged on research questions and research objectives. Appendix 1 shows the structure of the interview guide

3.6.2 Observation Guide

To avoid bias of the respondents, the researcher designed an observation guide in line with major objectives of the study. The observation guide was created to assist the researcher in staying concentrated on the overall scope of the study. The researcher utilized a checklist for viewing, a camera, and a notebook to document the findings. The general structure of the guide was amended after a pilot survey which was conducted by the researcher on the 10th of January 2024. Appendix 2 shows the observation guide used in the research.

3.6.3 Questionnaire

The questionnaire design guide was produced based on the study's objectives and questions. As a result, the questionnaire guide was designed to extract information from respondents drawn from the neighborhood. The questionnaire was designed with both closed-ended and open-ended questions to collect quantitative and qualitative data.. The pretesting phase helped the researcher rectify the errors detected in the baseline questionnaire guidance. Appendix 3 shows the questionnaire that was administered in the research.

3.7 Data Collection Methods

The several approaches utilized to get information and data for research objectives are referred to as data-collecting methods.

3.7.1 Key Informants Interviews

Key informant interviews are qualitative depth interviews with people who know what is going on in the community. These experts can provide insights into the nature of problems and proffer solutions. Two responders from the Ministry of Water Resources Development and Management were interviewed for this study to get information on the nation's water and sanitation (WASH) industry. Interviews were also conducted with two respondents from the ZINWA, as they are the ones that offer water services to the people. The objective is ensuring that everyone has access to high-quality, cheap water in suitable supplies at all times.

Interviewing key participants from a variety of sectors enables the researcher to examine different points of view and underlying concerns.

3.7.2 Participation Observation

Participatory observation is when a researcher watches and joins in with the activities of the people they are studying. Watching and talking to people affected by water shortages helps us understand why it's happening. It gives us a better understanding of their experiences and opinions. According to Crossman (2019), participant observation is a research method where a sociologist joins a group they are studying to learn about a social issue. In this study, watching and joining in with the activities being studied lets the researcher gather lots of detailed information that can't be measured in numbers. Watching and joining in with the community is important because it helps to build trust and good relationships with the people there. This can make it easier for everyone to talk openly and honestly. Watching and taking part in an activity can help us find out how people act and use their power when it comes to managing and sharing water.

3.7.3 Questionnaire Survey

We developed 26 questionnaires and inquired about the water troubles of city dwellers. The tool was used to ask a lot of questions, and you can find them in appendix three. We asked them these questions about how climate change is impacting their lives, and it was helpful for many reasons. To develop viable solutions to mitigate the effects of water insecurity, improved the researcher's comprehension of the specific ways in which people are influenced by water. Additionally, it was advantageous to ask these questions to build rapport and trust with the respondents, since this might make it more likely that they will provide accurate and true responses.

3.7.4 Documentation Review

Information gathered from the documents will assist the researcher in their investigation. It's data that has already been collected and is not the main focus of the study. Secondary data is faster and cheaper to gather than primary data because it doesn't involve going out into the field. Secondary data is information that has already been collected and is easy to get from other places. You can find information from many places like the internet, books, and research papers to collect secondary data. The Ministry of Environment and ZINWA are government groups in Zimbabwe that take care of the country's water. They share information about water policies, programs, infrastructure, and water security.

3.8 Target Population

The research was conducted in Rimuka Kadoma which is located in Mashonaland West province of Zimbabwe. In Rimuka the study is focused on both males and females, all age groups including children and the elderly since water shortages affect everyone.

3.9 Sampling

The study chose specific people and communities to help answer its research questions. Arikunto (2010) said that purposive sampling is when the researcher picks the sample for a specific reason. The study used purposive sampling because the researchers didn't have much time, money, or the means to travel to Rimuka. So, by purposefully choosing certain people to interview, the researcher was able to talk to Rimuka residents who know about or have seen the water shortage, to learn about what causes it and how it affects them.

3.9.1 Sampling Procedure

For a design to be called random sampling or probability sampling, each element in the population must have an equal and independent chance of selection in the sample (Kumar, 2011). According to Williman (2005), random sampling is also utilized because it provides the most trustworthy representation of the entire population and is bias-free. The study utilized a random sample because the population was extensive and uniformly distributed, with all targeted women being more susceptible to climate change due to their gender roles.

3.9.2 Sample Size

A sample is a subset of individuals from a larger population from which one will collect data for the research. According to Mujere (2016), a sample is a group of people, objects, or items that are taken from a large population for a measurement. The research sample size of the targeted population is going to consist of 20 females to include all age groups.

3.10 Data Analysis

Analyzing data involves doing many things to make the data easier to understand and organize, so that we can answer our research questions. The research used the content analysis method to study the words and numbers in the data and show how common themes are in the data. The study used SPSS to analyze numbers because it works well for handling and analyzing data. We studied qualitative data by looking at themes in the content or

important quotes from people who know a lot about the topic. So, the qualitative information supported and backed up the numerical results of the study.

3.11 Ethical Considerations

Participants in the study must understand and agree to take part before the research begins. Getting permission is really important because the research might take a lot of time for the people involved. They need to understand what's going on and agree to it before it begins. The research made sure that nobody's name was written on the surveys so that no one knew who was participating. People were also told about the main reason for the study and could choose to stop being part of it at any time. This was done to keep their information private and to keep them safe. Also, the people taking part were told that the information they provide will only be used for school purposes and will be kept private and confidential as a group.

3.12 Limitations of the Study

The research didn't go smoothly because there were some problems. There wasn't enough time, some information was hard to get, and some people didn't want to share information because it was private. Some people had different opinions about the research because they were hoping it would give them physical benefits. This may have affected how much they put into participating. This study was affected because the staff are busy with their regular work and can't get all the resources and information they need from other organizations because of confidentiality.

3.13 Validity and Reliability

Data used in this study was obtained from fieldwork. To maintain the validity and reliability of the study, the student used probability sampling, thus selection of the sample was done arbitrarily. The study used interviews, questionnaires, and observations and these were effective for triangulation to reduce bias and for reliable results. In this study validity, reliability and feasibility of the study design was gained through the pilot study which was carried out. The pilot study helped to test research protocols and data collection instruments.

3.14 Chapter Summary

In conclusion, this chapter talked about how we studied the reasons for water insecurity and its effects in Rimuka. We also looked at ways to deal with the effects of water insecurity. The researcher used both qualitative and quantitative research methods for the study. It also showed how many samples were used and how they were chosen, either on purpose or randomly. When doing a case study, it was important to think about the ethics, like getting permission from the people involved and keeping their information private.

CHAPTER FOUR: RESULTS AND DISCUSSION.

4.1 Introduction

This part of the book tells about how the information gathered was gotten ready, studied, and then put to the test to see if it supported the research idea. The chapter shows the results of the research and explains them using graphs. It also discusses how the results relate to the research questions and objectives from chapter one. The focus was on showing the results and how they relate to Rimuka suburb in Kadoma.

4.2. Background Information

Demographics show us the people in the research and how they compare to the general population in Rimuka suburb. The number of people in a household and the types of people in it can affect how much water is used and how it is used.

The study looked at people of different ages. Most of the people studied were between 17 and 24, and 25 and 50. They made up 89% of the total. The second biggest group of people is those who are 65 years old or older, and they make up only 11% of the population. The information shows that most people living in the Rimuka area have jobs. The older people get, the more townhouses they own. So it's not expected that many old people would take the survey. This is why there are more people over 17 than between 17 and 50.

This shows that a lot of the people who answered the survey had personal experience with not having enough water, so they could give better information about how they saw water shortages. A small number of people who answered the survey were men, and a larger group were women. This could be because women often stay at home and take care of the house while many men work far away from home. This shows that women use water a lot for household work and they know how to manage water well. This shows that more women in the crowded suburb of Rimuka are likely to have problems with access to water.

We need to find long-lasting ways to help families with water problems. This will help prevent illnesses like cholera and typhoid. So, it's easier to see why there isn't enough water

in Rimuka because the families there are so big. To prevent water problems, families have to dig shared wells and put in water-saving pipes and faucets.

4.3 Causes of Water Insecurity in Rimuka.

Results pertaining to the first objective addressing the causes of water insecurity in Rimuka suburb are presented in this section. Figure 4.1 highlights the causes of water insecurity in the study area.

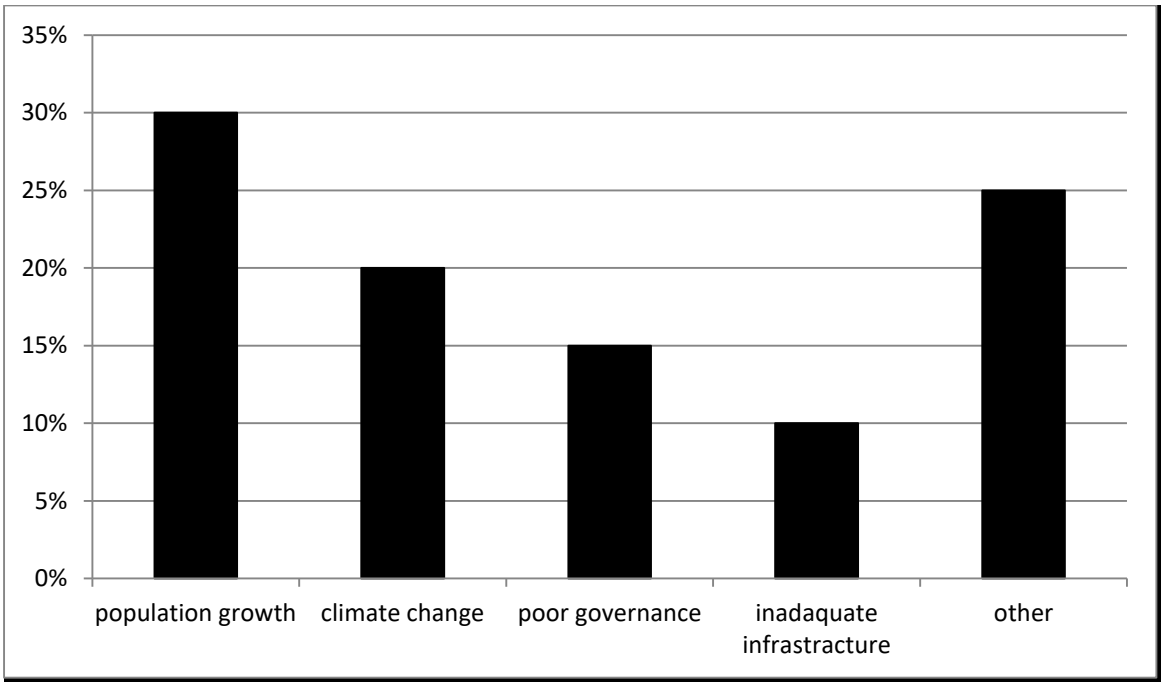


Figure 4.1: Causes of water insecurity in Rimuka Ward of Kadoma (Source: Author's fieldwork 2023)

The Rimuka suburb has a problem with its infrastructure which makes it hard for people to get enough water. Providing clean and safe drinking water to the people in the towns is difficult because there are not enough water treatment facilities and distribution systems. Participant one said that;

> *The towns lack proper sanitation facilities, which increase the risk of waterborne diseases,*

The communities frequently go without electricity, which might interfere with the water supply. In general, Kadoma and Rimuka in particular, struggle to provide for the water demands of their citizens due to inadequate infrastructure.

Water insecurity in Rimuka is also a result of population increase. The few water supplies in these communities are being stressed by the towns' recent fast population growth. Participant two stated that;

> *With more people needing water, the already inadequate water infrastructure has been unable us to keep up with the demand. Also, because more people are living in cities and cutting down trees, there may be less water for everyone. If we don't do something to stop the population from growing so fast and improve the water systems, the problem of not having enough water in these areas will get even more serious.*

Another significant factor causing water insecurity in Rimuka is climate change. The settlements are situated in an area that is semi-arid and already vulnerable to drought; the effects of climate change are exacerbating the problem. Participant three said;

> *Our suburb is experiencing water shortages and stress due to rising temperatures and decreasing rainfall; additionally, the changing climate is intensifying and increasing the frequency of droughts, further reducing the amount of water available to meet our daily needs.*

Hence, the increased frequency of extreme weather events like floods brought on by climate change has the potential to harm water infrastructure and worsen water insecurity.

Lastly, another reason for water insecurity in Rimuka is bad leadership. The water from the town's supply is often used in the wrong way for mining and other purposes, like watering crops. Not having enough people involved in deciding how to manage water can lead to problems and fights over water. We need to improve how we run things and be more careful and honest about how we manage water to make sure we have enough water in this area.

4.4 The Impact of Water Insecurity on Water Resources in Rimuka.

The lack of water in the Rimuka area can have a big effect on water resources like the Claw dam. When we use up surface water and groundwater, it can cause a lot of problems. As explained, it can make the water too salty to drink or use for farming. The first person who answered said;

The drying up of Claw Dam here in Kadoma, which can affect the local ecosystem and wildlife, some of us use irrigation can and it hurts agricultural yields and food security.

Overall, these impacts of water shortages on water resources can be severe and have a significant impact on the local community causing conflict between communities and individuals over limited water resources. In addition, the lack of water can have negative economic impacts, such as increased poverty and unemployment.

Table 4.1 shows water sources and their level of contamination and the possible treatment methods to address the impacts of consuming contaminated water.

Table 4.1 Water sources, pollution levels, and treatment techniques in the Rimuka area.

Water Sources	**Level of contamination**	**Water treatment methods**
Kadoma City Council Water Supply	25%	Boiling Chlorination
Boreholes	60%	Boiling Chlorination
Water Kiosks	30%	Ultraviolet disinfection
Wells	40%	Boiling Chlorination

(Source: Survey, 2024)

Kadoma City Council takes care of the city's water system. However, not enough money, worsening buildings, and not taking care of things often affect how the water gets to people. This leads to a high level of bacterial, viral, and other pollutant contamination in the water supply, which increases the risk of waterborne illnesses including cholera, typhoid, and diarrhea. The results of this study indicate that Kadoma's water treatment facility is not running at full capacity and that the city's water supply is unfit for human use. Boiling and chlorinating water became common practices among the locals to remedy tainted water.

Boreholes are a common source of water in the area of study. However, the water from boreholes can be contaminated with bacteria and other pollutants, due to its location

particularly if the borehole is not properly constructed or maintained. This study found that boreholes in Kadoma are contaminated with raw sewer due to old sewer pipes or poor sewer maintenance. Due to poor maintenance of boreholes, there will be rust which makes it not safe for drinking. Yet it is estimated that half of the people in Rimuka rely on boreholes for their water needs.

In Rimuka, wells are another important option for getting water. However, wells can easily become dirty with germs, viruses, and other harmful substances if they are not properly built or taken care of. Now, the people in the area are making the water safe to drink by boiling and filtering it to prevent sickness from dirty water. In the research geographical area, water kiosks are a typical source of water, especially in places with limited access to piped water. However, if a water kiosk is not properly maintained, the water from the kiosk may be polluted with various contaminants and pathogens. According to the research, Kadoma's water kiosks had germs, viruses, and other contaminants in them. An estimated number of individuals get their water from water kiosks.

4.5 Sustainable alternatives to water insecurity.

Results pertaining to objective three addressing the sustainable alternatives to water insecurity in Rimuka suburb. Figure 4.2 highlights the sustainable alternatives to water insecurity.

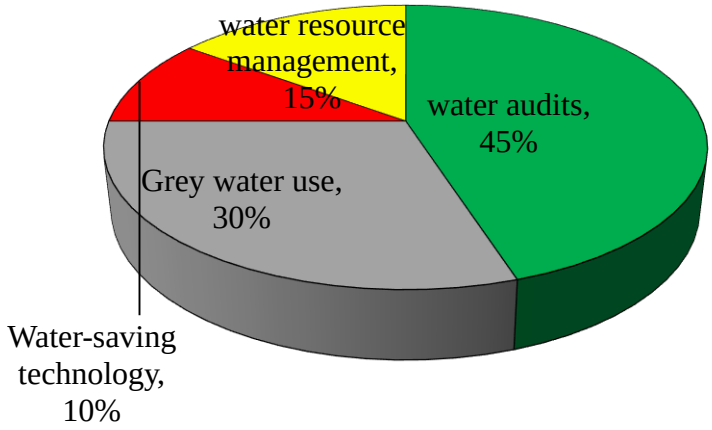


Fig 4.2 Sustainable alternatives to address water insecurity in Rimuka (Source: fieldwork 2024)

The information shows that if the community checks its water use often, it can learn more about how it uses water and find places where water is being wasted. This can help to make choices about how to use less water and save water. The water audit results can help Rimuka residents understand where they are using too much water and how they can use it more efficiently. This can help people in the community become more aware of their water usage and find ways to stop wasting water. By finding where water is being wasted, the community can make a plan to fix the problem. This could mean fixing leaky faucets or using water-saving fixtures.

During focus group discussions the data indicates that, grey water use is another sustainable alternative to the impacts of water insecurity in Rimuka suburb. It depends on a number of factors, including the type of wastewater being used, the availability of treatment facilities, and the amount of water that can be safely reused but is less implemented due to some residents are not aware of the benefits of water reuse or how to implement it in their own houses. For example, wastewater from showers and laundry can be used for irrigation, while wastewater from toilets and kitchen sinks may require treatment before reuse. Hence, by improving water security, grey water use can also reduce the demand for potable water and improve the health of plants and soils.

The study shows that not many people in Rimuka use water-saving technology, especially those who don't have a lot of money. On the other hand, doing this can help save water by using it more efficiently. For instance, using faucets and showerheads that use less water can help save water without reducing their effectiveness. Also, technology can help farmers use water more efficiently for their crops. By using water-saving things and systems, the community can save water and money. This can help with the water shortage in Rimuka and the community can use the saved money for other water projects or to improve water systems.

The results also show that not many people are aware of how to manage water resources. This includes things like planning for water supply, managing water use, and involving people who are interested. So, by looking at the bigger picture of water management, the people in Rimuka can find ways to deal with not having enough water and make sure that it is used fairly and without waste. So, by carefully planning how to use water, the neighbourhood can make sure to use water well and for a long time. This can make sure there's enough water, use less water, and keep the environment safe. Also, by involving people who use

water, own the land, and work for the government, the community can create water plans that fit their own needs and worries.

4.6 Discussion of results

In this research, we found that not having enough water has many effects in the neighbourhood of Rimuka, Kadoma. The study looked at different problems with water in Rimuka, like not having enough clean water, the water being dirty, and people getting sick from the water. It also looked at how not having enough water affects the people who live there. However, Halvorson (2010) also agrees that bad water quality causes diseases in many parts of the developing world where water supply problems lead to outbreaks. Halvorson (2010) said that in poor countries, dirty water and bad bathrooms cause 80% of sickness. The spread of diseases from dirty water was making the community sicker every day.

The chapter also showed that the community has problems with getting clean water and good bathrooms. It also tells us how to fix these problems and make sure there is enough clean water in Rimuka. Furthermore, the findings gave suggestions for government officials, non-profit organizations, and others involved to help reduce water problems and improve ability to handle future challenges. Hunters and their colleagues say that we need to make the water system better and cheaper to stop people from getting sick from diarrhoea. Hunters and others also said that, these treatments should consider the culture of the people, what the community wants and needs.

In general, the study gave a detailed look at the research results about not having enough water in Rimuka, Kadoma. It showed how complicated this problem is and suggested ways to make things better for the people in the community. Diseases from dirty water have made people sicker and poorer. The government can help reduce diseases in the future by providing clean drinking water, improving sanitation, and helping with sewerage disposal. They can also help by paying for some of these things.

4.7 Chapter Summary

In this chapter, we looked at the information we got from people in the community. We asked them questions to check our ideas, and then we explained what the information means. In addition, tables, graphs, and charts were used to show the results of analysing the data. Also,

we used information about the characteristics of the people to show, study, and explain the data.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study looked at how people in crowded neighborhoods don't have enough water and gave ideas to schools, water agencies, government officials, and non-profit groups. The goals of the study, which were discussed in the first chapter, will be used to make recommendations and share results.

5.2 Summary of the Findings

This part gives a short overview of the study's results. It includes the main parts of the dissertation, which are divided into five sections. These sections talk about the background of the study, the reasons for water insecurity, how water insecurity affects water resources, and ways to lessen the impact of water insecurity around the world and in specific areas. It also discusses the methods used in the study and the results, and then wraps up with a conclusion.

5.3 Conclusion of the Study

Certainly, the people living in Rimuka, a crowded area, were greatly affected by the large number of people moving to the city and the changes in weather. This caused more sicknesses like cholera and typhoid to spread. The study found that the people in Kadoma suburb of Rimuka are having a harder time getting clean drinking water because the infrastructure and resources are not enough. This supports what Gleick (2014) said about how it's hard for people in developing countries to get clean, safe drinking water because there isn't enough infrastructure and resources.

The study found that the city of Kadoma is struggling to give its people clean water because of problems with its water system. This makes it hard for the Rimuka area to have enough safe water. The old pipes and equipment that bring water to households are a big reason why we can't get clean water. The investigation found many problems, like not enough resources, old buildings, too many people in one area, and not enough teamwork between groups involved.

Also, the research found that some people who live in cities don't know how to manage water resources. This is shown by checking if people know how water use affects the environment, if they understand how to save water, if they know where to find water nearby, and if they are willing to do things that help the environment. The local government needs to make rules and

study the reasons for problems with the environment and people's health. This will help keep people safe from getting sick from contaminated water.

5.4 Recommendations from the study.

Old city toilets should be replaced and every house should have its own toilet. Women should have their privacy and safety respected. This is very important. Both men and women should take turns to clean and maintain the toilets. Women are really important when it comes to water and clean bathroom stuff. It is very important for the local government to talk to and include the local people in decisions that affect them directly. Women should have the power to go to meetings about water management because it's important to make decisions that consider their needs.

Another important idea is to improve the water system in the Rimuka area. This could mean fixing up and updating the places where we store and treat water, as well as the pipes that carry it, so that people can always have access to clean water. Officials can make it easier for the community to get water by fixing the pipes and stuff, so less water is wasted. This will make people healthier, help the economy grow, make farming more productive, and improve everyone's lives. Sustainable Development Goal 6, which is about "Clean Water and Sanitation," says that everyone has the right to clean and safe water. This is important for helping the environment and keeping people healthy. Communities with enough water stay healthier, have less poverty, get more food, and have more job opportunities. Communities can thrive in many areas of life by making sure there is enough water for everyone.

To get people to save water, we need to take steps to save water too. Authorities can use different ways like radio, TV, social media, and events to teach people how to save water. They can teach about fixing leaky faucets, using water-saving appliances, and watering plants the right way. We can share information about why saving water is important and give tips on how to use less water. To help save water in the Rimuka area, we need to encourage people to use less water.

We need to look for other ways to get water for Rimuka so that there is enough for everyone. Officials can look into other ways to get water, like collecting rainwater, taking water from the ground, or reusing wastewater. This can help make sure communities have enough water and don't rely too much on just one source for it. Some experts like hydrologists, geologists, and engineers can help find new sources of water in Rimuka, Kadoma. Their knowledge is

important for figuring out if different water supply options will work and last a long time. These solutions can help solve the water problems in Rimuka area for a long time and increase the water supply when it's not enough.

To get rid of water insecurity, it's important for the community to be involved. Addressing water insecurity needs the community to be actively involved. It's a good idea for the government to involve local people in making decisions about water use. They should ask for their opinions on how to fix problems and teach them about why it's important to save water. We can help people take better care of water by making them feel responsible for it and taking ownership of it.

Being ready for emergencies is really important for making sure everyone has enough water. Water agencies need to have plans for dealing with floods and droughts because climate change can affect the water supply and it's hard to predict what will happen. Simple guidelines and steps need to be set up to help handle water emergencies. This means working with the right people, using good ways to talk to others, and getting emergency items to where they're needed. Having good plans for emergencies helps officials make sure that not too many people are hurt by not having enough water.

5.5 Chapter Summary

In short, the fifth part highlights the importance of using long-lasting ways to manage water and investing in infrastructure to solve the water problems in Rimuka Kadoma. To make sure everyone can easily get clean water the government, local groups, and others need to team up.

REFERENCES

Aggarwal R, Ranganathan P, (2018). Study designs: Part 1 - An overview and classification. Perspect Clin Res.184-186. doi: 10.4103/picr.PICR_124_18. PMID: 30319950; PMCID: PMC6176693.

Arikunto, S. (2010). Research Design. Pendekatan Metode Kualitatif, Al Fabet, Bandung, 22.

Ashton, P, J and Haasbroek, B 2002 Water demand management and social adaptive capacity: A Southern Africaan case study In: Hydropolitics in the developing world: A Southern African Perspective.

Australian Government. (2020). Water conservation in Australia. Retrieved from <https://www.australia.gov.au/topics/environment/water/conservation.

Bakker, K. (2017). Water, population, and security in South Africa. In J. Allouche & D. A. Nicol (Eds.), Africa's water crisis: Challenges and solutions (pp. 169-196). Springer.

Beukering P.J.H.. (2012). Global estimates of the value of ecosystems and their services in monetary units: Problems and limitations. Ecological Economics 70(3), 594–608.

Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (2014). At risk: natural hazards, people's vulnerability and disasters. Routledge.

BMU. (2020). Rainwater harvesting in Germany. Retrieved from <https://www.bmu.de/themen/wasser/regenwasser-sammlung-und-speicherung.

Brown, Thomas C., Mahat, Vinod, Ramirez, Jorge A. (2019) Adaptation to Future Water Shortages in the United States Caused by Population Growth and Climate Change. Earth's Future, 7 (3). 219-234 doi:10.1029/2018ef001091

Chen, Y., Li, Z., Fang, G., & Li, W. (2018). Large hydrological processes changes in the transboundary rivers of Central Asia. Journal of Geophysical Research: Atmospheres, 123(10), 5059-5069.

Council for Scientific and Industrial Research (CSIR). 2017. Closed-loop processing in the paper and pulp industry. Retrieved from <https://www.csir.co.za/news/closed-loop-processing-in-the-paper-and-pulp-industry.

Crossman, A. (2020) An Overview of Qualitative Research Methods. Direct Observation, Interviews, Participation, Immersion, Focus Groups. Thought Co. https://www.thoughtco.com/qualitative-research-methods-3026555

Dehghani, M. Saghafian, B. Zarger, M. (2019). Probablistic hydrological drought index forecasting based on meteorological drought index using Archimedean copulas.

Drake, E. (2018). Water Stress and Conflict Severity: A study on how environmental changes affect conflicts in Africa.

FAO. (2017). Water scarcity in agriculture. Retrieved from <https://www.fao.org/water/en/.

Fox L, (2017). Community Health Assessment Community Assessment for Public Health Emergency Response Travis County. Austin Public Health. p.13. PDF file. Web. http://www.austintexas.gov/sites/default/files/files/Health/CHA CHIP/CHA_CASPER_2017_Final_Report_FINAL__003_.pdf. A

Gleick, P. H. (Ed.). (2014). The World's Water Volume 8: The Biennial Report on Freshwater Resources. Island Press.

Halvorson SJ, Williams AL, Ba S, Dunkel FV. (2010) Water quality and water borne disease in the Niger River Inland Delta, Mali: A study of local knowledge and response. Health Place.

Hope, R.A., & Rouse, M.J. (2014). Managing Water Insecurity: Institutions and Policies in Developing Countries. Earthscan Publications.

Hunter, P. R., Zmirou-Navier, D., & Hartemann, P. (2009). Estimating the impact on health of poor reliability of drinking water interventions in developing countries. Science of the total environment, 407(8), 2621-2624.

IPCC. (2014). Climate Change Impacts, Adaptation, and Vulnerability. Intergovernmental Panel on Climate Change Report.

Karumbidza, B. (2018). Water Scarcity and Social Unrest in Zimbabwe. London: Publisher.

Kayser, G. L., Rao, N., Jose, R., & Raj, A. (2019). Water, sanitation and hygiene: measuring gender equality and empowerment. Bulletin of the World Health Organization, 97(6), 438-440. https://doi.org/10.2471/BLT.18.223305

Kelman I., Gaillard J.C., & Lewis J. (2010). Participatory Action Research For Disaster Risk Reduction:

Kim, M., Kim, J., & Lee, S. 2018. The impact of water insecurity on poverty and gender inequality in Africa. Journal of International Development, 30(1), 105-121.

Kumar, A. (2011). Research and Writing Skills. New York, NY: Lulu Press. (978-1-4466-0560-8)

Le Roux, I., & Witbooi, S. (2016). Water scarcity and insecurity in South Africa: The consequences for policy and law. In K. W. Medd & K. Walker (Eds.), Water law and policy in a new era of scarcity (pp. 89-103). Springer.

Madzikanda, T. (2017). Inadequate Water Storage Capacity as a cause of Water Insecurity in Zimbabwe. Tylor and Francis

MAF. (2020). Sustainable water management in Morocco. Retrieved from <https://www.maf.gov.ma/en/sustainable-water-management-in-morocco.

Mavhura, E. (2017). Building resilience to food insecurity in rural communities: Evidence from traditional institutions in Zimbabwe. Jàmbá: Journal of Disaster Risk Studies, 9(1), 1-9.

Mavhura, E. (2019). Systems analysis of vulnerability to hydrometeorological threats: An exploratory study of vulnerability drivers in Northern Zimbabwe. International Journal of Disaster Risk Science, 10, 204-219.

Mesly, O. (2015). Creating models in psychological research. Springer.

NASA, (2017). "The Consequences of Climate Change," Global Climate Change: Vital Signs of the Planet , 2017b. https://climate.nasa.gov/effects.

Ortega, A. N., McKenna, R.M., Kemmick Pintor J., Langellier B.A., Roby D.H.. (2017). Health care access and physical and behavioral health among undocumented Latinos in California. Medical Care Research and Review

Ozkan S, Tuzun H, Gorer N, Ceyhan M, Aycan S, Albayrak S, Bumin MA. (2007) Water usage habits and the incidence of diarrhea in rural Ankara, Turkey. T Roy Soc Trop Med H.

Pandey, M. M. (2015). Research Methodology: Tools and Techniques (Vol. 1). Romania: Bridge Centre.

Smith, J. (2020). Ageing infrastructure and lack of maintenance as a causal factor of water insecurity. London Publisher.

Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. International Journal of Academic Research in Management (IJARM), 5(2), 18-27.

UNEP 2018. Deforestation and land degradation in Africa. Retrieved from <https://www.unep.org/news-and-stories/deforestation-and-land-degradation-africa,kim

United Nations Children's Fund, (2017). "Progress on Household Drinking Water, Sanitation, and Hygiene 2000-2017 Special Focus on Inequalities." UNICEF Publications.

United Nations Department of Economic and Social Affairs. (2018). Sustainable Development Goal 6 Synthesis Report 2018 on Water and Sanitation: A Global Assessment of Drinking Water, Sanitation and Hygiene (WASH) Progress towards SDG Target 6.1 and 6.2 by 2020. United Nations Publications.

United Nations Development Programme (UNDP), 2019: Climate Change and Water Scarcity: A Global Assessment Report. [Accessed on March 31st, 2023]

United Nations World Water Development Report (2020).Water and climate change Usha Kumari (2021) Green technologies for the defluoridation of water.

United Nations, (2020). Educational, Scientific and Cultural Organization. World Water Development Report : Water & Climate Change.

United Nations. (2018). Sustainable Development Goal 6: Ensure availability and sustainable management of water and sanitation for all.

University of Namibia (2018). Green infrastructure plan for Windhoek. Retrieved from <https://www.unam.edu.na/news/green-infrastructure-plan-for-windhoek.

Virgillito, A., & Polidoro, F. (2017). Big Data Techniques for Supporting Official Statistics: The Use of Web Scraping for Collecting Price Data. In Data Visualization and Statistical Literacy for Open and Big Data (pp. 253-273).

IGI Global Water Aid Bangladesh. (2016). Retrieved from https://www.wateraid.org/bd/.

Water Aid Bangladesh (2016). Retrieved from https://www.wateraid.org/bd/

White, D. (2017). Health Impacts of Water Stress: Evidence from a Texas Colony Survey. Public Health Journal.

WHO (2015), Economic cost of the health impact of air pollution in Europe Clean air, health and

wealth, https://www.euro.who.int/__data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf

WHO 2019. Water, sanitation and hygiene in Africa. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/water-sanitation-and-hygiene-in-africa.

WHO, UNICEF. Water for life: Making it happen 2005–2015.Geneva, World HealthOrganization and United Nations Children's Fund, 2005.

World Bank Group. (2020). Water scarcity overview [Fact sheet]. World Bank Group - Water Global Practice. https://www.worldbank.org/en/topic/water/brief/water-scarcity#:~:text=Water%20scarcity%20is%20the%20lack,and%20economic%20development.

World Bank, (2019). Afghanistan - Urbanization review: managing spatial transformation for prosperity and livability. Washington, DC: World Bank Group.

World Bank. (2017). World Development Report. Development and Climate Change. Washington, DC: World Bank.

World Bank. (2018). Rainwater harvesting in Ghana. Retrieved from <https://www.worldbank.org/en/news/feature/2018/03/15/rainwater-harvesting-in-ghana.

Wutich, A., Brewis, A., & White, D. (2020). Anxiety, Despair, and Water Insecurity: Results from a Qualitative Study of the Navajo Nation. American Journal of Public Health, 110(4), 502-504.

WWF 2020. Water in Zambia. World Wildlife Fund. https://www.worldwildlife.org/sites/default/files/Zambia-Water-Factsheet-ENGLISH.pdf

Yin, R. K. (2019). Case study research: Design and methods (4th Ed.). Thousand Oaks, CA: Sage.

APPENDICES

APPENDIX 1: KEY INFORMANTS INTERVIEW GUIDE

My name is Amanda R Shoko, a student at Bindura University of Science Education doing an Honours Degree in Disaster Management Sciences. I am currently carrying out research on "*WATER INSECURITY IN HIGH DENSITY SUBURBS, A CASE STUDY OF RIMUKA, in KADOMA CITY*". You are kindly required to assist in this research by providing your ideas. The information you provide will be kept confidential and strictly for academic purposes only.

NAME OF INSTITUTION:……

1. Can you describe the current water situation in the suburb? How has it changed over time?

2. What are the main causes of water insecurity in your area? (e.g. drought, over-extraction of groundwater, pollution, infrastructure failures, etc.)

3. How have these causes affected the availability and quality of water for different user groups (e.g. households, agriculture, industry, and environment)?

4. What are the impacts of water insecurity on different aspects of life in the suburb (e.g. health, food security, economic development, social stability)?

5. What measures have been taken to address water insecurity in your area? Have they been effective? Why or why not?

6. Are there any sustainable alternatives to addressing water insecurity? (e.g. water conservation, efficient use of water, rainwater harvesting, wastewater treatment, etc.)

7. How have local communities been involved in addressing water insecurity? What role have they played in identifying solutions and implementing them?

8. What are the main challenges in addressing water insecurity in your area? How can they be overcome?

9. How do you see the future of water management and security in the suburb? Are there any potential solutions or technologies that could address the issue?

10. Are there any other factors that you think are important to consider when addressing water insecurity in your area (e.g. climate change, population growth, urbanization, etc.)?

11. Are there any success stories or best practices in addressing water insecurity that you would like to share?

12. How can we ensure that solutions to water insecurity are equitable and inclusive, and that they do not disproportionately impact certain groups (e.g. low-income communities, marginalized communities)?

13. What are the key policies and regulatory changes that could help address water insecurity in the area?

14. How can we better integrate water management and security into broader development plans and policies?

15. Are there any ways in which water insecurity could be addressed through international cooperation and collaboration?

Thank you for your participation

APPENDIX 2: PARTICIPATION OBSERVATION GUIDE

My name is Amanda R Shoko, a student at Bindura University of Science Education doing an Honours Degree in Disaster Management Sciences. I am currently carrying out research on "*WATER INSECURITY IN HIGH DENSITY SUBURBS, A CASE STUDY OF RIMUKA, in KADOMA CITY*". You are kindly required to assist in this research by providing your ideas. The information you provide will be kept confidential and strictly for academic purposes only.

I. Introduction

- Brief overview of the importance of water and the issue of water insecurity
- Purpose of the observation guide: to explore the causes, impacts, and sustainable alternatives to water insecurity

II. Causes of Water Insecurity

A. Climate Change

1. Observe changes in precipitation patterns, such as droughts or floods, and their impact on water availability

2. Note the effect of rising temperatures on rainfall pattern, water sources and how this affects water supply

3. Document the impact of water insecurity in Rimuka and their access to freshwater

B. Over-Extraction of Groundwater

1. Observe the rate of groundwater extraction and how it compares to the natural recharge rate

2. Note the impact of over-extraction on water tables, including land subsidence and saltwater intrusion

3. Document the effects of over-extraction on agriculture and domestic use

C. Pollution

1. Observe the sources of water pollution, such as industrial waste, agricultural runoff, and sewage

2. Note the impact of pollution on water quality and the people's health

3. Document the effects of pollution on human health, including waterborne diseases and the cost of water treatment

III. Impacts of Water Insecurity

A. Environmental Impacts

1. Observe the impacts of water scarcity on ecosystems, including changes in vegetation, habitat loss, and altered species interactions

2. Note the effects of water pollution on people's lives

3. Document the impact of climate change on water resources, including changes in river flows

B. Social and Economic Impacts

1. Observe the impacts of water insecurity on human health, including the prevalence of waterborne diseases and the cost of healthcare

2. Note the effects of water scarcity on agriculture, including crop failures, food insecurity, and economic losses

3. Document the impact of water insecurity on industry, including the cost of water treatment, reduced productivity, and business closures

C. Political and Social Impacts

1. Observe the impacts of water insecurity on political stability, including conflicts over water resources and the effect on international relations

2. Note the effects of water insecurity on social structures, including internal migration, displacement, and social unrest

3. Document the impact of water insecurity on cultural heritage, including the loss of traditional practices and cultural identity

IV. Sustainable Alternatives to Water Insecurity

A. Water Conservation

1. Observe the use of water-efficient technologies, such as low-flow toilets and showerheads, and their impact on water consumption

2. Note the effectiveness of water-saving practices, such as rainwater harvesting and grey water reuse

3. Document the benefits of water conservation, including reduced water bills, increased water supply, and decreased energy consumption

B. Water Recycling and Reuse

1. Observe the use of wastewater treatment and recycling facilities, and their impact on water supply

2. Note the effects of water reuse on agriculture, industry, and domestic use

3. Document the benefits of water recycling and reuse, including reduced water demand, increased water supply, and reduced energy consumption

C. Sustainable Water Management

1. Observe the implementation of sustainable water management practices, such as integrated water resource management and water-sensitive urban design

2. Note the impact of sustainable water management on water quality, ecosystem health, and community well-being

3. Document the benefits of sustainable water management, including increased water security, improved ecosystem health, and enhanced community resilience

Thank you for your participation

APPENDIX 3: QUESTIONNAIRE GUIDE

My name is Amanda R Shoko, a student at Bindura University of Science Education doing an Honours Degree in Disaster Management Sciences. I am currently carrying out research on "*WATER INSECURITY IN HIGH DENSITY SUBURBS, A CASE STUDY OF RIMUKA, in KADOMA CITY*". You are kindly required to assist in this research by providing your ideas. The information you provide will be kept confidential and strictly for academic purposes only.

Section A

1. Tick in the provided box to show your answer

i. ***Respondent's age (years)***

-24	25-45	46-64	65+
☐	☐	☐	☐

ii. ***Tick in the provided box to show your marital status.***

Married	Unmarried	Divorced	Widow	Elderly	Disabled
☐	☐	☐	☐	☐	☐

ii. ***Respondent's highest level of Education***

Not Educated	Primary	Secondary	Tertiary
☐	☐	☐	☐

iii. ***Respondent's Household Size***

<5 5-8 9-12

☐ ☐ ☐

iv. Respondent's Source of income

Government Private Sector Self-Employed Unemployed

☐ ☐ ☐ ☐

v. Household income level (US$)

<$20 $30-$60 $70- $100 $100+

☐ ☐ ☐ ☐

Section B

2. Tick in the provided box to show your opinions on water insecurity:

a. What do you believe are the main causes of water insecurity in your high-density suburb?

Inadequate infrastructure

Population growth and increased demand

Climate change and drought

Poor governance and mismanagement

Other (please specify) ……

b. **How would you describe the overall impact of water insecurity on your daily life and well-being**?

Significant impact

Moderate impact

Some impact

Minimal impact

No impact

c. How would you rate the availability of clean and reliable water supply in your neighbour

Very good

Good

Poor

Very poor

d. How frequently do you experience water shortages in your area?

Daily

Multiple times a week

Weekly

Rarely or Never

e. Have you ever had to resort to alternative water sources due to lack of piped water?

Yes

No

f. If yes, please specify the alternative water sources you rely on (e.g., boreholes, wells, etc.

……..…

g. How satisfied are you with the quality of water you receive in your area?

Very satisfied

Satisfied

Dissatisfied

Very dissatisfied

h. Do you have concerns about the safety and cleanliness of the water supply in your neighborhood?

Yes

No

i. If yes, please describe your concerns.

……..

j. **Are you aware of any government initiatives or programs aimed at addressing water insecurity in your area?**

Yes

No

k. If yes, please provide details of these initiatives or program.

……

l. How would you rate the effectiveness of the current efforts to address water insecurity in your neighborhood?

Highly effective

Moderately effective

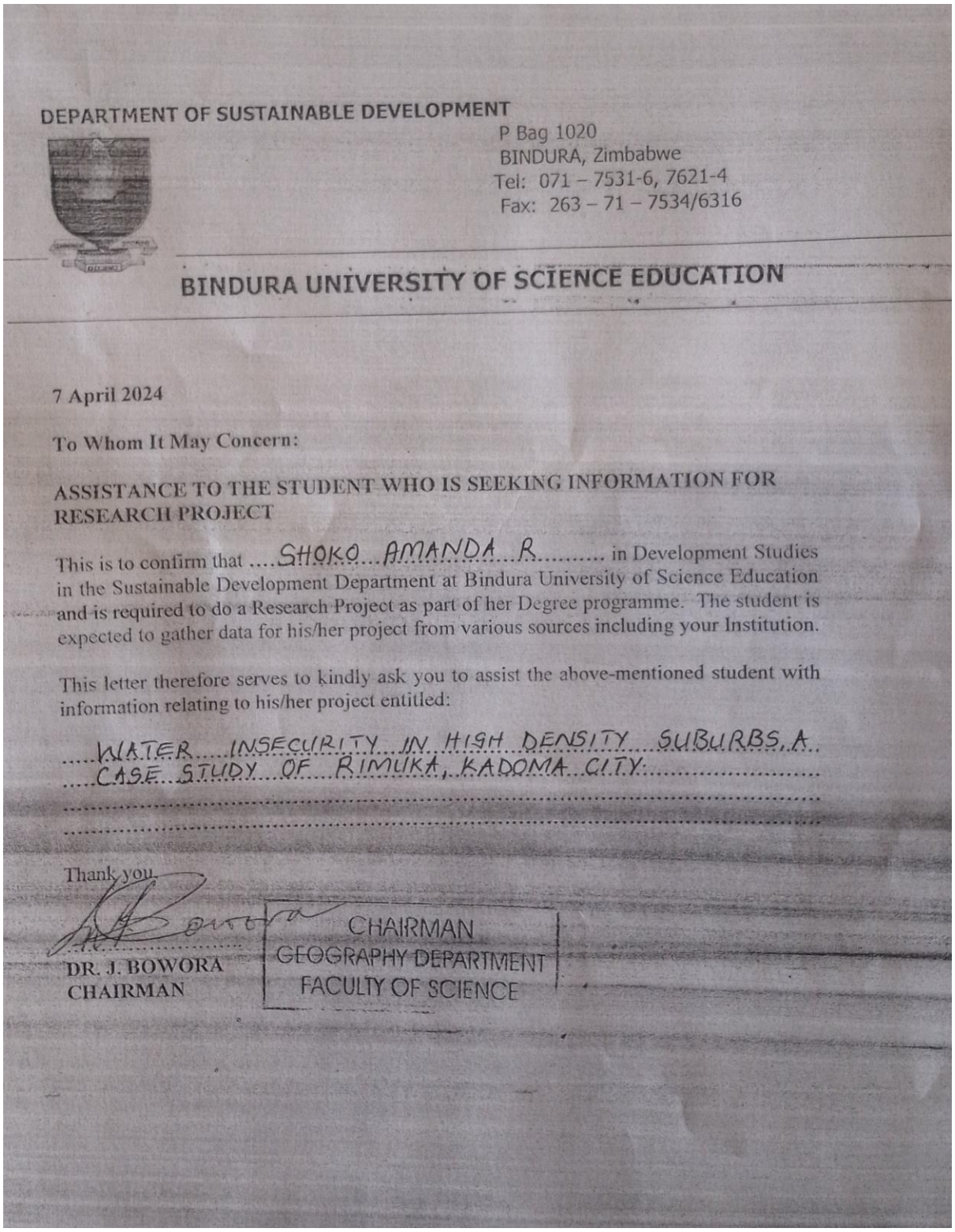
Somewhat effective

Ineffective

Not sure

Thank you for your participation

APPENDIX 4: DATA COLLECTION LETTER



DEPARTMENT OF SUSTAINABLE DEVELOPMENT

P Bag 1020
BINDURA, Zimbabwe
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Fax: 263 – 71 – 7534/6316

BINDURA UNIVERSITY OF SCIENCE EDUCATION

7 April 2024

To Whom It May Concern:

ASSISTANCE TO THE STUDENT WHO IS SEEKING INFORMATION FOR RESEARCH PROJECT

This is to confirm that ....SHOKO AMANDA R..... in Development Studies in the Sustainable Development Department at Bindura University of Science Education and is required to do a Research Project as part of her Degree programme. The student is expected to gather data for his/her project from various sources including your Institution.

This letter therefore serves to kindly ask you to assist the above-mentioned student with information relating to his/her project entitled:

.....WATER INSECURITY IN HIGH DENSITY SUBURBS, A CASE STUDY OF RIMUKA, KADOMA CITY.....
.....
.....

Thank you.

.....
DR. J. BOWORA
CHAIRMAN

CHAIRMAN
GEOGRAPHY DEPARTMENT
FACULTY OF SCIENCE