UNIVERSITY OF THE WESTERN CAPE
Faculty of Community and Health Sciences

Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia

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A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Public Health, School of Public Health, University of the Western Cape

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Supervisor: Prof Brian Van Wyk

25 November 2020

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DECLARATION OF ORIGINALITY

I declare that the thesis entitled, *Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia* is my own work, that it has not been submitted for any degree or examination to any other university and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name: Michael Albertus Mulondo Date. 25 November 2020

Signed. 

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DEDICATION

This work is dedicated to the following persons:

My late father, Stefanus Mulondo, whose legacy encouraged me to undertake this academic study. May his soul rest in peace. My loving mum, Ursula Mulondo, who has and still believes in her son whose life is a success story. Thank you, Mum;

And

To my loving wife, Clara Mulondo, who encouraged me to never give up, and who always reminded me with these words, "Have you finished with your thesis writing?"

And

To my loving brother, Herbert and his wife Shelma Mulondo, who hosted me during my stay in Paarl (RSA), while attending classes at the University of the Western Cape (UWC, RSA). God bless you;

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And

To my two children, Abigail and Timothy Mulondo, who reminded me that nothing is impossible in life;

And

To my heavenly Father, who made this academic journey a walk of faith and belief.

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ACKNOWLEDGEMENTS

I wish to acknowledge and thank the following persons:

- My supervisor: **Professor Brian van Wyk**, for his positive guidance, timely assistance, unwavering patience, incredible insight and wisdom, which is highly appreciated and forever appreciated.

- My academic friend and colleague: **Ms Marjorie Katjire**, for her critical and technical input during the research proposal phase, including her inspiration to complete my thesis at all costs.

- My field research team: **Miss Hendrina Martin** and **Albertina Shaanika**, for their presence and commitment during all the data collection phases, note-taking and language interpretation. They have sacrificed their comfort and safety to obtain as much data from the community of the Havana informal urban settlement. **Ms Victoria Wilhelma**, a social worker, who introduced me to the community leaders of the Havana informal urban settlement. Her technical input during the site visits was timely and valuable, which contributed to the write-up of the research study.

- Ministry of Health and Social Services, Medical Epidemiologist. Windhoek: **Dr Lilian Kahuika**, for her insight and knowledge on the hepatitis E outbreaks in informal settlements and the Namibia government's response to dealing with hepatitis E and other pandemics.

- Ministry of Agriculture, Water and Rural Development, Directorate Water Supply and Sanitation Coordination. Windhoek: **Ms Theopolina Nantanga**, who provided important information and resources about the role of the Namibia government in providing quality drinking water to communities, and Community-Led Total Sanitation (CLTS) training.

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- City of Windhoek, Section Head: Health Department: **Ms Nevia Mundia**, for her unwavering co-operation, pivotal information and professional guidance concerning the processes and focal persons of the City of Windhoek municipality.

- UNICEF. WASH Specialist. Windhoek, Namibia: **Mr Mathew Shuuya**, who provided technical and current information about the role of UNICEF in Namibia about WASH.

- World Health Organization (WHO), Windhoek, Namibia: **Dr Petrus Mhata**, who provided pivotal information about hepatitis E outbreaks and other WASH-related diseases in Namibia.

- Red Cross Society of Namibia. National Manager: Health and Social Services. Windhoek, Namibia: **Ms Laimi Onesmus**, who provided information on their Community-Led Total Sanitation (CLTS) programmes in informal settlements of Namibia.

- Havana informal settlement community leaders: Councillor **Mr Martin David**, Councillor/Her Worship **Ms Fransina Kahungu** (Mayor of Windhoek), **Ms Foibe Silvanus**, **Mr Chicco Philippus**, and **Mr Johannes Nghifikepunye**. Their valuable contribution and insight into the challenges of the Havana informal settlement guided the research study and provided strategic recommendations for future project implementation.

- The poor communities of Havana informal urban settlement: Their transparent and valuable information made this thesis a reality.

- The University of Namibia, Social Entrepreneurship department: **Dr Wifred April**, for his valuable input on social entrepreneurship and mobilising his students to visit Havana informal urban settlement. The donations to the poor communities of the Havana informal urban settlement, as part of his students practical, will be forever appreciated.

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ABSTRACT

Water, sanitation and hygiene (WASH) are fundamental to health and are regarded as a fundamental human right for survival, dignity, productivity, reproductive health and happiness. In low socio-economic communities and settings, especially those who are residing in informal urban settlements, where appropriate WASH interventions are not in place, the risks of mortality and morbidity from especially infectious disease are high. A participatory action research (PAR) study was conducted to address the poor WASH conditions in the Havana informal urban settlement in Windhoek, Namibia. The study comprises of four phases. In phase 1, the scoping review revealed that behavioural interventions, targeted at the community level and addressing multiple WASH conditions, might be the key to improved WASH practices in resource-constrained settings or developing countries. The situational analysis revealed the strengths (Available WASH facilities), weaknesses (Absence of WASH facilities and good practices), opportunities (Access to WASH budget and strategies) and threats (Health Outbreaks). In Phase 2, the main outcome of a participatory approach was that community engagement was established around a common goal (with objectives) to deal with identified and prioritised WASH conditions. In Phase 3, the rapid appraisal revealed promising results for the Community WASH Action Plan (COMWAP) training sessions in the areas of community health education, youth empowerment, an awakening of social entrepreneurial initiative and for igniting community innovation and income-generating opportunities to address their poor WASH conditions. In Phase 4, the validation phase introduced the drafting of tailor-made WASH guidelines and a training manual for WASH peer educators and health promoters residing in informal urban settlements. The research study recommends a tripartite partnership between the Havana informal urban settlement, the City of Windhoek (representing the government of Namibia) and relevant stakeholders to implement the Community WASH Action Plan (COMWAP), including the proposed WASH guidelines and training manual as a strategy that is aimed at empowering poorer communities to address their poor WASH conditions. This study emerges as a groundbreaking approach that transcends the submission and publication of a doctoral thesis. The study generated a new and insightful understanding of a WASH Action Plan (COMWAP), which could be replicated in other informal settlements situated in the rest of the Namibia and Africa.

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KEYWORDS

Water, Hygiene, Sanitation, Informal urban settlements, Participatory, Community, Interventions, Situation analysis, Scoping review, Rapid appraisal, Healthy Cities

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ABBREVIATIONS AND ACRONYMS

ADDIE: Analysis, Design, Development, Implementation, Evaluation

CLTS: Community-Led Total Sanitation

CDCP: Centre for Disease Control & Prevention

FGD: Focus Group Discussion

HEV: Hepatitis E virus

JMP: Joint Monitoring Programme

MDGs: Millennium Development Goals

PAR: Participatory Action Research

PICO: Population - phenomena of Interest – Context

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SDGs: Sustainable Development Goals

SWOT: Strength, Weakness, Opportunity, Threat

UN: United Nations

UNFPA: United Nations Population Fund

UNICEF: United Nations Children's Fund (previously the United Nations Children's Emergency Fund)

WASH: Water, Sanitation and Hygiene

WHO: World Health Organization

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CHAPTER 1: INTRODUCTION

In this chapter, the concept of *Water, Sanitation and Hygiene* (WASH) is introduced. The poor WASH conditions in low socio-economic communities and settings, especially informal urban settlements, are described. Interventions that have been implemented by the Namibian Ministry of Health and Social Services, the City of Windhoek and other stakeholders in an effort to improve the poor WASH conditions, especially of the Havana informal urban settlement with many extensions as well as uncontrolled urban sprawl, are also described. The chapter explains the rationale and significance of the research and concludes with an overview of the thesis.

1.1 Water, Sanitation and Hygiene (WASH)

The concept of WASH is used to group together water supply, sanitation and hygiene to address health deficiencies in order to achieve a stronger, more positive impact on public health. The WASH acronym has been broadly adopted in international developmental communities and the concept is used as a model for how global initiatives can connect with local, national and regional partnerships (Gomathi, Theresa & Debora, 2017). The WASH concept represents a separate field of work where each component is dependent on the presence of the other. For example, without toilets, water sources become contaminated, and without clean water, basic hygiene practices are not possible (UNICEF, 2017). Mahon and Fernandes (2010) explain that these three core WASH issues or components are clearly interlinked in the following ways:

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- Communities are at risk of microbiological contamination owing to the lack of effective water sanitation.
- Sanitation facilities and systems rely on water for flushing, cleaning and transporting human waste/faeces.
- Improved hygiene behaviour and practices are a result of accessible water for handwashing after defecation and before eating food.

Thus, a much stronger public health outcome can be achieved if the three core WASH issues or components are all addressed simultaneously in a coordinated manner, rather than focussing on each area separately. The three core WASH issues should be used as a strategy to achieve many of the targets of Sustainable Development Goals (SDG 6) that focus on

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affordable access to WASH, which is a key public health issue, especially in developing countries such as Namibia (Mahon & Fernandes, 2010).

Many of the water and sanitation approaches to date are employed in an international development focus on providing either improved water, sanitation or hygiene, but all three issues are intertwined and all three are needed for a sustained impact (Prüss-Ustün, Bartram, Clasen, Colford, Cumming & Curtis, 2014).

According to Bartram et al. (2014), the international monitoring of WASH has been on-going since the 1930s. That was when such monitoring was carried out by the League of Nations' Health Organisation and subsequently by the World Health Organization (WHO) and now jointly by WHO and The United Nations Children's Fund (UNICEF) through their Joint Monitoring Programme (JMP) (Bartram, Brocklehurst, Fisher, Luyendijk, Hossain, Wardlaw & Gordon, 2014).

According to the United Nation's Sustainable Development Goals Report (United Nations, 2016), WHO and UNICEF's JMP for WASH has regularly produced estimates of the progress of global WASH progress since 1990. In September 2001, world leaders adopted the Millennium Development Goals (MDGs), which set out time-bound targets for several components of development policy (United Nations, 2016). The targets set for the MDGs from 2000 to 2015 promoted increased access to WASH (Costanza, Fioramonti & Kubiszewski, 2016).

MDG's target concerning drinking water, sanitation and hygiene were repeatedly edited until adopted in its final form in 2006 as Target 7C: to halve between 1990 and 2015, 'the proportion of the population without sustainable access to safe drinking water and basic sanitation' (United Nations, 2016,: pp 22-23). The human right to WASH was subsequently recognised in 2010 by the United Nations (UN) General Assembly and UN's Human Rights Council resolutions (Murthy, 2013).

The global community has committed to achieving 17 SDGs by 2030. This commitment includes Goal 6 of the SDGs that emphasises the access to WASH that should be universally available as a global priority (Rosen, 2017). According to the World Health Organization (2017), the establishment of SDG 6, ensure the availability and sustainable management of

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water and sanitation for all. Goal 6 of the SDG reflects the increased attention on water and sanitation issues in the global political agenda. The SDG 6 includes eight global targets that are universally applicable and aspirational which comprised of the provision of drinking water; the provision of sanitation and hygiene services; the treatment and reuse of wastewater and ambient water quality; the water-use efficiency and scarcity; the integrated water resources management (IWRM) including transboundary cooperation; the protection and restoring of water-related Ecosystems; the international cooperation and capacity-building; and the participation in water and sanitation management (UN Water, 2018).

The importance of WASH for public health

WASH aims to save lives and reduce illness by improving global access to healthy and safe water, adequate sanitation and improved hygiene, as these play an important part in maintaining health (Gomathi, Theresa & Debora, 2017). The fact that WASH is the subject of dedicated targets in the SDG is testimony to its fundamental role in public health (WHO, 2017). Russell and Azzopardi (2019) argue that water, sanitation and hygiene (WASH) are fundamental human rights that underpin survival, dignity, productivity, reproductive health and happiness.

WASH is fundamental to health for both communities and health care settings. This link between WASH and health was demonstrated during the 72nd World Health Assembly that was held in May 2019, where WHO member states made commitments to improve and sustain WASH services in communities and health care facilities (UN-Water Family News, 2019). WHO member states affirmed the fundamental role of WASH in health as a strategic commitment in achieving universal health coverage, improving the quality of care and in preventing the spread of antimicrobial resistance (WHO, 2019).

The poor responses to and slow progress of WASH interventions in some countries are becoming a public health concern. The outbreaks of life-threatening illnesses and infectious diseases still pose a great threat to the public health of poor communities. The hepatitis E virus (HEV) is the most common cause of viral hepatitis worldwide which has estimated the infections of millions of people each year, resulting in tens of thousands of deaths (Webb and Dalton, 2019). Also, the 2019 Coronavirus Disease (COVID-19) outbreak has resulted in more deaths with reported cases in over 93 countries across six continents since mid-December 2019 (Haghani and Bliemer, 2020). Thus, improved WASH can tackle infectious

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diseases that are associated with human excreta, faecal pathogens and unhygienic practices (Crocker & Bartram, 2016).

WHO (2017) states that worsening WASH conditions make the health of urban dwellers vulnerable to the exposure of WASH-related diseases through unprotected sources of drinking water, use of unimproved sanitation and unsatisfactory post-exposure hand-hygiene practices. Improved WASH promotes better health and nutrition that enables poor communities to work more productively at home and in the workplace, which, in turn, maximises their earning potential (Marotz, 2014). WHO (2017) states that attention to WASH can contribute significantly to improving healthy outcomes and is particularly important for reducing the burden of disease as well as relieving pressure on the health care systems of poor countries.

Rosen (2017) states that in the post-2015 framework, health goals and targets should focus on maximising healthy lifestyles at all stages of life, which is an important entry point for measures to improve access to WASH. These should include a focus on prevention, including targets on behaviour change (such as handwashing with soap), improved information (such as hygiene and sanitation promotion or access to other health care workers) and improved environments (sanitation and access to safe water) (Ki, 2013).

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WASH and development

The problems associated with poor WASH practices have been linked to human and socio-economic development factors that affect virtually all aspects of human habitation and survival, especially for those who live in informal urban settlements (Szirmai, 2015).

The socio-economic development of poor communities includes improved WASH services and increased financial income of communities living in informal urban settlements. Socio-economic development also requires the economic empowerment of poor women and girls, which should result in reducing the time that is spent collecting water from distant water sources (Sherraden, 2014). Better access to WASH promotes long-term prevention and control measures for improving health, reducing poverty and improving the socio-economic development of informal urban settlements. Russell and Azzopardi (2019) state that WASH is essential for human survival and the foundation upon which development has been built.

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Russell and Azzopardi (2019) argue further that development agencies need to reconsider WASH as an approach to achieving the SDGs and encourage essential ongoing investment in WASH. Improving access to WASH has a positive impact on the growth and development of children and communities. Thus, WASH must be regarded as a developmental agenda with a special focus on marginalised groups, such as women, children, refugees, poor communities and informal urban settlements (The Global Handwashing Partnership (GHP), 2019). WASH impacts positively on a number of key resources essential for development and has been a priority on the UN's development agenda for the last 50 years as illustrated in Figure 1.1 below.

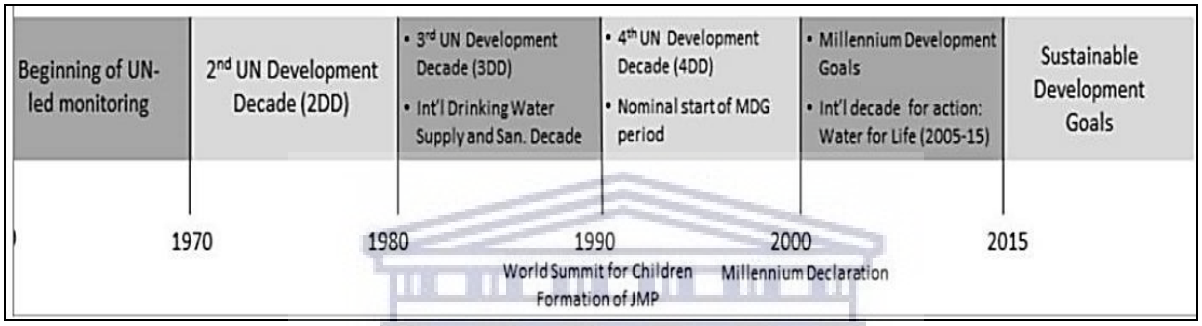

Figure 1.1: Timeline of international targets and actions related to WASH (Bartram et al., 2014: pp. 8137-8165)

1.2 Informal urban settlements

WHO (2015) propagates the idea that the issues affecting WASH in many countries need to be studied within the context of population growth and urban health. The issues pertaining to global health and WASH conditions will occur increasingly in cities owing to mass migrations and the rapid emergence of informal urban settlements (Dos Santos, Adams, Neville, Wada, de Sherbinin, Bernhardt & Adamo, 2017). The population in Namibia's urban settings have grown much faster between 1991 and 2011, contributing mostly to overall urban growth from 300,000 to more than 900,000 people (Figure 1.2).

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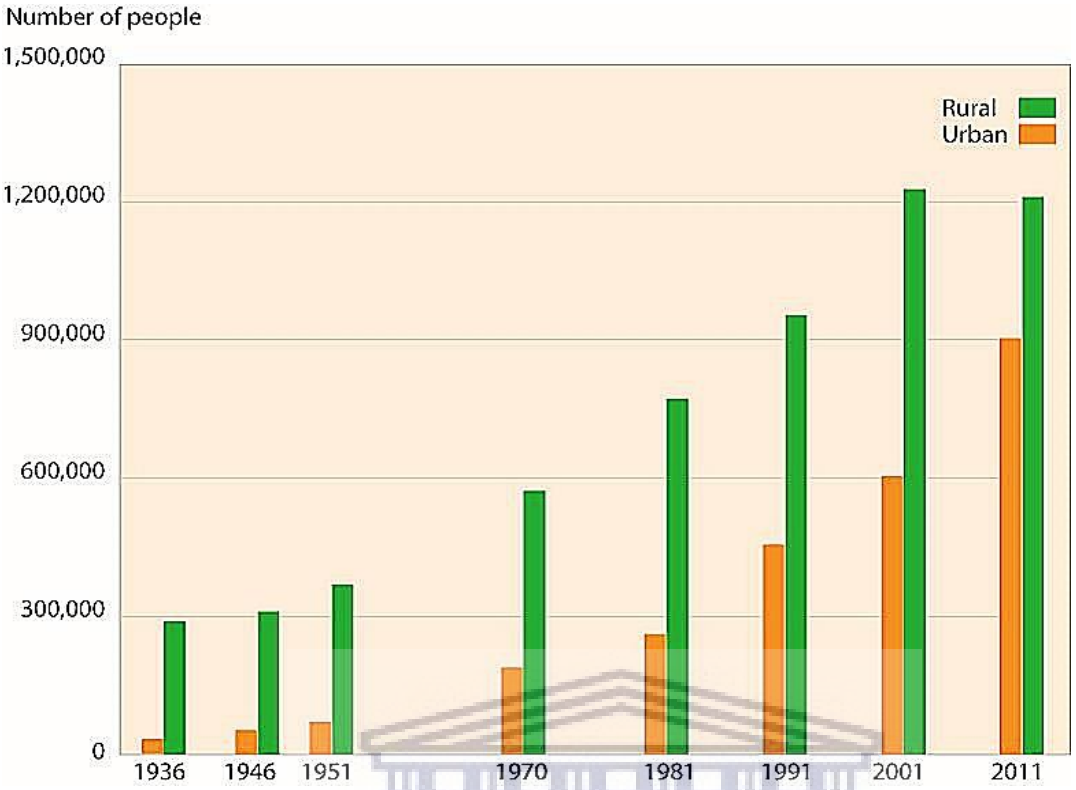

Figure 1.2: The number of people in urban areas recorded during censuses between 1936 and 2011 (Weber, 2017)

Furthermore, the households of informal urban settlements or urban shack homes have increased more than sevenfold, from 50,000 in 2009 to over 100, 000 in 2017/18 (Figure 1.3).

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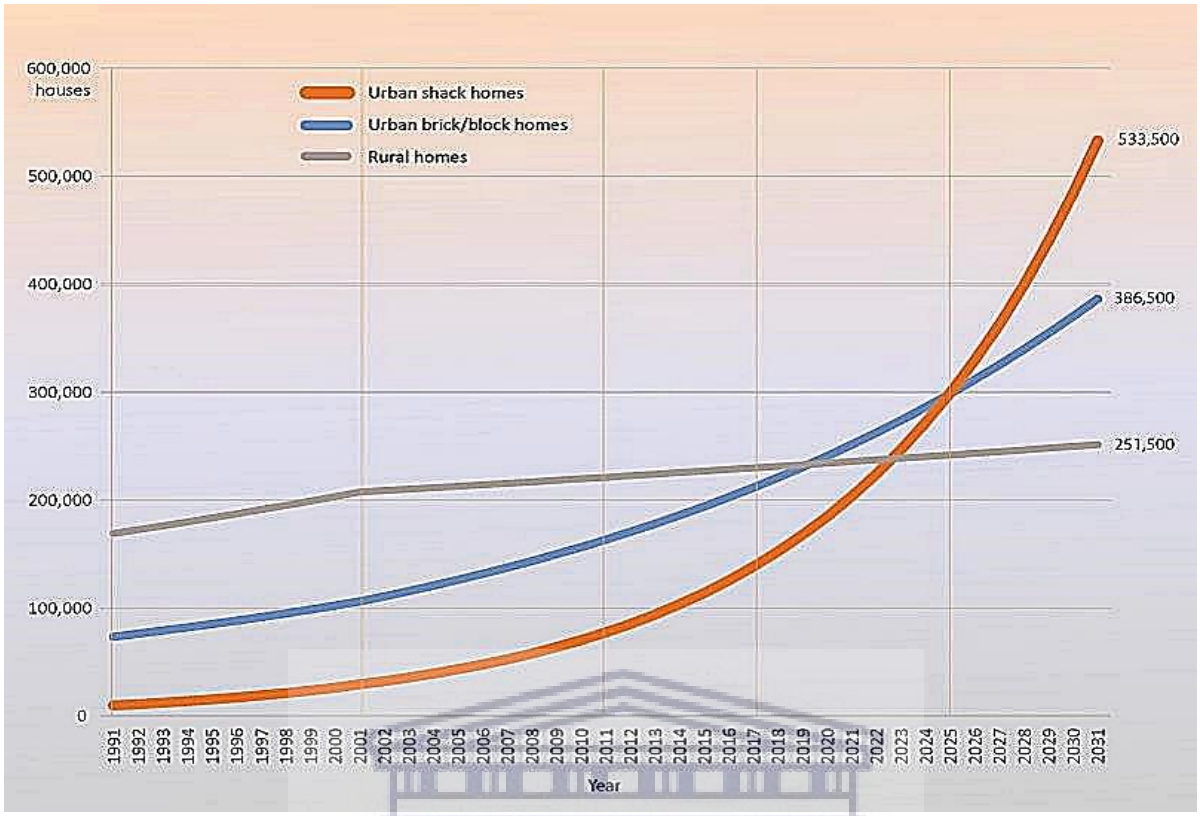

Fig 1.3: Informal urban settlement growth from approximate 50,000 in 2009 to over 100 000 in 2017 (Weber, 2017)

The urbanisation rate of Namibia was 38% in 2007 and has increased to 49% in 2017; with at least 16% of the population living in shacks (NSA, 2013). Paccoud (2011) projects that up to 70% of the world's population would be living in urban areas by 2050, resulting in rapid increases in the formations of informal urban settlements. Human settlements continue to expand in all-risk areas as a result of population expansion, rural-urban migration and city expansion, increasing demand for WASH-related facilities and services (Johannessen, Rosemarin, Thomalla, Swartling, Stenström & Vulturius 2014). The objective of the Human Settlements development is to focus on transformations across multiple dimensions, including demographic growth, economic empowerment, and environmental changes in the informal urban settlements, which includes the availability of affordable and sustainable WASH services (Dhakal, Bigio, Blanco, Delgado, Dewar, Huang & Mueller, 2014).

There are approximately 2.5 billion people worldwide who do not have access to improved WASH conditions, and more than 1 billion people practise open defecation (WHO/UNICEF, 2014). Poor WASH conditions place informal urban settlements in vulnerable positions in

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relation to WASH-related diseases which amount to 6% of all diseases and annual deaths globally (Ngure, Reid, Humphrey, Mbuya, Pelto & Stoltzfus, 2014).

The changing patterns of urbanisation and the particular health burdens experienced by informal urban settlements create a demand for investigative research that will promote the concept of Healthy Cities. WHO (2015) introduced the Healthy Cities framework in response to health issues that have emerged owing to rapid urbanisation and the development of informal urban settlements. WHO defines the Healthy Cities approach as a continual process that creates and improves resources, physical and social environments and enables communities to mutually support each other in performing all the functions of life and achieving their maximum potential (WHO, 2015; Acuto, Morissette & Tsouros, 2017). The framework promotes the principles of active community participation in policy-making and implementation and endorses a participatory action research approach. This approach has been used in some African countries to upgrade rather than eliminate informal urban settlements through the active engagement of community members and leaders (Oni, Smit, Matzopoulos, Adams, Pentecost, Rother & Van der Westhuizen, 2016). The SDG also recognise the need to make cities inclusive, healthy, resilient and sustainable. This goal is especially pertinent for vulnerable population groups such as the impoverished informal settlements, who are affected by poor WASH conditions.

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1.2.1 Windhoek informal urban settlements and poor WASH conditions

The lack of serviced and well-demarcated land promotes overcrowding and uncontrolled sprawling in the informal urban settlements such as Havana informal settlement, Ombili informal settlement, Goreangab informal settlement, Hakahana informal settlement and Freedom Land (Polytechnic of Namibia, 2011). The informal urban settlements consist of a diverse culture of Namibians, with English, Afrikaans and Oshiwambo as the predominantly spoken languages.

The City of Windhoek produced maps of informal settlements in 2018 showing the demarcated Havana informal urban settlement with all its many extensions as well as uncontrolled urban sprawl as illustrated in Figure 1.4 and Figure 1.5.

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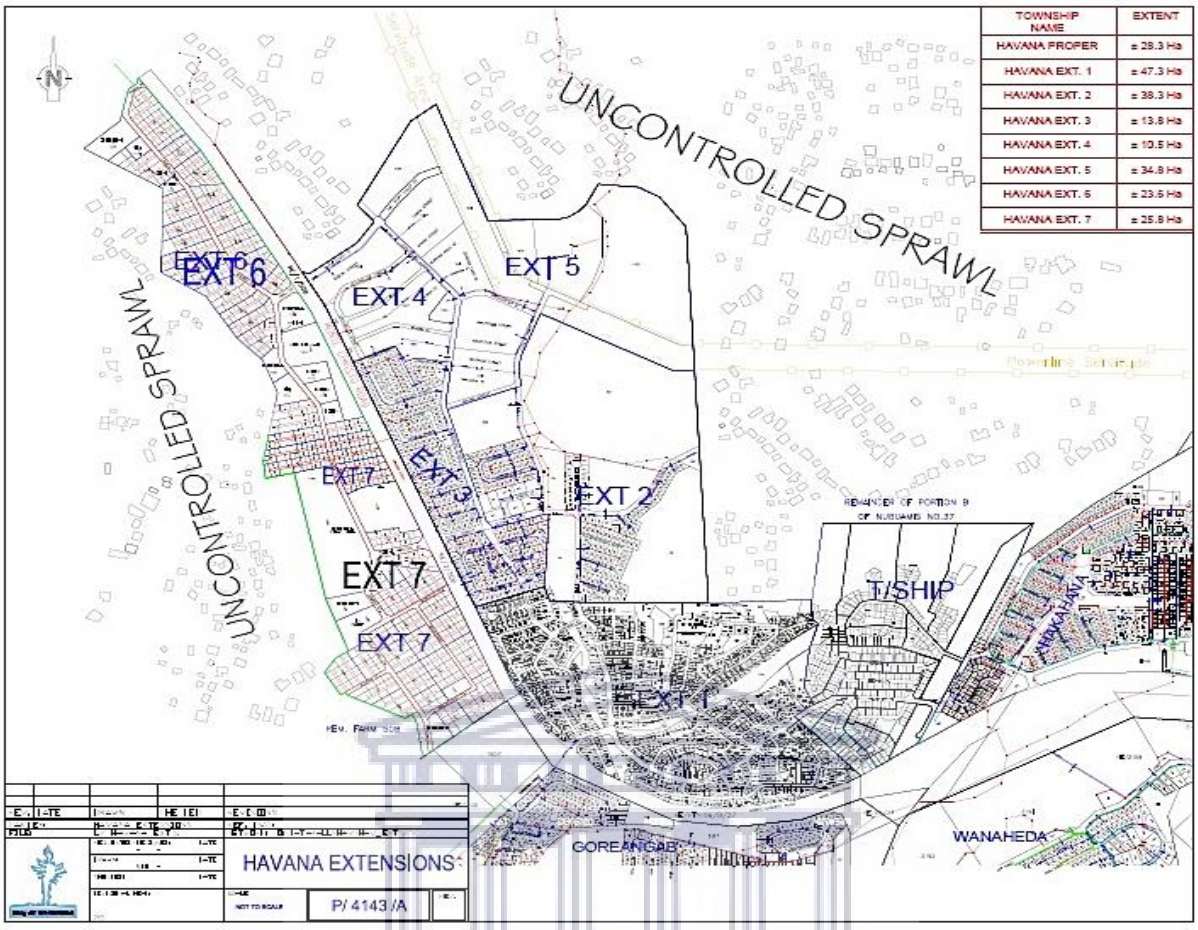

Figure 1.4: Map of Havana informal settlement with all its extensions (City of Windhoek, 2018)

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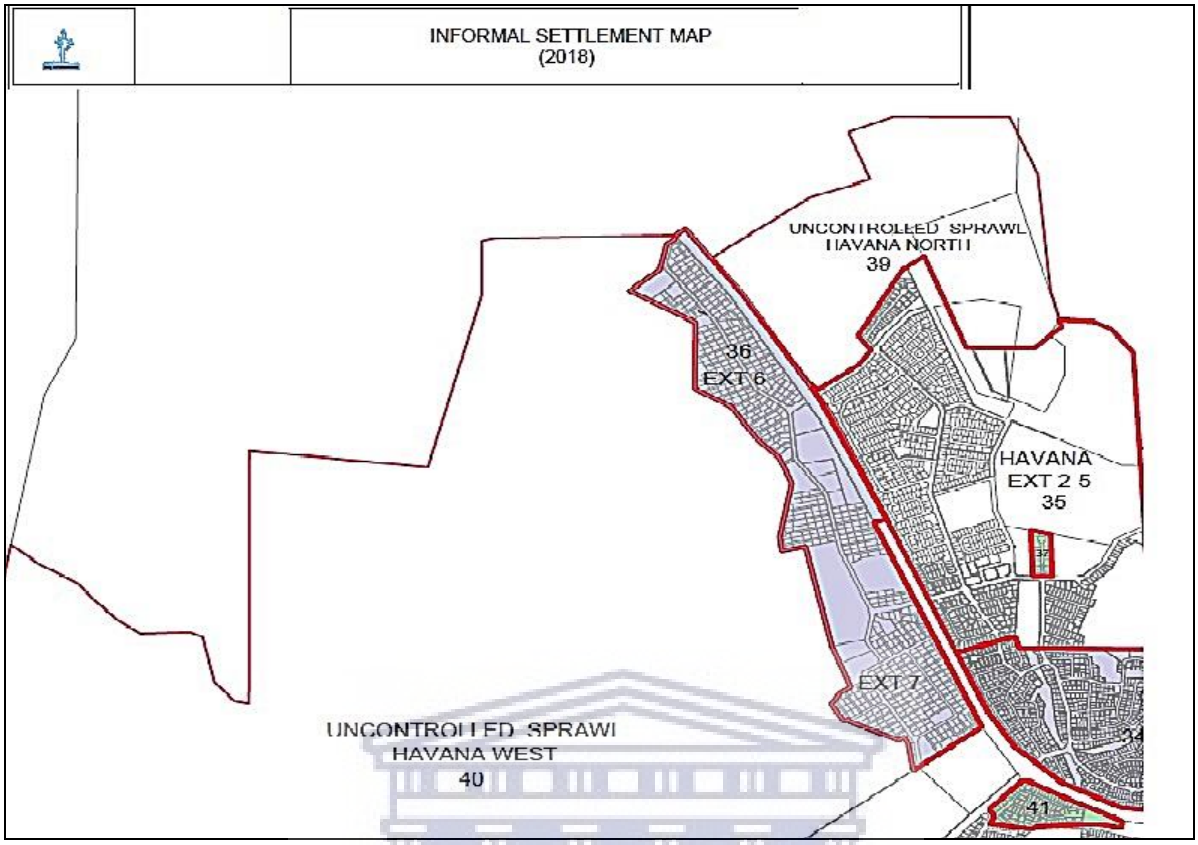

Figure 1.5: Map of uncontrolled sprawling by illegal occupants of the Havana informal settlement (City of Windhoek, 2018)

Cline, Domingue, Fournier and Villar (2012) state that as more people migrate to Windhoek's urban areas in search of a better education, health care and job prospects, informal urban settlements are steadily growing in size. This also implies that basic demands for improved WASH conditions in informal urban settlements are increasing. Research by Gold and Namupolo (2013) indicates that the current WASH conditions in Windhoek's informal urban settlements are very poor owing to factors that are related to 'land tenure, limited resources and finances' (Gold & Namupolo, 2013, p. 22). The toilet facilities in these informal urban settlements are limited or absent and they utilise a dry sanitation system, forcing most residents to opt for open defecation practices.

Van Rooi (2014) reveals the plight of informal urban settlement with regard to WASH conditions and mentions the disposal of rubbish and waste and the lack of trash disposal bins. This implies that the general health circumstance of inhabitants in informal urban settlements of Windhoek are at risk owing to the poor WASH conditions. The informal urban settlements are breeding grounds for endemic diseases owing to uncontrolled disposal of rubbish that is caused by overcrowding, the high density of the population and poor WASH conditions

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(Reyes, Ahn, Thurber & Burke, 2012). The uncontrolled disposal of waste in informal urban settlements generates pollution and poor WASH conditions that pose serious health risks.

Basic sanitation and sanitation issues were not effectively addressed, although the Government of Namibia developed a national sanitation strategy in 2009 from 2010 to 2015, It describes the need to provide sustainable sanitation services to urban households and informal urban facilities (Ministry of Agriculture, Water & Forestry, 2009). According to Law (2014), the escalating water sanitation and hygiene problems in informal urban settlements of Windhoek raised concerns among health officials during the February 2014 outbreak of cholera in some parts of the City of Windhoek and Kunene region. Sitata (2014) concurs that the overpopulated informal urban settlements of Windhoek are of a particularly high risk to the health of its inhabitants owing to poor WASH conditions. The City of Windhoek experienced a polio outbreak in 2006, despite the introduction of a dry sanitation system to the informal urban settlements during 2003 (Uhlendahl, 2012). The City of Windhoek confirms that on-going consultations with community members in informal urban settlements are needed to address the poor WASH conditions (City of Windhoek, 2013).

1.3 Current interventions and gaps

1.3.1 Interventions

The government of the Republic of Namibia, along with the Ministry of Health and Social Services, the City of Windhoek and various other stakeholders have implemented several interventions to address issues that are related to poor WASH conditions in Namibia, especially in the Havana informal urban settlement (Kasote, 2018).

The government of Namibia introduced and piloted the Community-led Total Sanitation (CLTS) approach in the northern part of Namibia (Ohangwena region) during 2014 to eliminate the practice of open defecation. To date, a number of people have been trained as CLTS facilitators to help communities end the practice of open defecation and improve the practice of poor hygiene. This initiative is supported by the Ministry of Agriculture, Water and Forestry (Directorate of Water Supply and Sanitation Coordination).

UNICEF assisted the government of Namibia in 2015 to develop a communication strategy called Open Defecation-Free Namibia (ODFN), which will remain operative until 2030. The communication strategy includes an advocacy programme to raise awareness of the

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importance of sanitation and hygiene and a mass media campaign to mobilise the public to react to poor WASH conditions. The strategy is based on SDG 6 that promotes clean water and sanitation that was established by the UN's General Assembly in 2015. It calls for the availability and sustainable management of water and sanitation for all (UNICEF, 2015). The government of Namibia, through its WASH intervention, met the SDG 6 target of clean water and sanitation for all by reaching the highest percentage of 47% of the population living in informal settlements washing their hands with soap and water (Ohwo & Agusomu, 2018).

The City of Windhoek, through its Transformational Strategic Plan 2017-2022, is addressing the poor sanitation issues by building communal toilets and installing more water points in informal urban settlements (Kahiurika, 2019). The City of Windhoek is also engaged in activities in the Havana informal settlement. These activities include the following:

- providing water tanks,
- installing water taps/points,
- extending water sewerage networks,
- rehabilitating water infrastructure,
- increasing access to sanitation facilities for the safe disposal of human excreta,
- improving food safety,
- improving environmental hygiene,
- organising clean-up campaigns, waste removal and refuse collection and hygiene education sessions (City of Windhoek, 2018).

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Through their surveillance teams and community health-extension workers, the Ministry of Health and Social Services of Namibia continues to provide health education on the importance of handwashing and prevention of WASH-related diseases such as hepatitis E. The current outbreak of hepatitis E in the Havana informal urban settlement was caused by poor WASH conditions and contaminated water (see Figure 1.6).

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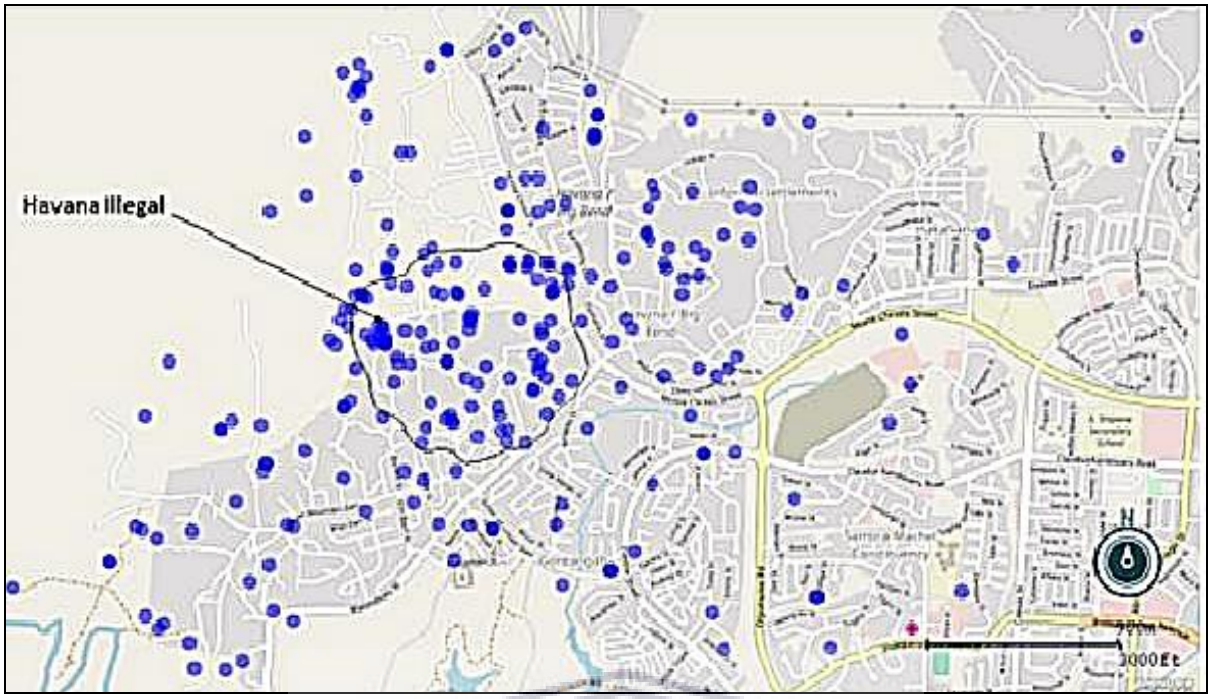

Figure 1.6: Map of the current outbreak of hepatitis E cases (blue dots) in the Havana informal urban settlement (Ministry of Health and Social Services, 2018).

In addition to the provision of education, various stakeholders have embarked on a joint collaboration. These include the Ministry of Agriculture, Office of the Prime Minister, Namibia Institute of Pathology (NIP), WHO, UNFPA, UNICEF, Centre for Disease Control & Prevention (CDCP), Red Cross Society, Ministry of Information, Communication and Technology, Coca Cola Company, media houses, Office of the Governor and Regional Council for the Khomas Region and the Ministry of Education. This joint collaboration creates an opportunity for a multi-sectoral approach to effectively addressing the poor WASH conditions in the Havana informal urban settlement and the hepatitis E outbreaks (Ministry of Health, 2018).

The Namibia National Health Emergency Management Committee has been established as a continuing intervention to combat the hepatitis E outbreaks, by coordinated response interventions that are structured around key thematic areas such as coordination, surveillance, case management, social mobilisation and WASH.

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1.3.2 Gaps

The CLTS approach was only implemented in rural settings creating a gap in the urban settings such as the Havana informal urban settlements. In addition, the National Sanitation Communications Strategy has not achieved its objectives of effectively delivering WASH services at all levels, by creating a gap and backlogs in the country's initiative to combat open defecation and other WASH-related challenges (UNICEF, 2015). Although Namibia met its Millennium Development Goal 7 on increasing improved and safe drinking water to urban areas by 99%, a proportion of people, especially those living in informal urban settlements, are still without access to basic sanitation (National Planning Commission, 2013).

The link between diseases and levels of poor WASH conditions in informal urban settlements are not well documented or sufficiently studied, which is another gap, preventing successful interventions. In addition, the lack of evidence on poor WASH conditions makes it difficult to source the required resources to address key WASH issues and to ensure the demand for a WASH intervention by communities. It is for this reason that this study aims to address the poor conditions of water, sanitation and hygiene in an informal urban settlement in Windhoek, Namibia.

The City of Windhoek does not have sufficient resources and capacity to cope with the accelerated growth of the Havana informal urban settlement community who lives in poor WASH conditions. The City of Windhoek does not know the extent to which informal urban settlements have access to drinking water, sanitary facilities and hygienic practice. There is thus a gap in their knowledge (McFarlane, Desai & Graham, 2014). The education sessions on good hygiene that are currently being conducted by the City of Windhoek are limited to the informal vendors' outlets or markets. The rest of the Havana informal urban settlement, especially among the illegal occupants in uncontrolled sprawls, are not being reached, which is creating a vacuum in addressing the poor WASH conditions (City of Windhoek, 2018). In addition to this, the City of Windhoek further claims that despite their efforts to set up communal toilets, they are facing challenges of vandalism, water wastage and the theft of sanitation equipment (Kahiurika, 2019). To close this gap and to improve on the establishment of adequate WASH conditions in the Havana informal urban settlement, further WASH interventions need to be introduced that focus on meeting the needs of vulnerable and poor communities.

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1.4 Problem statement

The link between limited community health education and poor health has been well documented and proved to be an effective strategy for addressing the outbreak of diseases owing to poor access to safe water, inadequate sanitation facilities and inadequate hygiene in the informal urban settlements (Doyle, Ward & Early, 2018). However, many countries have difficulty providing community health education to communities in their informal urban settlements, leaving these communities at risk (Sharma, 2016). Community health education is a combination of learning experiences designed to help individuals and communities improve their health, aimed at increasing their knowledge of WASH and influencing their attitudes and behaviour about personal hygiene and sanitation. The informal urban settlement community members learn to promote, maintain and restore their health and develop positive attitudes aimed at changing behaviour.

Many community health educators believe that rather than use persuasion in public health communication, It is best to work with informal urban communities to develop problem-solving skills and provide information to help them make informed choices (Bhagat, Howard & Aldoory, 2016). Community health education strategies underscore an informed decision-making approach emphasising active community participation and empowerment. The strengthening of participatory and representative decision-making of informal urban settlement dwellers through community health education will promote individual and community action towards good health. Sharma (2016) further emphasises that community health education is an important factor in ensuring significantly improved health outcomes and calls for the development of appropriate action plans to promote healthy living conditions, especially in informal urban settlements.

The provision of community health education to dwellers in the informal urban settlement provides the foundation on which communities are enabled to play an active role in improving their own WASH conditions (Graham & White, 2016). Community health education and information-sharing is key to any interventions for achieving improved WASH conditions and aims to enable communities to urge the Namibian government to fulfil their responsibilities in addressing health and health equity for informal urban settlements. The dissemination of relevant WASH information, through community health education, will also

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encourage positive behavioural change and willingness to sustain WASH intervention projects in the informal urban settlements (Ohwo & Agusomu, 2018).

In summary, there is a need to develop and implement appropriate interventions to promote community health education by improving the knowledge, understanding and capacity of informal urban settlements in Windhoek in respect of WASH so that these communities may support the social, economic and environmental determinants of good health.

1.5 Outline of the thesis

The thesis consists of nine chapters.

Chapter 1 introduces the thesis by detailing the prevalence of poor WASH conditions in the Havana informal urban settlement. It provides the background information that situates the study in the specific context of WASH, the current interventions and identified gaps, and explains the problem statement, rationale and significance of the study.

Chapter 2 reviews the existing knowledge of WASH and its impact on resource-constrained poor countries such as Namibia. The chapter further highlights the need for WASH education and interventions, such as the promotion of community health education.

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Chapter 3 presents a scoping review of known interventions for addressing the particular, identified poor water, sanitation and hygiene conditions in resource-constrained settings and developing countries.

Chapter 4 provides the formulation of the research question and the aim and objectives of the study. A description of the study setting is presented, followed by the participatory action research study design and an overview of the four phases of the study.

Chapter 5 presents the findings of the situation analysis of the living and WASH conditions in the Havana informal urban settlement.

Chapter 6 presents the implementation of a Participatory Action Research (PAR) approach to address the poor WASH conditions in the Havana informal urban settlement of Windhoek.

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Chapter 7 presents the results of Phase 3 and the rapid appraisal design that was conducted in order to determine the outcome and impact of the COMWAP that was piloted in the Havana informal urban settlement.

Chapter 8 presents Phase 4, with a validation of the findings of the three (3) phases of the study. The joint development of the action plan(s) to address the poor WASH conditions is facilitated. These chapters discuss the development of strategies and interventions to address poor WASH conditions in informal urban settlements.

Chapter 9 concludes with a summary of the chapter as well as with recommendations for future research. The study's limitations are also covered in this chapter.

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CHAPTER 2: LITERATURE REVIEW

This chapter reviews the existing knowledge in the area of WASH (Water, Sanitation and Hygiene) and its impact on resource-constrained poor countries such as Namibia, highlighting studies in water, sanitation and hygiene education and interventions, such as the promotion of community health education. The literature review of this chapter will be expounded in the next Chapter 3 with a more focused scoping review. WASH impacts positively on a number of key resources essential for community development and has been a priority on the development agenda for the last 50 years (Mackinnon, Ayah, Taylor, Owor, Sempebwa, Olago, Kubalako, Dia, Gaye, Campos & Fottrell, 2019).

This literature review addresses three broad areas related to WASH. The first is factors that affect WASH in resource-constrained poor countries. Various scholars state that WASH refers to three core components that include access to and availability of water, adequate sanitation and good hygiene (Cronin, Badloe, Torlesse & Nandy, 2015). The second area to be addressed is the impact of poor WASH conditions on resource-constrained settings, like informal urban settlements. The third area to be addressed is WASH interventions and education. Finally, the chapter presents a scoping review, which extends into Chapter 3 from articles that have been accessed from peer-reviewed journals and various electronic databases.

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2.1 WASH factors in resource-constrained poor countries

2.1.1 Water: Access, Availability and Quality

Namibia has subscribed to the United Nations' Sustainable Development Goals (SDGs). SDG 6 addresses the availability and sustainable management of water and sanitation for all, including good hygiene. The SDGs encourage access to safe water, the supply of clean drinking water and sanitation for all by 2030 (Mackinnon et al., 2019). Adams, Boateng and Amoyaw (2016) explain that the most common indicators of access to safe water are affordability, quality of the source, time, distance and volume of improved water. Access to improved water sources and safe quality of water will improve people's health especially those residing in informal urban settlements (Richmond, 2019). The 2015 MDGs' assessment shows that even though five developing regions met the drinking water goal, selected sub-

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Saharan Africa countries (SSA) (Figure 2.1) are among the regions that did not meet the goal (Armah, Ekumah, Yawson, Odoi, Afitiri & Nyieku, 2018).

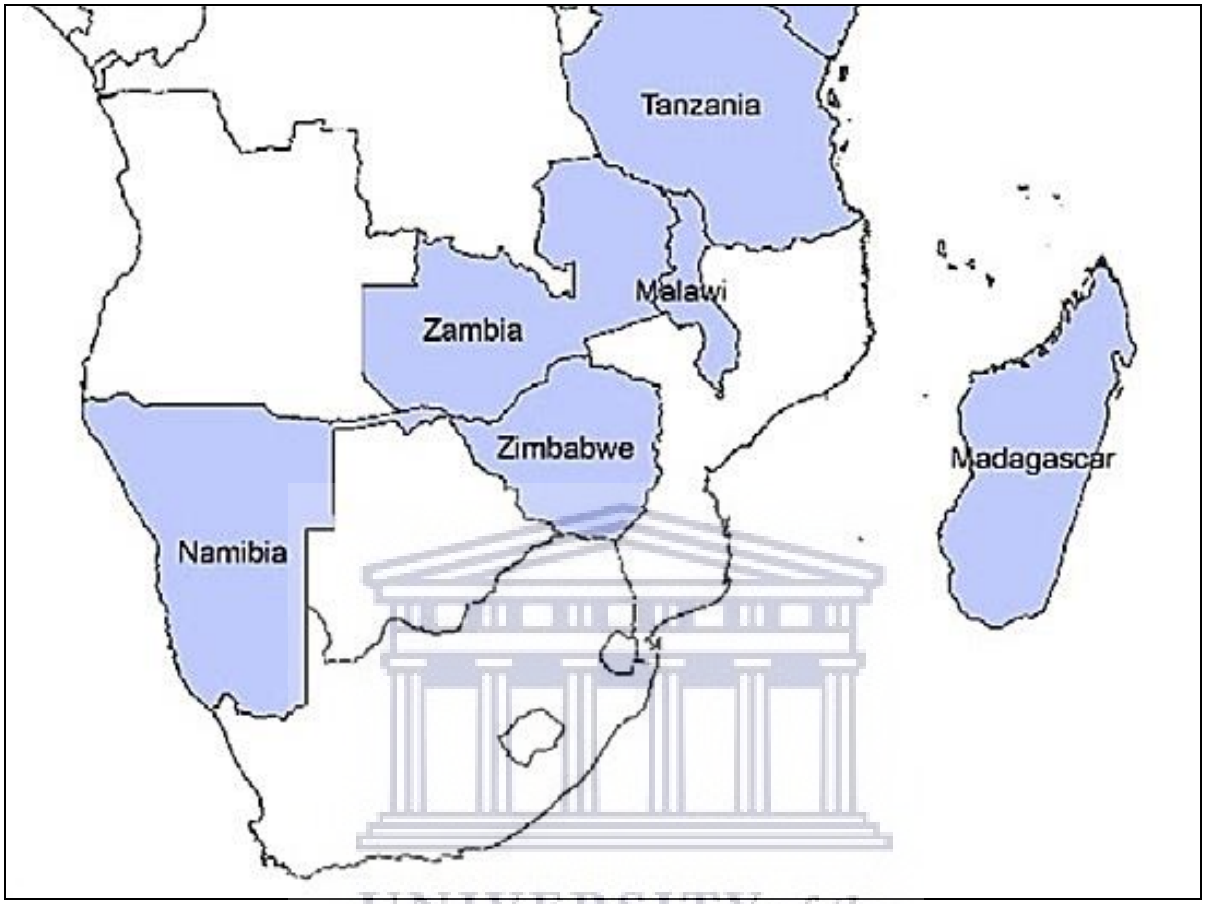

Figure 2.1: The study's selected countries in sub-Saharan Africa (Armah, et al., 2018)

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According to Osei, Amoyaw, Boateng, Boamah and Luginaah (2015), only 64% of the population in sub-Saharan African countries has access to an improved water source.

WHO and UNICEF (2017) have defined improved drinking water sources as piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater and packaged or delivered water. Although at 91%, Namibia had the highest access in sub-Saharan Africa to improved water sources during 2010-2015 (Figure 2.2), the informal urban settlements are still considered as being vulnerable and marginalised, with many who dwell in shacks with no access to improved water and sanitation (Armah, Ung, Boamah, Luginaah & Campbell, 2017). Other countries in Sub-Saharan Africa still faces a major challenge concerning access to improved drinking water.

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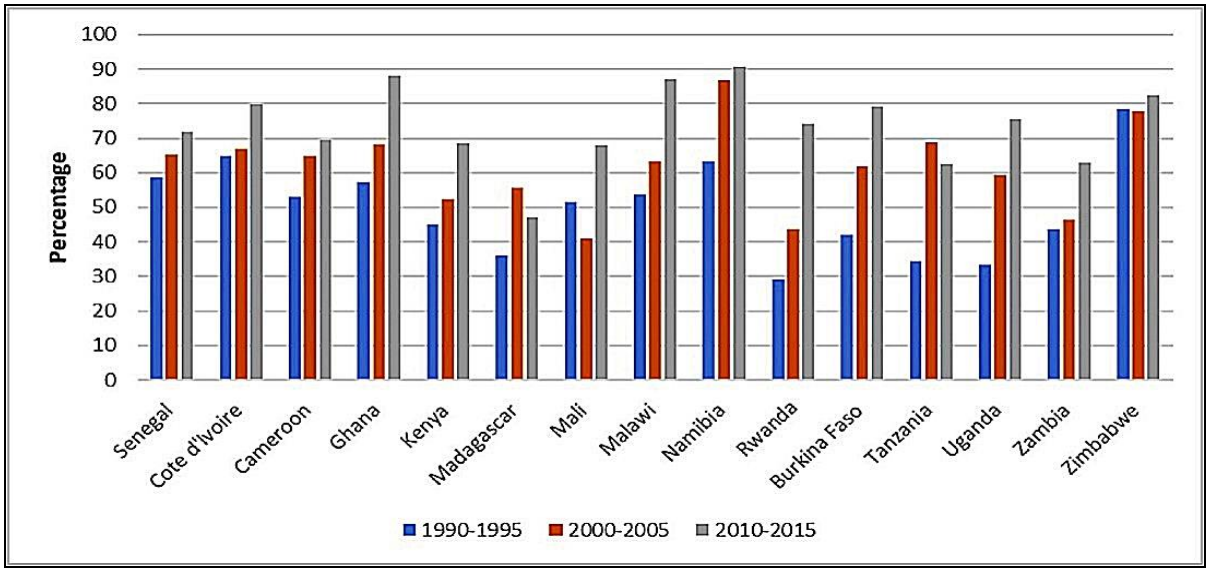

Figure 2.2: Access to improved water sources in sub-Saharan Africa (Armah, et al., 2018)

UN Habitat (2016) states that rapid urban population growth has led to an increased demand for the limited municipal water supply and improved drinking water. The continuing growth of the urban population in Windhoek and the expansion of informal urban settlements pose a daunting challenge to the City of Windhoek's municipality in their quest to ensure access to improved and affordable drinking water (Weber, 2017). Previous studies that focus on the quality of life in the informal urban settlements indicate that there are levels of absolute poverty and extreme health risks related to poor WASH conditions (Crush, Nickanor & Kazembe, 2019). Even as the demand for water intensifies in the urban areas and especially in informal urban settlements, water supply capacity is further constrained by other factors such as climate change (Adams, Williamson, Sorkness, Hatfield, Eggen & Esmond, 2017).

The environmental, social, economic and political context of sub-Saharan Africa needs to be examined in order to determine the factors that influence the access to improved and quality drinking water in informal urban settlements. Dakyaga, Kyessi and Msami (2018) claim that what is considered an improved quality of water in informal urban settlements is largely influenced by the context in which water consumers find themselves (social), the income levels of households (economic), gender (political) as well as the demand for water (environmental). Furthermore, equity in access to water should be a central principle of water policy. An example of inequity in access to water is that of women living in informal urban settlements, who are forced to walk long distances or wait in long queues because of limited water sources or points. The number of trips needed to satisfy daily water needs in informal settlements is also important to understand the full burden of time better, especially on the

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women and girls who predominantly serve as water fetchers in African societies and who often make multiple trips per day (Thompson, Porras, Wood, Tumwine, Mujwahuzi, Katui-Katua & Johnstone, 2000; Adams et al., 2017).

In addition, the access to quality water remains a challenge in sub-Saharan Africa with the discriminatory gap between the urban poor and urban rich populations (Osei et al., 2015). Thus, the mere access to improved water sources does not imply availability or reliability, nor does it guarantee that water sources are always secured for household use in the context of informal urban settlements. The daily struggles of communities in informal urban settlements in their search for drinking water must be understood in the context of an ever-increasing demand for improved water sources or points (Adams et al., 2017).

Even where quality water exists, inconsistency is seen in the supply of quality water, mostly favouring the formally planned urban areas to the disadvantage of the informal urban settlements. There is a need to understand the supply of quality water to informal urban settlements in cities such as Windhoek (Adams & Smiley, 2018).

Dakyaga, Kyessi and Msami (2018) explain that quality water is assessed through the analysis of the turbidity of the water, the colour and the odour. The quality of water is determined by and subject to quality tests, public acceptance and day-to-day domestic consumption by urban informal settlements. Although the scientific method of testing for quality is relevant for water quality analysis, the experiences and notions of acceptability of informal urban settlements of the quality of an existing water source or point also serve as standards for measuring water quality (McGranahan, Walnycki, Dominick, Kombe, Kyessi, Limbumba, Magambo, Mkanga & Ndezi, 2016). Research studies conducted by Dahyaga (2018) have shown that the surveillance of water quality is periodically done by municipal water departments, especially when there is a suspicion of the outbreak of disease in the informal urban settlements, but this does not happen on a routine basis. On the other hand, a significant proportion of water-disease outbreaks, such as hepatitis E, result from the consumption of poor quality water or water in which the quality deteriorated through the collection, handling and storage process (Agensi, Tibyangye, Tamale, Agwu & Amongi, 2019).

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More evidence also shows that the change in the water quality in many circumstances is driven by the degree of water handling, water-collection practices and in the distribution process among informal urban settlements (Dakyaga, Kyessi & Msami, 2018). Although regular cleaning of the storage containers is part of ensuring and maintaining the quality of water for domestic consumption, routine cleaning is barely done in informal urban settlements (WHO, 2011). Previous research has shown that policymakers are not always cognisant of the deep-seated infrastructural issues related to access, availability and quality of water, while national and international surveys fail to reveal the full scale of water insecurity in urban informal settlements (Tortajada, 2014).

2.1.2 Sanitation: Facilities, Practices and behaviours

The word sanitation is derived from the Latin word *Sanitas*, meaning 'health' (Thakur & Singh, 2018). The concept includes the creation and maintenance of sanitary and healthy conditions and good hygiene (Marriott, Schilling & Gravani, 2018). Sanitation is considered to be an applied science because of its importance to the protection of human health and its relationship with environmental factors, which relates to poor WASH conditions in informal urban settlements. McFarlane et al. (2014) state that sanitation is a critical constitutive part of every community and improved sanitation is core to and critical for human survival, social-economic development and an indicator of the country's development and progress. Sanitation can be defined as the promotion of good hygiene through the prevention of human contact with the hazards of waste, especially faeces, by means of proper treatment and disposal of waste (WHO & UNICEF, 2011).

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WHO and UNICEF (2017) have defined improved sanitation facilities as flush to piped sewer systems, septic tanks or pit latrines; improved pit ventilated-latrines, compositing toilets or pit latrines with slabs. According to Armah et al. (2018), WHO and UNICEF regard improved sanitation facilities as those designed to hygienically separate excreta from human contact. WHO and UNICEF illustrate the difference between improved and unimproved sanitation facilities in Table 2.1 below.

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Table 2.1: Definition of improved and unimproved facilities (WHO/UNICEF Joint Water Supply and Sanitation Monitoring Programme, 2017)

Service	Improved	Unimproved
Sanitation facilities	Flush to piped sewer systems, septic tanks or pit latrines; improved pit ventilated-latrines, compositing toilets or pit latrines with slabs.	Pit latrines without a slab or platform, hanging latrines or bucket latrines and open defecation.

Other examples of improved sanitation facilities that are used in informal urban settlements of sub-Saharan Africa include flush toilets, bucket latrines, improved pit ventilated-latrines, hanging toilets or hanging latrines, pit and composting toilets (Silvestri, Wittmayer, Schipper, Kulabako, Oduro-Kwarteng, Nyenje & Van Raak, 2018). A study that was conducted between 2010-2015 on selected countries in sub-Saharan Africa indicates that Namibia has only achieved approximately 50% (Figure 2.3) of the access to improved sanitation facilities Africa (Armah, et al., 2018).

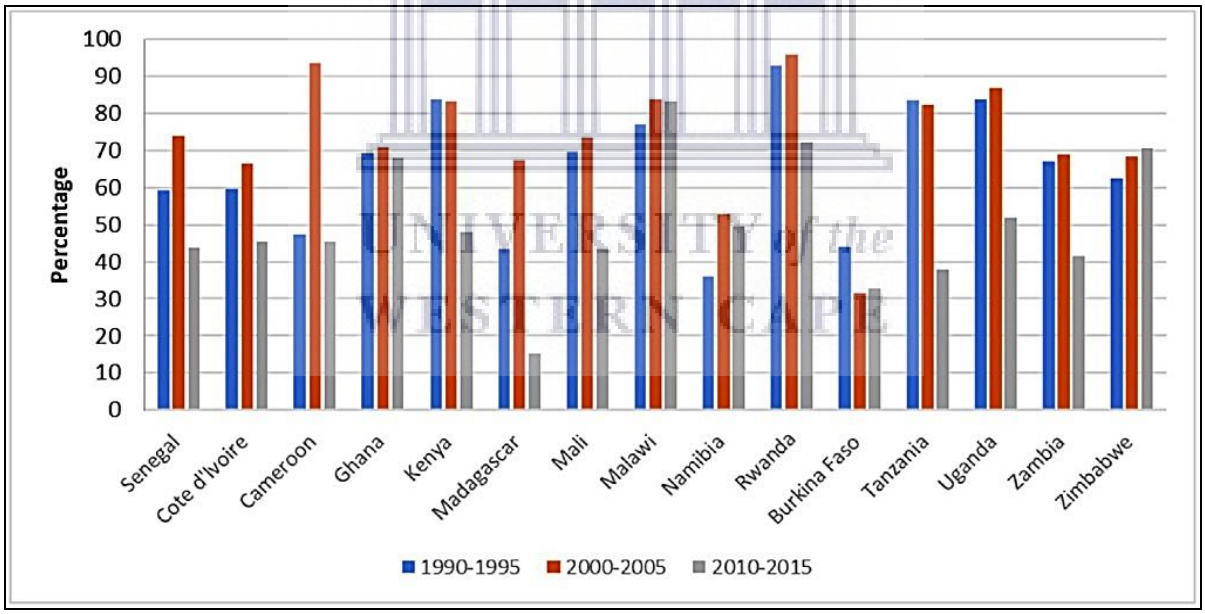

Figure 2.3 Access to improved sanitation facilities in sub-Saharan Africa (Armah, et al., 2018).

According to Armah, et al. (2018), Namibia has experienced increased access to improved sanitation facilities from 35% in 1990-1995 to 54% in 2000-2005. However, it declined to 50% in 2010-2015. The decline of improved sanitation facilities in Namibia can be attributed to mass migration and high population growth of informal urban settlements in Windhoek.

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Although the City of Windhoek provides municipal services to its residents, the urban poor who are residing in informal settlements have very limited access to improved sanitation. Mulenga, Bwalya, and Kaliba-Chishimba (2017) confirm that access to improved sanitation is more concentrated in rich households compared to the poor informal urban settlements.

The lack of improved sanitation systems and delivery influences the daily quality of life in informal urban settlements. The lack of sanitation facilities such as communal toilets in informal urban settlements leads to the practice of open defecation. Silvestri et al. (2018) state that more than 215 million people living in informal urban settlements of sub-Saharan Africa continue to engage in open defecation. The practice of safe disposal of faeces and the development of behavioural changes related to the safe disposal of faeces is critical especially for communities in informal urban settlements (Silvestri et al., 2018).

However, another study by Lewis, Siyambango and Lendelvo (2018) have shown that women who have access to shared sanitation facilities are reporting that the latrines are usually dirty, are located outside their homes and lack bathing or changing rooms. Poor sanitation practices do not only include defecation and urination, but also poor water storage, lack of handwashing, no bathing and poor menstrual management. Another study that was conducted in Namibia found that people in informal urban settlements did not feel that communal sanitation facilities offered improved health benefits (Gold & Namupolo, 2013). The researchers found that while residents were pleased to receive a sanitation unit, they lost motivation because of the amount of time they spent maintaining these toilets which then became dirty, and were perceived to have low health benefits (Chitekwe-Biti, 2018; Lewis et al., 2018).

Studies conducted in Rwanda and Uganda show that households in informal settlements share sanitation facilities owing to overcrowding and high poverty levels (Kabange & Nkansah, 2015). The households in the informal urban settlements who share sanitation facilities and excreta containment, exhibit higher exposure to WASH-related illnesses. Poor sanitation is believed to be the main cause in some 280,000 of WASH-related deaths (WHO, 2016). According to WHO and UNICEF, sanitation facilities shared among four to five households are regarded as inadequate and risky (Kabange & Nkansah, 2015). There is insufficient space for every household in informal urban settlements to build their own toilets, forcing many

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households to occupy land that is illegal with no municipal infrastructure (Karuaihe & Wandschneider, 2018; Richmond, 2019).

Poor sanitation can cause contamination through water, hands, soil, pets and flies that can affect areas where children are playing and where food is prepared and cooked (Mills & Cumming, 2016). According to the World Health Organization (WHO) (2018b), more than 2.6 billion people do not have access to adequate sanitation, which constitutes 40% of the world's population. Inadequate sanitation poses unique health risks and infections to women, including increased risk of maternal mortality from unhygienic birthing practices, poor infection control and urogenital tract infections (Shrivastava & Shrivastava, 2018). Namandje (2018) states that the pace of sanitation service delivery is very slow, especially in the informal urban settlements of Windhoek, Namibia. The poor sanitation service delivery in the informal urban settlement of Windhoek is the result of the slow allocation of affordable and serviced land. Other factors such as unemployment, the unequal distribution of resources and a lack of political will have resulted in the lack of access to proper sanitation in informal urban settlements (El-hadj, Faye & Geh, 2018).

2.1.3 Hygiene: Practices and behaviours

Zolnikov (2018) defines hygiene as behaviours that can improve cleanliness that lead to good health, such as frequent handwashing, face washing and bathing with soap and water. Ratnaprabha, Kumar and Kumar (2018) also explains that personal hygiene refers to maintaining the cleanliness of one's body and clothing to preserve overall health and well-being. Personal and home hygiene and handwashing are key elements to be considered when preparing and eating food (Marriott, Schilling & Gravani, 2018).

Mackinnon et al. (2019) conclude that improved handwashing practice leads to more effective behaviour changes and consequently to improved health outcomes. It is estimated that washing hands with soap and water could reduce diarrheal disease-associated deaths by up to 50% (Vikke, Vittinghus, Giebner, Kolmos, Smith, Castrén & Lindström, 2019). Unfortunately, the inhabitants of informal urban settlements are unable to perform essential hygienic activities such as bathing, handwashing and maintaining hygiene, owing to their poor WASH conditions and environment (Corburn & Sverdlik, 2018). In some instances, family members residing in informal urban settlements might simply dip their hands into the

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same bowl of water before eating, facilitating the spread of germs and bacteria which leads to diseases such as hepatitis E (Harrison & DiCaprio, 2018).

The hygienic practice of handwashing is influenced by the community perception of what hygienic is and what it is not. This perception of good hygiene makes handwashing an unimportant hygiene practice following the disposal of faeces, making informal settlements vulnerable to endemic outbreaks of hepatitis E, cholera and other WASH-related diseases (Center for the Advancement of Health, 2008).

A study conducted during 2017 in the low socio-economic area (informal urban settlement) of Nelson Mandela Bay, South Africa, indicated that there were poor hygiene practices despite improved water sources (Melariri, Steenkamp, Williams, Mtembu, Ronaasen & Truter, 2019). The practise of good hygiene is followed in informal urban settlements subsequent to the provision of community health education and the adoption of strong and functional policies on WASH (Pal & Pal, 2017).

2.2 The impact of poor WASH conditions in resource-constrained settings

There continues to be a high prevalence of diseases in developing countries and resource-constrained settings owing to poor WASH conditions. Research evidence shows that adverse health conditions are linked to poor WASH and tend to be exacerbated in informal urban settlements (Tsiko, 2015). WHO indicates inadequate WASH provision has caused 58% of the 842,000 annual diarrheal deaths in 2012 (WHO, 2014) and other infectious diseases (Crocker & Bartram, 2016).

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The outbreaks of hepatitis E in Namibia have been persistent since September 2017, with a total of 1,524 suspected cases and 16 deaths owing to poor WASH conditions such as poor provision of a safe supply of water and sanitation facilities to affected communities in the Havana informal urban settlement (Ministry of Health and Social Services, 2018). WHO (2018) reports in its weekly bulletin that the hepatitis E outbreaks are showing signs of increase. The increasing trend is largely attributed to reduced intensity of response interventions and lack of intense social mobilisation and community engagement. Windhoek is mostly affected accounting for over 80% of the total reported cases in the Havana informal urban settlement, followed by others like Goreangab, Hakahana and Okuryangava informal settlements (WHO, 2018).

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2.3 WASH education interventions

The World Health Assembly adopted a declaration in 2012 that WASH education had to be incorporated in all countries' agendas on community health-integrated interventions health education and promotion (Grimes, Croll, Harrison, Utzinger, Freeman & Templeton, 2015). WHO (2009) defines community health-integrated services and interventions as the management and delivery of health services so that poor communities may receive a continuum of preventive and curative services or 'one-stop-shop' support, according to their health and WASH needs. It was at WHO's Eighth Global Conference on Health Promotion in Helsinki (2014) that it was stated that health promotion practice can contribute to the prevention of endemic diseases owing to poor WASH conditions, which is not just disease-focussed but incorporates a more holistic approach to promoting health and healthy community WASH initiatives.

According to Alaazi and Aganah (2019), health promotion interventions that exemplify healthy community WASH initiatives are tailored to empowering communities, especially the most marginalised and informal urban settlements. Health promotion puts emphasis on the active engagement of informal urban settlement communities in order to generate healthy WASH-related support for social and behavioural change. Fredericks (2018) states that the approach of community health-integrated interventions, health education and health promotion are highly recommended for resource-constrained, poor countries such as Namibia. The resource constraints include, among others, financial resource constraints, inadequate human resource and skills shortages. The limited resources that are earmarked for poorer communities need to be used as efficiently as possible especially in addressing the poor WASH conditions in informal urban settlements.

Schmidt (2014) stresses the importance of assessing the negative impact of poor water, sanitation and hygiene in poorer communities. Schmidt further states the need for more research on the outcomes of community health-integrated interventions, health education and health promotion that will address the poor WASH conditions of informal urban settlements. Echazú, Bonanno, Juarez, Cajal, Heredia and Caropresi (2015) state that research on the effects of poor WASH conditions is needed to inform the improvement of current WASH conditions in the informal urban settlements. In addition, WASH interventions in poor communities with unsafe water and inadequate sanitation have shown that community health

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education and health promotion can reduce the risk of WASH-related diseases (Schmidt, 2014). WASH interventions, through community health education and health promotion, have been proven effective and important in changing health behaviours of communities (Mittelmark, Kickbusch, Rootman, Scriven & Tones, 2017).

The large-scale outbreaks of cholera in Haiti and hepatitis in South Sudan have demonstrated the absolute necessity of rapid and efficient deployment of WASH interventions through community health education (Sarwar & Sarwar, 2015). WASH interventions such as community health education and health promotion is a planned and systematically applied strategy that is designed to produce behavioural changes and improve the WASH conditions in informal urban settlements (Doyle, Ward & Early, 2018). Through health education and health promotion, community members are mobilised into action to resolve their own health issues and WASH-related problems. The quality of life of poor communities is improved through community health education, but, to be effective, community members must view their WASH conditions as pertinent to the intervention (Graham & White, 2016).

Community health education and the promotion of good health is a learning experience designed to help informal urban communities improve and maintain their health by increasing their WASH knowledge and influencing their attitudes towards reducing risky behaviour (Sarwar & Sarwar, 2015). Health education and the promotion of good health also motivate poor communities to adopt health-promoting behaviours by providing appropriate WASH knowledge and helping to develop positive attitudes.

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The Ministry of Health in Ethiopia, in collaboration with other stakeholders, has adopted a Community-Led Total Sanitation (CLTS) health education programme which was implemented in the country among poor communities. CLTS health education has assisted the communities to understand and realise the negative effects of poor sanitation and has empowered them to find solutions to their inadequate situation collectively (Crocker, Saywell & Bartram, 2017).

CLTS focuses on the change in sanitation behaviour rather than the construction of sanitation facilities and has targeted a multitude of hygiene behaviours (Azage & Haile, 2015). It is thus important to note that community health education and the promotion of health put emphasis on the need for behavioural change among the inhabitants of informal urban settlements. For instance, the change in the communities' behaviour towards faecal-contaminated environments and improvements in hygienic practices is evident because of community

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health education (Aseyo, Mumma, Scott, Nelima, Davis, Baker & Dreibelbis, 2018). Behavioural change is crucial for helping to prevent incidences of water and sanitation-related contamination. The high quality of WASH interventions has also proven to be effective in combatting diarrheal illness (Martin, Hulland, Dreibelbis, Sultana & Winch, 2018).

A recent study in Cameroon found that community health education and the promotion of good health, such as hygiene-based interventions and handwashing campaigns, might reduce the risk of diarrheal illness and other WASH-related diseases (Gorham, Yoo, Garabed, Mouhaman & Lee, 2017). Another recent study on community health education and promotion in sub-Saharan Africa investigated the impact of combining a water intervention with either hygiene education and/or improved sanitation (Roche, Bain & Cumming, 2017). The sub-Saharan study confirmed that the effect of such community health education and promotion interventions has consistently been found to be strong and effective.

Community health education can provide an opportunity for informal urban settlements to go through the stages of identifying their WASH problems and then planning and implementing possible WASH interventions (Sarwar & Sarwar, 2015). The literature shows that it is imperative that in health education and health promotion, informal urban communities are encouraged to identify their WASH problems and plan to implement and evaluate their WASH interventions. These interventions will consequently ensure the full involvement, initiatives and ownership of the community.

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McKenzie, Pinger and Kotecki (2011) state that community health education and health promotion are much more than just factual information if owned by the community because they cover all those experiences and skills that affect the way the community think and feel about their health. Community health education also motivates communities to put health education information into practice.

In conclusion, the literature review will continue in the next chapter with a focussed scoping review.

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CHAPTER 3: SCOPING REVIEW OF KNOWN WASH INTERVENTIONS

3.1 Introduction

There are about 800 to 900 million people around the world living in resource-constrained environments, such as informal urban settlements, who are affected by poor water, sanitation and hygiene (WASH) conditions (Quah, 2016). Poor WASH conditions are occurring increasingly in cities owing to mass migrations and the rapid emergence of informal urban settlements (Dos Santos, Adams, Neville, Wada, de Sherbinin, Bernhardt & Adamo, 2017).

Poor WASH conditions negatively affect the health outcomes of poor communities regionally and globally and expose them to multiple and overlapping endemic diseases. There is sufficient evidence of the negative effect of poor WASH conditions, such as acute respiratory infections, soil-transmitted helminth infections and diseases associated with chemical contamination of water (Campbell, Benova, Gon, Afsana & Cumming, 2015). The poor WASH conditions in resource-constrained settings or developing countries have increasingly become a concern to those who are affected and infected by deadly infectious diseases (Dangour, Watson, Cumming, Boisson, Che, Velleman & Uauy, 2013).

According to the World Health Organization (WHO) and United Nations Children's Fund (UNICEF), issues affecting water, sanitation and hygiene (WASH) in resource-constrained settings need to be studied within the context of informal urban settlements (WHO, 2017; UNICEF, 2017). This study explored tentative and confirmed linkages between poor WASH conditions in resource-constrained settings and related barriers to addressing the poor WASH conditions by scoping review methods. Results from previous scoping reviews and Cochrane reviews show that most of the WASH interventions were found to reduce the levels of poor WASH conditions significantly in resource-constrained settings or developing countries (Fewtrell, Kaufmann, Kay, Enanoria, Haller & Colford, 2005).

This scoping review explored the barriers to and bridges for addressing the poor WASH conditions in resource-constrained settings or developing countries (Dangour, Watson, Cumming, Boisson, Che, Velleman & Uauy, 2013).

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3.2 Methods

3.2.1 Study design

Scoping reviews are exploratory projects that systematically map the literature available on a topic, identifying the key concepts, theories, sources of evidence and gaps in the research. This study was guided by the Arksey and O'Malley framework for conducting scoping reviews (Arksey & O'Malley, 2005; Tricco, Lillie, Zarin, O'Brien, Colquhoun, Kastner & Kenny, 2016).

3.2.2 Study stages

The scoping review was divided into three stages: Search strategies and selection process; study selection; data extraction and charting (Joanna Briggs Institute, 2015; Peters, Godfrey, McInerney, Soares, Hanan & Parker, 2015). These stages are outlined below.

3.2.2.1 Stage 1: Search strategies and selection process

The search strategy followed the three-step process recommended by the Joanna Briggs Institute which consists of a preliminary search of online databases and potentially relevant text words in the titles and abstracts of the most pertinent papers and a process of checking the reference lists of all identified reports and articles for additional studies (Joanna Briggs Institute, 2015).

- *Step 1 - Search of online databases*

At least seven online databases were searched through, namely EBSCOhost, PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Medline/MeSH 2017, Google Scholar, Cochrane, health source databases and a manual search. The search strategy was developed with the assistance of a librarian specialised in systematic and scoping reviews (Morris, Boruff, & Gore, 2016), using keywords related to the following key terms and phrases, which were Interventions AND (Poor AND Water AND Sanitation AND Hygiene) AND *conditions* AND (*developing countries *).

- *Step 2 - Potentially relevant text words/keywords*

The text words and keywords contained in the title and abstract of retrieved papers were analysed. The time covered the period from 2000 to 2017 with an English language limit. The search strategy was underpinned by key inclusion criteria for qualitative research broadly known by the acronym PICO (Population - phenomena of Interest – Context) recommended by the Joanna Briggs Institute for scoping reviews (Joanna Briggs Institute, 2015). The reviewer defined the PICO inclusion criteria as follows:

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- Population: Communities living in resource-constrained settings, such as informal urban settlements.
- Phenomena of Interest: Poor WASH conditions and experiences.
- Context: Studies in resource-constrained settings or developing countries (and sub-Saharan Africa region).

When the paper was not explicit enough about the PICO criteria, some authors were contacted through the Research Gate website (www.researchgate.net) to obtain relevant information. Non-English articles and papers were excluded owing to time constraints.

The study reached data saturation as an act of serendipity to accomplish new research directions and producing results that improve the quality of life of poor communities (Erdelez, Heinström, Makri, Björneborn, Beheshti, Toms & Agarwal, 2016). Data saturation was achieved following the search for 10-45,500 articles and articles containing relevant keywords/keywords, and the selection and evaluation of 79 articles, as shown in Table 3.1 below. Other eligible items were not included in the presentation of results, as no new data was presented previously, but had repetitive content (Saunders, Sim, Kingstone, Baker, Waterfield, Bartlam & Jinks, 2018).

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Table 3.1: Search term used and number of articles identified

Database	Keywords	References Identified	Selected
Health Source	Interventions AND (Poor AND Water AND Sanitation AND Hygiene)AND *conditions* AND (*developing countries *)	1955	1
Medline	Interventions AND (Poor AND Water AND Sanitation AND Hygiene)AND *conditions* AND (*developing countries *)	8858	10
Google Scholar	Interventions AND (Poor AND Water AND Sanitation AND Hygiene) AND *conditions* AND (*developing countries *)	45500	20
Cochrane	Interventions AND (Poor AND Water AND Sanitation AND Hygiene) AND *conditions* AND (*developing countries *)	10	3
PubMed	Interventions AND (Poor AND Water AND Sanitation AND Hygiene) AND *conditions* AND (*developing countries *)	4566	7
CINAHL	Interventions AND (Poor AND Water AND Sanitation AND Hygiene) AND *conditions* AND (*developing countries *)	1458	2
EBSCO	Interventions AND (Poor AND Water AND Sanitation AND Hygiene) AND *conditions* AND (*developing countries *)	3913	26
Manual search	Using titles related to interventions and poor water sanitation hygiene and developing countries	10	10
Total			79

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- *Step 3 - Checking the reference lists*

All identified reports and articles for additional studies related to the keywords were checked off in a reference list, as illustrated in Table 3.1. The grey literature searches were also undertaken to identify any non-indexed literature of relevance to this review. The review team also searched the reference list of the papers identified through the database search.

3.2.2.2 Stage 2: Study Selection

The study selection was implemented after a WASH article had been selected through a three-stage process, once it had been retrieved from the literature search. Firstly, all titles were screened; secondly, the abstracts were screened; and thirdly, eligible articles were identified for full-text retrieval.

The review of titles and abstracts was carried out by three reviewers, who included the lead reviewer, co-reviewer and an editor, who determined eligibility for the study. Any disagreement regarding paper selection was resolved through discussion or consultations with the co-authors. During this stage, the three reviewers explored and engaged more deeply with relevant WASH literature for title and content eligibility. This process assisted the reviewers to get new information that was fed into the study identification phase (Glonti, Cauchi, Cobo, Boutron, Moher & Hren, 2017).

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3.2.2.3 Stage 3: Data extraction and analysis

The lead reviewer collected and sorted key pieces of information from the abstracts of the selected articles. The two co-reviewers assisted the lead reviewer in the title screening, abstract screening and full article review. The data were extracted from the large quantity of published research literature reviews, which included some standard information such as author, year of publication, study objectives and additional information (Sikweyiya, Nduna, Khuzwayo, Mthombeni & Mashamba-Thompson, 2016). A draft charting form (see Figure 3.1) was developed at the protocol stage to aid the collection and sorting of key pieces of information from the selected articles.

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1. Bibliographic information
- Study ID
- Article title
- Extracted by
- Checked by
- Type of publication (journal article, book chapter, grey literature)
- Country

2. Researcher details
- Authors and affiliations (list as presented on paper)

3. Aims and methods
- Study aims/objectives
- Methodology
- Methods

4. Scoping review PICO
- Population
- Phenomenon of Interest
- Context

5. A priori themes (does the paper report data relating to the following?)
- Social difficulties around poor WASH conditions
- Reducing harms associated with poor WASH conditions
- (eg, endemic diseases/safety)
- Early interventions to address poor WASH conditions
- Changes to settings/environments
- Participatory approaches
- Sustainable approaches
- Evaluability

6. Emergent themes (does the paper report on any further issues not related to WASH conditions that might be of interest to this review?)

7. Outcomes reported

Figure 3.1: Data Extraction form

The data extraction form included a category for reviewers to record emergent themes that were discussed and refined during review team meetings. The data were extracted from the selected articles and organised into a table (see Table 3.2). The table was developed using the characteristics of the included studies, containing a summary of the characteristics of the participants, interventions, study objective, outcomes and other relevant information (Grant & Booth, 2009).

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Table 3.2: Characteristics of included studies

Author(s)	Year	Countries	Population target	Interventions	Study objective	Outcomes
Alam et al.	2016	Bangladesh	urban slum residents	Developed sanitation behaviour, changed messages and low-cost hardware targeting practical actions	To develop behaviour change to support shared toilet maintenance and user satisfaction	A designed WASH intervention package
Okurut et al.	2015	East Africa, Uganda	informal urban settlements	Team re-emphasised attempt to change peoples' behaviours for improved sanitary practices and facilities in low-income informal settlements	To Assess demand for improved sanitation	A multi-disciplinary research team
Tessema et al.	2017	Ethiopia	Peri-urban/village	Implemented CLTSH approach	To assess the implementation of a community-led initiative	CLTS has increased
Waddington et al.	2009	35 developing countries	Poor urban and peri-urban communities	Sustainable behavioural change on improved sanitation	To evaluate the impact of water, sanitation and/or hygiene	Sustainable and more effective water point-of-use
Pittet	2005	Karachi, Pakistan.	low-income urban population	Water supply, water quality treatment	To determine the effect of hand-hygiene promotion on infectious diseases in a low-income population	Hand-washing with soap

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Table 3.2: Characteristics of included studies (Continued)

Author(s)	Year	Countries	Population target	Interventions	Study objective	Outcomes
Guiteras et al.	2014	Bangladesh	Informal urban settlements	Sanitation strategies that could be adopted and driven by communities and stakeholders	To measure the effect of alternative policies on investment in hygienic latrines	Ecosan is a communally managed solution
Munamati et al.	2016	Sub-Saharan Africa	Landless poor communities	Provided subsidies to landless poor for communal latrines	To establish the key determinants of sanitation success of sub-Saharan Africa	Appropriate policies and interventions to improve sustainable sanitation access in post-2015
Sijbesma et al.	2009	Bangladesh, Burkina Faso, Sri Lanka, Zimbabwe, Niger	Urban population and informal urban populations	Improved sustainable sanitation access and handwashing	To explore how reductions of key sanitation and hygiene risks are measured	Complete abandonment of open defecation
Mubarak et al.	2016	Kabul, Afghanistan	Poor urban and peri-urban communities	Hygiene promotion	To evaluate the prevalence of hygienic practices	Improved sanitation and hygienic practices
Clasen et al.	2007	Low-income countries	Urban slum dwellers	Increased access to potable water, encouraged the use	To assess the effectiveness of improving the microbial quality of drinking water	Improved quality of drinking water

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Table 3.2: Characteristics of included studies (Continued)

Author(s)	Year	Countries	Population target	Interventions	Study objective	Outcomes
Clasen	2015	Developing Countries	Adults and children in poor settings with endemic diarrhoeal disease	Good hygiene practices, clean water storage, improved sanitary practices, consistent water supplies	To summarise the evidence of the effectiveness of HWTS interventions to prevent diarrheal diseases.	Improved water safety/storage and reliable water supplies
Garn et al.	2017	India	Poor urban communities	Household water treatment and safe storage	To determine the impact of sanitation interventions on latrine provision	Attained sanitation access
Taylor et al.	2015	low or middle-income countries	Poor urban communities	Boiling, filtering, or chlorinating water	To evaluate the impact of WASH interventions to control cholera	A robust impact study that evaluated a wider array of WASH interventions
Fewtrell et al.	2005	Developing countries	Communities in poor resource settings	Total Sanitation Campaign: latrine subsidy/provision, sanitation education, community-led total sanitation	To identify peer-reviewed articles that presented WASH interventions that measured diarrhoea morbidity	Significant reduction risks of diarrhoeal illness

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Table 3.2: Characteristics of included studies (Continued)

Author(s)	Year	Countries	Population target	Interventions	Study objective	Outcomes
Sanusi	2010	Nigeria	Urban fringe (informal urban) settlement	Wearing shoes, Handwashing before eating and after defecating, Piped water access	To investigate the supply of water and sanitation facilities in urban settings	Improved access to clean drinking water
Strunz et al.	2014	Ethiopia, Morocco, India, Nigeria, Uganda, Salvador, Brazil	Poor urban communities	Hygiene practices	To investigate the relationship between WASH interventions and soil-transmitted helminth (STH) infection	Significant reduction of soil-transmitted infections
Rusca et al.	2017	Lilongwe, Malawi	Low-income urban neighbourhood	Implemented development projects that produced water-intensive provision	To conduct an in-depth examination of hygiene practices	Water-intensive hygiene practices are consistently undertaken by residents

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Table 3.2: Characteristics of included studies (Continued)

Author(s)	Year	Countries	Population target	Interventions	Study objective	Outcomes
Banana et al.	2015	Chinhoyi, (Zimbabwe), Kitwe (Zambia), Blantyre (Malawi), Dar es Salaam (Tanzania)	Poor urban communities, shack/slum dwellers, informal urban	Consistent handwashing with free distributed soap	To explore how poor communities support innovative pro-poor city-wide sanitation strategies	Sanitation deprivations have been addressed
Piper et al.	2017	Low and middle-income countries, developing countries, Karachi (Pakistan), India	Poor communities, children younger than 18 years of age	Water supply, water quality, handwashing and hygiene practices, safe water storage containers, improved water and sanitation infrastructure	To assess the effect of WASH interventions to improve water quality and supply	Significant reduction risks of diarrhoeal diseases

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The method known as ‘Data synthesis’ (Arksey & O'Malley, 2005) was used to synthesise the results. During data synthesis, the reviewers examined each WASH concept to identify context, mechanism and outcome components. The researcher aimed to arrive at a new and enhanced understanding of the WASH phenomenon (Colquhoun et al., 2014), which could inform the scoping review to use the WASH intervention that could lead to improved outcomes. A thematic analysis of the WASH study was carried out by conducting an overview of all the reviewed data and discussing the process and results of the data synthesis. The studies provided in Table 3.2 were used to determine what outcomes had been examined in the studies. Arksey and O’Malley (2005) process was followed for the content analysis of the selected papers. During this process, it was determined that improved water, sanitation and hygiene (WASH) practices have become evident through behavioural change interventions. The Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) was adopted as a framework to affirm that behavioural change interventions may sustain improved water, sanitation and hygiene (WASH) practices (Dreibelbis, Winch, Leontsini, Hulland, Ram, Unicomb & Luby, 2013).

The IBM-WASH model aims to provide both a conceptual and practical tool for improving understanding of the multi-level and multi-dimensional factors that influence water, sanitation and hygiene practices in conditions in resource-constrained settings or developing countries (Hulland, Martin, Dreibelbis, Valliant & Winch, 2015). This model consists of three dimensions: contextual factors, psychosocial factors and technology factors, which operate on five levels, namely structural, community, household, individual and habitual (Dreibelbis et al., 2013). The reviewers identified and analysed the drivers of poor WASH-behaviour data according to the three main dimensions (contextual, psychosocial and technology) and the five levels of the IBM-WASH-framework, as presented in Table 3.3.

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Table 3.3: The Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH)

Levels	**Contextual factors**	**Psychosocial factors**	**Technology factors**
Societal/Structural	WASH Policy and regulations	Cultural identity	National policies and promotion of WASH products/infrastructure
Community	Access to WASH resources (such as water for handwashing or water treatment)	Shared values related to water, sanitation, hygiene and handwashing practices	Collective ownership of resources and facilities
Interpersonal/Household	Household structure(such as sanitary facilities)	Aspirations to influence positive WASH practices	Sharing of access to products (such as Having soap or water for handwashing)
Individual	Health education and WASH-related training	Knowledge, belief, attitude, traditions and the perceived threat of illness such as diarrhoeal disease	The perceived cost of sanitary infrastructure
Habitual	Opportunity for positive behaviour (such as to practice improved WASH behaviours) and/or barriers towards bad behaviour repetition	Existing WASH-related habits and outcome expectations	Ease/Effectiveness of routine use of WASH products and infrastructures/facilities

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3.3 Results

The reviewers followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart for systematic reviews (Peters et al., 2015). The search strategy results are displayed in the scoping review flowchart outlined in Figure 3.2. The screening of the 79 articles was conducted by the three reviewers and completed in three stages: screening by title; screening by abstract and reading the full text. The reviewers identified 19 articles for inclusion in the review process.

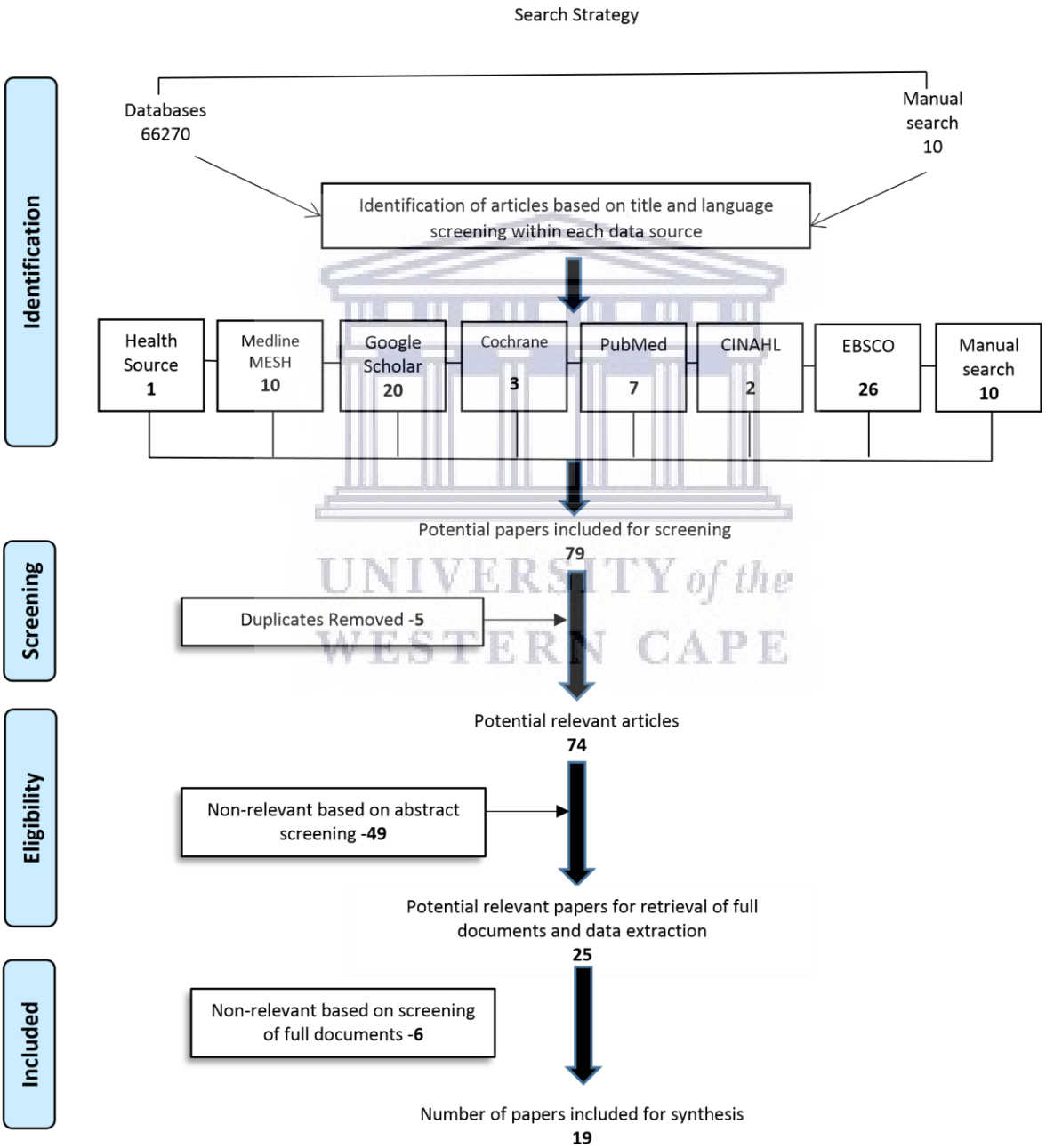

Figure 3.2: Article screening process based on PRISMA protocol (Peters et al., 2015)

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The electronic and manual search strategies initially yielded 74 papers after duplicates were removed. Twenty five papers were selected after examination of titles and abstracts. Nineteen met the inclusion criteria and were finally selected based on an examination of their full content.

3.3.1 Description of selected studies

From the selected studies, three levels of WASH interventions were developed: the individual level, the community level and the policy level, as displayed in Table 3.4. The WASH interventions are diverse in approach according to the selected and included: improvements in the following:

- water access, such as water quality, water quantity and distance to water;
- sanitation access, such as access to improved latrines, building ventilated-latrine maintenance and faecal sludge management; and
- hygiene practices, such as hygiene education, handwashing before eating and/or after defecation, water treatment, soap use, wearing shoes and water storage practices (Strunz, Addiss, Stocks, Ogden,Utzinger & Freeman, 2014).

Five types of interventions were identified by the reviewers: water quality, water supply, hygiene, sanitation and multifactorial (combination) interventions, as displayed in Table 3.4 (Piper, Chandna, Allen, Linkman, Cumming, Prendergast & Gladstone, 2017).

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Table 3.4: Level/Types of WASH interventions

Level of Interventions	Interventions	Type of Interventions
Individual	Reduced diarrhoeal illness	Water quality
	Use of water	Water supply
	Hand-washing	Hygiene
	Correct disposal of human faeces.	Multifactorial (combination)
Community	Point-of-use treatment	Water quality
	Provision of household connections/points	Water supply
	Improvements in drinking water	Water quality
	Sanitation facilities (Pit-latrines provision)	Sanitation
	Hygiene practices	Hygiene
	Healthy childcare	Hygiene
	Wastewater disposal	Sanitation
	WASH Awareness campaign	Multifactorial (combination)
	Hygiene and health education	Hygiene
	Tanker/truck-provided water	Water supply
Policy	Water supply and quality (Affordability)	Multifactorial (combination)
	Sanitation and hygiene education	Hygiene
	Treatment to water supplies	Water quality
	Source treatment	
	Hygiene education	Multifactorial (combination)
	Adequate sanitation infrastructure	Water quality
	Health Education	Water quality
		Multifactorial (combination)
		Sanitation
		Multifactorial (combination)

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Previous Cochrane reviews conducted by Clasen (2015) and Dangour et al. (2013) found that WASH interventions are defined or coded according to types or categories such as water quantity or supply improvement, water quality, sanitation intervention and hygiene intervention, as shown in Table 3.4. Literature that determined similar interventions, with reasons for their effectiveness, their target population and the circumstances of these interventions, were also searched. Each study was coded for a range of variables relating to the type of intervention, effect size and precision, internal validity relating to evaluation quality and external validity relating to context and behavioural mechanisms (Waddington & Snilstveit, 2009).

Table 3.5 shows a selected number of articles on the type of WASH-coding interventions reviewed, which included water quality (n = 3), poor sanitation facilities and behaviours (n = 5), hygienic practices (n=3), poor water supply (n=3) and other (multifactorial) poor water, sanitation and hygiene challenges (n=5).

Table 3.5: Number of studies that investigated the Type of WASH-CODING interventions

Types of WASH-CODING Interventions	Number of Studies
Water quality	3
Water supply	3
Sanitation	5
Hygiene	3
Multifactorial (combination)	5

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WASH outcomes as displayed in Table 3.6 could also be classified according to five coding categories:

- water quality, such as safe drinking water and storage, point-of-use water treatment (n = 4);
- water supply, such as sustainable and more effective point-of-use water, increased access to potable water, water shortages (n = 3);
- sanitation, such as behaviour change messages, improved sanitary practices, the building of Ecosan toilets, subsidies for communal latrines, formulation of sanitation policies (n = 4);

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- hygiene, such as good hygiene practices, handwashing, washing hands with soap before eating or after eating (n=3) and
- multifactorial (combination) interventions (n = 5).

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Table 3.6: Number of studies that investigated WASH-coding interventions/outcomes

Types of WASH-coding interventions	Outcomes	Number of Studies
Water quality	Safe drinking water and storage, point-of-use water treatment	4
Water supply	Sustainable and more effective point-of-use water, increased access to potable water, water shortages	3
Sanitation	Behaviour change messages, improved sanitary practices, the building of Ecosan toilets, subsidies for communal latrines, formulation of sanitation policies	4*
Hygiene	Good hygiene practices, handwashing, washing hands with soap before eating or after eating	3*
Multifactorial (combination)	Improved WASH practices and behaviours	5*

The asterisk * sign indicates studies related to behavioural change.

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According to the 19 selected studies in Table 3.6, WASH-related problems were mostly related to poor behaviour (n =12) and lack of services and facilities (n = 7).

Table 3.7 displays the number of selected studies that were identified that discussed the various WASH-related problems following the WASH-coding categories.

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Table 3.7: Number of studies that investigated WASH-CODING categories/problems

WASH-Coding Category	WASH Problem	Number of studies
Water	Diarrhoea, unsafe storage	3
Sanitation	Poor sanitary behaviours, lack of sanitary facilities, poor sanitation investments, shared toilets often unclean and poorly maintained, open defecation, no toilets and latrines, high morbidity and mortality worldwide	4
Hygiene	Bathing without clean water, water shortages, poor handwashing	2
Hygiene and sanitation	Poor handwashing, open defecation, unhygienic and unsanitary waste management	3
Water and Sanitation	Lack of water provision and sanitation facilities	1
Water and hygiene	Poor handwashing	1
Water, sanitation and hygiene	Soil-transmitted helminth (STH) infection, diarrhoea, poor water quality, the burden of water collection and water costs, poor handwashing, cholera	5

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3.3.2. Factors that have an impact on WASH interventions

Seven codes based on the data synthesis framework were used. These included the sifting, charting and sorting of material according to key WASH issues, themes and outcomes (Levac, Colquhoun & O'Brien, 2014). The seven codes were: water, hygiene, sanitation, hygiene and sanitation, water and sanitation, water and hygiene, a combination of water, sanitation and hygiene (see Table 3.7).

Table 3.7 presents the final set of WASH problems, issues or factors and their associations with WASH-coding categories. Table 3.6 presents the final set of WASH interventions and their association with outcomes. A large number of factors applicable to WASH issues or problems had already been identified in existing scoping reviews of barriers to and bridges for helping to address poor WASH conditions in resource-constrained settings or developing countries. However, additional interventions related to individual, community and policy

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contexts also emerged from the analysis of selected papers (see Table 3.4). It should be noted that a greater number of selected studies identifying WASH interventions were associated with behaviour change (see Table 3.6 and asterisk *). It was observed that only a small selection of studies examined WASH-related facilities and infrastructural factors without behaviour change factors (see Table 3.6). Therefore, our findings may not be generalisable in other WASH outcomes. The next discussion section (3.4) elaborates on the findings of behaviour change interventions and outcomes.

3.4 Discussion

This scoping review aimed to explore the interventions that address the WASH challenges experienced by poor communities in resource-constrained settings or developing countries. The studies reviewed seem to indicate that the implementation of behaviour change intervention among resource-constrained settings will address the WASH challenges that are experienced by poor communities, such as informal urban settlements. Findings of this scoping review were interpreted by using a data synthesis perspective to support the implementation of a behaviour change intervention—in this case, the Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) as described in Section 3.4.1 and Table 3.4 (Dreibelbis et al., 2013).

3.4.1. Towards an Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) framework

The reviewed studies indicated that the IBM-WASH framework facilitates the process of developing WASH interventions in the context of the individual or habitual levels. These individual or habitual levels can reach large sections of the community in resource-constrained settings. According to Dreibelbis et al. (2013), the individual-level focusses on variables such as knowledge, belief, attitude, traditions, perceived risk, self-efficacy and behaviour. The habitual level focusses on WASH-related habits as illustrated in Table 3.3.

The study sought to explore the individual and habitual levels of the IMB-WASH frameworks (see Table 3.3) that are likely to positively affect the WASH-intervention outcomes as presented in Tables 3.4 and 3.6. The individual at the individual level needs to draw on the psychological factors (see Table 3.3) which contribute to positive WASH knowledge and understanding about the positive influences of human behaviour on WASH conditions. The behaviour of individuals at the individual level is influenced by their

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knowledge, beliefs, attitudes and traditions concerning the poor WASH conditions (Assefa & Kumie, 2014). The behaviour of the individual at the habitual level can have a positive environmental impact in the context of their WASH conditions (Kurz, Gardner, Verplanken & Abraham, 2015).

The IBM-WASH framework calls for the inclusion of contextual (or environmental) and technological factors at the individual and habitual levels, that may positively influence an individual's behaviour, especially in poor settings that lack basic infrastructure (Lilje, Kessely & Mosler, 2015).

Finally, this review revealed that factors related to WASH problems (Table 3.7) call for interventions such as the Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) framework. It was concluded that the IBM-WASH framework provides a simple, adaptable tool for understanding WASH behaviour and habit formation that is informed by existing theoretical insights at multiple levels and dimensions, such as the individual and habitual levels (Dreibelbis et al., 2013). In this scoping review, it emerged that the IBM-WASH framework, in the context of the individual or habitual levels, may generate a lasting and sustainable solution towards positive attitude and improved behavioural change.

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3.4.2 IBM-WASH framework influence on sustainable behavioural change

The scoping review determined that an IBM-WASH framework is an effective tool for sustainable behavioural change among poor communities who are settled in resource-constrained settings or developing countries. The IBM-WASH framework provides a deeper understanding of the factors that influence positive behaviour that could be sustainable and beneficial in such settings.

The study concluded that awareness and WASH education can foster behavioural change at the individual and habitual levels of the IBM-WASH framework (see Table 3.3). Other studies have confirmed that health promoters continually invest in behaviour-change interventions, such as the IBM-WASH framework, that focus on sustainable behaviour-change approaches by empowering communities to gain more control over healthy lifestyle decisions (Laverack, 2017).

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According to the 19 selected studies, as per PRISMA protocol (see Figure 3.2), the WASH-related problems were mostly related to poor behaviour (n =12) and lack of services and facilities (n = 7). The improvements in sustainable WASH behaviour or health behaviour change are the most important bridges for combatting WASH-related challenges because sustainable WASH behaviour and appropriate facilities will reduce the risks of WASH-related diseases (Assefa & Kumie, 2014). Also, the characteristics of the included studies (Table 3.3) demonstrate that safe WASH-related behaviour that is inter-linked with WASH facilities is more effective in reducing WASH-related challenges and poor conditions (Dube & January, 2012).

3.4.3 IBM-WASH framework influence on implementation and intervention outcomes

According to selected studies (see Table 3.2 and Table 3.6), WASH interventions such as the IBM-WASH framework do ensure positive and long-lasting outcomes especially for poor communities who are settled in resource-constrained settings or developing countries.

3.4.4 Originality of the Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) framework

Several studies have recommended the Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) framework as a tool for reducing WASH-related health risks in resource-constrained settings or developing countries (Otiwaa-Borketey, 2017). Previous findings indicate that IBM-WASH as an intervention has supported the development of new norms and original approaches around sustainable WASH behaviour across multiple levels (Bartram & Cairncross, 2010; Dreibelbis et al., 2013; McMichael & Robinson, 2016). The IBM-WASH framework assisted the reviewers to obtain a better understanding of multi-level and multi-dimensional barriers/bridges that sustained WASH interventions in resource-constrained settings or developing countries (Alemu, Kumie, Medhin, Gebre & Godfrey, 2017). The findings from the synthesis of data showed that the Integrated Behavioural Model (IBM-WASH) is an ideal framework to address poor water, sanitation and hygiene conditions in resource-constrained settings or developing countries.

3.4.5. Strengths and limitations

The selected studies showed that the strength of the IBM-WASH model lies in its integrated response to key WASH issues that have been identified as barriers in resource-constrained settings or developing countries. The strength of the IBM-WASH framework is found in

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exploring multi-level and multi-dimensional barriers and bridges of WASH intervention. By using the PICO inclusion criteria, the reviewers identified a number of strengths that support IBM-WASH. These are identifying target audiences; describing the benefits that will be offered by improved WASH behaviour; and creating WASH interventions that influence or support the desired behaviour change among communities in resource-constrained settings or developing countries (Hulland et al., 2015; Nizame, Nasreen, Halder, Arman, Winch, Unicomb & Luby, 2015).

The selection of studies was limited to only English language articles and papers owing to time constraints and language barriers. The findings may not be generalised in many settings, as the study focussed only on resource-constrained settings or developing countries. Although it was possible to categorise the levels and types of WASH intervention (Table 3.4 and 3.5), it was not possible to prove linkages between the type of intervention with the IBM-WASH framework owing to the lack of appropriate literature.

3.4.6. Lessons learned

The selected studies in this scoping review illustrate several important lessons in fostering long-term sustainability of WASH interventions and implementation in resource-constrained settings or developing countries. These indicate that WASH interventions may include the following:

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- maintaining a strong fit between core WASH intervention elements and existing socio/cultural and community practices;
- creating supporting structures between WASH interventions and poor environmental settings;
- fostering community dialogue about the WASH interventions on a daily basis; and
- enhancing the poor community's capacity to readily integrate WASH interventions with existing practices that can support the sustainability of the intervention (Iwelunmor, Blackstone, Veira, Nwaozuru, Airhihenbuwa, Munodawafa & Ogedegbe, 2015).

The scoping review proved to be a complex, time-consuming and challenging method for undertaking a research agenda. The process required a critical mindset to ensure that reviewers select the appropriate articles to inform the outcome of the study.

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3.5 Conclusion

The findings from the scoping review confirmed that behavioural WASH interventions should address the poor water, sanitation and hygiene (WASH) conditions in resource-constrained settings or developing countries. The IBM-WASH framework is a multi-level, cross-dimensional approach and a practical tool towards sustained WASH interventions. More research and scoping reviews are needed that will focus on WASH interventions that are related to change behaviour. These interventions can be explored, selected and compared to other behaviour change frameworks or models and not just limited to the IBM-WASH framework. The results of the scoping review indicate that there is a need to consider WASH interventions that address multi-level factors.

In conclusion, the scoping review established a background and basis for the next chapter, which continues with the description of the research study methodology and study design.

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CHAPTER 4: METHODOLOGY

The current chapter starts with a formulation of the research question and the aim and objectives of the study. A description of the study setting is presented, followed by the participatory action research study design and an overview of the four phases of the study. The tools for data analysis are described, guided by the World Health Organization's (WHO) conceptual framework of Healthy Cities that underpins the study. This framework is discussed extensively in Chapter 6. A Healthy City aims to prioritise the health and well-being of communities in urban settings by focussing on multiple and co-existing social and environmental determinants of health, rather than on individual diseases (WHO, 2015). The WHO framework of Healthy Cities strengthens the participatory, equitable and inclusive process that is evident throughout the four phases of the study. Overall, the conceptual framework referenced the key concept or principle of participatory action research (PAR) that has been applied in this study.

4.1 Research Question

The overall question of the research study is as follows:

What interventions and participatory action research processes could address the identified WASH conditions in a poor, under-resourced informal urban settlement in Windhoek Namibia?

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4.2 Aim and Objectives

The study aimed to address the poor WASH conditions in the Havana informal urban settlement in Windhoek, Namibia through a participatory process.

The objectives of the study were:

1. To review interventions for addressing poor WASH conditions in developing countries (Phase 1a).
2. To describe WASH conditions in the Havana informal settlement and explore interventions that would improve conditions (Phase 1b).
3. To Implement a Participatory Action Research (PAR) approach as a means to address poor WASH conditions in the Havana informal urban settlement of Windhoek (Phase 2).

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4. To test the Community WASH Action Plan (COMWAP) as a pilot in the Havana informal urban settlement as a trial run for a refined WASH intervention (Phase 3a).
5. To evaluate the impact of the Community WASH Action Plan (COMWAP) activities through a rapid appraisal design for improvement, effectiveness and/or informed decisions about future WASH programming (Phase 3b).
6. To validate the findings generated from the three phases of the study during a feedback session (Phase 4a).
7. To facilitate a joint action plan by developing WASH guidelines and a training manual for WASH peer educators and health promoters residing in informal urban settlements (Phase 4b).

4.3 Description of Research Setting

The setting for the study was the informal urban settlements of the suburb of Katutura in the City of Windhoek, Namibia. There are 43 informal urban settlements, with Havana informal settlement being the biggest. People who have occupied an area of land without the explicit permission of the owner (City of Windhoek) and built their houses with metal sheets (Van Asperen & Zevenbergen, 2007) establish the informal urban settlements. In Namibia, most of the informal urban settlements are neglected in terms of the supply of basic services such as the provision of quality drinking water, sanitary facilities and hygiene education. Tjitemisa (2013) and Kohima (2016) estimated that 30 % of more than 350 000 residents of Windhoek live in informal urban settlements; thus an estimated population of 105 000. The overcrowding and sprawling is the result of more people migrating from rural areas to urban areas, such as the City of Windhoek, in search of a better education, health care and job prospects, resulting in the steady growth of the Havana informal urban settlement.

Previous research indicates that informal urban settlement dwellers who reside in Windhoek, experience issues of land tenure and socio-economic challenges which contribute to poor WASH conditions (Gold & Namupolo, 2013). As a result, the overpopulated Havana informal urban settlement of Windhoek is a particularly high-risk setting in terms of the health of its inhabitants owing to poor WASH conditions (Sitata, 2014). The Havana informal urban settlement is characterised as a community living in ‘shacks’ of corrugated iron sheets as illustrated in Figure 4.1.

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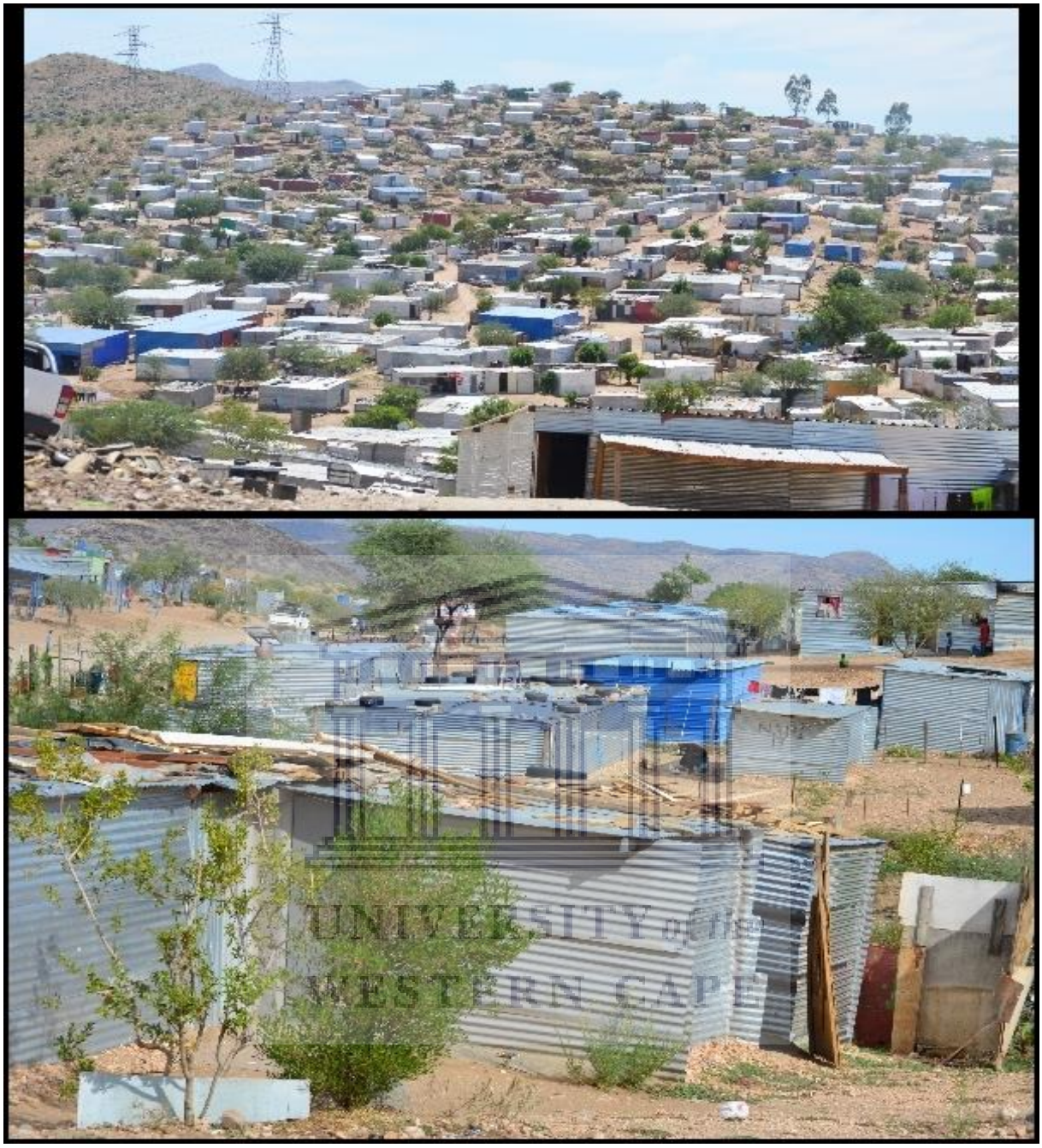

Figure 4.1: A photo of the Communities living in shacks taken by the author in Havana informal urban settlements, Windhoek. July 25, 2016

4.4 Study Design

A Participatory Action Research (PAR) design was used and implemented throughout the study. The PAR approach played an integral part during Phase 2 of the research study. The PAR study approach originated in Paulo Freire's philosophy (1982) which emphasises that communities in informal urban settlements are not just objects of research, but communities that need to be participating in the research inquiry. The research study employed the Paulo Freire principle that argues that PAR should be learning through doing, a theme that was

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explored throughout the study (Kemmis, McTaggart & Nixon, 2014). Paulo Freire's principle of learning by doing was the criterion by which the level of participation of community members was measured. The participatory research process of sequential reflection and action was carried out with the local people of the Havana informal urban settlement rather than inflicting it on them (Cornwall & Jewkes, 1995). The participatory research process has been instrumental in ensuring the highest level of community participation. The WASH knowledge and perspectives of the Havana informal urban settlement community formed the basis of the research and planning.

The study employed the flexible cycle of the PAR approach that comprised participation, action and research components (Dick, 2004; Terre Blanche, Durrheim, & Painter, 2012; Mash, 2014). The PAR approach provides the research study with a scientific, rigorous component that will assist researchers, the community and stakeholders to pursue solutions to the research problems (Hayes, 2011). The PAR approach ensures the quality of community participation and the fair distribution of power between the researcher and participants. This study design stresses the importance of community participation and exploring local knowledge and perceptions. The research study offered opportunities to the Havana informal community to engage as active contributors. Thus, the researcher followed the flexible cycle of the PAR approach that allows for active participation of the Havana informal settlement community, exploring the action of WASH interventions and the research process that facilitated learning and empowerment of the informal urban settlement as illustrated in Figure 4.2 below (Dick, 2004).

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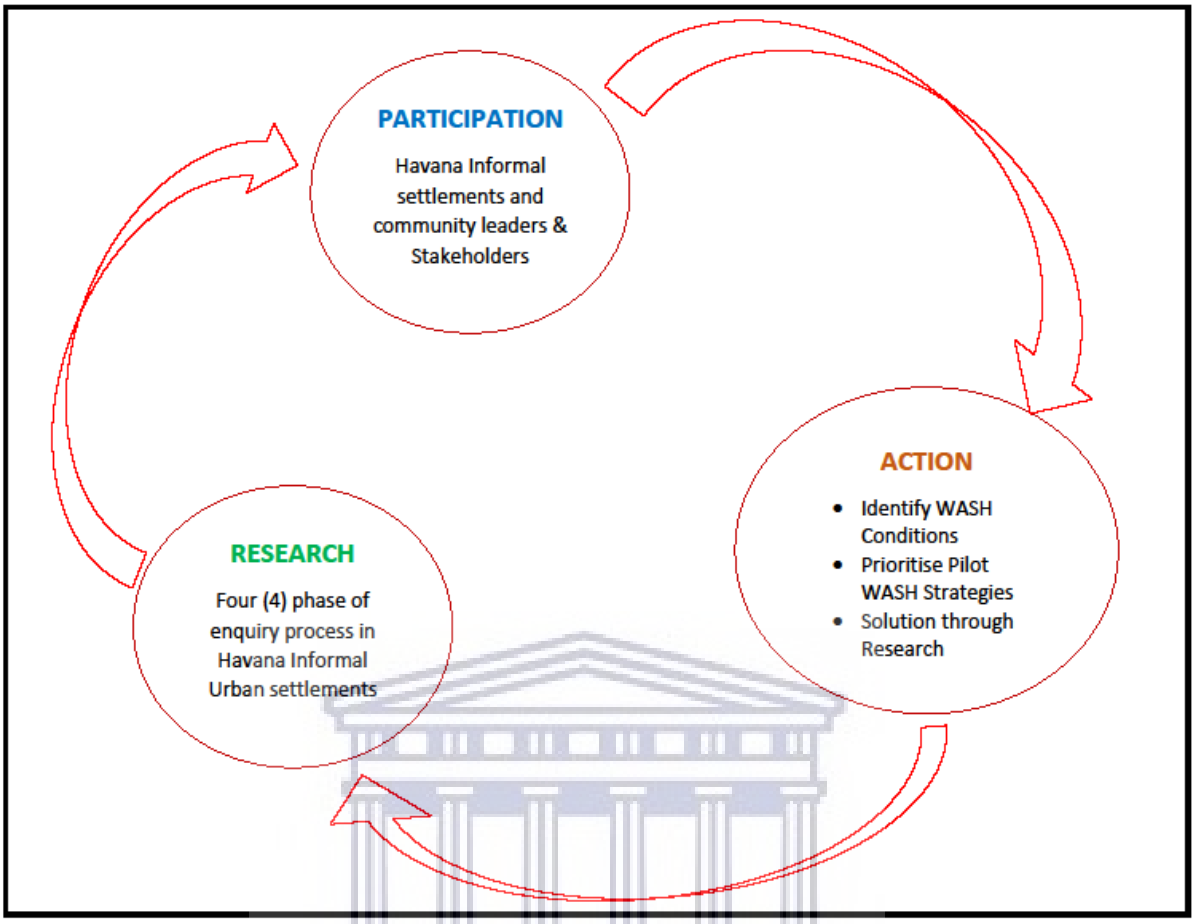

Figure 4.2: Flexible cycle of the PAR approach (Dick, 2004).

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4.4.1 Participation

4.4.1.1 Community participation

Community participation is defined as the voluntary and democratic involvement of communities in carrying out the project or research activities (Cornwall & Jewkes, 1995). The Havana informal urban settlement community actively participated, volunteering and establishing the research agenda, content, process, decision and tone. Kemmis, McTaggart and Nixon (2014) state that community participation guarantees that decision-making is based on the communities' needs, priorities and affordability.

Community members of the Havana informal urban settlement and community leaders who are affected by the poor WASH conditions were involved as active participants in the research study (Chevalier & Buckles, 2013). Communities and leaders have been identified through a participatory process, as described in sections 5.2 and 5.3.

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Previous research has proved that the absence of community participation has resulted in WASH problems, shack demolitions and the lack of an effective decision-making process (Kemmis, McTaggart & Nixon (2014). The researcher recognised the importance of a bottom-up approach, which embodied the participatory research study by galvanising the community into action by encouraging them to share their WASH needs and expectations. A bottom-up approach is a key measure for improving citizen engagement and accountability. Chiabai, Paskaleva and Lombardi (2013) argue that bottom-up approaches are based on stakeholder engagement that is successful when stakeholders are put at the centre of the decision-making process.

The top-down approach that had been used by previous researchers and local authorities in most development projects and research denied the Havana informal settlement dwellers the opportunity to participate in the decisions meant to elevate their standard of living. The mobilisation of the community to take charge of their betterment is of utmost importance for any successful development project and WASH intervention. Danquah, Analoui and Koomson (2018) say a genuinely participatory process should encompass all stages of the project cycle to achieve the best WASH intervention. The participation process fosters an increase in the project's impact through participatory approaches.

The communities who belong to the Havana informal urban settlement know their WASH needs best. For this reason, community members have been encouraged to come forward through community meetings and consultations with community leaders, as well as actively articulating their WASH needs. The community's perspective on their WASH needs can influence the WASH policies of the City of Windhoek and the Government of Namibia. The results of the study will be communicated to the relevant authorities, including the City of Windhoek, to enhance the delivery of WASH services in the informal urban settlement of Havana.

Through the guidance of the researcher, the community of the Havana informal urban settlement gained ownership and a new power-base in the inquiry process, which was lacking in previous research studies that were conducted in the Windhoek informal urban settlements. The study sought to avoid communities being deprived of the rich experience of participatory research that amplified the voices of the poor and underprivileged.

The participation process made data collection much easier and ensured that information was accurate and representative of the needs, priorities and living environment of the Havana

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informal urban settlement. The participation process assisted the researcher to strengthen the consensus-building among community members during meetings, enabling different views of participants to be weighed up against one another to avoid misunderstanding and conflicts in their interpretations of the WASH concepts. Mash (2014) states that communities who have both the right and the duty to participate in solving their problems have a greater responsibility in assessing their WASH needs, mobilising local resources and suggesting new WASH solutions, as well as creating and maintaining a local partnership with relevant stakeholders. Local partnerships with relevant stakeholders are imperative to ensure robust research networks and collaboration for sustainability. Gray and Stites (2013) argue that collaboration with all sectors of society is one of the keys to unleashing sustainability that resolves environmental and social challenges.

According to Kemmis, McTaggart and Nixon (2014), community participation is an active process whereby beneficiaries and communities influence the direction and execution of research projects and WASH interventions rather than merely receiving a share of the project's benefits. The community of the Havana informal urban settlement and the researcher reached an agreement that communities would actively participate in the research study when there were any specific benefits for them. Through the active participation of the Havana informal settlement community, the researcher sought to achieve the following: increased research efficiency, improved research effectiveness, the sharing of WASH intervention costs by stakeholders and community capacity building. The participants, especially the community leaders, played an active role in the selection of participants in the study and data collection process by demonstrating community ownership of the research process.

4.4.1.2 Strategic Partnerships

The participants of the research study included the Havana community, community leaders and relevant stakeholders, especially those responsible for decision-making and policy implementation of WASH strategies (see section 5.3). The involvement of various stakeholders as strategic partners would assist with the cost-sharing and resources of WASH intervention through their unique skills, knowledge, attitudes and expertise. The researcher envisaged that the active participation of stakeholders as strategic partners would eventually culminate in the empowerment of the inhabitants of the Havana informal settlement to make better use of their knowledge, skills, attitudes and human resources to address their poor

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WASH conditions. According to Brown (1997), strategic partnership with the community is vital and in a strategic partnership, the community is involved in the following steps:

- The 'what': organising community, scenario forming, formulating basic research and project concepts, presenting and marketing WASH concepts;
- The 'how': creating a climate for participation;
- The 'why': acceptance by the community;
- The 'who' and 'for whom': participants in the intended research project in the Havana informal urban settlement.

The process for community involvement described by Brown (1997) was adopted (see Figure 4.3).

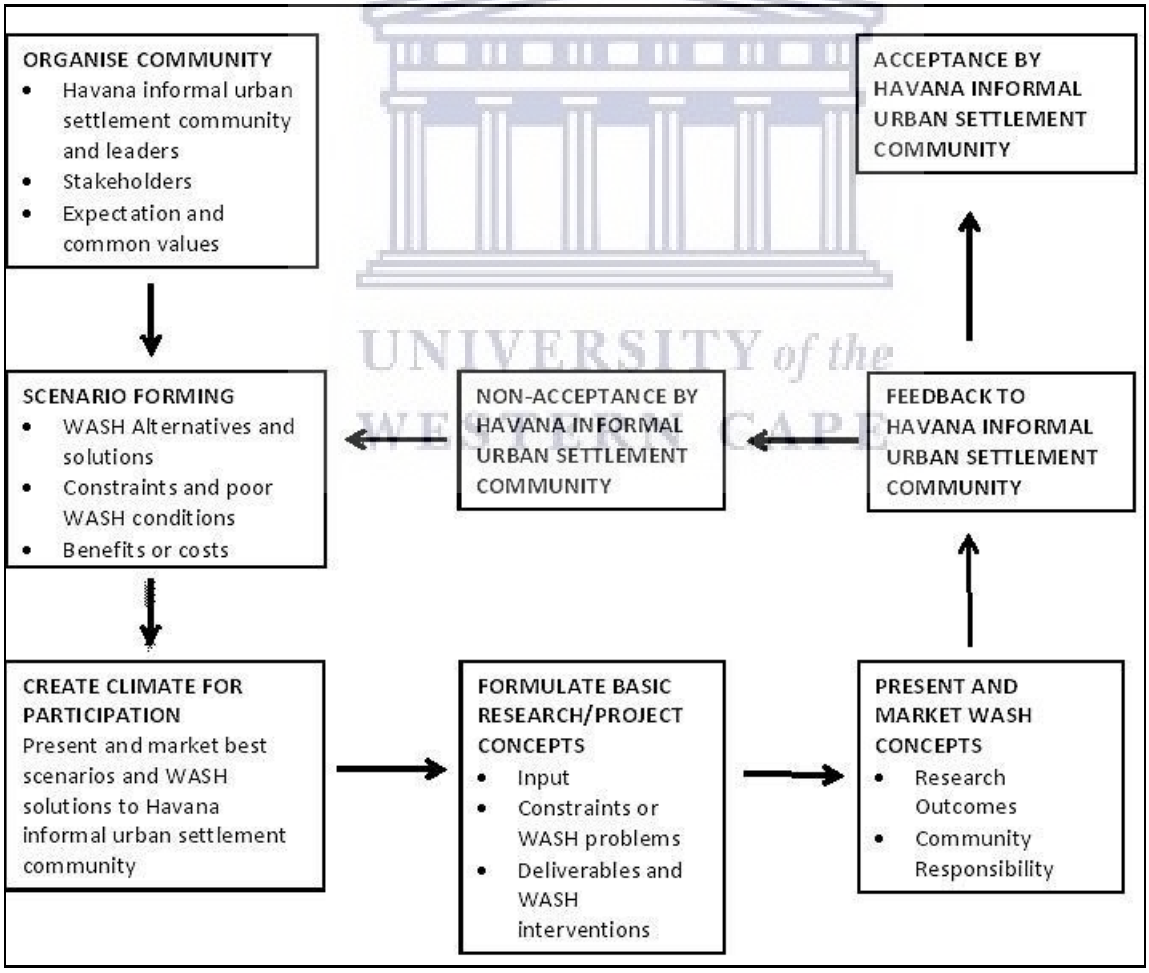

Figure 4.3: Community participation and involvement process (Brown, 1997)

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Participation is considered to be an active process, meaning that the aim was for the communities of the Havana informal urban settlement to take initiatives and assert themselves, as well as to make informed decisions for WASH interventions. The community involvement occurred throughout Phases 1 to 4 and included both physical and mental involvement through thinking, planning, deciding, acting and evaluating processes. Even before the commencement of the fieldwork, the researcher was continuously engaged in dialogue and negotiations with the community leaders and gatekeepers who reside in the Havana informal urban settlement.

4.4.2 Action

The following steps were employed as part of the Action process:

4.4.2.1 Identify WASH conditions and needs of informal urban settlement

The research sought to describe the severity and extent of the poor water, sanitation and hygiene conditions through a situational analysis in Phase 1 of the study (Polit & Beck, 2012). Accessible, accurate and reliable data on the WASH conditions were routinely collected and updated throughout the phases of the research study. It was observed during the identification process that reliable information on key WASH indicators or phenomena was often lacking at local level in the informal urban settlement, but even when limited information was available, the research relied on relevant literature such as peer-reviewed articles and research related to the Havana informal urban settlement (Giné-Garriga, de Palencia & Pérez-Foguet, 2013). The Joint Monitoring Programme (JMP) indicators for Post-2015 Monitoring of Drinking-Water, Sanitation and Hygiene was adopted as a guide and framework to identify WASH conditions and needs. See Table 4.1 below.

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Table 4.1: Indicator proposed by JMP for Post-2015 Monitoring of Drinking-Water, Sanitation and Hygiene /List of core WASH indicators (Joint Monitoring Programme, 2012)

WASH Area	**WASH Component**	**Rationale**
Water Supply	Financial Control. Pro-poor service delivery. Point-of-use water treatment.	A key sustainability aspect of the supply, particularly related to improve transparency and accountability. A key community crosscutting issue. Fundamental human rights criteria include accessibility, affordability and non-discrimination.
Sanitation	Access to and use of Sanitation. Latrine conditions.	Check the current use of the facility, rather than a mere household's ownership of the toilet. Distinguish between open defecation and latrine sharing
Hygiene	Handwashing. Point-of-use water treatment. Disposal of stools and faeces	A rigorous assessment of handwashing behaviour would entail structured observation, a prohibitively expensive exercise. An assessment of the adequacy of handwashing facilities, i.e. presence of soap and water, maybe an interim solution. Causes of faecal contamination to the immediate household environment.

The adoption of the JMP indicator was part of a consultative and participatory approach, which involved one community leader, one key stakeholder and two members of the community. This JMP WASH indicator is reliant on a combination of qualitative study tools, which are specially designed to collect data from the study sites and the household in the informal urban settlement.

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4.4.2.2 Prioritise issues and needs for pilot WASH strategies

Maslow's idea of the hierarchy of human needs was adopted as a guideline to prioritise the issues and needs of the Havana informal urban settlement for pilot WASH strategies (McLeod, 2007). To accomplish the task of prioritising needs, the researcher engaged the community in a participatory process of individual and group conversations. The concept of urgency and community WASH needs has been classified in the order of most urgent to less urgent needs as illustrated in Figure 4.4.

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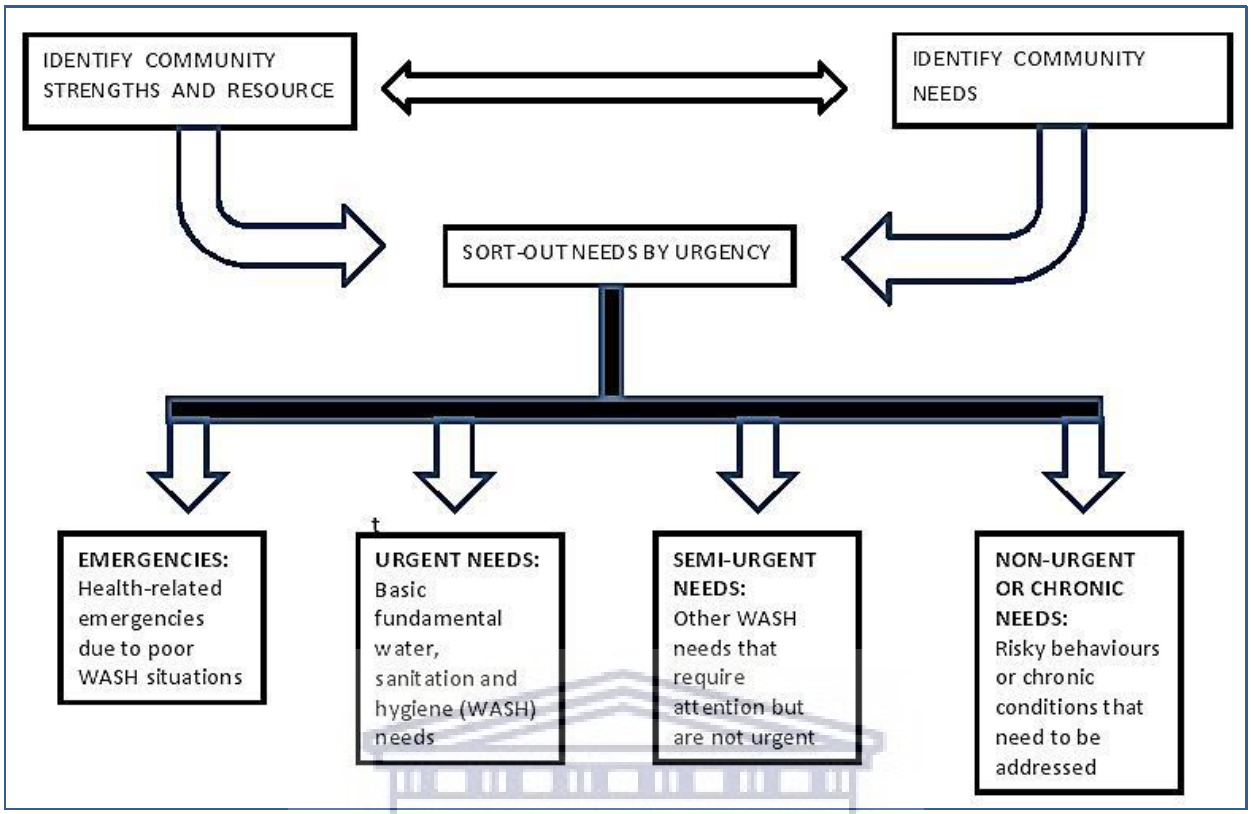

Figure 4.4: Prioritising Community Needs

The criteria used for the prioritisation of the needs and WASH issues were as follows:

1. **Emergencies**: Prioritisation included pilot WASH strategies that dealt with emergency health situations that are related to poor WASH conditions. These pilot WASH strategies included interventions that address the poor WASH conditions in the Havana informal urban settlement.

2. **Urgent needs**: Prioritisation included the fundamental water, sanitation and hygiene (WASH) needs, with reference to the availability, accessibility, supply, quality and sustainability of WASH resources and facilities. The local authorities' resources for providing immediate assistance were measured against the urgent WASH needs of informal urban settlements. Health-related urgent needs were highly prioritised to address WASH-related diseases such as cholera and hepatitis E.

3. **Semi-urgent needs**: Once the Havana informal urban settlement had their basic WASH needs met, the researcher worked with the community to address other important needs based on overall health and WASH conditions. WASH-related behaviour was addressed owing to the risk of a possible outbreak of WASH-related diseases.

4. **Non-urgent/chronic needs**: For situations that do not require emergency or immediate WASH intervention, risky behaviour or chronic conditions that need to be

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addressed were assessed, through a collaborative process with the community and stakeholders.

The Havana informal urban settlement had been assisted through the process of addressing their needs after most of their urgent WASH needs had been identified. Furthermore, the most dire of the poor WASH conditions of the Havana informal urban settlement were prioritised during the situational analysis in Phase 1 of the research study (see Chapter 5).

4.4.2.3 Seeking Solutions

A targeted scoping review was conducted to identify the interventions that had addressed selected WASH conditions (see Chapter 3). Partnerships were fostered with the community members of the Havana informal urban settlement and relevant stakeholders, to pilot WASH interventions during Phase 3 of the research study. The practical steps that have been taken to foster partnerships are presented in Section 5.2 and Sections 5.3.1 to 5.3.3.

The findings of the pilot were presented during Phase 4 of the research study, which were reviewed for validation. The recommendations were developed for an action plan to serve as an intervention for addressing the poor WASH conditions.

4.4.3 Research

The research process was based on the research of Chevalier and Buckles (2013) who state that research is a conscious effort and an inquiry process to formulate community knowledge and experiences, which adds to and informs the theories of action. The research process comprised the Four Phases of the research study, which is discussed extensively in Chapters 5–8.

4.5 Rigour for qualitative phases

Trustworthiness and credibility were used as the central concepts for appraising the rigour of a qualitative study (Ghafouri & Ofoghi, 2016). Polit and Beck (2012) state that trustworthiness is the degree of confidence in the data of qualitative research, which is the criterion of credibility. Credibility was demonstrated after the data collection was carried out during the four phases of the research study. Multiple techniques, such as interviews, focus groups and workshops, were used to establish the credibility of the data collection, which was the sole instrument of the study and the primary vehicle for gathering information. (Schwandt, Lincoln & Guba, 2007). The study succeeded in obtaining the true WASH

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experiences of informal urban settlements based on the perception of the community and not on the priority of the researcher. According to Lincoln and Guba (1986), credibility is subject-oriented that is focussed on the human experiences of communities and their living environment. A prolonged community engagement was achieved that extended from December 2017 (see Section 5.4) to March 2019 (see Section 8.4), and persistent observations were made to learn more about poor WASH conditions in Havana informal urban settlements.

Credibility was demonstrated throughout the four phases of the study to ensure that the WASH concepts were accurately identified and described (De Vos, Delport, Fouché, & Strydom, 2011). Furthermore, the phases of the study were conducted according to research standards that can validate and confirm that the results are correctly understood (Håkansson, 2013). The authority of the study was also established after the research was immersed in the context and literature of the research study especially during the situation analysis and scoping review phases (Clarke, Friese & Washburn, 2015).

As soon as approval for the research was given and all the necessary protocol had been met, a pilot study was conducted in a 3-week period during November and December 2017, by interviewing four households, totalling eight participants, with the assistance of interpreters. Timelines for Phases 1 through 4 are discussed in greater detail in Sections 5.4, 6.4, 7.2.5 and 8.4.

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The participants in informal urban settlements were purposively chosen (see section 5.3.1 for details) with the assistance of local community leaders, who acted as gatekeepers. The pilot study aimed to determine whether the questions generated were useful information in the context of the WASH phenomenon. Krefting (1991) states that piloted interventions are important where informants from informal urban settlements consistently either agree or disagree with the questions. No problems were discovered during the pilot study and the information was included in the data analysis that was obtained from field notes and transcriptions of audio recordings.

Before the interviews, two women and one man were recruited as research assistants and were trained to assist the researcher to conduct the semi-structured interviews with the participants. The two women were experienced in qualitative research and also acted as

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interpreters throughout the four phases of the research study. Before data collection, each of the research assistants interviewed three people who were not part of the respondents, in the presence of the researcher, as part of their training. The researcher played a supervisory role during the data- collection process and kept diaries and field notes.

4.5.1 Situation Analysis

The researcher aimed for credibility by seeking the truth of the data and the interpretations and belief in the findings of the study (Polit & Beck, 2012). To achieve credibility and trustworthiness, the WASH phenomena under investigation and data were obtained through the situation analysis, which was accurately recorded during interviews, focus groups discussions and community meetings (Hennink, Hutter & Bailey, 2011).

The researcher ensured that participants were given the opportunity to verify their statements during the interview, transcription and data analysis phases, including addressing data gaps during the situation analysis phase. Trust was fostered with community members throughout the situation analysis process, which contributed to the belief in the trustworthiness of the data (Schurink, Fouché & De Vos, 2011).

Adequate operational procedures were incorporated in the research methodology, such as purposive sampling (see section 5.3.1), whereby data were derived from semi-structured interviews, focus group discussions and follow-up consultative meetings. A 'prolonged engagement' during December 2017 until March 2018 (see section 5.4) was conducted during the consultative community meeting to gain an adequate and credible understanding of their WASH conditions and to establish a relationship of trust between both parties (Denzin & Lincoln, 2011: pp 196,203). The researcher spent a considerable amount of time with the community during Phase 1 of the research study (see section 5.4), to become acquainted with the research site of the Havana informal urban settlement and to establish rapport with the communities.

Prolonged and varied field experience was ensured by the researcher spending time with the community and community leaders before commencing with the interviews, focus group discussions and community meeting. The researcher visited the community at the Havana informal urban settlement several times as indicated in section 5.2 so that the community could become accustomed to him. Trust was built with the community and community leaders through several interactions, whereby the researcher learnt about the culture and

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observed community cohesion during visits to the study sites. The community participated out of their own volition in the research study, without any coercion from the researcher. The community chose their local language, such as Oshiwambo and Afrikaans, to enable them to be conversant and able to express themselves. A local interpreter was used to interpret since the researcher was not well-versed in all the local languages.

The data collected during the situation analysis was subjected to community members' checks statements during the interview and transcribing stages. The purpose of the members checking is to have a community member who has lived in the poor WASH conditions validate the reporting findings. This was done by giving the notes that were taken by the researcher and audiotape transcripts to some participants at the end of interviews for verification and clarity. After the transcription and analysis of all interviews, the community members were asked to verify the developing WASH themes and preliminary categories and their interpretations. The follow-up interviews and meetings ensured that the collected information had been interpreted correctly and the facts had not been misconstrued. Memos, journals and diaries were kept to ensure objectivity and to avoid the subjective influence of the researcher's social status and background in the research process as illustrated in Figure 4.5. The recording of memos and journals not only helped to avoid subjective influence, but also served as an audit trail, which had been an important undertaking in qualitative study research.

Critical self-reflection on the research process and the interpretation of the data were also done during the research study.

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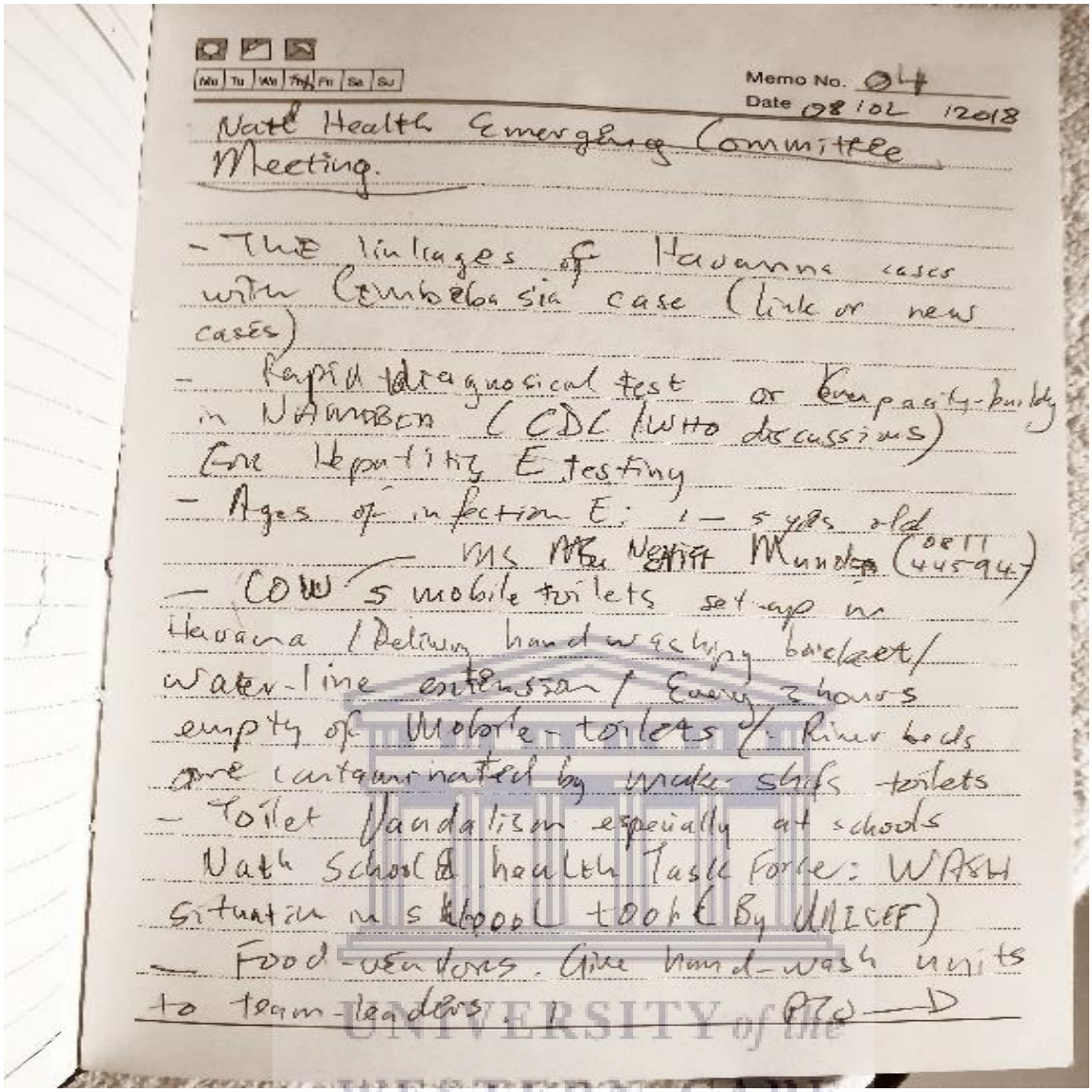

Figure 4.5: A photo of Researcher memos and journals sample taken by the author in Windhoek, Namibia. August 14, 2018.

The notes and field recordings made during the situation analysis prevented personal bias. The researcher attained methods triangulation for the research study by using various qualitative research methods such as semi-structured interviews, audio recordings, reflective journals, field notes and the literature review (Creswell, 2014).

As part of the peer debriefing, the researcher engaged in discussions about the research process and findings with an independent coder who is an experienced qualitative researcher and two resource persons who have a wealth of experience in qualitative research methodologies. The audio recordings, the transcribed data and the WASH themes with

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interpretations were made available to a colleague in the International University of Management (IUM), Windhoek, Namibia and to an independent academician. The two colleagues probed the researcher's biases, explored WASH meanings and clarified the basis of certain interpretations. The researcher also availed the audio recording to some community members and leaders to listen to and to check the meaning of the WASH themes that emerged from their verbatim report and WASH experiences. In addressing credibility, the researcher will attempt to demonstrate and present a true picture of the WASH phenomenon under investigation in Chapter 5.

4.6 Ethics

The researcher ensured that the following ethical principles, based on the Nuremberg code of 1949, were observed (Code, 1949; Shuster, 1998).

Informed Consent: The researcher ensured that the study adhered to legal obligations especially where community members were ignorant about their rights and privileges, to avoid discomfort and coercion. The community members of the Havana informal urban settlement who participated in the interviews, community meeting and follow-up workshop, and a survey were allowed to choose whether they wished to participate in the study and whether they had a complete understanding of the procedures of the research. Permission and consent were obtained from the community members and community leaders through the signing of a consent form (Appendix F: Consent form sample). Before the commencement of interviews for each household, participants were provided with information about the research both verbally and through the use of the Participant Information Sheet (Appendix G: Participant Information Sheet sample).

Principle of respect, anonymity and confidentiality: Community members from the Havana informal urban settlement who participated in interviews, community meeting and follow-up workshop, and a survey were orientated to the issues of respect, confidentiality and anonymity. Participants were briefed about the confidential nature of the study that ensured their anonymity. Participants were assured that the information gathered, as well as the photographic images, would be used for research purposes only. The photographic images in the study were included as illustrations of a scholarly argument and are not included for purely cosmetic purposes (Snyman, 2012). The protection of the facial identity of sensitive photographic images of a community member or members were considered, as shown in

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Figure 5.13.

According to Devakumar, Brotherton, Halbert, Clarke, Prost and Hall (2013), photography is a valuable resource in clinical health research and informed consent is required, although its form may vary depending on the context. Photographs can be a valuable tool for academic research, for illustrating a situation, for increasing awareness or funding, and for acting as evidence that contributes to advocacy. Consent was given to the distribution and publication of photographic images (photographs) for academic and research purposes only. Simons and Usher (2012) reiterated the importance of considering the ethics of photography and ethical guidelines for the use of photographs in research.

Any information, either written or electronic, that identifies a participant directly or indirectly, has been subjected to the duty of trust and confidence (Blightman, Griffiths & Danbury, 2014).

Right to debriefing and information dissemination: The community members and community leaders received on-going debriefing and updates on the progress of the study and throughout Phases 1-4. All data obtained during the interviews, survey and workshop will be kept for a period of three to five years in case of future publications related to the research report. The results of the study were shared during Phase 4 with communities and relevant stakeholders. The researcher envisages publishing the study in an accredited and a peer-reviewed journal.

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Principle of beneficence and Justice (rights of community members): The community members and workshop participants were allowed to review and comment on the fundamental and operational ethics of the research and had the right to make substantive contributions to the draft research report.

Social value: The research study empowered the community members and added value to their knowledge and capacity which addressed the poor WASH conditions in the informal urban settlements.

Scientific validity and independent ethical review: The research study was approved by the University of the Western Cape Senate's Higher Degrees Committee and ethics clearance was obtained from the Biomedical Research Ethics Committee at the University of the

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Western Cape (Ethics Reference number:BM17/8/3) (Appendix F: Permission letters). Permission and approval were obtained from the City of Windhoek, Ministry of Health and the community leaders as part of the accountability and transparency process of the study (Appendix A: Permission letters).

The above-mentioned formal permission was very important to protect both the researcher and the participants. Furthermore, the agreement of individuals in authority and/or gatekeepers was important, which enabled the researcher to gain access to the Havana informal urban settlement. The inclusion of gatekeepers and relevant stakeholders was essential so that gatekeepers were comfortable with the dissemination and publication of the research study. The gatekeepers in this study included the constituency councillor, Khomas Regional Councillor, City of Windhoek officials, Ministry of Health officials, Community Development Committees (CDC)/Youth forum and community activists. Two main gatekeepers were very instrumental in choosing the participants from the Havana informal urban settlement. A meeting with the constituency councillor, Khomas Regional Councillor, CDC/Youth forum and community activist was conducted after gaining approval to enter the study site. An explanation of the purpose and general nature of the study was given to the gatekeepers and relevant stakeholders to obtain their support in the research study. The recruitment of participants was based on the principles of fairness, respect for participants, voluntary participation and the avoidance of coercion.

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4.7 Entry to the site of informal urban settlements

The choice of the Havana informal urban settlement as a geographic setting for the study was directly linked to the WASH conditions and the choice of the WASH problem in which the inquiry was to be undertaken.

The Havana informal urban settlement is the biggest and fastest-growing among the 43 informal urban settlements in the Katutura suburb of the city of Windhoek. The informal urban settlement is a community with a mixed cultural flavour of people with high levels of poverty. The socio-economic complexities within the informal urban settlements are attributed to the increasing unemployment and the ever-swelling gap between the rich and poor. The Havana informal urban settlement has become a social and health burden owing to the mass migration from the rural areas to the urban City of Windhoek.

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Prior knowledge of informal urban settlements was valuable to be able to foresee possible challenges that might arise during the study. The researcher investigated all 43 informal urban settlements, including the Havana informal settlement, as part of the pilot study. In selecting informal urban settlements as the research field setting, the characteristics of the setting were carefully studied to ascertain the best field of study. The Havana informal urban settlement was the preferred field of study because of its geographic accessibility, cross-cultural differences, mixed socio-economic statuses, increasing growth and because it was anticipated that cooperation with the participants would be easily achieved and credible information gathered.

In conclusion, the methodology chapter provided a framework for conducting the situation analysis as discussed in the next chapter.

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CHAPTER 5: SITUATION ANALYSIS

5.1 Introduction

A situation analysis was conducted to describe WASH conditions in the Havana informal urban settlement in Windhoek. In this analysis, the internal and external factors that contribute to poor WASH conditions in Havana have been outlined. The analysis is a component of the participatory approach which employed qualitative research methods, such as interviews, focus group discussion and a consultative community meeting to confirm the research findings (see sections 5.4.1-5.4.3). It is argued that a situation analysis provides an evidence base for responding to the needs and expectations of the community being studied (Schmets, 2016). The purpose of the situation was to describe WASH conditions and explore WASH interventions that have the potential to improve poor WASH conditions. The contribution of the situational analysis to this study clearly demonstrated the identification of key WASH themes as illustrated in Section 9.2.1.

5.2 Gaining entry to the community

The purpose of the introductory and consultation process was to gain entry to the community and to establish open communication channels with active community engagement. Attree *et al.* (2011) claim that community engagement is central to strategies that promote health and well-being of poorer communities, especially in countries where the distribution of health services is inequitable. The introductory process with communities in the current study entailed a series of three site visits to the Havana informal urban settlement to become acquainted and familiar with community members and community leaders. The introduction of the researcher to the community leaders was imperative for establishing rapport and for getting buy-in from the community for the research study.

The first introductory visit was to the Regional Councillor at the Moses Garoëb Constituency Office. A second introductory meeting was conducted with three community development committee (CDC) members, who were responsible for the socio-economic welfare of the Havana informal urban settlement. The third introductory meeting was conducted with three members of the general population who were residing in Max Mutongolume, Cuba and Kabila A, branches of the Havana informal urban settlement. These three community members served as key informants during the data-collection process.

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5.3 Study population and sampling

The research population in this study comprised 58 community members and four community leaders from the Havana informal settlement, as well as eight stakeholders. The process of recruitment of the community members is discussed in section 5.3.1.

The concept of data saturation was used to arrive at the sample size of 58 community participants (Bryman, 2015). The community participants were prompted and probed for more information on WASH conditions during individual interviews. When the saturation point was reached, namely that no new information was received, the research study concluded the interviews with community participants and did not interview any more participants (Saunders, Sim, Kingstone, Baker, Waterfield, Bartlam & Jinks, 2018).

5.3.1 Community members

The research study employed a purposive sampling technique that can be used alongside qualitative research techniques to identify and recruit suitable participants from Havana's informal urban settlements. (Creswell, 2014). Tongco (2007) state that Purposive sampling is especially exemplified through the key informant technique, wherein one or a few individuals are solicited to act as guides to a culture or local community. The purposive sampling encompasses a heterogeneous or Maximum variation purposive sampling technique that examined a diverse range of perspective and a comprehensive variety of ideas that are all relevant to the WASH conditions of the informal urban settlements (Etikann & Bala, 2017).

Two gatekeepers, who were the local community leaders of the Havana informal urban settlement, assisted the researcher with the recruitment of community participants.

The inclusion criteria for the selection of community participants were formulated through the introduction and consultation process (as outlined in section 5.2) as well as similar studies (Tsinda, Abbott, Pedley, Charles, Adogo, Okurut & Chen-oweth, 2013). Heterogeneous sampling technique was employed to select community participants from a wide range of subjects related to the study - i.e. a better understanding of WASH (Etikan, Musa & Alkassim, 2016).

The inclusion criteria for the selection of the community participants were as follows:

- community members who had resided for more than two years in the Havana informal urban settlement;
- community members who had actively participated in previous community WASH activities—these included: some community members who had migrated from the

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northern rural informal settlements to the urban informal settlements of Windhoek and had previously been involved with the Community-Led Total Sanitation (CLTS) programme of the Ministry of Agriculture, Water and Forestry (Directorate of Water Supply and Sanitation Coordination); community members who had volunteered for the Namibian Red Cross society as Community Health extension workers; community members educating the informal settlement on sanitation and good hygiene practices; and some who were engaged in the hand-washing campaigns of the City of Windhoek; and

- community members from different socio-economic levels and cultural groups belonging to the 16 language groups of Namibia (socio-economic levels included unemployed, employed, self-employed and the poorest individuals residing in the informal urban settlements).

The demographic characteristics of the community participants are presented in Table 5.1. The ages of the participants ranged between 20 and 60 years with the median age of 30 years. The majority of participants were female (57%) and unemployed (79%).

Table 5.1: Demographic characteristics of community participants [N=58]

Participants	**Frequency (n)**	**Percentage (%)**
Age(in years)		
< 20	4	7
20 – 29	14	24
30 – 39	16	28
40 – 49	14	24
50 – 59	9	16
60 +	1	1
Sex		
Male	25	43
Female	33	57
Status		
Formal	3	5
Unemployed	46	79
Self-employed	9	16

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5.3.2 Community leaders

The community leaders were identified during the introductory process with the communities and stakeholders. The community site visits were followed-up with an official visit to the community leaders. According to Jimenez, Hudson, Lima and Crabtree (2019), community leaders need to be engaged to enhance preparation for an in-depth interview with a community member. The researcher introduced himself to the community leaders before data was collected by two community members who resided in the Havana informal urban settlement. A resource person, who was also a key informant throughout the research study, recommended the two community members.

The positions held by the community leaders who had participated in the interviews were:

1. Regional Councillor: Khomas Region, Moses Garoeb Constituency (Havana informal settlement)
2. Councillor: Moses Garoeb Constituency (Havana informal settlement)
3. Chairperson: Youth Forum of the CDC, Moses Garoeb Constituency (Havana informal settlement)
4. Secretary: CDC, Moses Garoeb constituency (Havana informal settlement)
5. Community representative(s) who acted as acting or interim leaders for Havana informal settlement were appointed by the councillor on an ad hoc basis or as community needs arose.

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5.3.3 Stakeholders

Eight key stakeholders were identified and interviewed as key informants. Community leaders recommended the key stakeholders during the introductory process. The research study involved the stakeholders at the initial stages of the research study to increase the understanding of the external driving forces behind poor WASH conditions. The stakeholders were well acquainted with the problems and issues of the Havana informal urban settlement and provided relevant insights and expert views.

The stakeholders included:

- the Ministry of Health and Social Services of Namibia;
- City of Windhoek;
- UNICEF Namibia;

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- WHO Namibia;
- Ministry of Agriculture, Water and Rural Development (Directorate Water Supply and Sanitation Coordination);
- Red Cross Society of Namibia (National Manager: Health and Social Services);
- University of Namibia (Social Entrepreneurship Department); and
- A social worker, who represented the University of Namibia because of her previous research project at the Havana informal urban settlement.

5.4 Data Collection

The research study made use of individual interviews, which was followed-up with one focus group discussion (FGD), and concluded with one consultative community meeting as data-collection methods. The data collection for this phase took place from December 2017 to March 2018. The data-collection process was continued in Chapter 6 (Phase 2) with a workshop and follow-up meeting.

5.4.1 Interviews

The interviews were conducted using a semi-structured interview schedule (Appendix B). The topic guide for the interview was developed after the literature review and discussion with peer researchers. Field notes and a self-reflective journal were written immediately after each interview to avoid losing rich details of experiences and reflections in the field. The self-reflective journal formed part of an audit trail in qualitative research and was an important means of enhancing rigour and recording the intentions and disposition of the researcher (Polit & Beck, 2012).

The individual interviews with community members were important to obtain detailed information about their personal feelings, perceptions and experiences about WASH conditions. The researcher, with the assistance of two interpreters, met each community participant at the appointed time in their corrugated house in the community. The individual semi-structured interview format enabled participants to express their views on the topic and generated additional areas of discussion. The interview schedule was translated into Afrikaans which was predominantly spoken by the community. The research incorporated translation as an integral part of the study because of the importance of cross-language translation in qualitative research (Mandal, 2018).

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In cases where community members could not speak Afrikaans or English, local interpreters who were fluent in one of the 16 local languages, were recruited from local communities. The local interpreters were taken through training sessions regarding the interview guides to familiarise themselves with the contents and goals of the interview. According to Squires (2008), researchers successfully address language barriers between themselves and their participants when they systematically plan for how they will use interpreters and translators throughout the research process.

The researcher carried out in-depth interviews with the community leaders to obtain factual and meaningful information about WASH conditions. The interviews with community leaders were conducted in their offices during weekdays and some in their homes during weekends. The interviews commenced and were followed-up with consultations with stakeholders to gain a broader range of information about the Havana informal urban settlement. The interviews with stakeholders as key informants were undertaken at their respective office premises.

After every interview, the audiotape recorder was played back for audibility and for the participant to listen to his/her own words and clarify issues before the data were transcribed by the researcher. All individual interviews were audiotape-recorded and field notes were taken to assist the researcher in recording the data collected.

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Interviews were transcribed verbatim and translated into English where necessary. Transcription was performed under the supervision of the researcher immediately after the individual interviews had been completed to maintain the validity of the discussions. Transcripts were reviewed to ensure data and translation quality. The translated transcripts underwent another round of consistency checks by the researcher to maintain high data quality. The researcher continued to interview participants until no new themes emerged. Observations and assessments during interviews were written up as field notes to complement the transcripts.

During the data-collection period, the researcher remained in constant communication with the interviewers in the field to respond to any issue that might arise during data collection.

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Field notes were taken throughout the interview process and included a description of the research sites of the Havana informal urban settlement; the date and time of the interviews; and general observations of the interviews (see Figure 5.1). The field notes were written immediately after each interview to capture the richness and detail of the interviews. In cases where field notes were taken in local languages, the interpreters translated the interviews into English. The field notes were written accounts of information the researcher had heard, seen or experienced during the course of the interviews in the Havana informal urban settlement and were both descriptive and reflective as they contained a narrative account of the WASH conditions. The field notes contained chronological descriptions of events in the field that added context to the data analysis (Polit & Beck, 2012). The field notes enabled the researcher to identify, interpret and analyse the WASH phenomena under investigation (Gerrish, Ashworth, Lacey, Bailey, Cooke, Kendall & McNeilly, 2007) and, together with other complementary data obtained in the interviews, helped with the validation of the recorded information. The field notes also became valuable during the subsequent transcription of the audio recordings.

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Figure 5.1: A photo of the Field note-taking during Phase 1 taken by the author in Havana informal urban settlements, Windhoek. December 10, 2017

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5.4.2 Focus Group Discussion (FGD)

The researcher conducted one follow-up FGD after the interview (see section 5.4.1) to probe for more information on new and emerging WASH themes. The FGD provided a wealth of information on the WASH themes and proved to be a good method for determining what issues and concerns should be addressed in the follow-up phase of research (Young, 2019). Thirteen community members, two community leaders and one stakeholder participated in the FGD (see Figure 5.2 below).

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Figure 5.2: A photo of the FGD in Phase 1 taken by the author in Havana informal urban settlements, Windhoek. February 11, 2018

The research study employed a Nominal Group Technique (NGT) during the FGD (Fink, Kosecoff, Chassin & Brook, 1984). The NGT approach uses the four-stage model of Cohen, Manion and Morrison (2011), as indicated in Table 5.2 that prioritises individual contributions in the formation of a collaborative group response. The four stages generated data through participant dialogue and were agreed upon by the group (Cohen, Manion & Morrison, 2011).

Table 5.2: Stages of the Nominal Group Technique (NGT)

STAGES	ACTIVITY
Stage 1	Participants wrote their answers to questions based on WASH conditions of the Havana informal urban settlement.
Stage 2	Comments were added onto a flipchart sheet. All other additional information that was missing or expanding needs.
Stage 3	Participants (without the researcher's input) used collected comments to create 'clusters' of WASH ideas that reflect a consensus or dissension.
Stage 4	The participants suggest a summary of key points related to Stages 1-3.

Source: Cohen, Manion & Morrison model (2011)

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In stage 1, sixteen (16) participants participated in NGT discussions that were facilitated by the researcher. The participants were brainstorming Participants to questions based on WASH conditions of the Havana informal urban settlement.

According to Wimpenny (2010), the NGT is considered appropriate to Participatory Action Research (PAR) for its openness to multiple contributions and interest in emancipation as a core value. The NGT-approach uses a face-to-face FGD that encourages participants to contribute points of interest based on an initial prompt. The prompts here consisted of four flashcards with abridged versions of the following research questions:

- What are the socio-demographic characteristics of the Havana informal urban settlement?
- What are the current WASH conditions in the Havana informal urban settlement?
- What health problems and diseases are present owing to poor WASH conditions at the Havana informal urban settlement?
- What are the solutions and interventions that will address the poor WASH conditions in the Havana informal urban settlement?

In *Stage 2*, participants were asked to record their answers and comments on a flipchart. *Stage 3* encouraged participants to write their ideas, then choose the one they deem most appropriate, and then create "clusters" of WASH ideas that reflect consensus, the hierarchy of priorities or divergent feedback from all. In *Stage 4*, participants agreed on a final list of ideas grouped in order of priority. A summary of the key emerging themes (5) and subthemes (28) related to poor WASH conditions was proposed, which are discussed in section 5.6.

5.4.3 Community meeting

The researcher also conducted one consultative community meeting (Phase 1) after the FGD (see section 5.4.2). The consultative community meeting was attended by 39 community members and leaders, as well as two stakeholders (see Figure 5.3). The consultative community meeting (Phase 1) of this chapter continued with a workshop and follow-up meeting (Phase 2) in Chapter six. The community meeting was useful to verify information on the state of WASH conditions in the Havana informal urban settlement. The meeting with attendees from the Havana informal urban settlement was part of the community engagement process that was a vital part of the research study. According to Cyril, Smith, Possamai-Inesedy and Renzaho (2015), community engagement concerning WASH through meetings

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improves the health of disadvantaged populations such as those in informal urban settlements and enhances health programme participation in migrant communities who are usually excluded from research and innovative WASH programmes. The community meeting contributed to better outcomes for all stakeholders, encouraging community ownership and lowering project costs for future WASH interventions. Cyril et al. (2015) state that effective community meetings are about recognising the fact that involving the community in a research study is no longer about data collection and information dissemination, but is a two-way information sharing approach and a feedback forum.

The community meeting produced rich and varied views on their experienced [poor] WASH conditions. It provided a forum where community members provided new information on the WASH conditions and phenomena. It produced more information which contributed to the scientific or technical knowledge on WASH and provided a context for the implementation of WASH interventions in resource-constrained settings (as discussed in the scoping review of Chapter 3).

Figure 5.3: A photo of the Participants in the community meeting of Phase 1 taken by the author in Havana informal urban settlements, Windhoek. February 26, 2018

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5.5 Data Analysis

The SWOT (strengths, weaknesses, opportunities and threats) analysis described by Mintzberg (1990) was applied during the consultative meeting to determine the environmental impact of poor WASH conditions on an informal urban settlement. The SWOT analysis is a method used to assess the 'strengths', 'weaknesses', 'opportunities' and 'threats' related to the phenomenon under research. In this descriptive qualitative study, both the position and components of a SWOT analysis are examined. The SWOT analysis is considered an effective situation analysis technique that plays an important role in any field of research requiring strategic planning (Gürel & Tat, 2017). The SWOT analysis describes internal and external factors. The internal factors indicate the community strengths and weaknesses and the external factors indicate the critical threats and opportunities related to the research phenomenon (WASH conditions).

During the consultative meeting, a four-quadrant box was drawn with its four elements in a 2x2 matrix, which allowed for a summary that was organised according to the four-section titles of the SWOT analysis. The SWOT analysis was related to the environmental impact of poor WASH conditions on the Havana informal urban settlement (Table 5.3).

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Table 5.3: A Four-quadrant SWOT analysis box

	POSITIVES	**NEGATIVES**
INTERNAL Resources and experiences of communities Financial and physical resources Current WASH activities Past WASH experiences	*Strengths* What are your advantages, in terms of people, physical resources, finances, health? What do you do well? What WASH activities or processes have met with success in informal urban settlements?	*Weaknesses* What could be improved in your community in terms of people, physical resources, funding? What current WASH activities and processes lack effectiveness or are poorly done in the Havana informal urban settlement?
EXTERNAL External factors beyond control Economy Funding Demographic Legislation Future WASH trends	*Opportunities* What possibilities exist?	*Threats* What obstacles exist?

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The above-mentioned SWOT analysis box comprised positives and negatives in the context of the internal and external environment of communities residing in an informal urban settlement. The internal environment or factors consisted of strengths that were regarded as positive and weaknesses which were regarded as negative. The internal environments were the resources and experiences of communities that might include human, financial and physical resources, current and past WASH activities and experiences. Strengths were the characteristics of a community that added value and advantages in term of its people, resources and health. Weaknesses meant that something was disadvantageous and unfavourable in the community, which could be improved in terms of the people, resources and health.

The external environment or factors consisted of opportunities which were regarded as positives, and threats, which were regarded as negative. Opportunities were positive factors that presented the community with the opportunity of achieving its goals, given the time and the circumstances. Thus, opportunities ensured that communities yielded positive results in addressing their poor WASH conditions. Threats were negative factors that prevented communities from maintaining their health and existence. The external environment included factors that the community had no control over and might include future WASH trends, the local and international economies, funding and donors or demographic changes influenced by migration and population growth and legislation.

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5.6 Summary and Discussion of the Results

A summary of the emerging main themes (five) and sub-themes (28) related to the poor WASH conditions are presented in Table 5.4 below. The themes are then described as narrative accounts, with quotations and pictorial illustrations to reflect the essence and phenomena of the WASH conditions experienced by the interviewees. The verbatim quotes that were collected from all data collection methods were carefully selected to represent the voices of poor communities in the Havana informal urban settlement. The verbatim quotes of participants are reflected in italics and serve as evidence of the participants' real-life stories and experiences of WASH conditions in this informal urban settlement. To re-contextualise the findings, a literature review is presented in which the findings are tested in view of the relevant literature at the end of each WASH theme.

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Table 5.4: Emerging Themes and Sub-themes

THEMES	CATEGORIES	SUB-THEMES
1: Experiences of living in an informal urban settlement	Benefits and advantages Disadvantages	1.1 Access to services and facilities 1.2 Entrepreneurial opportunities 1.3 Community representation 1.4 Overcrowding 1.5 Health risks and outbreaks 1.6 Poverty and unemployment 1.7 Insecure land tenure 1.8 Corrupt leadership
2: Provision of Water services	Water supply and use Challenges to water supply	2.1 Adequate supply of water to poorer communities 2.2 The provision of quality drinking water 2.3 Safe water storage by households 2.4 Insufficient water supply to poorer communities 2.5 Poor maintenance of water taps 2.6 Inequitable water points 2.7 Poor behavioural practices of water storage 2.8 The costs of subsidised water
3: Sanitation infrastructure and services	Sanitation services and actions Challenges with sanitation facilities	3.1 The provision of communal toilets 3.2 The provision of waste management services 3.3 Community action against open-defecation 3.4 Unfit state of toilets and facilities 3.5 Inadequate sewerage systems 3.6 The practice of open defecation and public urination 3.7 Limited knowledge of waste management
4: Community practices related to hygiene and handwashing	Strengths and Weaknesses	4.1 Makeshift bathrooms 4.2 Hygiene and handwashing
5: Environmental health services and education		5.1 Sub-standard Health Inspections 5.2 Limited Behavioural change communication on WASH

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5.6.1 Theme 1: Experiences of living in an informal urban settlement

Theme 1 consists of two sub-themes: benefits and advantages (access to services and facilities, entrepreneurial opportunities and community representation) and disadvantages (overcrowding, health risks and outbreaks, poverty and unemployment, insecure land tenure and corrupt leadership).

5.6.1.1 Benefits and advantages

- *Access to services and facilities*

The participants indicated that migration to urban settings such as Windhoek created job opportunities and schooling for their children. Most participants preferred life in the city to rural settings, because of easy access to basic health services and facilities. Some participants valued the availability of public transportation, electricity and free unlimited shopping experiences.

> *We like the life in the city because [we] can go to the clinic when my children are sick and the taxi is available when I go to work* (Community Participant 9).

- *Entrepreneurial opportunities*

Studies conducted on the advantages of increasing the growth of urban population indicate that urban population growth reshapes the economic, demographic and social landscapes of a city, resulting in increasing jobs and business opportunities (Shang, Li, Li & Chen, 2018). Some participants indicated that urban growth created entrepreneurial opportunities for income-generation and job-creation for unemployed community members.

> *I have many customers for my Kapana business [*referring to selling of barbeque meat*] and I also sell sweets for the children* (Community Participant 31).

Most participants have indicated that Windhoek presents business and entrepreneurial opportunities to poorer communities. Some have indicated that they have started selling fresh food produce. Another participant expressed gratitude for the provision of informal markets in informal urban settlements by the City of Windhoek to conduct their entrepreneurial activities.

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> *I could not found (sic) a job when I came to Windhoek one year ago, so, I started selling fresh fruits and vegetable in the market. Today, I can rent a kambashu [*referring to a shack*] and wear nice clothes* (Community Participant 21).

Previous studies have shown that rural migration to urban settings can benefit communities and family members left behind in rural homes through the remittance of earnings from the city (Bouoiyour, Miftah & Muller, 2017). The participants indicated that unemployment forced them to start their own business to generate income for their necessities. Although the income was very little from their small businesses, they could feed themselves and take care of their children.

> *I am selling kapana [*referring to barbequed meat*] and beer from my own small business because there are no jobs. Now I can take care of my family. Even, my children can go to school* (Community Participant 34).

- *Community representation*

Participants indicated that the City of Windhoek had political structures that represented the interests of communities through local councillors. The local councillors conducted periodical meetings with informal urban settlements on issues related to socio-economic, health and political factors. Some participants were concerned about the motives of community leaders but appreciated the opportunities for community engagements in the local urban planning and decision-making.

> *We have a local councillor who represent us at the City of Windhoek Council meetings. He knows our problems and speaks for us* (Community Participant 27).

The participants indicated that the community had the power and free will to vote for their local councillor and political representative on the City of Windhoek Council and the Khomas Regional Council. Communities indicated that community leaders were playing an important role in representing informal urban settlements at Windhoek City Council meetings. The Moses Garoëb Constituency office, which was occupied by the Havana Councillor, was an important place to which they could submit their concerns and problems.

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Some of us cannot speak English only Oshiwambo. We choose our community leaders to speak for us at the City of Windhoek and government (Community Participant 43).

5.6.1.2 Disadvantages

- *Overcrowding*

Participants indicated that rural-to-urban migration caused urban expansion and growth that had caused the Havana informal urban settlement to become over-crowded, which in turn had led to crime and social deprivation.

We are very afraid of criminals here, especially in the night time. Some people steal too much here (Community participant 22).

Most participants complained that overcrowded living conditions in their *kambashus* or shacks result in lack of privacy and diseases.

We are eight to ten people sleeping in one shack. As a man, [it] is not good to sleep with women in one place even if they are your nieces and sisters. No privacy (Community Participant 25).

According to Uddin (2018), cities such as Windhoek are struggling to accommodate their rising populations and informal urban settlements.

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- *Health risks and outbreaks*

Participants indicated that the population growth of informal urban settlements created multiple health risks to communities by exposing them to diseases. Outbreaks of tuberculosis and hepatitis E had been worsened by the increased population growth in the Havana informal urban settlement.

My uncle was coughing a lot for two weeks and most of us sleep in the same shack went to the clinic, because we also start to coughing (Community Participant 28).

Some of my friends are having hepatitis E after they went to the clinic. I am afraid to get that sickness because we are many people here (Community Participant 29).

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The participants raised their concerns about the presence and spread of various infectious diseases in the Havana informal urban settlement. Participants indicated that their poor social status was a cause of health inequalities and inaccessibility to quality health care. The World Health Organization (WHO) and United Nations Human Settlements Programme (UN-HABITAT) (2010) confirmed that cities such as Windhoek that had high concentrations of informal settlements indicated high levels of urban health inequities.

Participants indicated that the Havana informal urban settlement was prone to outbreaks of disease such as cholera and hepatitis E. The latter disease had caused serious complications for communities, with symptoms such as fever, vomiting, abdominal pain, itching and skin rashes.

> *My husband was complaining about pain in the stomach and to vomit a lot. We take him to the hospital now they say that he has hepatitis E* (Community Participant 37).

WHO indicated that the ongoing outbreaks of hepatitis E in Namibia since September 2017 were a concern and had spread to other informal urban settlements of Windhoek (WHO, 2018).

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- *Poverty and unemployment*

Some participants raised their concern about unemployed young people who were roaming about the informal urban settlements, with increasing numbers of young people migrating to Windhoek for employment.

> *Our youth are sitting around here with no jobs. There are so many of them who came from the north* [referring to northern part of Namibia] *looking for jobs in Windhoek* (Community Participant 28).

A previous study conducted by Awumbila, Owusu and Teye (2014), indicated that increasing levels of poverty and unemployment in urban areas could be attributed to the migration of poor people to cities. Participants indicated that poverty and unemployment were increasing in informal urban settlements, which negatively affected their living conditions. Most

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participants indicated that the consequences of poverty and unemployment were malnutrition among their children.

> *I do not have a job and my children sometimes go to school without breakfast. It is now two years without a job* (Community Participant 6).

- *Insecure land tenure*

All participants indicated they did not have rights to occupy land which made them vulnerable to eviction by the Windhoek municipality. Their situation was precarious as they were usually regarded as illegal occupants and the poorest segment of the City of Windhoek. In a study that was conducted in Dar es Salaam, Tanzania, it was shown that most communities residing in informal urban settlements were trying to secure tenure and land rights (Masum, 2018).

> *We are afraid that the municipality police will come anytime to chase us away and break our shacks. Where will we go with our children? We want the land to build our own houses with bricks with no disturbance from the municipality* (Community Participant 17).

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- *Corrupt leadership*

Participants indicated that they had entrusted their votes to community leaders but were disappointed that leaders did not have their interests at heart and had forgotten about the community. One community leader was thought to have become greedy by making selfish decisions that were not beneficial to the informal urban settlements. Participants expressed their concern about the lack of transparency and corrupt practices of leaders who were enriching themselves at the expense of the poor communities.

> *Our leaders don't care where and how we are living here. Some of them take our money from the government and use it for themselves. Those leaders we voted [for] are not staying here in kambashus [*referring to shacks*] but in nice houses in town* (Community Participant 39).

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5.6.2 Theme 2: Provision of water services

Theme 2 consists of two sub-themes: water supply and use (adequate supply of water to poorer communities, provision of quality drinking water, safe water storage by households) and challenges to water supply (insufficient water supply to poorer communities, poor maintenance of water taps, inequitable water points, poor behavioural practices of water storage and the costs of subsidised water).

5.6.2.1 Water supply and use

- *Adequate supply of water to poorer communities*

The participants indicated that the City of Windhoek had supplied water to Havana informal urban settlement by providing water taps and water points within the proximity of the community.

> *We are happy that Windhoek municipality has built water taps nearby our houses* (Community Participant 4).

The government of Namibia had embarked on a poverty-reduction strategy in its Harambee Prosperity Plan that covered the provision of basic services to the poor, such as the supply of clean drinking water (National Planning Commission, 2016; Makamani, 2018). The participants indicated that on-going dialogues with their community leaders about water supply raised opportunities to be taken up further with policy-makers.

> *Our representation of the community through our councillor in both the civic and political arena gives us the opportunity for negotiations with City of Windhoek and government* (Community Participant 10).

The participant from the City of Windhoek indicated that the City of Windhoek had made provision in their annual budget for the provision of more water taps to informal urban settlements.

> *The City of Windhoek has made provision for capital projects, municipal service delivery and infrastructural provision in its annual budget to informal settlements* (Stakeholder Participant 2).

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The participants indicated that the City of Windhoek was subsidising the costs of water that was supplied to the Havana informal urban settlement, making it affordable to most communities. Most participants indicated that the communities use their 'voting-power' as an opportunity to influence their local councillors to negotiate affordable water supply from the City of Windhoek. Kang (2019) states that a citizen is the one who has voting power as a holder of constitutional rights to make his or her society a better place to live together.

- *The provision of quality drinking water*

The participants indicated that the water taps from the City of Windhoek gave them access to quality drinking water.

> *We are so happy that the municipality gave us taps to get some water. It helps us to have drinking water* (Community Participant 25).

Participants indicated that the City of Windhoek and related government ministries such as the Ministry of Health and Social Services conducted periodic testing of water quality and safe drinking water.

> *The City of Windhoek conducts periodic testing and water management at the Gammams Waterworks, which is located close to the Goreangab dam. The purpose of periodic water testing is ways to enforce strict measures of water quality standards* (Stakeholder Participant 2).

- *Safe water storage by households*

Some households were taking full responsibility for the safe storing of water in clean and hygienic containers with lids to prevent water contamination, especially water that was collected from the communal water taps.

> *We always cover my water container to stop flies and dust to spoil the water. It is not healthy when flies go into the water* (Community participant 9).

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A participant noted that communities were demonstrating acts of responsibility and accountability by using water purification tablets if they detected water contamination.

> *We received water purification tablets from the people of Health to use for water containers. The tablets keep the water healthy* (Community Participant 15).

5.6.2.1 Challenges to water supply

- *Insufficient water supply to poorer communities*

Communities indicated that inadequate water supply was causing negative public health outcomes especially for women and children. Some participants noted that communities were getting semi-purified water from alternative water sources such as the Goreangab dam, sewerage water and other nearby water streams as illustrated in Figure 5.4 below.


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Figure 5.4: A photo of the Community members collecting water from semi-purified water sources taken by the author in Havana informal urban settlements, Windhoek. March 03, 2018

Participants also noted that some communities were reusing the water two or three times for washing hands, cleaning utensils and/or bathing owing to a limited supply of water. The participants expressed their frustration and disgust about the poor condition of the water.

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> *We use water twice like washing our hands in the same water we wash clothing or dishes and so forth* (Community Participant 14).

It was also reported that two to three people in a household shared the bathwater which had become a common practice to cope with the lack of any water supply.

> *In the morning I take a bath before I go to work and my two children will bath in the same water before they go to school. I cannot use all my water because it is little. I need water for cooking food* (Community Participant 19).

Njiru (2005) states that sustainable development cannot be achieved if larger proportions of informal settlements do not have access to a sufficient water supply. Participants were entitled to a basic water supply necessary for having adequate water and a healthy environment that promoted community well-being.

- *Poor maintenance of water taps*

Despite expressing satisfaction with the supply of taps, participants indicated that they were dependent on public water taps and that these water taps had been broken or out of order for periods of two to five consecutive days or more. The lack of routine maintenance of broken water taps had resulted in an interruption of water supply. The interruption of water supply owing to broken water taps meant that the community had resorted to eating food without washing their hands or spending days without bathing.

> *The water taps are always broken for two weeks. I have to wake up very early in the morning to fetch water at neighbouring water points. The waiting lines are long because of broken taps* (Community Participant 11).

The participant from the City of Windhoek, on the other hand, indicated that approximately 40% of the residents of Windhoek resided in informal urban settlements owing to the migration of rural people to the city of Windhoek, which placed a great strain on the water supply.

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The City of Windhoek is burdened by the overwhelming demand for water supply to the Havana informal urban settlement. Due to the ever-increasing growth of the population, the City of Windhoek is facing the challenges of budgetary constraints (Stakeholder Participant 2).

The poor maintenance of water taps was also compromising the quality of drinking water. Participants indicated that some communities had observed a different and unnatural colour of water running from the water taps. A number of complaints had been made to the City of Windhoek and local councillors about the water quality but no feedback had been received.

W*ater from our taps has different and strange colours and looks a bit whitish* (Community Participant 6).

Participants had indicated that although the City of Windhoek was providing clean drinking water to Havana informal urban settlement, the community members had discovered traces of dirt in the water during 2017. This discovery had been reported but feedback was still being awaited from the City of Windhoek at the time of this research study. The communities were speculating that broken underground pipes had compromised the quality of drinking water. Several participants confirmed complaints from friends or household-members of a runny or aching stomach, which they linked to dirty water.

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My friends always complaint about stomach pain after drinking tap water with strange colours
(Community Participant 11).

- *Inequitable distribution of water points*

The participants raised their concerns about limited water points in the Havana informal settlement. The majority of communities that were located in remote areas did not have access to water taps, although the water points were available to some communities.

The water taps are very much overcrowded with long queues because there are not enough water taps. Sometimes we wait for one to three hours just to have access to drinking water (Community Participant 32).

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Most participants indicated that communities had to walk 1–2 km to fetch water from neighbouring communities, owing to distribution inequity. At the time of the study, one water point was shared among 30 to 40 households. People having to walk long distances to fetch water from communal water points in the Havana informal urban settlement is illustrated in Figure 5.5 below.


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Figure 5.5: Fetching water from communal water taps (Faes, 2013)

- *Poor water storage practices*

The participants indicated that the storage of water in containers such as pots, jerry cans and drums was a concern because of the poor handling practices of water by households. This poor handling was attributed to limited knowledge about and awareness of water storage and also to the lack of resources such as additional water containers. The water containers were contaminated before and after the water had been stored, making these containers susceptible to water-borne diseases.

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I sometimes don't clean the containers because the water is too little to clean the containers. Sometimes dust or dirt is there inside. I also use the same containers to put in local alcohol brew and forget to clean it nicely when I want to store water in it (Community participant 12).

The water quality in households had been compromised because of poor storage methods, which resulted in a runny stomach and diarrhoeal conditions that were life-threatening. The participants from the City of Windhoek and Ministry of Health and Social Services considered that tap water might not necessarily be contaminated or pose a public health risk, but the water handling and storage by many households posed a great health threat.

- *The cost of subsidised water*

The majority of the poorer community indicated that they wanted free water despite the subsidised water tokens that had been provided at reasonable prices. The communities were required to buy a water token of between N$/R30 to N$/R100 to have access to drinking water, which was unaffordable to most poorer communities. Although the City of Windhoek was subsidising the drinking water, communities were still finding it difficult to afford water owing to high levels of unemployment and poverty. Water tokens came in the form of tags which were quantified in cubic litres of water that community members purchased from the City of Windhoek municipality and periodically recharged with money. The water tokens and water vending machines are illustrated in Figure 5.6 below.

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Figure 5.6: A photo of the Water tokens and water-vending machines taken by the author in Havana informal urban settlements, Windhoek. December 11, 2017

The inability to afford the purchase of water resulted in dirty clothes and unhygienic conditions and the presence of body odour in both adults and children.

We cannot wash us because no money to buy water (Community Participant 17).

The participants indicated that the high costs of drinking water were a critical situation especially in the light of high levels of poverty and unemployment.

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I move here to this place two years ago and now my problems are so many. I am not employed for a very long time now and I cannot buy anything like water (Community Participant 29).

5.6.3 Theme 3: Sanitation infrastructure and services

Theme 3 consists of two sub-themes: sanitation services and actions (provision of communal toilets, provision of waste-management services, community action against open defecation) and challenges with sanitation facilities (unfit state of toilets and facilities, inadequate sewerage systems, practice of open defecation and public urination, limited knowledge of waste management).

5.6.3.1 Sanitation services and actions

- *The provision of communal toilets*

Participants indicated that the City of Windhoek had built communal toilets in the Havana informal settlement (illustrated in Figure 5.7 below).

Figure 5.7: A photo of the Communal toilets built by the City of Windhoek taken by the author in Havana informal urban settlements, Windhoek. January 27, 2018

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The communal toilets that had been provided by the City of Windhoek had sewerage systems as illustrated in Figure 5.8 below.

Figure 5.8: A photo of the Communal toilets with sewerage systems taken by the author in Havana informal urban settlements, Windhoek. January 26, 2018

- *The provision of Waste management services*

Participants noted that the City of Windhoek had provided waste dumping sites and rubbish bins for some communities (as illustrated in Figure 5.9 below).

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Figure 5.9: A photo of the Rubbish dumpster taken by the author in Havana informal urban settlements, Windhoek. February 03, 2018

- *Community action against open-defecation*

Participants indicated that open defecation was prohibited by some households and that they preferred to use communal toilets.

> *We do not tolerate people who pee [*referring to urination*] or kakas [*referring to defecation*] around our place and home. No, we already warned them* (Community Participant 21).

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5.6.3.2 Challenges with sanitation facilities

- *Unfit state of toilets and facilities*

Participants indicated the toilet facilities were not sufficient for all the people who needed to use them. The communal toilets that had been provided by the City of Windhoek were unsuitable and dirty as some community members were defecating on the floors or did not flush the toilets. The participants also indicated that the water basins (sinks) were missing in communal toilets. The stench of communal toilets was unbearable and nauseating as illustrated in Figure 5.10 below.

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Figure 5.10: A photo of the Communal toilets in the Havana informal urban settlement taken by the author in Havana informal urban settlements, Windhoek. February 10, 2018

Participants affirmed that 10 to 40 households were using the communal toilets and that these had been vandalised and neglected. The participant from the City of Windhoek reported that over 333 communal toilets had been vandalised during 2017 and 2018 in total. The community still demanded the construction of communal toilets, which was a very costly exercise for the City of Windhoek. The participants indicated that communities were complaining about infections and abdominal pains because of dirty toilets. Cases of hepatitis E were connected to poor toilet facilities and sanitary practices.

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- *Inadequate sewerage systems*

The majority of participants indicated that the Havana informal settlement did not have adequate sewerage systems, especially since the available toilet facilities resulted in water spillage. A limited number of communal toilets with sewerage systems had been installed in certain parts of the Havana informal settlement that had been legally demarcated by the City of Windhoek. The informal settlements that did not have communal toilets and sewerage systems were exposed to water-borne diseases. There was no water pipe or proper water drainage system in most areas of the Havana informal urban settlement.

> *We don't have proper systems like drains to flush faeces and urine. We asked the municipality to make pipes for sewerage but we are waiting now a long time* (Community Participant 27).

Participants indicated that the makeshift toilets were very popular in the informal urban settlements, which caused grey water spillage and a bad odour owing to the lack of a sewerage system (as illustrated in Figure 5.11 below).

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Figure 5.11 A photo of the Greywater spillage and lack of sewerage systems taken by the author in Havana informal urban settlements, Windhoek. February 10, 2018

Some participants indicated that spilt grey water was a threat to children because of the skin diseases it caused. The grey water was affecting the living environment of communities, as illustrated in Figure 5.12 below.

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Figure 5.12: A photo of the Water spillage taken by the author in Havana informal urban settlements, Windhoek. February 11, 2018

- *The practice of open defecation and public urination*

The participants indicated that the limited toilet facilities forced communities into openly defecating in riverbeds and the surrounding living environment. Participants complained that human faeces were scattered around the shacks of households. The open space such as riverbeds and bushes were common places where open defecation and urination were being practised by most community members. Children invariably experienced the development of sores and infections on their feet after defecating in riverbeds.

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The riverbeds are a place of sickness we develop sores in our feet, especially our children who go to the riverbeds (Community Participant 34).

The participants from the City of Windhoek indicated that Windhoek had a high level of open defecation that had reached 74%, compared to the rest of Namibia that only had a 50% open-defecation level. The Havana informal urban settlement was known for its rampant open-defecation practices as illustrated in Figure 5.13 below.

Figure 5.13: A photo of Open defecation taken by the author in Havana informal urban settlements, Windhoek. March 09, 2018

Some of the participants reported that they were defecating in riverbeds and bushes owing to limited communal toilets.

We defecate outside and adults pick up the waste and throw at the riverbed (Community Participant 41).

The poor communities who had migrated from communal areas and small towns to Windhoek were unable to pay for sanitation services, therefore they use shared toilets or practised open defecation. A study conducted by Kasote (2018) on open-defecation

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confirmed that the poor, who migrate from communal areas and small towns to Windhoek practise open-defecation because they are unable to pay for sanitation services.

- *Limited knowledge of waste management*

Participants indicated that communities did not have sufficient knowledge of waste management, which caused the littering of used plastic grocery bags filled with human faeces and urine. These plastic grocery bags or 'flying toilets' were disposed of in riverbeds or behind their houses (shacks). The curiosity of children attracted them to the discarded grocery bags with the idea that sweets or toys were in the bags and because of the colourful labels of 'Shoprite' or 'Pick n Pay'. In this way, countless children were exposed to human faeces and waste that caused diseases and sicknesses. The participants noted that the Havana informal settlement had become a dirty environment with human faeces and waste because of the lack of correct waste-management practices.

> *Havana needs to be cleaned. It is dirty everywhere. I have been here now for ten years and I am hopeless* (Community Participants 44).

According to a previous study by Kadhila (2019), solid waste is known to cause a wide variety of environmental pollution including water, ground and air pollution. If not properly managed, the consequences can be harmful to biodiversity and human health.

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5.6.4 Theme 4: Community practices related to hygiene and handwashing

Theme 4 consists of two sub-themes: Strengths (makeshift bathrooms, awareness and knowledge of handwashing) and Weaknesses (poor hygiene and handwashing).

5.6.4.1 Strengths

- *Makeshift bathrooms*

Participants have indicated that some communities who have access to water are practising good personal hygiene by bathing daily. Some communities have built makeshift bathrooms to wash daily as illustrated in Figure 5.14 below.

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Figure 5.14: A photo of the Makeshift bathrooms taken by the author in Havana informal urban settlements, Windhoek. March 09, 2018

- *Awareness and knowledge of handwashing*

Participants noted that good handwashing was practised by communities that had access to water. The participants indicated that the current hand-washing and hygiene campaign that was conducted annually by the City of Windhoek was an opportunity to expand the programme to the rest of the Havana informal urban settlement.

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I teach my children to wash their hands before they eat food (Community Participant 47).

5.6.4.2 Weaknesses

- *Hygiene and handwashing*

Participants indicated that children attend school without bathing or washing themselves for days and weeks. The personal hygiene of school-going children was affected by limited water and caused bad body odour in the classrooms.

Participants noted that handwashing practices of informal settlements were very poor especially after defecation and before eating food. Most participants were concerned that communities exposed themselves to oral-hand disease transmission.

We don't wash our hands every time we eat because you will not die. Everything you eat with your mouth comes out of your body (Community Participant 50).

5.6.5 Theme 5: Environmental health services and education

Haradanhalli Prashanth, Kumari, Siddhareddy, Pradeepkumar and Surendran (2019) state that safe and hygiene practices among communities are important and can be promoted by providing behavioural-change communication about sanitation and hygiene and through continuous environmental health inspections.

5.6.5.1 Sub-standard health inspections

Participants indicated that the environmental health inspectors from the City of Windhoek did not conduct periodic health inspection which could have detected the erection of a makeshift bathroom that was causing uncontrolled grey water spillage. The role of health inspectors were very important especially in the context of poor WASH conditions of informal urban settlements. The health inspection of informal settlements was inconsistent and inadequate, putting communities at risk of contracting WASH-related diseases and infections. The handling of foodstuff by informal vendors in informal settlements without handwashing called for regular and consistent visits by health inspectors.

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5.6.5.2 Limited behavioural change communication about sanitation and hygiene

Participants indicated that good hygiene was linked to socio-cultural perceptions and behavioural practices of the inhabitants of the Havana informal urban settlement. The participants indicated that hygiene campaigns, billboards and education materials were presented in English by the City of Windhoek. The participants were concerned that the level of community knowledge about personal hygiene was very low because of illiteracy and the language barrier.

> *I am 47 years old but I cannot read and write English only Afrikaans and Otjiherero. Most of my neighbours here in Havana only speak Oshiwambo language* (Community Participant 44).

5.7 Summary and points to take forward

The situation analysis illustrated that communities migrating to informal urban settlements had advantages such as access to health services and facilities, entrepreneurial opportunities and representation at the City of Windhoek through local councillors. However, living in an informal urban settlement negatively affected the health and security of communities owing to overcrowding, poverty, unemployment and corrupt leadership.

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Despite the provision of quality drinking water by the City of Windhoek, informal urban settlements were experiencing the inequitable distribution of water points and the poor maintenance of existing water taps. Communities were challenged by the cost of water although water was subsidised by the City of Windhoek.

The City of Windhoek had provided communal toilets and waste management services to informal urban settlements. In addition, the community had taken a stance and taken action against open-defecation. Communities were still practising open-defecation owing to inadequate toilets and sewerage systems and a limited knowledge of sanitation and waste management.

The awareness and knowledge of hygiene and handwashing were limited in the informal urban settlement, despite the initiative of some inhabitants to build a makeshift bathroom for personal hygiene purposes.

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The situation analysis confirmed that environmental health services and education were very weak owing to the poor standard of health inspection by the City of Windhoek. The current messaging about behavioural change among inhabitants of the informal urban settlement about sanitation and hygiene was limited because of language barriers and illiteracy.

In conclusion, the situation analysis provided evidence that water and sanitation services and facilities were inadequate for healthy living of community members in the Havana informal settlement. It clearly illustrated the specific shortcomings, which required immediate interventions that would address the poor WASH conditions in this informal urban settlement, which will be explained further in subsequent research phases. The next chapter discusses the implementation of a PAR approach to obtain more research findings that were derived from a community workshop and follow-up meeting.

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CHAPTER 6: IMPLEMENTATION OF A PARTICIPATORY ACTION RESEARCH APPROACH

6.1 Introduction

In Phase 2, a Participatory Action Research (PAR) approach was implemented in line with Objective 2, to embark on a PAR approach to address poor WASH conditions in the Havana informal urban settlement of Windhoek. The current chapter reports on the proceedings and findings derived from a community workshop and follow-up meeting that occurred between 22 September and 13 October 2018.

6.2 Study design

The participatory approach was followed, as described by Terre Blanche, Durrheim and Painter (2012). In a PAR approach, the participating communities are not just objects of research, but active participants in changing their own environment and advocating for action towards improved WASH conditions, as described by Kemmis, McTaggart and Nixon (2014). The participatory approach is critical because of its action agenda for reform that may change the lives of communities and provide a voice for marginalised individuals residing in an informal urban settlement (Creswell & Poth, 2016). The participatory approach stresses the importance of the community's participation in improving poor WASH conditions, increasing community ownership and enabling community empowerment. This approach is fundamental as it offers opportunities for community members to engage as active contributors throughout Phase 2.

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6.3 Study population and sampling

The current phase engaged 60 participants (see table 6.1) who comprised community members, community leaders and stakeholders in a workshop to actively engage with the participants in the research study. The follow-up community meeting engaged with 15 participants. Adults and young people from the informal urban settlement who participated in Phase 1 were invited to the community workshop. In the sampling process, attention was given to issues of power, group dynamics and hierarchy within the community.

The demographic characteristics of the participants who attended the workshop and follow-up community meeting are described in Table 6.1 and Table 6.2 below. Most participants (60%) in the workshop were between the ages of 20–39 years and the majority were female

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(80%) and unemployed (80%). Community members were in the majority (n=53; 88%), with four community leaders (7%) and three stakeholder representatives (5%).

Table 6.1: Demographic characteristics of the Workshop participants in Phase 2

		Frequency (n)	**Percentage** (%)
Age (in year)			
	≤ 20	1	12
	20 – 29	3	27
	30 – 39	6	37
	40 – 49	3	17
	50 – 59	1	5
	60 – 69	1	2
Sex			
	Male	12	20
	Female	48	80
Status			
	Employed	7	12
	Unemployed	48	80
	Student	5	8
Designation			
	Community	53	88
	Community Leader	4	7
	Key informants	3	5

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Most participants in the community meeting were between the ages of 20–29 (20%) and 30–39 years (40%) and mostly female (67%) and unemployed (60%). Eleven community members were in attendance (73%) with three community leaders (20%) and one stakeholder (7%).

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Table 6.2: Demographic characteristics of the Community meeting

	Frequency (n)	Percentage (%)
Age (in year)		
≤ 20	2	13
20 – 29	3	20
30 – 39	6	40
40 – 49	2	13
50 – 59	1	7
60 – 69	1	7
Sex		
Male	5	33
Female	10	67
Status		
Employed	1	7
Unemployed	9	60
Student	5	33
Designation		
Community	11	73
Community Leader	3	20
Key informants	1	7

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6.4 Data Collection

The data collection took place during September 2018. Group discussions were held during the community workshop and follow-up community meeting. All group discussions were audiotape-recorded and field notes were taken to record the data collection.

6.4.1 Workshop

The workshop with the community and stakeholders occurred on 22 September 2018. The researcher adopted the Hancock and Duhl model of 'Healthy Cities' during the workshop (Ashton, Grey & Barnard, 1986; Hancock, 1993; WHO, 2015). The Hancock and Duhl model on Healthy Cities is based on the concept that the social, economic and physical environments are the key to the health of cities. According to Hancock and Duhl, a Healthy City is one that is continually creating and improving its physical and social environments. Healthy Cities also expand community resources that enable people to support each other mutually in performing all the functions of life.

A future 'Healthy City', such as the City of Windhoek, can embrace and make productive use of the differences in class, ethnicity and lifestyle. Several studies have found that a 'sick city'

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isolates and segregates differences between the poor and rich, instead of drawing a collective strength from its mixture of different communities (Paccoud, 2011). The City of Windhoek can be an equitable and inclusive community whereby the health of people are placed at the centre of urban development and planning, economic development, social sciences and public health.

The Healthy Cities Model was applied during the workshop proceedings through an education presentation given by the researcher. The model was introduced to the workshop participants as part of the workshop presentation, which was followed up with group work and discussions. The presentation on the World Health Organization's approach of Healthy Cities focussed on the health and well-being of communities in informal urban settings (WHO, 2015).

The agenda of the workshop was outlined to the community participants including the brainstorming activities. The group discussions set the momentum of the workshop agenda and fostered an open communication process that involved all participants. Members of the community were required to become actively engaged during the workshop and were also encouraged to be interested in the topic of the inquiry. The community participants were divided into groups to discuss the Healthy Cities Model. Each group was instructed to appoint a leader among them who would act as a facilitator and responder of the group. All members of the group had a chance to interact with their respective group by expressing their own ideas, thoughts and feelings. As the session ended, the group leaders reviewed the group discussion and presented feedback during a plenary session. The plenary sessions form part of the data-collection stage.

The workshop discussions were audio-recorded and field notes were taken since the participants' active participation generated supplementary and rich data that assisted the researcher in the data collection. The discussion that was audio-recorded was immediately translated into English and transcribed after the sessions. The verbatim transcription of the audio recordings was checked for accuracy to ensure validity.

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Figure 6.1 illustrates the presentation and group work that followed during the community workshop.

Figure 6.1: A photo of the Community workshop during Phase 2 taken by the author in Havana informal urban settlements, Windhoek. September 22, 2018

The workshop offered new ideas by summarising and clarifying the important points and ideas of the discussions.

6.4.2 Community meeting

The community meeting was conducted on 13 October 2018 at the Max Mutongolume community hall in the Havana informal urban settlement. The community meeting was a practical tool for engaging with the broader community in a robust research enquiry process aiming to improve health outcomes (Adams et al., 2017). The community meeting engaged with a wider audience of the Havana informal urban settlement which provided insightful and unique information on the community's WASH perspectives and experiences.

Prior to the community meeting, with permission from community leaders and community members, notices were posted in several locations of the Havana informal settlement. Although the participants were fewer than the preceding workshop, more constructive interaction and thematic discussions took place. The meeting with the community necessitated an on-going engagement for further public involvement, which was a follow-up on the workshop. The meeting was also audio-taped, accompanied by field notes that were used to increase the rich data of the study. The meeting allowed for a two-way flow of information as an opportunity for engaging in in-depth dialogue and problem-solving (Cyril

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et al., 2015). The two-way communication created a more transparent environment during small discussions, whereby participants shared their thoughts, ideas and opinions regardless of their socio-economic status. The meeting was facilitated by the researcher with the assistance of one community member who interpreted the meeting proceedings and discussions.

6.5 Data Analysis

Data analysis in qualitative research is an iterative process of gathering and evaluating the data simultaneously to maximise the meaning of the data (Polit & Beck, 2012; Creswell, 2014). In Phase 2, the data analysis was conducted and involved verbatim transcription of the voice recordings and field notes of all the focus group discussions during the meeting and workshop. The process of data analysis included making sense of the text, preparing the data for analysis, conducting different analyses and delving into understanding, representing and interpreting the data (Creswell, 2014). The WASH thematic analysis, which included the identification of WASH themes and sub-themes, using Tesch's coding technique, was part of the data-analysis process that was followed (Creswell, 2014). Tesch's coding analysis process involves five steps:

- Firstly, the researcher organised and prepared the data for analysis including the transcription of the workshop proceedings and typing up of field notes during the meeting and workshop (Addendum K: Typed-up field notes sample).
- Secondly, the researcher read through all the data to get a general sense of the information and opportunities for reflection. The researcher read all the notes during the same period of time to make meaning of their contents. Additional notes about the research topic were written in the margin whenever something came to mind about the data. The reading and reflection gave the researcher the necessary background information about the poor WASH conditions of the Havana informal urban settlement.
- Thirdly, the researcher coded the data by making a list of all the topics discussed during the meeting and workshop. The topics were clustered together according to similarities and inserted in columns on one sheet that could be arranged as major topics, unique topics and additional topics. After the researcher had gone back to the data, the topics in the columns were abbreviated as codes and written next to the appropriate segments of the text to see whether new WASH categories and codes had

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emerged. The researcher looked at all the material in one category at a time by focussing on the content of each category.

- Fourthly, the researcher used the coding process to generate descriptions of the setting and participants residing in informal urban settlements to generate WASH themes for analysis. The researcher found the most descriptive wording for the topics and turned them into categories. The categories were reduced by grouping together those that were related to each other and lines could be drawn between categories to show interrelationships. A final decision was made on the abbreviation for each category and these categories were alphabetically arranged to ensure that no duplication had occurred. The data material belonging to each category were assembled in one place to perform a preliminary analysis.
- Fifthly, The WASH theme was discussed in detail during the re-coding of existing data and presented with illustrations in this chapter of the study. The description of the findings and identified themes are presented in section 6.6.

Atlas.ti computer software (Version 8) is a qualitative research tool that was used for coding and analysing transcripts and field notes. The software assisted the researcher to apply codes to a collection of unstructured text, which could identify and visualise the basic text content analysis (Silver & Lewins, 2014). The data from transcripts and field notes were analysed and interpreted by using the coding and annotating activities as prescribed by Atlas.ti. The connections that were identified and drawn from the verbatim transcription and field notes were consolidated as primary data and their significance evaluated. The researcher followed several steps in the data analysis using Atlas.ti software as illustrated in Figure 6.1 below.

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6.5.1 Enhancing the credibility of coding

To ensure rigour, transcripts of the audio recording have been submitted to an independent coder, who is a research scholar with extensive experience in qualitative data analysis, to verify the credibility of the coding. The researcher and the independent coder met for a consensus discussion after the completion of the individual analysis. The independent coder verified the data through a literature control to place the findings in the context of existing literature.

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The emerging themes were then re-contextualised within existing literature to find support for aspects revealed during the analysis. These discussions assisted in reducing the data to categories and sub-categories and main emergent themes (Creswell, 2014). The use of an independent coder ensures the trustworthiness of the research findings. The Atlas.ti steps of data analysis are illustrated in Figure 6.2.

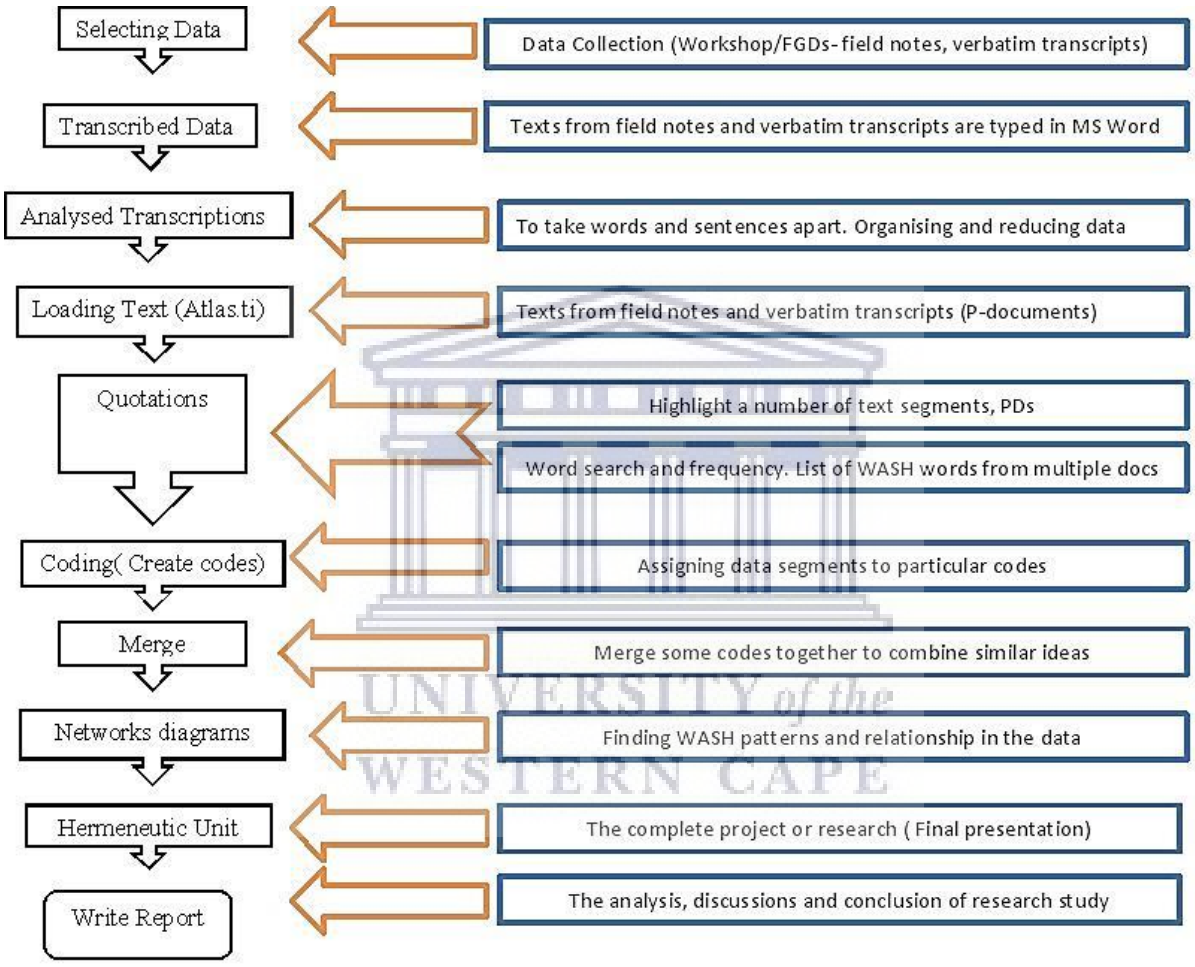

Figure 6.2: Atlas.ti steps of data analysis

6.6 Findings and Discussions

The eleven characteristics of a 'Healthy City' model were presented during the workshop for discussion as illustrated in Table 6.3 below.

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Table 6.3: The Hancock and Duhl model of Healthy Cities (WHO, 2015)

CHARACTERISTICS OF HEALTHY CITIES	**CONDITIONS OF HEALTHY CITIES**	**CONDITIONS OF HAVANA INFORMAL URBAN SETTLEMENT (City of Windhoek)**
ENVIRONMENT: Clean and safe environment of high quality	• Clean air and water and plants and animals; • mechanisms for sustainability; • healthy and liveable environment.	Poor water, sanitation and hygiene conditions.
ECO-SYSTEM: Stable and sustainable eco-system	• A suitable range of temperature and solar radiation, clean air and water and plants and animals; • mechanisms for sustainability.	Uninhabitable geographic setting & mountainous, dangerous natural surroundings.
COMMUNITY: Strong, mutually-supporting & non-exploitative community	• The incorporation of views from all groups in the community; • linkage with community development and human development.	Extremely poor communities, unemployment and unequal socio-economic status.
PARTICIPATION: Public participation and control over the decisions affecting one's life, health and well-being	• Community participation; participatory research and analyses; • social and cultural values of the communities and which are developed by consensus; • participatory planning for health.	• Exclusion from urban planning and city-wide development; • non-participatory status in decision-making processes.

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LIVEABILITY: Meeting of basic needs (food, water, shelter, income, safety, work) for all the city's people	• The community needs to be convivial; • basic needs are met.	• Poverty, unemployment, hunger; socio-economic needs.
RESOURCES: Access to a wide variety of experiences and resource	• Renewable resources; • information-sharing; • the involvement of the media.	• No access to WASH-related resources; • language barriers in behavioural-change communications; • poor education messages.
ECONOMY: Diverse, vital and innovative city economy	• The economy needs to be adequately prosperous, generating enough wealth; • national and international networking; • wealth distributed fairly within the community.	• Low economic wealth status; • limited access to financial assistance; • extreme poverty.
EQUITY: Equal treatment related to services and support	• Equitable, where community members are treated with fairness and justice; • inter-sectoral collaboration; • the integration of activities; • members living harmoniously together, building social support systems and participating fully in the life of the community; • maintaining cordial relationships and sustaining a viable human presence.	• Disconnected from the rich urban community of the city; • culture and language inequality that cause disunity and tribalism among communities.

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COMPATIBILITY: A city that is compatible with international standards with enhanced knowledge and behaviour parameters	• Health-related knowledge, attitudes, behavioural intentions and interpersonal skills; • healthy lifestyles; • periodic monitoring and evaluation.	• No basic knowledge of WASH and community health education.
SERVICES: An optimum level of appropriate public health and sick care services accessible to all	• Community members achieve a satisfactory level of health care services; • health literacy.	• Limited health facilities and services in informal settlements.
HEALTH: High health status (both high positive health status and low disease status)	• Improved health and quality of life for all citizens; • high political commitment; • development of a city health profile: a local health action plan; • health advocacy.	• Disease outbreaks and other WASH-related infections.

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6.6.1 Workshop

The WHO concept of Healthy Cities was presented to the community during the workshop session. The workshop pursued a broader notion of a Healthy City than simply the absence of diseases, by emphasising that health comprises psychological, physical and eco-friendly dynamics (Oni et al., 2016). Thus, the concept of Healthy Cities emphasises the multiple and co-existing social and environmental determinants of health, rather than individual diseases and specific risks (WHO, 2015). The workshop participants demanded more research that would focus on health work in the cities of Namibia, including the theoretical and practical difficulties associated with the WASH phenomenon.

The community was exposed to more knowledge of Healthy Cities and how to apply the Healthy Cities Model in addressing their poor WASH conditions. The purpose of the workshop was focussed on community empowerment that allowed poor communities to play an active role in the decisions to make the Havana informal settlement a healthy environment. Helping communities to get control over their environment demands a strategic partnership with the City of Windhoek as part of the community empowerment process.

The workshop strongly suggested an increased role to be played by the City of Windhoek to address the WASH challenges of informal urban settlements. The city of Windhoek is a critical site for enquiry and action concerning the health and well-being of its citizens. The workshop agreed that the City of Windhoek must re-align their focus from urbanisation and migration to the health knowledge of informal urban communities. The workshop discussed the changing patterns of urbanisation and particular WASH health burdens on the informal urban settlements of Windhoek. The workshop sought to put a particular geographic focus on the Havana informal urban settlement and the impact of poor WASH conditions on Windhoek as a Healthy City. The increasing presence of WASH-related diseases, such as hepatitis E, was the main urban health challenge in the city of Windhoek.

6.6.2 Community meeting

The community meeting's findings are discussed in the context of the Healthy City Model (Table 6.3), which shows that people living in informal settlements are the most affected by poor WASH conditions.

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The findings of the community meeting indicated that the living environment of communities were characterised by the poor quality of WASH service that was linked to their WASH situation. The community comprised people from diverse backgrounds and cultures who had migrated from all parts of Namibia to the city. Families found themselves stranded without financial income and employment, resorting to living in shacks with poor living conditions. The high levels of unemployment caused families to live in unsanitary and unhygienic conditions owing to the lack of financial means to improve their living conditions.

Communities were concerned about the outbreaks of disease and the slow response of health authorities to contain outbreaks in informal urban settlements. The political will to eradicate disease in informal settlements was not seen as a priority for the government, especially the health authorities. No sustainable health action plans were in place for poor communities residing in informal settlements. Many households were living in poverty by surviving from day to day and relying on fellow community members for daily sustenance. Some communities stayed for a period of two years without decent homes, moving from place to place seeking permanent housing.

The high-risk geographic locations of communities made them prone to the dangers of snakes and other poisonous insects. The communities were concerned about the inaccessibility of ambulances and fire-brigades in cases of an emergency evacuation. The findings of the meeting confirmed that health care services were available but not always affordable to the poorer communities of the Havana informal urban settlement. The health services such as organ transplantations and specialised health care were only available at private medical centres, putting informal settlements out of reach of comprehensive health services. The participation of communities in health activities were limited or non-existent in the remote areas of the informal settlements.

The meeting further identified that community participation as beneficiaries in financial projects were compromised because of corrupt leaders. The community members were convinced that community projects represented only the interests of the community leader for financial gain rather than the interests of community members.

Participants in the community meeting indicated that resources in an informal urban settlement were scarce although some individuals were opting for entrepreneurial

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opportunities. Furthermore, the economy of the city only benefitted the formal markets and businesses but neglected the informal markets of informal settlements. The economy of Namibia had grown on average by 3% per annum for the past three decades, yet the unemployment rate remained much higher than in other developing countries (Ziramba, Zaaruka, Mumangeni, Tjeriko & Kaune, 2019).

6.7 Verification/validation of previous WASH themes from Phase 1

The discussion of the themes and sub-themes are a verification and validation of the re-emerging and previous themes that were discussed during Phase 1. The discussions of the re-emerging themes and sub-themes are supported with quotes that are cited from raw data of the community meeting and workshop during Phase 2. Sandelowski (1994) states that quotes are used to validate research findings and to clarify and verify the literature of previous studies. This is also true of the Phase 1 data.

The five main themes and 16 sub-themes are discussed with direct quotations from raw data obtained from participants to support the identified themes and sub-themes. In qualitative studies, evidence of multiple realities includes the use of multiple quotes based on the actual words of different participants and presenting different perspectives from participants (Creswell & Poth, 2016). The purpose of the multiple quotes presented here is to share the results of the study and the multiple perspectives on each theme.

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A summary of the re-emerging main themes and sub-themes related to the poor WASH conditions are presented in Table 6.4 below.

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Table 6.4: Themes and Sub-themes from Phase 2

THEME	SUB-THEME
1: Living environment and conditions of an informal urban settlement	1.1 Extreme poverty and insufficient housing 1.2 Inadequate municipal services 1.3 Uninhabitable habitat and hostile geographic locations
2: Provision of quality drinking water	2.1 The provision of water tanks 2.2 Inadequate water points 2.3 Alternative water sources 2.4 Water storage practices
3: Sanitation facilities	3.1 Limited toilet facilities 3.2 Open defecation practices 3.3 Vandalism and theft of toilet facilities
4: Hygiene and handwashing practices	4.1 Inadequate personal cleanliness 4.2 Poor handwashing practices
5: Towards improving WASH conditions	5.1 Provision of adequate and quality drinking water 5.2 Provision of sufficient sanitary facilities 5.3 Combating open defecation and urination 5.4 Improving community knowledge levels on the care of communal toilets 5.5 Promoting handwashing, personal hygiene and cleanliness 5.6 Strengthening of existing municipal services and infrastructure.

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6.7.1 Theme 1: Living environment and conditions of an informal urban settlement

The poor living environment and conditions are an important element that contribute to the poor WASH conditions of informal urban settlements. The sub-themes include extreme poverty and insufficient housing, inadequate municipal services and uninhabitable and hostile geographic locations.

- *Extreme poverty and insufficient housing*

Most participants indicated that their living conditions were characterised by extreme poverty and poor housing. According to Amao and Ilesanmi (2013), recent increases in poverty combined with rapid population growth in developing countries such as Namibia, have created substantial pressures on housing provision. Housing supply shortages and the deterioration in the quality of the housing provision have become an increasing concern. The participants indicated that they are forced to settle for poor housing conditions such as shacks and temporary corrugated-iron houses.

> *I stay here at Max Mutongolulume area of Havana for five years and we are suffering a lot because of poverty. I moved here to build myself a Kambashu (*referring to shack*) because housing is very expensive in Windhoek* (Community Participant 11).

> I *stay here at Kabila area of Havana settlement for two years with my family and children. All my friends are very very poor because we cannot find jobs* (Community Participant 14).

The findings of this study showed that informal urban settlements where the participants lived were residential areas in the capital city of Windhoek, where illegal houses were constructed on land that was not legally demarcated by the City of Windhoek municipality. Communities were aware that they occupied land illegally and might face forced eviction by the City of Windhoek. Communities but were willing to face the risks of forced eviction rather than be without housing. The study discovered that most communities did not have a legal claim on occupied land because of non-compliance with the City of Windhoek.

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The illegal shacks (housing) is not in compliance with current planning and building regulations of the City of Windhoek. The current mushrooming of shacks in the Havana informal urban settlement are unplanned settlements and areas where unauthorised housing is prohibited (Community Participant 27).

The study found that the City of Windhoek did not have information on the exact number of people living in the Havana informal urban settlement owing to the growth of the informal population. Most participants indicated that they had never participated in formal population censuses, because of constant mobility owing to their search for jobs and better housing conditions. The study found that many of the participants living in the Havana informal urban settlement were not officially recognised by the City of Windhoek owing to their illegal status.

We know that we are breaking the laws of Windhoek municipality, because this land we stay is not ours. We are many people here but the municipality says that we must move away. Where can we go? (Community Participant 33).

The number of informal urban settlements in Windhoek was still increasing because of lack of tenure, insecurities and failure to provide housing to poor communities (Namandje, 2018). The city of Windhoek had grown rapidly since independence, from 141,562 inhabitants in 1991 to 322,300 residents in 2011, this being a total growth of 128% at an annual growth rate of 4.2%. The current population of Windhoek is about 413,000 people (Weber, 2017).

- *Inadequate municipal services*

Basic and infrastructural services of the City of Windhoek were inadequate in the Havana informal urban settlement. Participants indicated that they lacked proper roads, streetlights and sewerage systems, refuse removal services and land servicing. The demand for municipal service provision to informal urban settlements was increasing as a result of the rise in informal settlement populations (Devkar, Thillai Rajan, Narayanan & Elayaraja, 2019). The relationship between the number of people living in informal urban settlements and municipal service delivery was unpredictable and uncertain. Some participants claimed that they had not received reliable refuse removal, electricity and sanitation services for the last four years.

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> *The municipality does not come to clean our places. The rubbish in the riverbeds is many because there are no dumping sites or rubbish bins* (Community participant 19).

> *We don't get services here from the municipality like cleaning the rubbish or black bags from rubbish. We are waiting for the municipality to give us good services* (Community Participant 24).

The participant from the City of Windhoek indicated that it was hard to maintain demographic data for municipal service delivery owing to the constant changes in the population of informal urban settlements. Participants indicated that municipal service-delivery was non-existent, especially in remote places. A few participants indicated that settlements located in the proximity of the Havana informal markets (referred to as 'The Crossroads') had been provided with access to roads and municipal services, but this access had been limited for the rest of the informal settlement. The participants indicated that the Windhoek municipality had provided refuse bags to some residents every week, but not to the residents of most informal settlements.

A participant from the City of Windhoek indicated that several informal urban settlements in Windhoek lacked electricity and street lighting because of financial constraints that limited the upgrading strategy of the City of Windhoek.

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> *It is difficult for the Windhoek municipality to identify the needs of the Havana because many of the informal settlements operate outside of Windhoek municipality planning policies. Budgetary constraints limit the City of Windhoek to fulfil its obligation to informal settlements* (Community Participant 29).

The provision of basic municipal services to informal urban settlements was important and included necessary services to poor households (Karuaihe & Wandschneider, 2018).

- *Uninhabitable habitat and hostile geographic locations*

The majority of the participants indicated that they were residing in informal urban settlements that were uninhabitable and situated in a hostile geographic environment. The participants indicated that the dangerous and uninhabitable environment of informal

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settlements comprised overcrowding, criminal activities and environmental pollution accompanied by disease.

> *My family is not safe here because so many botsotos (*referring to criminal-minded people*) are walking around the streets stealing our things* (Community Participant 37).

The findings of the study discovered that shacks in the Havana informal urban settlement were erected in a pattern of dispersed settlement and scattered in mountainous areas. Amado (2018) defines the pattern of settlements as the way shacks and houses are distributed in an urban setting whether densely populated or mostly non-agricultural.

6.7.2 Theme 2: Provision of quality drinking water.

The participants indicated that the poor water conditions in the Havana informal urban settlement were a health concern that demanded the provision of quality drinking water by the City of Windhoek. Muzondi (2014) states that the sustainable human development of informal settlements was built upon sustainable access to quality drinking water. The sub-themes emerging included: the provision of water tanks, inadequate water points, alternative water sources and water storage practices.

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- *The provision of Water tanks*

The provision of drinking water by the City of Windhoek by means of water tanks was not consistent and reliable. Figure 6.3 below illustrates the provision of quality drinking water in water tanks.

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Figure 6.3: A photo of the Water tanks refilled with drinking water taken by the author in Havana informal urban settlements, Windhoek. March 13, 2018

Some of the participants indicated that the water supply services and water tanks of the City of Windhoek were not distributed evenly throughout the informal urban settlements. The water supply service by the City of Windhoek to areas that were without water taps was commendable but participants were concerned about the consistency and sustainability of these services. According to WHO (2019), safe and readily available water is important for public health, whether it was used for drinking, domestic use, food production or recreational purposes.

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- *Inadequate water points*

Most participants living in remote areas indicated that quality drinking water was not available owing to the lack of water points. Participants indicated that inadequate water points in remote and poor areas forced communities to travel long distances to fetch water. According to WHO standards, the communal water taps should be no further than 200 meters from the nearest household (Weber, 2017).

> *I live in the outskirts of Havana that is 2 km from the nearest of water taps. Sometimes I stay without water for three days when the taps are broken or no money* (Community Participant 41).

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Most participants indicated that more water points were needed owing to large numbers of people residing in the Havana informal urban settlement. The current situation of overcrowding at water taps was attributed to the limited water points. Participants indicated that overcrowding at water points was a concern because households who collected water had many water containers. Participants chose to collect water with many containers owing to limited water points.

> *We will wait for three to five days for the repair of broken water taps by the Windhoek municipality* (Community Participant 47).

According to Lewis, Siyambango and Lendelvo (2018), Windhoek's water management system was divided into formal and informal sectors, but access to water points in informal urban settlements was spatially skewed in favour of formal urban areas.

According to Nangombe (2015), there are shared public water access points (WAPs) at the Havana informal urban settlement, but these water points cannot cater for all households because most water points were inaccessible.

> *Many times all taps are having many people wanting water. Many times when we collect water then many people are standing in the line for water* (Community Participant 51).

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The access to quality drinking water through available water points was a pertinent issue which demanded increased water supply to informal urban settlements (Lewis, Staddon & Sirunda, 2019).

- *Alternative water sources*

The participants indicated that communities had mushroomed in and around the semi-purified water sources and alternative water sources such as the Gammams Waterworks and Goreangab Dam. One of the participants indicated that inaccessibility to water taps forced them to opt for semi-purified sources and dams. Participants indicated that they used the semi-purified water for domestic purposes such as laundry and personal use.

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We go fetch water at Goreangab dam for cooking and washing out clothes. Sometimes, we bath ourselves with the water from the dam (Community Participant 46).

- *Water storage practices*

The participants indicated that many households in the Havana informal urban settlement used containers for water collection and storage, but few households cleaned their containers regularly. Participants indicated that the problems of risky handling and storage of water were due to limited access to water points. Communities were forced to store drinking water for longer periods, which was a risk for potential contamination from insects, dust and environmental factors beyond their control. The participants also indicated that most of the containers were not covered with lids. A few households used separate cups to draw drinking water from the containers. Ferdous, Sultana, Rashid, Tasnimuzzaman, Nordland, Begum and Jensen (2018) state that significant recontamination of water can occur through drawing water with cups and hands.

When I collect water from the taps, I keep the water in a jerry can or clean drum for a long time like five to nine days (Community Participant 53).

I find flies one day in the water container because the children did not place the lid back on the water container. I don't clean the container nicely because I can't waste water to clean the water container. If there is no clean tap water than I use the water from the dam to clean container (Community Participant 59).

According to research findings, contamination of water can occur at any point in the water chain from the source to the point of use (Ferdous et al., 2018). Participants indicated that most contamination occurred during water storage, not at the source. Previous studies conducted by Adams and Smiley (2018) also show that point-of-source bacterial contamination is rare when water is obtained from underground water-pipes or taps which is treated by local municipalities.

6.7.3 Theme 3: Sanitation facilities

The participants indicated that sanitation facilities such as communal toilets were in a very poor condition owing to poor behavioural practice of communities. According to Simiyu (2016), the lack of sanitation facilities in informal settlements leads to the use of alternative

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methods such as open defecation. The emerging sub-themes included limited toilet facilities, open defecation practices, vandalism and theft of toilet facilities.

- *Limited number of toilet facilities*

Participants indicated that the Havana informal urban settlement had limited sanitation facilities such as communal toilets and sewer systems and no faecal treatment facilities.

> *The toilets are very few and we don't cope because many people are using toilets* (Community Participant 42).

The lack of toilet facilities and proper knowledge of environmental sanitation behaviour are a common phenomenon in informal urban settlements (McMichael, 2018). The participants indicated that communal toilets were shared by five to ten households owing to the limited number of toilets. Participants indicated that too few toilets forced women to rely on plastic bags or buckets instead of waiting for the next available toilet. The situation was worse especially during the night as the safety of children and women were regarded as a priority. The majority of female participants indicated that too few toilets affected their health and privacy, especially in emergency situations.

> *My female friend almost mess up her underwear because the toilet next to her house was full of people. The situation is not getting better because we do not have enough toilets* (Community Participant 47).

Participants indicated that the Havana informal urban settlement was mostly characterised by communal toilets that were shared by between seven and ten households that lived in the same area. This overcrowding at communal toilets had several public health consequences.

> *We are so many people here staying in Kabila B area with very limited toilets. The toilets here are not enough and sometimes you see new faces who are also using the same toilets* (Community Participant 41).

> *I developed some irritation on my private parts. After I went to the clinic they told me that I get vaginal infections, because I get it from the toilet* (Community Participant 27).

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According to Satterthwaite, Sverdlik and Brown (2019), sharing communal toilets because of too few toilets is posing a health risk for informal settlements especially when these toilets are poorly maintained and dirty.

- *Open defecation practices*

Participants indicated that communities opt for open defecation in riverbeds owing to bad odours from the available toilets. The participants indicated that open defecation was practised because of a limited number of communal toilets and that these had to be constructed by the City of Windhoek. Participants expressed concern about the presence of human faeces owing to open defecation.

> *When you walk out of the kambashu (*referring to a shack*) I find myself walking on human waste (*referring to faeces*). My small kids will come home with dirty hands smelling of human waste (faeces) after playing in river beds* (Community Participant 37).

Some participants indicated that human faeces were associated with the risk of hepatitis E, especially in the highly dense population of the Havana informal settlement. Previous studies have also shown that children make hand contact with human faeces or with soil that has been contaminated by human faeces (Islam, Ercumen, Ashraf, Rahman, Shoab, Luby & Unicomb, 2018). According to Galan, Kim and Graham (2013), it is estimated that 215 million people continue to engage in open defecation in southern Africa and this practice facilitates the transmission of diarrheal disease—one of the leading causes of mortality in children under five in sub-Saharan Africa. The participants indicated that the cause of this problem was open defecation and urination by community members. Previous studies by Gold and Namupolo (2013) also indicated that insufficient sanitation facilities in informal urban settlements compelled residents to defecate in the nearby bushes and riverbeds.

> *When nature calls to relieve oneself (*referring to defecation*) than I will just go to the riverbed that's close to my kambashu* (referring to a shack*)* (Community Participant 59).

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- *Vandalism and theft of toilet facilities*

The participants indicated that toilets were inaccessible owing to vandalism. Participants pointed out that available communal toilets were vandalised owing to a lack of ownership and the irresponsible behaviour of community members.

> *I do not understand why my fellow community members are breaking our toilets. The toilets are broken every day and vandalised by irresponsible people. This side of Max Matungulumwe area the toilets are not enough for the community but you find people are vandalising the toilets. I do not understand*. (Community Participant 13).

The participants indicated that communal toilets in the Havana informal urban settlement were filthy and the manholes were blocked with broken glass, bottles and strange objects. According to NBC (Namibia Broadcasting Corporation) (2018), the City of Windhoek was disappointed about the vandalism of toilet doors and sanitation units by some communities. Some participants suggested that vandalism was connected with community crime levels.

> *We here in Havana are tired of people breaking out toilets. We suspect that it's people who not staying here but coming from other locations. We reported the situation to our councillor to inform the police to arrest these criminals* (Participant 22).

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Greed (2007) states that increasing vandalism of communal and public toilets is a behavioural issue and related to the unsuccessful battle against the problems of crime.

6.7.4 Theme 4: Hygiene and handwashing practices

The participants indicated that the recent outbreak of hepatitis E, especially in the Havana informal settlement, was due to inadequate personal cleanliness and poor handwashing practices. A recent study that was conducted by Corburn and Sverdlik (2018) on informal settlements and human health, found that many communities were facing increased challenges of personal hygiene, especially those communities living in informal settlements.

- *Inadequate personal cleanliness*

Participants indicated that the ignorance about personal hygiene and good hygienic practices were due to education materials that had been written in English and not a local language.

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The lack of education about hygiene was inadequate among the poor communities that contributed to the poor hygienic practices. Some participant reiterated that bad body odour and breath was a common problem in informal settlements because of irregular bathing and a lack of mouth hygiene. The participants discovered that some of the household members had developed diseases because of a lack of cleanliness.

> *My neighbour develop constant itching and irritation of his skin one month ago. He went to the clinic and they told him to bath him every day because he touches dirty soil (*referring to contaminated soil*)* (Community Participant 27).

According to Mundia (2013), communities in the informal urban settlement have general knowledge regarding hygiene, although the depth of knowledge of personal hygiene is not sufficient. This indicates that knowledge of hygiene among informal settlements is reasonably good. However, there is a gap between hygiene knowledge and actual practice, as indicated by most participants of the Havana informal settlement. Participants also indicated that the main source of information about personal and household hygiene was the community health extension workers and hygiene campaigns by the City of Windhoek. According to previous studies by Pore and Randive (2014), when personal hygiene is compromised, it can have adverse effects on the health status of informal settlements.

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- *Poor handwashing practices*

The participants indicated that the lack of handwashing was a central problem that household members were facing owing to ignorance and lack of water sources. The practice of handwashing after defecation or before eating food was infrequent among community members. Some participants indicated that doing laundry or washing dishes was regarded as a primary means of handwashing rather than washing hands with soap before preparing food or eating meals.

> *Our household use three to five jerry cans per day for drinking, bathing, cooking and washing. Sometimes the water is not enough to wash our hands before eating* (Community Participant 49).

Participants indicated that despite the health risk of infrequent handwashing, some community members did not wash their hands before eating.

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I have noticed that my friend doesn't wash his hands after defecation and proceed just to eat his lunch. It is now two weeks I heard that he has hepatitis E in Katutura hospital (Community Participant 69).

6.7.5 Theme 5: Recommendation for improving WASH conditions

The participants in this study made various suggestions during data collection to address the poor WASH conditions in the Havana informal urban settlement. The sub-themes were: provision of adequate and quality drinking water, provision of sufficient sanitary facilities, combating open defecation and urination, improving community knowledge levels on the care of communal toilets, promoting handwashing, personal hygiene and cleanliness, and strengthening of existing municipal services and infrastructure.

- *Provision of adequate and quality drinking water*

Most participants expressed the need for adequate water to alleviate shortages of quality drinking water in the informal urban settlements. Although water accessibility remained a challenge in informal settlements, the City of Windhoek could play a pivotal role in addressing water shortages (Lewis, Siyambango & Lendelvo, 2018).

The municipality of Windhoek must give us water when water taps are broken. The water-tanks are the solutions for households here in Havana. If they give water-tanks to two households to share thrn Havana will not have shortages of drinking water (Community Participant 42).

- *Provision of sufficient sanitary facilities*

Participants indicated that the government, through the City of Windhoek, was not driving the sanitation agenda of informal urban settlements. The participants stated that communities needed political will and support to address the poor sanitary challenges of the Havana informal urban settlement.

Our community leaders must come and see the problems we have with toilets that is not enough for our community. We suffer a lot. My children go to the bush to relieve themselves. Our leaders must help us because we vote for them (Community Participant 11).

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- *Combating open defecation and urination*

The participants indicated that the practice of open defecation and urination was a concern that needed to be addressed by individuals residing in the Havana informal urban settlement. According to the WHO (2017), improved sanitary facilities and infrastructural interventions were effective and sustainable in combating open defecation and urination.

> *We want to fight these people that are urinating openly. It is not good for our children* (Community Participant 19).

- *Improving community knowledge levels on the care of communal toilets*

The participants expressed their concern that the current health promotion programmes in the Havana informal settlement were very limited or non-existent. They indicated that communities in informal settlements had limited knowledge of improving their health decision-making skills. Participants indicated that appropriate health information on vandalism of communal toilets was limited, which resulted in the neglect of communal toilets.

- *Promoting hand-washing, personal hygiene and cleanliness*

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Participants explained that it was the government's role to provide education and awareness on handwashing continuously. They indicated the need for consistent handwashing campaigns by the City of Windhoek to address the myths and misperceptions about hand hygiene. The participants suggested that communities needed to be empowered to play a role in educating fellow members on personal care and cleanliness. Participants stressed the importance of keeping hands clean as one of the most important steps to avoid getting sick and spreading germs to others.

> *I always teach my children to wash their hands at any time of the day or night. I know and understand the importance of handwashing and always encouraged the communities to wash their hands, especially after defecations* (Community Participant 19).

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A recent study conducted by Safari, Mohamed, Dimoso, Akyoo, Odhiambo, Mpete and Mwakitalima (2019) indicate that handwashing campaigns at household level with a focus on ending open defecation encourage personal hygiene and cleanliness.

- *Strengthening of existing municipal services and infrastructure.*

Participants indicated that there was consensus among communities on the need for the roll-out of basic municipal services and refurbishment of existing city-wide infrastructure by the City of Windhoek. The participants indicated that Public Municipal Service Infrastructure such as roads, refuse removal, street lights and toilets in informal settlements needed to be upgraded, refurbished or refitted. Some participants suggested that the renovation and refurbishment of existing communal toilets by the City of Windhoek was more important.

> *I am staying seven years in Havana and the toilets have never been renovated or repair. The Windhoek municipality must build new toilets if they cannot even paint the toilets* (Community Participant 52).

6.8 Summary and points to take forward

The current research phase succeeded in achieving broad and consistent participation through a workshop and community meeting with the Havana informal urban settlement. The successful introduction of the Hancock and Duhl model for Healthy Cities during the workshop resulted in rich discussions on the health improvement and quality of life for all informal urban settlements. The workshop participants were empowered with basic knowledge of Healthy Cities and how to make informed decisions about their living environment. The degree of autonomy and self-determination to change their sanitation and hygiene practices were increased as part of the learning and empowerment process. Community ownership and action towards improved WASH interventions were evident throughout the workshop. The process of community involvement and capacity building gave the workshop participants a sense of accountability and confidence to be catalysts of change in the informal urban settlements.

The workshop succeeded in capturing the unique WASH perspectives and experiences of the communities. The follow-up community meeting produced very rich and in-depth data on the living conditions in an informal urban settlement in a Healthy City.

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The re-emerging themes and sub-themes presented a clear and concise picture of the poor WASH conditions and experiences of communities living in the informal urban settlements. The themes are a verification of the results from the Situation Analysis (Phase 1) of the study. The results of the thematic findings in this chapter have confirmed the connection and correlations of Phase 1 and Phase 2. The correlation has illustrated that the connected WASH themes of both phases comprised the poor living environment and conditions of an informal urban settlement, which include poor water supply and services, inadequate sanitation facilities and behaviour, and poor hygiene and handwashing practices.

In conclusion, Phase 2 encouraged the use of the PAR approach as a means of involving all stakeholders, particularly the community participants that are affected by poor WASH conditions. This approach is a powerful technique that was utilised throughout Phase 2, which encouraged learning and action among communities, especially during the workshop and community meeting. Involving the Havana informal urban settlement in the pilot implementation and evaluation of WASH action plans is a key strategy in the PAR approach.

The thematic findings that emanated from Phase 2 aided with the development, implementation and evaluation of a pilot WASH intervention in the next chapter (Phase 3).

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CHAPTER 7: DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF A WASH INTERVENTION

7.1 Introduction

In this chapter, the development, implementation and evaluation of a pilot water, sanitation and hygiene (WASH) intervention are described. The development of a WASH intervention is based on the instructional design of the ADDIE Model. The 'pilot' WASH intervention involved a two-day training workshop to educate and equip participating community members with information on how to address the poor WASH conditions in the Havana informal urban settlement. The evaluation of the pilot WASH intervention was conducted with a rapid appraisal design (see section 7.2.5).

7.2 Development of the WASH Intervention

The ADDIE model of Grafinger (1988) was used to inform the development of the Community WASH Action Plan (COMWAP). The ADDIE model is considered to be one of the most solid and effective training tools to create training programmes for both adults and poorly educated communities (Sink, 2014). The ADDIE model has been lauded for the following attributes:

- Clear, well-defined goals;
- Outcomes that are measurable, reliable and valid;
- A rational basis for decision-making and successful implementation;
- Team effort utilised;
- A meaningful performance focus whereby learners' performance is the focal point of all teaching and learning activities; and
- People of all ages engaged in a life-long learning experience (Branch & Merrill, 2012).

The ADDIE model was chosen in the current study because it is an effective training tool to educate community members with low literacy levels to adopt a problem-solving behaviour (Malan, Mash & Everett-Murphy, 2015). The ADDIE model uses a systemic problem-solving approach to develop new training programmes to facilitate behaviour change, as reported in a study done in Indonesia (Arbarini, Jutmini, Joyoatmojo & Sutarno, 2018). The ADDIE model creates opportunities for communities to select their training objectives. In addition, the

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ADDIE model enhances effective learning practices and behaviour among marginalised communities with limited learning experiences. Molenda (2015) also argues that the ADDIE model is geared towards helping learners to acquire meaningful skills and knowledge. The ADDIE model focusses on learning outcomes that can be measured in a reliable and valid way, by creating valid and reliable measuring instruments (Branch & Merrill, 2012).

The ADDIE model has the following characteristics:

Firstly, the model is a cost-effective tool and is time-efficient for both the learner and the community. The ADDIE model is cost-effective because it only requires a small team that can develop a training programme for communities (Patel, Margolies, Covell, Lipscomb & Dixon, 2018). A single individual on an instructional design team may perform multiple tasks to reduce the costs. Minimal resources are required for learners to apply the new skills and knowledge they have acquired during the training programme. The ADDIE model is time-efficient because it requires a short period of time in which to equip learners to determine what they have learnt. Making use of the ADDIE model saves time compared to the use of other types of instructional design models of learning (Czaja & Sharit, 2016). The model also uses questionnaires during an evaluation phase for the timely and quick observation of the learner's performance and outcome of a training programme (Iswati, 2019).

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Secondly, the model is consistent because it is based on lifelong learning with various theories, models and perspectives concerning how people learn or acquire knowledge and skills.

Thirdly, the model presents basic principles and guidelines for designing training and instructional programs for all settings and ages, including older people. The operational element includes a good training design that is linked to increased productivity and improvements in learning practices (Welty, 2007). According to Bopape, Mothiba and Bastiaens (2019), the ADDIE model guides the development, implementation and evaluation of a context-specific training programme for the inhabitants of informal urban settlements.

Lastly, the model makes training effective by engaging learners in learning activities to ensure that learners have a meaningful learning experience. Learners are capacitated to use the training material successfully at a later point in time or transfer what they have learned to

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new situations. The model makes training effective because it brings about competence in a particular skills area as well as higher motivation, learner satisfaction and increased feelings of accomplishment (Czaja & Sharit, 2016). The model improves the usability of training and instructional programmes that improve the learning needs of learners.

The ADDIE model consists of five stages, namely analysis, design, development, implementation and evaluation of the training programmes (Figure 7.1).

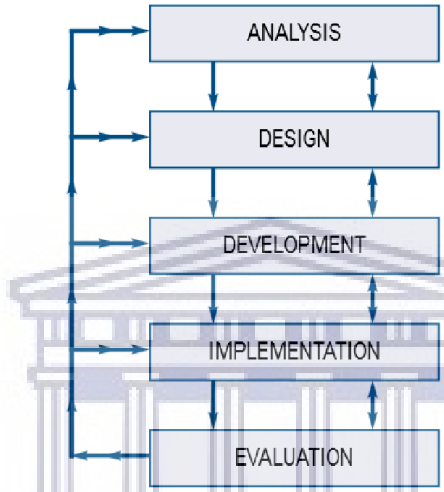

Figure 7.1: The ADDIE Model (Source: Grafinger, 1988)

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7.2.1 Stage 1: Analysis

In the analysis stage, the needs of community members are assessed to identify the gap(s) between the current and the desired performance. The results of the needs assessment form the basis of the (to-be-developed) training programme (Cheung, 2016). In the current study, the situation analysis of Phase 1 fulfils the needs of the analysis stage of the ADDIE model. The situation analysis revealed:

- The training needs of the inhabitants of the Havana informal urban settlement were to address their limited knowledge of sanitation, hygiene and waste management and inadequate social entrepreneurial skills.
- The content of future training programmes would have to be geared towards community development through high-quality and practical training experiences.
- The type of skills, knowledge and resources that were required by the community members to address their poor WASH conditions were evident.

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The situation analysis revealed that the community members of the Havana informal urban settlement had a need for education programmes about WASH to address knowledge gaps and their limited understanding of sanitation and good hygienic practices. The situation analysis revealed that there were poor WASH conditions in the informal urban settlement present as a result of poor living conditions, inadequate provision of water services, insufficient sanitation infrastructure and services, poor community practices related to hygiene and handwashing and a lack of environmental health services and education. The researcher found that knowledge about WASH in the Havana informal urban settlement was inadequate owing to a high level of illiteracy and there were language barriers where information was only available in English.

The situation analysis further confirmed prevailing economic insecurities in the informal settlement owing to high levels of unemployment. It was identified that a considerable number of income-generating opportunities existed in the informal settlement which were unutilised at the time. There was, therefore, an identified need to train community members in social entrepreneurship.

From the situation analysis, it was derived that a community training programme should be developed that would empower the community members to address the poor WASH conditions of the Havana informal urban settlement. The content of such a training programme should address knowledge deficiencies about WASH, as well as enable community members by providing them with skills for social entrepreneurship and for redressing poor WASH conditions through waste management and recycling.

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7.2.2 Stage 2: Design

According to Khalil and Elkhider (2016), the design stage of the ADDIE model is the blueprint of how the training programme is created and the anticipated performance is defined. The design stage addresses how instructional goals and objectives shape the learning strategies (Ozdilek & Robeck, 2009). The design stage identifies how the learner will know if the learning objectives have been met and what measures will be used to determine the outcomes of the learning objectives.

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The steps in design and planning are described as the following:

- The first step of the design process was to identify the knowledge and learning needs of community members. After the learning needs had been identified, the designer team determined whether the community learning needs might be solved efficiently before designing the training programme. The situation analysis contributed to the identification of the community's learning needs and what skills were needed to solve the WASH problem.
- The second step of the design process was the establishment of a design and planning team which comprised a subject-matter expert, instructional designer, researcher and community volunteer. The subject-matter expert, who also acted as an instructor, provided information about the content and resources concerning all aspects of the topics that would determine how the training programme was to be designed. The instructional designer was primarily responsible for designing the training programme. The researcher developed a rapid appraisal questionnaire (see section 7.2.5) as an evaluation instrument for the learning experience. The researcher was responsible for data collection and analysis. The community volunteer who had lived in the Havana informal urban settlement for more than five years provided valuable input on the historical background, socio-economic demographics and cultural make-up of the community. The community volunteer also acted as the voice and ears of the community by confirming how the content of the training programme fitted into the expectations of the larger community.
- The third step of the design process involved the identification of community learners. The identification process was important as it ensured that the learning materials were appropriate to the community's knowledge and skill levels. The target audience was selected to be representative of the overall characteristics of the community. The overall characteristics included variables like gender, age, employment status, cultural and social diversity. The entry competencies which were eligible for inclusion were: proficiency in a local language, basic reading and writing skills, including cross-cultural communication abilities.
- The fourth step of the design process was the formulation of the learning objectives for the training programme. The learning objectives were designed through the following process:
    - firstly, the design and planning team met to discuss and agree on the training gaps and learning needs of the community;

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- secondly, the team identified and determined what type of change or desired behavioural change was needed from the community learners by focussing on the content and activities that would drive these behaviours;
- thirdly, the team agreed on the learning objectives that should include the community learners (target audience), the situation of the participants (condition) and the degree of the change (behaviour);
- fourthly, the learning objectives were drafted by the team over a period of two days which included the basic tools to effectively measure the learning performance of learners.

- The fifth step of the design process involved specifying the learning activities, namely the knowledge components and learning procedures. The learning activities actively involved community learners in the learning experience to obtain competency in a particular skill area.
- The sixth step of the design process outlined the course structure of the training programme including the sequencing of the training content. The course structure refers to the choice of topics and the organisation and sequencing of course content that support the learning objectives for the training course (Welty, 2007). Mayfield (2011) explains that a course structure may be constructed into lesson units that comprise many parts such as introduction, session objectives, reading assignments, instructional content, handouts, class discussion, assignments and a unit summary. Drljača, Latinović, Stanković & Cvetković, (2017) explain that it is necessary to create a draft framework for the training course in the design stage by starting with the course learning structure of a training programme. The most important step towards quality teaching and learning is to provide students with a structure for learning and appropriate learning activities.

The design stage details the writing of learning objectives in measurable terms, specifying the learning activities and outlines the structure of the training programme (Welty, 2007). The researcher will discuss each of these in turn.

(i) Learning Objectives

Branch (2009) defines learning objectives as specific statements of a learning outcome or what a learner should be ready to do. The learning objectives refer to what the training should accomplish in terms of performance and what the learners should exhibit in the learning

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environment to be considered competent (Branch & Merrill, 2012). Merli (2011) explains that learning objectives provide a framework for devising ways to evaluate student learning and measure student achievement. The learning objectives indicate what a learner is predicted to realise after completing a training programme. Branch and Merrill (2012) further state that learning objectives should be concise, complete and adequately describe the intended outcome of a training programme. The learning objectives should support the achievement of the training programme, which focusses on the alleviation of the community learning needs (Smith, 2017).

The learning objectives of the training intervention were as follows:

- To understand the life experiences and challenges of their poor hygiene and sanitation conditions;
- To gain the required skills for social entrepreneurship and income-generating activities;
- To obtain the necessary knowledge of community health education that will enable them to deal with their poor WASH conditions;
- To equip community learners with the ability to actively participate and interact with others in the execution of the training programme during the implementation stage.

(ii) Learning Activities

The learning activities are a sequence of instructions and ordered steps with logical relationships, which enable learners to accumulate specified skills, knowledge and attitudes by achieving the learning objectives (Budoya, Kissaka & Mtebe, 2019). According to Sink (2014), the learning activities of the training programme usually have their origins in one or more learning theories. Learning theories provide conceptual structures by taking information and getting it transformed so that it is stored in the long-term memory of learners and later recalled as an observable human performance (Gagné, 1997; Clark, 2018). Sink (2014) further states that learning activities are part of the design phase of the ADDIE model and are influenced by learning theories as illustrated in Figure 7.2 below.

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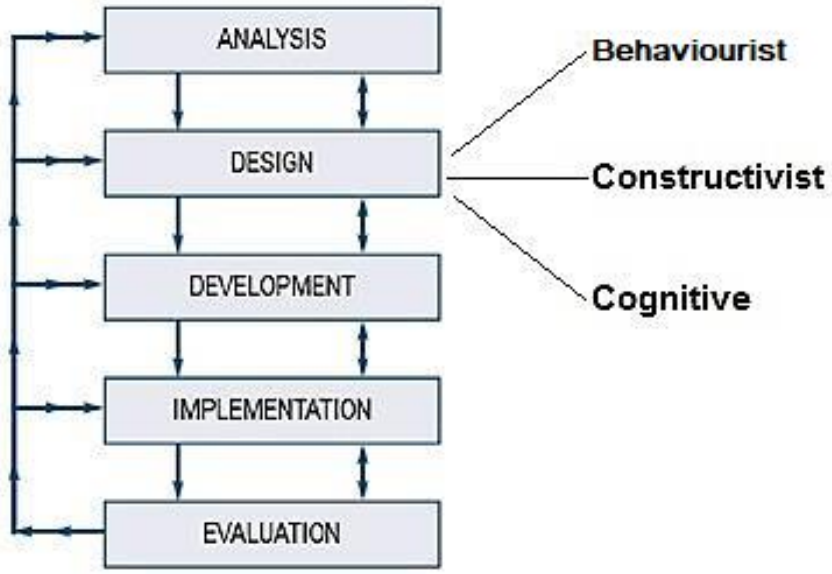

Figure 7.2: ADDIE Model and learning theories (Sink, 2014)

The learning activities of the design stage were based on constructivist learning theory, which views the ADDIE model as 'learning by doing'. Martin, Kolomitro and Lam (2014) explain that 'learning by doing' refers to situations where the learner acquires training content through the action of performing the task. Learning is viewed as an active process in which the learner constructs meaningful relationships between the new knowledge presented in the instruction and his/her existing knowledge. A study on constructivism and the ADDIE model suggests that learners should bear responsibility for their learning by being proactive in acquiring and applying new knowledge (Drljača, et al. 2017). Therefore, constructivist learning theory motivates the learner to create a new idea only if actively involved in the learning process. Khalil and Elkhider (2016) also state that constructivist learning enables the learner to construct meaning by exploring an environment, solving a problem or applying the information to a new situation.

Constructivist learning theory is defined as the notion that knowledge is constructed by the learners as they attempt to make sense of their experiences (Driscoll, 2000; Bada & Olusegun, 2015). Constructivist learning theory is a discovery-oriented process where learners use existing knowledge and past experiences to discover facts and relationships (Bruner, 1967; Bruno, 2009; Clark, 2018). Constructivist learning theory is learner-driven and allows learners to transfer what they have learnt to their real world (Gagné & Medsker, 1996; Sink, 2014). Constructivists believe individuals and communities learn best if they actively construct meaning from the learning content. According to Gupta and Gupta (2017),

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constructivist learning theory supports the notion that no learning is feasible until learners are involved in the teaching-learning process. Therefore, the instructor is regarded as a facilitator who promotes the creativity of learners as s/he transfers knowledge to the learners. The learning process aims to reflect the real-world experiences of learners within the learning experience. A training programme that is based on the constructivist theory enables learners to transfer what they have learned to their living environment in a more efficient and effective manner (Cianciolo & Regehr, 2019). The learning activities were designed in a systematic manner embedding principles of constructivist and contextual learning using the ADDIE model of instructional design.

The following five learning activities were implemented to realise the learning objectives:

- Activity 1 (Introduction): Community learners were instructed to introduce themselves by presenting a brief profile of their background, family life, socio-economic status and their personal experience with poor WASH conditions in the Havana informal urban settlement.
- Activity 2 (Presentation): The two training modules on Community Health Education and Social Entrepreneurship were presented to the community learners, with the aid of pictures and a flip-chart. The community learners were required to respond to questions posed by the instructor with the help of the flip-chart in the context of the presentation. The learners exchanged their thoughts with the instructor(s) and one another during a question and answer (Q&A) session to demonstrate their understanding of the presentation.
- Activity 3 (Exploration): Community learners used the contents of the presentation in Activity 2 to identify several poor 'WASH hotspots' in their living environment and to explore how the contents of the presentation might address their poor WASH conditions.
- Activity 4 (Group interaction): The learners were required to share the good ideas that emanated from their exploration process during Activity 3. The instructor(s) led the group discussions and facilitated the interaction among the community learners. The levels of participation and reactions of each learner were observed by the researcher during the group interactions. Group interaction can also contribute to the exchange of experiences with other learners, while at the same time enables a deeper understanding of the learning material (Drljača et al., 2017).

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- Activity 5 (Reflection): Community learners presented a 15-minute group presentation to reflect the pros, cons, concepts and potential impact of the teaching and learning experiences during the training programme. The instructor(s) created a rubric that formed part of the reflection process as an assessment tool to evaluate the learners' group presentations. According to Muhammad, Lebar and Mokshein (2018), a rubric is an assessment tool that has a description of the expected performance for each criterion to evaluate learning outcomes.

The learning activities include the training methods, learning materials and the duration of the training programme. Each of these will be described in turn.

Training methods

Training methods are the techniques the trainer or instructor uses to implement a training session and transfer new knowledge, skills and attitudes to learners (Martin, Kolomitro & Lam, 2014). Training is defined as the development and delivery of information that learners will use after attending the training (Martin, Kolomitro & Lam, 2014). Training methods are the activities that a trainer or instructor employ as a medium to convey knowledge, experience or information to the learner, which might lead to behaviour and attitude change according to the learning objectives (Hervie & Winful, 2018). Methods refer to how the subject matter or module is going to be dealt with (Smith, 2017). In the current intervention, the following training methods were employed: lecture, group discussion, demonstration, plenary and brainstorming.

A face-to-face lecture formed part of the training method during an on-site training workshop at a community hall in the Havana informal urban settlement. The lecture began with a presentation which explained the learning objectives followed by a discussion of the training content. According to Albert and Hallowel (2013), learners prefer face-to-face engagement with an instructor who can answer their questions in a learner-centric dynamic. Face-to-face lectures increase the level of interaction and the amount of interaction between a trainer and learner and among learners (Martin, Kolomitro & Lam, 2014). The face-to-face lecture was an effective method for introducing new learning information and concepts to community learners. Cantillon, Wood and Yardley (2017) and Cantillon (2003) further states that presentations are useful for conveying new information and learning concepts to the learners. With the help of the presentation, the instructor was able to introduce the WASH and social

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entrepreneurship topics, summarise the main points of the learning activities and stimulate further learning that is aimed at the realisation of the learning objective. Zakirman, Lufri and Khairani (2018) conclude that presentations are efficient, time-specific, flexible and adaptable to various subjects and learning.

At the end of the lecture, the learners engaged in group discussions. Group discussions improve learners' critical thinking skills which enhance learning as well as encourage equal participation of learners (Pollock, Hamann & Wilson, 2011). Group discussions promote learner-to-learner interaction which is a crucial component of critical thinking, problem-solving, deep learning and learner achievement (Oyarzun, Stefaniak, Bol & Morrison, 2018). The group discussion took place in small groups of seven community learners to stimulate group dynamics such as interpersonal communication, attitude similarity and group commitments to its goals and activities. Harris and Sherblom (2018) state that small group discussions ensure effective communication among group members, strengthen team-work and create a satisfying group engagement.

The group discussions were followed-up with a plenary session that contained a feedback discussion by the rapporteurs of each small group. The plenary session was employed by instructors to review the community's learning experience and to present a chance for community learners to reflect on what they had learnt during the face-to-face lecture session. The plenary session allowed the instructors to assess the learners' understanding of the WASH and community health education topics. According to BusinessDictionary.com (2019), the plenary session is a session where all participants engage in an activity at the end of a lesson or a formal gathering to evaluate what happened during the lesson.

Demonstration as a teaching method was employed as part of a practical session on social entrepreneurship and waste recycling. The term demonstration refers to a way of teaching in which instructors 'demonstrate' potential educational projects or products for achieving the training objectives (Basheer, Hugerat, Kortam & Hofstein, 2016). A demonstration is a simple teaching method where the instructor plays an important role in involving learners and maximising their learning experience. Demonstrations provide learners with experiences of real events, phenomena and processes that help them learn. Demonstrations ensure that learners are attentive and encourage learners to involve various human senses to make learning permanent.

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The gathering of waste materials like discarded papers, plastics and glass bottles formed a part of the demonstration process. The demonstration process of creating re-usable materials for income-generation allowed community learners to ascertain the recycling process in an animated manner and to understand the way they could apply theoretical knowledge practically. The session on the recycling of waste material was a practical demonstration-based training technique that taught learners the way to recycle waste material into new and useful products. A study conducted in Nigeria proved that the demonstration teaching method was effective especially in teaching entrepreneurial education and social entrepreneurship (Eze & Nwaukwa, 2019). The demonstration sessions on waste recycling and entrepreneurship developed an interest with the community learners for income-generating activities and also motivated them to actively explore potential entrepreneurial opportunities. Grossman, Salas, Pavlas and Rosen (2013) state that the demonstration-based training technique is an experiential learning method that uses practical demonstrations as an efficient means of learning. Rosen, Salas, Pavlas, Jensen, Fu and Lampton (2010) also state that demonstrations are often paired with the use of instructional learning designed like the ADDIE model to reinforce the efficacy of learning.

The community learners engaged in a brainstorming session after the end of the waste recycling and entrepreneurship presentations. According to Rawlinson (2017), brainstorming is a great method to encourage creative thinking among learners and to get new ideas about a selected area of interest or a subject or problem. The brainstorming session encouraged free-thinking among community learners to embark on new areas of income-generation and entrepreneurship.

Learning materials

According to Hati and Afriazi (2019), learning materials refer to the various supporting tools and aids that are utilised in the course of training community learners. Learning materials are based on the real needs of learners and support student learning (Azarnoosh, Zeraatpishe, Faravani & Kargozari, 2016). Learning materials are a set of materials that an instructor may use in teaching and learning situations to help achieve desired learning objectives (Nathenson & Henderson, 2018).

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The learning materials that were used in the present intervention were developed and produced for the Havana informal urban settlement and comprised posters, flashcards and pictures. The face-to-face presentation was useful during the training programme intervention, whereby assistive devices were employed like pictures and other audio-visual facilities. The images and poster presentations were preferred as learning materials by community learners because most community participants were illiterate. Houts, Doak, Doak and Loscalzo (2006) state that learners remember visual materials like pictures far better than spoken words. The images and posters were effective in communicating the WASH concepts rather than oral presentations. The group discussions were also enriched with the visual stimulation of the images and posters.

Training duration

The training programme was scheduled to take place over two days, 23-24 November 2018, with a time allocation of 4 -6 hours per day (see Table 7-1). The two-day training programme was conducted in a community hall at the Havana informal urban settlement.

The first day of the training programme started with the thematic introduction of Water, Sanitation and Hygiene (WASH). The second day commenced with the presentation on the theme of Social Entrepreneurship, which was followed up with group discussions on ways in which Social Entrepreneurship addresses poor WASH conditions.

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(iii) Structure of the training programme

Drljača et al. (2017) explain that the structure of a training programme comprises a clearly detailed training schedule, a training time-frame and learning activities with well-defined goals. A structured training programme provides a consistent and high-quality training experience for community learners (Hati & Afriazi, 2019). The structure of the training programme at the design stage consisted of the training schedule, the learning modules, the form of the teaching instructional strategies and therefore the necessary resources.

Training schedule

Shelton and Saltsman (2011) describe the training schedule as the due dates of every learning module, assigned reading, assessment and other training activities. The training schedule is the course map for learners and should be included with the course syllabus. According to

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Devlin (2017), a training schedule is a list of activities involved in training sessions including the time allocated for each session. The structured training programme during the two-day training intervention had a detailed method of learning, subject/module, the outline of lesson(s) and the training duration as illustrated in Table 7.1.

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Table 7.1: Schedule of WASH Training Intervention

Method of learning	Subject/Module	Lesson on	Duration
Day 1			
Lecture	Water, Sanitation and Hygiene	What is WASH ?	3 periods of 50 minutes each
		What is hepatitis E?	
		WASH-related diseases and outbreaks	
Picture Presentation	Water, Sanitation and Hygiene	Pictorial illustrations	
Group discussions	Water, Sanitation and Hygiene	Possible interventions to address poor WASH conditions	
Day 2			
Lecture	Social Entrepreneurship	What is Social Entrepreneurship?	3 periods of 50 minutes each
Group discussions	Social Entrepreneurship	How does social entrepreneurship address poor WASH conditions?	
Practical demonstration (Practical)	Social Entrepreneurship	The recycling of waste materials	

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Learning Modules

A learning module is a sequenced collection of subject-related materials designed to guide learners through the content and assessments as specified by the instructor (Butcher, Davies & Highton, 2019). Rufii (2015) explains that a learning module is a self-contained, formally structured learning experience with a coherent and explicit set of learning outcomes and assessment criteria. A learning module is a competency-based tool focussed on what a community learner will know or be able to do as a result of using the tool (Donnelly & Fitzmaurice, 2005). Learning modules are organised collections of learning content that keeps community learners focussed on the lesson and are suitable for outcomes-based adult learning (Ricard, 1990; Remesh, 2017). The content of the current training programme was divided into two modules that comprised Water, Sanitation and Hygiene (WASH) and Social Entrepreneurship (see Table 7.1).

Teaching instructional strategies

Teaching instructional strategies are a mixture of the various methods to help the learners understand the lectures, discussions and learning activities. An example of teaching instructional strategies might be activities that the learner can engage in to practise the ideas and skills being presented during the training programme (Aldoobie, 2015). Branch (2009) states that teaching instructional strategies create an active learning environment that is learner-friendly for communities. Aldoobie (2015) states that an active learning experience promotes the engagement of learners in their learning environment.

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There are three types of instructional strategies in instructional design models like the ADDIE Model (Thomas, 2010). They are as follows:

- Organisational strategies that affect the way in which a lesson is arranged and sequenced;
- Delivery strategies that affect the way in which information is carried over to the learner, particularly the choice of instructional media; and
- Management strategies that involve the choices that help the learner interact with the activities designed for learning.

The purpose of formulating teaching instructional strategies is to match the learning content and learning objectives with the needs of the community learners. The instructor adopted a

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group work teaching strategy during the training with community learners. The group work made the community learners find out how to share, communicate and solve their WASH problems together.

Learning Resources

Learning resources are texts, videos, software and other material that instructors use to assist students to satisfy the expectations of learning defined by learning objectives and curricula. Chalk, a board, duster, charts, audio-visual aids, educational software, a library and instructional material are examples of learning resources. Tools could also be added to learning resources and could include textbooks (print and digital), workbooks, worksheets, flashcards, training workshops, non-fiction books, posters and academic games (El Mhouti, Nasseh & Erradi, 2013). Learning resources were vital during the training programme because they significantly increased the community learners' achievements and supported student learning.

7.2.3 Stage 3: Development of the WASH intervention

In the development stage, the final structure and content of the course are created by following all the elements and parameters defined in the ADDIE Stages 1 and 2 (Drljača, 2017). According to Ozdilek and Robeck (2009), the development stage addresses the tools and processes that are used to generate learning content, create instructional learning materials and provide guidance for the learners.

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Learning Content

Content is a source or means by which information, knowledge and skills are exchanged during each learning episode (Hati & Afriazi, 2019). Hemalatha (2013) states that content is the focal point for engaging the learner during the process of knowledge construction. Iswati (2019) further explains that the purpose and aims of the course are embedded in the content; which leads to the achievement of the learning goals.

The content of the current training programme was developed in line with the level of knowledge and with the basic English language syntax of the community participants. The content of the training programme was designed by a training team that consisted of the researcher, subject experts, two community leaders, a community member and one stakeholder. The team developed the content of the training programme, which comprised

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Community Health Education and Social Entrepreneurship modules. The Community Health Education module emanated from the findings of the situation analysis that confirmed the weak community and environmental health conditions and services of the Havana informal urban settlement. The Social Entrepreneurship module also emanated from the findings of the situation analysis that confirmed that communities migrating to informal urban settlements have socio-economic challenges such as poverty and high levels of unemployment. The detailed learning content of the Community Health Education and Social Entrepreneurship modules is depicted in section 7.2.4 of the implementation stage of the COMWAP interventions. The development of the learning content took place over 2–3 weeks.

Instructional learning materials

Instructional materials are a collection of learning and teaching resources that a teacher or instructor may use as a learning aid to achieve desired learning objectives (Lewis, 2018). Instructional materials include printed materials such as textbooks, posters, pictures and non-printed materials such as electronic media, environment (space) and human resources (instructors). Shelton and Saltsman (2011) indicate that instructional learning materials must be systematic, relevant for the needs of learners and revised when necessary. The majority of instructional learning materials involve learner-led and collaborative or active learning. Instructional learning materials are developed in such a way that learners have numerous and varied opportunities to master the learning outcomes.

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Guidance for learners

Guidance is a process of interaction and helping learners to understand their learning experiences and also helping them to achieve their learning goals, without feeling lost or isolated throughout the learning process (Zhang, Zhu, Wang & Chen, 2019). The guidance assists every learner to discover and develop their potential, educational gains, social usefulness and personal growth. Guidance is used as a form of systematic assistance whereby learners are aided in achieving satisfactory adjustment to educational, vocational and personal opportunities (Lazonder & Harmsen, 2016).

7.2.4 Stage 4: Implementation

The Implementation stage focusses on the execution of the training programmes with the aid of instructional materials (Ozdilek & Robeck, 2009). The learners are actively engaged and the training plan is put into action during the implementation stage. The purpose of the

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implementation stage is to establish an actual learning environment where the learners construct new knowledge and skills required for maximum performance (Prastati & Tarigan, 2014).

7.2.4.1 Participants

A total of 44 participants participated in the Community Training Programme. The community participants were recruited from the Havana informal urban settlement in Windhoek comprising community members, community leaders and stakeholders, who had the same characteristics of Phase 1 (Chapter 5) and Phase 2 (Chapter 6) of the research study (De Vos et al., 2011).

The demographic characteristics of the participants who participated in the Community Training Programme of the COMWAP, are described in Table 7.2 below. According to Table 7.2, most participants (46%) were between the ages of 30–49 years and the majority were female (73%) and unemployed (68%). Community members were in the majority (n=35; 80%) with three community leaders (7%) and six stakeholders (13%).

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Table 7.2: Demographic characteristics of the participants in the Community Training Programme (N=44)

Participants	Frequency (n)	Percentage (%)
Age(in year)		
< 20	4	9
20 – 29	8	18
30 – 39	19	43
40 – 49	12	27
50 – 59	1	2
Sex		
Male	12	27
Female	32	73
Status		
Employed	8	18
Unemployed	30	68
Self-employed	2	5
Student	4	9
Designation		
Community	35	80
Community Leader	3	7
Stakeholders	6	13

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7.2.4.2 Training programme and community workshop

The training workshop was officially opened by one of the community leaders who presented an introductory overview of the Havana informal settlement. The two-day workshop was facilitated by the researcher with the assistance of two subject experts, who co-facilitated the sessions on Community Health Education and Social Entrepreneurship, respectively. Posters and photographs were used in cases where the language barrier was a matter of concern to community participants.

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Figure 7.3 illustrates the Community Training Workshop during the implementation stage of the WASH intervention of COMWAP. The photograph below also displays the community participants who participated in the focus group discussions and plenary sessions during the workshops.

Figure 7.3: A photo of the COMWAP training workshop during Phase 3 taken by the author in Havana informal urban settlements, Windhoek. November 24, 2018

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The following were taken into account during the implementation stage of the Community Training Programme:

- The learning environment for the training was set up and prepared before the arrival of the community participants.
- The participants' registration area was set up with registration materials and instructional resources.
- Visual materials such as posters and pictures were prepared and placed on the walls before the training session.

The training schedule of the Community Health Education training workshop on Day 1 is presented in Table 7.3 below. The content of the Social Entrepreneurship training workshop

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on Day 2, which included the concept of waste materials-recycling, is presented in Table 7.4 below.

Table 7.3: Community Health Education training workshop programme

Time	Topics
8.30 –10.30	Presentation: What is WASH? Definition and the understanding of water. Focus on the availability, accessibility, affordability and quality of water Definition and the understanding of sanitation. Focus on the availability, accessibility of sanitation facilities, sanitary behaviour and practices Definition and understanding of hygiene. Focus on hygiene behaviour and practices.
10.30 –11.00	Group work and discussions Solutions to poor WASH conditions
11.30 –12.45	Presentation: WASH-related disease outbreak What is hepatitis E? Situation update on the hepatitis E outbreak Solutions to poor WASH conditions concerning hepatitis E outbreak
14.00	Closing.

Table 7.4: Social Entrepreneurship training module

Time	Topics
8.30 –10.30	Presentation: What is Social Entrepreneurship? Definition and the understanding of Social Entrepreneurship Definition and the understanding of Social Entrepreneurship development and poverty alleviation.
10.30 –11.00	Group work and discussions Social Entrepreneurship to address poor WASH conditions
11.30 –13.00	Presentation: Waste management and Recycling What is waste management? The recycling of waste materials (practical)
15:00	Closing.

In the workshop, participants were informed that the recycling of waste materials prevented unwanted waste and littering (Schioldborg, 2014). Karelberg and Varajärvi (2018) explain that informal urban settlements play an important role in the economies of developing countries, such as Namibia, through the technology of waste-materials recycling. The recycled waste-materials are reproduced as saleable and decorated articles. The articles which had been made by community members during a COMWAP workshop in the Havana informal urban settlement is illustrated in Figure 7.4 below.

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Figure 7.4: A photo of the Recycling of waste materials during Phase 3 taken by the author in Havana informal urban settlements, Windhoek. November 23, 2018

Nzeadibe and Iwuoha (2008) reiterate further that the methods of recycling and waste transformation provide jobs and means of livelihood for poor communities. The recycling of waste materials also contributes to the conserving of a clean environment and improved WASH conditions.

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7.2.4.3 Summary of community WASH action plan (COMWAP)

In summary, the components of a Community WASH Action Plan (COMWAP) comprises two training modules, four descriptions of the modules and the desired outcomes of the community training programme as depicted in Table 7.5. The two training modules with the descriptions of the modules and the desired outcome are presented in turn.

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Table 7.5: Summary of Community WASH Action Plan (COMWAP) Intervention

INTERVENTION	DESCRIPTION	OUTCOMES
1. Community Health Educations	1.1 The Introduction of WASH concepts and WASH-related diseases 1.2 The presentation on hepatitis E outbreaks—linkages to poor WASH conditions	Community participants learn to restore and maintain their health by developing a positive attitude towards behaviour change. The community support the on-going promotion of community health education in the Havana informal urban settlement. Communities are empowered with the knowledge of how to prevent oral-hand transmission owing to poor sanitation and not to drink unpurified water.
2. Social Entrepreneurship	2.1 Introduction to the concept of Social entrepreneurship 2.2 The utilisation of waste recycling as a means of income generation and employment creation 2.3 Entrepreneurial opportunities for self-employment, employment creation and the discovery of human capital	The communities are equipped with knowledge on entrepreneurship to start businesses and to explore innovative ways to capitalise on waste recycling for financial income.

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Community Health Education

The Community Health Education module was developed to promote the lifestyles and living environment of the Havana informal urban settlement to enhance the health, wellness and quality of the life of the communities (Doyle, Ward & Early, 2018). The consultation process with community members, two community leaders, one subject expert and one stakeholder on the findings of the situation analysis, culminated in two sub-themes which comprised the introduction of WASH concepts and WASH-related disease and hepatitis E outbreaks linked to poor WASH conditions. According to Doyle, Ward and Early (2018), community health education is a combination of learning experiences designed to help individuals and communities improve their health, increase their WASH knowledge and influence their behaviour practices. Hornik (2018) shows that it has been proved that community health education motivates informal urban settlements to adopt health-promoting behaviour and healthy hygienic practices.

(i) The Introduction of WASH concepts and WASH-related diseases

Background information

The introduction of WASH is presented as a key public health issue for international development within the focus of Sustainable Development Goal 6 (Guest, 2019). The WASH phenomenon was introduced to the participants in a participatory and coordinated learning environment. The introduction of WASH covers the concepts of what WASH stands for, what WASH does, what the impact of WASH is and what the WASH solutions are (Blanchet, 2018; Towns, Gerber & Anderson, 2018). The rapid migration to urban settings of Windhoek is accompanied by a growing demand for water, hygiene and sanitation services and knowledge about WASH (Slesinski, Stricker, Gnilo, Bryant, Roux & Ezeh, 2019). A study by Hutton and Chase (2016), indicates that it is critical to have the best available knowledge on WASH to achieve the sustainable development goal targets on water supply, sanitation and hygiene.

Rationale

The findings of the situation analysis confirmed that awareness and knowledge of WASH were limited among informal urban settlements despite the initiative of some communities to address their poor WASH conditions. There was a need to develop content on WASH in the training module as a result of the findings of the situation analysis. A study by Dery, Bisung,

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Dickin and Dyer (2019) indicates that there is a growing interest to examine the importance of community empowerment and improving their WASH knowledge through training and education,

Outcomes

Community participants learnt to restore and maintain their health by developing a positive attitude towards behavioural change. The community supported on-going interventions of community health education in the Havana informal urban settlement.

(ii) *The presentation on hepatitis E outbreaks and its linkages to poor WASH conditions*

Background information

Hepatitis E was presented during the training programme as a virus that is caused by an endemically transmitted infection that infects the liver, causing it to swell up. The outbreak of the Hepatitis E virus (HEV) in the Havana informal urban settlement was spread through faecal-contaminated water or the consumption of uncooked or undercooked meat. Studies conducted by Hakim, Wang, Bramer, Geng, Huang, De Man and Pan (2017) indicated that the Hepatitis E virus (HEV) has been responsible for repeated water-borne outbreaks since the past century, representing an emerging issue in public health. The link of poor WASH conditions and hepatitis E are discussed in the context of recent outbreaks and possible interventions in the Havana informal settlement.

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Previous studies conducted by Prüss, Kay, Fewtrell and Bartram (2002) indicated that the burden of disease at the community level was related to poor water, sanitation and hygiene conditions. Another study conducted by Sooryanarain and Meng (2019) found that poor sanitation conditions were the reasons for the emergence of the Hepatitis E virus in humans, especially among a poor and displaced population residing in informal urban settlements.

Rationale

The findings of Phases 1 and 2 have indicated that communities are concerned about the impact of hepatitis E outbreaks on the Havana informal settlement.

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Outcomes

Communities have been empowered with knowledge on how to prevent faecal-oral transmission and oral-hand contact after defecation. A study has proved that hepatitis E is most commonly transmitted via the faecal-oral route, contaminated water and contaminated hands after defecation, especially in developing countries (Nimgaonkar, Ding, Schwartz & Ploss,2018).

Social Entrepreneurship

The Social Entrepreneurship Module was presented during the community training, which focussed on the social changes that promote the improvement of the existing poor WASH conditions of the informal urban settlements (Gordon, Wilson, Tonner & Shaw, 2018). Social entrepreneurship encourages the participants to explore innovative ways to respond to the complex needs of communities residing in the Havana informal urban settlement. The Social Entrepreneurship module encourages the participants to assume the roles of social entrepreneurs in serving the general interest and common good of poor communities residing in an informal urban settlement (Ross, 2017). The social entrepreneurship presentation comprised an introduction of social entrepreneurship, entrepreneurial opportunities and waste management and recycling.

(i) Introduction to the concept of social entrepreneurship

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Background information

According to Durkin and Gunn (2016), the introduction of social entrepreneurship inspires training participants, transforms communities and ignites innovative approaches for solving the social needs of the poor. Social entrepreneurship develops a mission and vision in individuals to bring about change in the social challenges of the Havana informal urban settlement. Social entrepreneurship presents creative and innovative ideas to help alleviate social problems from society as a whole (Ghalwash, Tolba & Ismail, 2017).

Social entrepreneurship is all about recognising the socio-economic problems of informal urban settlements by assisting them to achieve social change through entrepreneurial principles, processes and action (Seelos, Mair, Battilana & Dacin, 2011; Seelos & Mair, 2009).

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A study conducted in Indonesia on social entrepreneurship indicated that the involvement of communities, especially women, in economic activity related to water, sanitation and hygiene (WASH), increased the empowerment of poor informal settlements (Indarti, Rostiani, Megaw & Willetts, 2019). According to Winschiers-Theophilus et al. (2017), several initiatives such as entrepreneurship training and workshops need to be conducted in informal urban settlements. The promotion of social entrepreneurship needs has gained wider attention in informal urban settlements, considering the high unemployment rate among Namibian youth and a lack of job opportunities.

Rationale

The community indicated, during a participatory process of Phase 2, the need for a training programme in social entrepreneurship because of their poor socio-economic status owing to high unemployment and extreme poverty. A study conducted in Nigeria by Afolabi, Kareem, Okubanjo, Ogunbanjo and Aninkan (2017) indicated that education and training in entrepreneurship provided the necessary skills, competence and understanding which prepared communities for self-reliance.

Outcomes

The communities were equipped with the knowledge that entrepreneurial activities added social value to poor communities and contributed to poverty alleviation and employment opportunities. Zahra and Wright (2016) state that the work of social entrepreneurs addresses issues of food and water shortages, environmental pollution and sustainability through innovative and affordable technologies. The training participants embraced their role as a catalyst of change as social entrepreneurs to address the socio-economic challenges of the Havana informal urban settlement.

(ii) Entrepreneurial opportunities for self-employment, employment creation and the discovery of human capital

Background information

Entrepreneurial opportunity is a situation in which any idea for a new product, service, raw material and market or production process can be successfully exploited to generate economic benefits for communities (George, Parida, Lahti & Wincent, 2016). Entrepreneurial opportunities are situations where products and services can be sold at a price to make a

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profit. Alvarez and Barney (2014) state that entrepreneurial opportunities are focussed on poverty alleviation and engaging in initiatives aimed at reducing poverty. Entrepreneurial opportunities covered elements of self-employment opportunities, employment creation and a discovery of human-capital opportunities .

According to Barba- Sánchez and Atienza-Sahuquillo (2017), the effect of the economic crisis on the business world has created the need for self-employment and the maximisation of new entrepreneurial opportunities that support the creation of wealth and employment.

Rationale

The community of the Havana informal urban settlement indicated during a participatory process of Phase 2 that entrepreneurial opportunities are evident owing to the mass population growth accompanied by the demand for food and other necessities. Keskinen (2015) states that emerging entrepreneurship and entrepreneurial opportunities in informal settlements must be supported to solve social issues like unemployment and poverty.

Outcomes

The community members who participated in the Social Entrepreneurial module were working for themselves and some of them were owners of small-scale businesses. Most participants understood the risks and rewards that accompanied entrepreneurial opportunities. Pugalis, Giddings and Anyigor (2014) indicate that entrepreneurial efforts and opportunities are viewed as a key means of 'lifting' people from poverty, especially communities living in informal settlements and urban slums. Entrepreneurial opportunities equipped communities with the knowledge of how to create start-up capital, measuring the performance in profit and achieving a return on investment.

(iii)*The utilisation of waste recycling as a means of income-generation and employment-creation*

Background information

The recycling of waste materials is a process that involves the collection, sorting and recycling of plastics, metal, cardboard and glass from household waste. Two case studies that were conducted in Nigeria and South Africa have proved that the recycling of waste materials creates opportunities for employment, income-generating projects and entrepreneurial

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opportunities for informal urban settlements (Nzeadibe & Iwuoha, 2008; Karlberg & Varajärvi, 2018). According to Schioldborg (2014), the recycling of waste materials creates employment and income to poorer communities who are residing in informal urban settlements. Practical sessions on converting recycling paper, glass and plastics into saleable materials formed part of the community's initiative to manage waste in their living environment.

A study by Gutberlet, Kain, Nyakinya, Ochieng, Odhiambo, Oloko, Zapata and Zapata-Campos (2016) in Kisumu, Kenya proves that small-scale entrepreneurs who provide household waste-collection services in informal settlements, as part of waste-recycling, succeeded in becoming a successful social micro-enterprise. Informal settlements may use the technologies of waste recycling as a means of generating income for poor households in the informal settlements (La Ferrara, 2013).

Rationale

The findings of the situation analysis have proved that inadequate municipal service delivery result in poor waste management in the Havana informal urban settlement. A study by Kalwani (2010), indicated that the lack of appropriate knowledge in, education and capacity building of informal urban settlements of waste management may lead to enormous quantities of uncollected waste posed by rapid urbanisation. The concept of waste recycling in the Havana informal urban settlement was presented during the community training according to the findings that had emanated from the situation analysis.

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Outcomes

The waste recycling training contributed to the reduction of waste pollution in the Havana informal urban settlement. Communities were now using recovered waste material to produce recycled products for income generation.

7.2.5 Stage 5: Evaluation

The Evaluation stage determines whether the training programme, methods and material were effective and successful as well as accomplishing the goal and objectives that had been established (Bates, 2019). According to Sitzmann and Weinhardt (2019), to evaluate a training programme effectively, the data of the training programme need to be gathered from participants, the results that emanate from the data collection need to be carefully analysed and any unforeseen training gaps or learning conditions need to be identified.

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Kirkpatrick (2016) defines evaluation as the determination of the effectiveness of a training programme. The evaluation phase is an essential component of the ADDIE process which occurs at the end of the implementation of a course or training programme in the form of a summative evaluation for instructional improvement (Davis, 2013). A summative evaluation was used that centred on training outcomes. Kirkpatrick (2016) states that summative evaluation connects all the ADDIE stages in a training programme including the learning goals and objectives. A summative evaluation certainly provides opportunities for future improvement and may assist and support future training.

Rapid appraisal

The summative evaluation in this study consisted of a rapid appraisal that guided the evaluation of the training evaluation. Beebe (1995) defines a rapid appraisal as a less structured data collection method aimed at supplying needed information in a timely and cost-effective manner. Kumar (1993) states that rapid appraisal is an approach to evaluate and determine the outcome and impact of an intervention such as the community training programme. According to De Vos et al. (2011), the evaluation focusses on the measuring of goal-attainment and objectives for the systematic collection of information and the outcomes of WASH interventions. The rapid appraisal was used to evaluate the impact of the COMWAP.

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The rapid appraisal was an effective technique to quickly, yet systematically, triangulate the collected data when time in the field was limited. The rapid appraisal posed the following questions during this evaluation stage, which was also considered the 'How' phase:

- How can the interventions be implemented;
- What are the costs of the interventions;
- Who will bear the costs; and
- Are the costs sustainable?

The rapid appraisal defined the WASH problem that needed to be solved and 'how to' solve the WASH problem (Mash, 2014).

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The rapid appraisal was conducted from 3–8 February 2019. A questionnaire was used during the rapid appraisal that focussed on the outcome of the intervention in Stage 4 above (Appendix E: Rapid Appraisal Evaluation Questionnaire sample). The rapid appraisal questionnaire was an important evaluation tool that focussed on the improvement of the community training programme as a WASH intervention in an informal urban settlement. Patton (2002) defines programme evaluation as the systematic collection of information about interventions to make judgements on how to improve their effectiveness for future programming.

Study design

The McKendrick evaluation model (Beebe, 1995) was adopted as a study design during the rapid appraisal technique. The following steps were followed:

- Determine what is to be evaluated: The rapid appraisal determined the poor WASH conditions of the Havana informal settlement and the critical element of the study.
- Identify key stakeholders: The stakeholders primarily intended were the people who had a stake in the evaluation and who made decisions based on the findings of the rapid appraisal's evaluations and outcomes. The priorities and concerns of different stakeholders were considered. The inclusion of key stakeholders aided the research with the evaluation planning, communication strategies during and after the evaluation, which, in turn, supported the utilisation of the evaluation findings of the study. Involving stakeholders during rapid appraisal evaluation added value to the perspectives to what would be considered a credible, high-quality and useful evaluation. The inclusion of stakeholders contributed to the logic and framing of key evaluation questions, the facilitating of quality data-collection and the increasing utilisation of the evaluation findings.
- Maintain the cooperation of the community: Strong and consistent contact with communities and community leaders were established. Continual visits to the Havana informal settlement were undertaken to learn the basic ‘political language’ and ‘culture’ of the community. Free-flowing discussions were initiated with the community that led to questions such as:
    - Who are the community gatekeepers or representatives?
    - How are they perceived in the community?

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- Are there factions, rivalries (political, religious and economic) in the community?

Such early knowledge was valuable that helped avoid early missteps and maintaining cooperation. The researcher was in a preferential position to explain the research goals, to obtain permission from the local community and to establish dates for rapid appraisals.

- Specify the programme objectives: The programme objectives enabled the local community and stakeholders to plan together for appropriate interventions and evaluate the effect of WASH interventions after they had been carried out. The evaluation ensured that the programme objectives were facilitated to establish rapport with local communities.
- Specify evaluation objectives: The evaluation goals and objectives were carefully explained from the onset of Phase 3 to avoid misconceptions among the community. A sound understanding of the evaluation objectives was key to utilising the research instruments without losing sight of the final objectives.
- Choose variables: The rapid appraisal process ensured that information on WASH variables was collected in advance and then progressively developed into a questionnaire for direct observations. While the rapid appraisal was searching for trends, patterns and variables for generalisation, the iterative nature of the process allowed for the discovery of the unexpected variables. Part of a larger iterative process was exploratory and subjected to change as new and better information was collected or as the variables changed.
- Choose the research design: The researcher chose a participatory research design that provided useful insights into the research and the interventions that would address the poor WASH conditions among the Havana informal settlement of Windhoek. The participatory approach facilitated smooth data collection from the local community.
- Implement measurement: The implementation of measurement in a rapid appraisal concerning cost and time involved low-cost activities and high adaptability to different situations and time.
- Analyse or interpret findings: The researcher collected, analysed and validated the data findings. The researcher ensured that no data findings went unchecked since they were used for making important decisions.

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- Report or implement results: The joint preparation of the rapid appraisal report was completed by the research team, which comprised the researcher, interpreter and an independent coder. The rapid appraisal report has been an important part of the iterative and participatory process.

Study population and Sampling

The study population was recruited from the Havana informal urban settlement in Windhoek comprising community members, community leaders and stakeholders who participated in the implementation of the training programme (See section 7.2.4 Stage 4: Implementation). In addition, the researcher also ensured that the study population had the same characteristics as per Phases 1 and 2 of the study (De Vos et al., 2011).

The socio-demographic characteristics of participants in the rapid appraisal are described in Table 7.6. The community participants who were engaged in the rapid appraisal of the COMWAP intervention were between the ages of 20–29 (29%), 30-39 (33%) and 40-49 (22%) years. Most were female (71%) and the majority was unemployed (77%). Thirty-eight community members were in attendance (84%), with four community leaders (9%) and three stakeholders (7%).

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Table 7.6: Demographic characteristics of community participants in the rapid appraisal of the COMWAP intervention

Participants	Frequency (n)	Percentage (%)
Age (in years)		
< 20	5	11
20 – 29	13	29
30 – 39	15	33
40 – 49	10	22
50 – 59	2	5
Sex		
Male	13	29
Female	32	71
Status		
Employed	4	9
Unemployed	35	77
Self-employed	3	7
Student	3	7
Designation		
Community	38	84
Community Leader	4	9
Stakeholders	3	7

Data Collection

A questionnaire was used as part of the rapid appraisal to obtain the participants' opinions on how to improve the WASH intervention such as the Community Training Programme's content. The data collected from the questionnaire were used to revise a future training programme accordingly. Revisions of the Community Training Programme were conducted based on the reflections of the training team and community members in the training experience.

Interviews and focus-group discussions were conducted with forty-five (45) participants which were part of the data-collection process, as illustrated in Figure 7.5 below.

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Figure 7.5: A photo of the Interviews and focus-group discussions during rapid appraisal process taken by the author in Havana informal urban settlements, Windhoek. February 08, 2019

Data Analysis

The data was analysed according to the rapid appraisal technique. This technique is a rigorous approach for data analysis because the analysis focusses on detailed, accurate and complete information of the Community Training Programme. Data analysis involves the following multi-step process:

- Organise the descriptive information (collected data) according to the WASH category, issue, topic, sub-topic or/and question;
- Sift information (collected data) according to its importance by exploring the causes and consequences of poor WASH conditions; and
- Prioritise information (collected data) for report writing and implementation (Schoonmaker-Freudenberger, 2008).

Findings

A summary of the main themes (3) and sub-themes (7) that emanated from the rapid appraisal are presented in Table 7.7 below. The themes are written as narrative accounts with quotations reflected in italics that serve as evidence of the rapid appraisal.

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Table 7.7: Themes and sub-themes from Phase 3

THEME	SUB-THEME
Characteristics of an informal urban settlement	1.1 The Geographic profile 1.2 The socio-demographic profile 1.3 The poor living conditions
Community WASH Action Plan (COMWAP)	2.1 Reflections on previous interventions 2.2 Community training programme
Proposed and future WASH interventions	3.1 Community empowerment and skills-building 3.2 Strategic partnership

Theme 1: Characteristics of an informal urban settlement

Theme 1 comprised three sub-themes, namely the geographic profile, the socio-demographic profile and the poor living conditions.

The Geographic profile

Most participants indicated that they were residing in the Havana informal urban settlement that was situated in Katutura, a suburb of Windhoek. Katutura used to be a black township in the former Apartheid era. The findings of the study showed that the Havana informal urban settlement was a dense network of disproportionately small shacks at close proximity to one another with no laid-out roads and very limited serviced infrastructure.

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> *I am staying in a small kambashu [*referring to a shack*] for two years now. There is no road and people are building the kambashu everywhere* (Community Participant 8).

The socio-demographic profile

Participants indicated the increasing migration of communities from rural areas to the urban settings of Windhoek that was affecting the socio-demographics of the Havana informal urban settlement. The participants indicated that the informal urban settlements consist of a diverse culture of Namibians, with English, Afrikaans and Oshiwambo as the predominant languages.

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> *Mixed people are staying here in Havana who speaks different local languages. The people who stay here longer than five years can speak English and Afrikaans when different peoples are communicating. But most people staying here speak Oshiwambo* (Community Participant 13).

The participants indicated that socio-economic inequalities governed the high levels of poverty and unemployment. Participants indicated that most people migrated from smaller towns and rural villages of the northern part of the country to Windhoek in search of jobs, economic opportunities and better living. According to participants, the unlicensed and illegal liquor outlets, labelled 'Shebeens', were mushrooming throughout the informal urban settlements owing to socio-economic disparities. These Shebeens were a means of financial income for poorer communities. Some participants indicated that communities also resorted to other means of income as informal vendors such as the selling of foodstuff at informal markets of the City of Windhoek. The informal vendors preferred to sell dry meat or carcasses because of the lack of refrigeration, making the meat or other vulnerable foodstuff risky because of insects, flies and other potential health risks. According to previous studies, the socio-economic status of informal urban settlements influences the opportunities for communities to engage in active WASH activities (Silvestri et al., 2018).

The poor living conditions

Participants indicated that all households and families were living in tin shacks or shanties made from corrugated iron sheets and other waste materials. According to participants, nine family members or more were living in one shack. Previous studies have indicated that the people who live in small, overcrowded dwellings or shacks tend to experience vulnerability and a greater risk to infectious disease (Barrera & Thompson, 2019).

> *My children and cousins stay with me because of schooling in Windhoek. We are three adults with six children staying in one Kambashu [*referring to a shack*]. No privacy but what can I do since we don't have money for bigger space* (Community Participant 29).

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According to WHO (2018), there is a direct association between overcrowding and adverse health outcomes, such as infectious disease and mental health problems. The participants indicated that they were used to living with limited communal toilets and water points. Participants also raised their concern about living in crime-prone conditions.

Most participants indicated that they could not address their poor living conditions that contributed to endemic disease.

> *I want to see so many changes in my community like more toilets … information on hepatitis E and sanitation, but we don't know how to speak to our neighbours. We want to build our toilets but we need money* (Community Participant 31).

The participants indicated that their limited capacity came with wide-ranging implications including limited health, lack of safety and land insecurity. According to Huchzermeyer (2009), critical re-skilling and capacity building are necessary for informal urban settlements.

Theme 2: Community WASH Action Plan

Theme 2 comprised two sub-themes: the reflections on previous interventions and community training programmes.

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Reflections on previous interventions

Participants indicated their preferential choice of a WASH intervention such as COMWAP because of previous WASH activities. Previous studies have indicated that engaging members of the community in public health interventions have been broadly defined as involving communities in decision-making (O'Mara-Eves, Brunton, Oliver, Kavanagh, Jamal & Thomas, 2015). Most participants confirmed that COMWAP intended to reflect community-identified needs and informed programming decisions. The participants indicated that previous interventions such as the Community-Led Total Sanitation (CLTS) approach had only been implemented in rural settings and not in the Havana informal settlement. Participants reiterated their concern concerning the Namibia National Communication Strategy for Sanitation that had not been implemented in informal urban settlements.

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I am staying here in Havana very long but I did not see the government talking to us about sanitation and hygiene. I only heard the Namibia Red Cross organisation working with our communities but I did not see them here at Kabila 2 area (Community Participant 41)

Some participants indicated that the hygiene education sessions that were currently conducted by the City of Windhoek were limited to the informal vendors' outlets or markets. The rest of the Havana informal urban settlement had not been reached. A study conducted by Niederberger and Glanville-Wallis (2019) stated that implementers must be able to listen more systematically to community concerns for future WASH interventions.

Community training programme

Participants expressed their appreciation with the introduction of the community training programme which had been supported by their active involvement and participation during the two modules presented. The participants indicated that the concept of social entrepreneurship and business innovation in addressing poor WASH conditions was a first-time exposure and knowledge-transfer experience. The participants indicated that the session on community health education had instilled a sense of dignity and pride in individual community members and at the same time, had brought about a wake-up call for social improvements. The majority of participants confirmed that they had practised handwashing with soap and personal hygiene, especially after defecation and before eating food. The participants demonstrated an increase in health knowledge about WASH and the improvement of entrepreneurial skills. These sentiments had been openly expressed during the workshop sessions.

The participants had enjoyed the social entrepreneurship session which had created several business initiatives in solar panel technology, tailoring and recycling. The participant who represented the unemployed youth had been inspired to embark on alternative income-generating projects. The youth participants indicated that they had applied their knowledge of social entrepreneurship as a skills development initiative for new career paths. The community training sessions had boosted the communities' confidence and ability to be creative and entrepreneurial. Most participants indicated that the community training programme had been very influential in changing individual behaviour with regard to personal cleanliness, healthy sanitary practices and good hygienic behaviour.

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> *We are so happy to learn about health education and to start our own business (referring to social entrepreneurship). Now I know so many things about sanitation and hygiene. We need this information to be shared with all the people* (Community Participant 8).

The participants indicated that households had had family discussions about responsible behaviour such as open defecation and the recycling of waste-material. The majority of participants indicated that littering had decreased most significantly since the introduction of the community training programme. A study has shown that a community training programme can help communities make a difference in their environment by reducing, reusing and recycling waste materials (Choshen-Hillel, Shaw & Caruso, 2015). Several households were practising safe-water activities such as the use of chlorination tablets in household water-containers. The participants indicated that the community training programme had provided community participants with a sense of responsibility to actively participate in WASH activities such as maintaining the cleanliness of communal toilets. Participants indicated that the session on Social Entrepreneurship had gained wider attention and interest among community members by showing creativity and innovation in designing saleable objects from waste materials.

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Theme 3: Proposed and future WASH interventions

Theme 3 comprised two sub-themes: community empowerment, skills-building and strategic partnerships. The participants indicated that the community's suggestions for improved WASH interventions had created opportunities for informal settlements to participate in decision-making processes. As a result, communities felt empowered and assumed more ownership of future interventions. According to Rudd (2007), partnerships and collaboration with communities are important and must include shared commitment for on-going dialogue and knowledge-sharing.

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Community empowerment and skills-building

Participants indicated that communities needed to be empowered and equipped with knowledge of community health and social entrepreneurship. They also indicated that empowering communities would enable them to explore key topics related to WASH-related themes. Participants had indicated that communities and families had to be better equipped with knowledge and skills to prepare and respond to the outbreak of disease better.

> *We want more information and knowledge on health that can help us to make better decisions for us and our children* (Community Participant 22).

Participants requested to be equipped to develop a business plan and project proposal for their community health outreach and social entrepreneurship activities. Serrat (2017) states that communities have a passion for work-related knowledge and action-related learning.

Strategic Partnership

Participants indicated that strategic partnerships between communities, government and stakeholders needed to be strengthened through continuous communication. Participants also indicated that strong rapport and cooperation between the City of Windhoek and communities needed to be encouraged. Participants recommended free-flow discussions between communities and key stakeholders which would ensure the improvement of future WASH activities. Thus, quality communication included partner participation and satisfaction, good relationships and dialogue (Corbin, Jones & Barry, 2016). Participants also recommended the establishment of formal collaboration and a partnership between the City of Windhoek, government, private business and the informal urban settlement community.

> *We want to work together with Windhoek municipality to make the health of communities better* (Community Participant 14).

The formal collaboration could be the foundation of a long-term joint venture in addressing the poor WASH conditions and sustainable livelihoods of informal urban settlements. According to Jones and Barry (2011)), intersectoral partnerships have been identified as a useful mechanism for addressing health challenges that face communities. Partnerships achieve more synergistic outcomes than individual partners working on their own.

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7.3 Summary and points to take forward

The piloting of a Community WASH action plan (COMWAP) through a community training programme ignited an interest for more knowledge on community health education and social entrepreneurship among informal urban settlements. The feedback from communities during the rapid appraisal demonstrated that a WASH intervention such a community training programme could facilitate the behavioural change of informal urban settlements. Also, the rapid appraisal had determined that WASH interventions could meet the needs of the informal urban settlements and the poor WASH conditions that it sought to address.

The rapid appraisal further illustrated that communities residing in informal urban settlements lived in small shacks in settlements that were densely populated with limited municipal services. The informal urban settlements encompassed a diversity of culture and languages with socio-economic inequalities. The poor living conditions of informal urban settlements were characterised by overcrowding, crime and the risks of disease. Despite previous WASH interventions by the City of Windhoek and government, the WASH needs of communities had not been addressed.

In conclusion, the evaluation of the community training programme provides evidence that future WASH interventions can be realised through on-going community empowerment and skills-building. The joint development of an action plan in this chapter will be continued in the next chapter, including the reflection and validation of the overall research findings.

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CHAPTER 8: REFLECTION AND DEVELOPMENT OF ACTION PLAN

8.1 Introduction

In this chapter, the reflection and validation of the research findings are discussed (see section 8.4), including the joint development of an action plan (see section 8.7) to deal with the poor WASH conditions in the Havana informal settlement. The reflection and validation of the findings are crucial aspects of authenticating findings generated from the research and are consistent with the perspectives of the research participants in a specific field of study (Creswell, 2014). The chapter discusses whether the researcher's findings and impressions correspond with the views of the communities of the Havana informal urban settlement, Windhoek.

The validation phase is imperative for assessing the reactions, comments and proposals of the Havana informal urban settlement communities. During this phase, the researcher customised the recommendations and WASH interventions consistent with the requirements and circumstances of the Havana informal urban settlement communities. An Action plan and methods to deal with the poor WASH conditions in the Havana informal urban settlement were developed jointly with the community, relevant stakeholders and the researcher (see sections 5.3.1-5.3.3).

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8.2 Study design

Member checking of the research findings was employed as a validation technique (Lincoln & Guba, 1985; Birt, Scott, Cavers, Campbell & Walter, 2016). Consistent with Madill and Sullivan (2018), member checking of the research findings are often utilised to assess validity which incorporates stakeholder feedback. Harper and Cole (2012) state that member checking may be a technique for exploring the validity of research findings, which are successively returned to community participants to see whether they are accurate and resonate with community experiences. The validation of the research findings through member checking was a process of confirming that there had been no gaps in the information and collected data of the research study (Lewis, 2009). According to Lewis (2015), member checking of research findings are checks and balances that are used to correct errors and to eliminate the likelihood of misrepresentation and the misinterpretation of the community. Member checks

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may involve sharing all the findings with the participants and allowing them to critically analyse the findings and discuss them (Creswell & Creswell, 2017).

The feedback session with the Havana informal urban settlement communities, which formed a part of the member-checking process, involved both agreements and disagreements with reference to the contents of the research findings. The researcher responded reflexively to any disagreements that emanated from the feedback by revisiting and systematically examining previous data. Caretta and Pérez (2019) state that disagreements are useful during member checking that gives much depth and detail to the research study. Respondent disagreements may assist the researcher to detect inconsistent and insufficient data collection, including the shortage of achieving data saturation (Varpio, Ajjawi, Monrouxe, O'Brien & Rees, 2017).

Sousa (2014) explains that the advantage of conducting member checks is that it allows the researcher the chance to verify the accuracy and completeness of the findings, which then helps to enhance the validity of the study. Thomas (2017) states that member checking is often useful for obtaining participant approval in participatory or collaborative research.

8.3 Study population and sampling

A total of 36 participants participated in the validation process during a feedback workshop conducted at a community hall. The participants were recruited from the Havana informal urban settlement comprising community members, community leaders and stakeholders, who had the same characteristics of Phase 1 (Chapter 5), Phase 2 (Chapter 6) and Phase 3 (Chapter 7) of the research study. The demographic characteristics of the community participants are presented in Table 8.1. The ages of the participants ranged between 20 years and 59 years with the median age of 30 years. The majority of participants were female (72%) and unemployed (72%).

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Table 8.1: Demographic characteristics of community participants (N=36)

	Frequency (n)	Percentage (%)
Age (in years)		
20 – 29	9	25
30 – 39	17	47
40 – 49	9	25
50 – 59	1	3
Sex		
Male	10	28
Female	26	72
Status		
Employed	4	11
Unemployed	26	72
Self-employed	2	6
Student	4	11
Designation		
Community	29	81
Community Leader	3	8
Key informants	4	11

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8.4 Data Collection

The data collection happened on 23 March 2019 which was part of a community feedback workshop. The feedback workshops assisted the researcher to obtain additional data that contributed to the general enrichment of the research study. Feedback workshops are a perfect platform to collect information during a group setting and to stimulate group conversations, which can generally yield richer and more in-depth data (Paradis, O'Brien, Nimmon, Bandiera & Martimianakis, 2016).

8.4.1 Feedback workshop

The feedback session and workshop with the community of the Havana informal urban settlement were conducted to determine whether the research study had adequately reflected the key findings of Phase 1 (Chapter 5), Phase 2 (Chapter 6) and Phase 3 (Chapter 7) of the research study. Binet, Gavin, Carroll and Arcaya (2019) state that a feedback workshop is a meeting that brings together communities and key stakeholders in which the findings of a research study are discussed.

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A well-attended participatory workshop was organised in the Havana informal urban settlement that served as a feedback session with 36 participants as illustrated in Figure 8.1 below. The feedback session was part of the process of developing an action plan. Figure 8.1 illustrates the presentations and group work that followed during the community workshop.

Figure 8.1: A photo of the Phase 4 Feedback session/workshop taken by the author in Havana informal urban settlements, Windhoek. March 23, 2019

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The researcher selected the participants who had previously participated in Phases 1–3 of the research study. One feedback session was conducted with community members and community leaders/gatekeepers and stakeholders. Unfortunately, not all stakeholders could attend the meeting owing to other commitments but the feedback was followed up with 4 individual meetings. The feedback sessions were based on the findings of the research study, which explored the experiences, perceptions and possible interventions of community members to address the poor WASH conditions of the Havana informal urban settlement. The researcher organised the feedback sessions in a community venue in the Havana informal urban settlement. Posters inviting the community and written invitations that were translated into local languages were extended to all interested community members and community leaders (see Figure 8.2 below).

Figure 8.2: Sample of community invitation

The researcher also invited additional key stakeholders such as WASH-related community groups, non-governmental, community-based and faith-based organisations to make sure that their constituencies were present during the feedback sessions. The feedback sessions lasted for at least half a day.

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The findings from the research study were presented, accompanied by open discussions that were facilitated by the researcher. The findings of the research study formed the basis of the development of a WASH action plan and strategies. A scribe was appointed to report back on each group session and the provision of feedback to the bigger group was presented during plenary sessions, as illustrated in Figure 8.3 below. During the feedback workshop, the researcher identified, tested and confirmed new WASH themes from a trans-regional perspective. The feedback workshops were ideal for testing new research questions, new fields and projects in an uncomplicated and flexible format.

Figure 8.3: A photo of the Phase 4 Group reports and feedback taken by the author in Havana informal urban settlements, Windhoek. March 23, 2019

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8.5 Data Analysis

Data analysis in qualitative research is an iterative process of gathering and evaluating the data simultaneously to maximise the meaning of the data (Creswell, 2014). The data analysis was conducted during Phase 4 and involved verbatim transcriptions of the voice recordings and field notes of all the group discussions during the plenary sessions. The WASH thematic analysis, which included the re-emerging themes, using Tesch's coding technique, was followed (Creswell, 2014). Tesch's coding technique included the subsequent steps (which were first described in section 6.5 of Chapter 6):

- All verbatim transcriptions and field notes were read carefully to get the overall sense of the data.
- Codes were written next to the appropriate segments and texts of the data.
- The most descriptive wording for the topics were found and translated into categories.
- The abbreviations of every category, including the codes, were finalised.
- The materials that belonged to each category were assembled in one place for a preliminary analysis.
- The recoding of existing data were not necessary.

The thematic analysis reflected the communities' experiences including their reflective perspectives of the research findings.

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8.6 Findings and Discussions

The findings of the research were presented during the feedback workshop and resulted in robust discussions and proposals. The workshop discussed the findings for every phase covered in the study, including the validation process and the development of an action plan. The findings of the workshop confirmed the poor conditions of the informal urban settlements and therefore the need for an improved WASH action plan that was tailor-made and focussed on the community. The presentation on the findings of Phases 1–3 confirmed that the present poor WASH conditions in Havana could cause poor health outcomes, like increased contamination and therefore the risk of exposing residents to outbreaks of WASH-related diseases. The workshop further confirmed the poor WASH conditions in informal urban settlements with reference to the insufficient, overcrowded living areas, poor housing, insecure tenure, inadequate sanitation infrastructure and services.

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The workshop sought to place a specific geographic focus in the Havana informal urban settlement because the communities that lived there were the most disadvantaged people in the city of Windhoek. Geographic mapping and understanding the characteristics of informal settlements were crucial to formulating a WASH action plan. The workshop identified the challenges further like the shortage of physical or infrastructural support, limited community health education and inadequate WASH policies.

The workshop participants acknowledged the necessity of more interventions like the Community WASH Action Plan (COMWAP) which specialised in interventions at the local and national level. They demanded that this be attended to. The workshop participants indicated that the action plan had to be location-specific and had to address the context-specific priorities of the area with tailor-made WASH programme content linked directly to the Havana informal urban settlement. The workshop participants strongly suggested that the proposed action plan promote good health and environmental outcomes that included safe management of both the sanitation structures and community health education. The workshop participants agreed that the city of Windhoek and the informal settlements needed to collaborate as role players in the implementation of the action plan. The workshop participants requested community leaders and relevant stakeholders to consult with the communities which would foster community empowerment and development.

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8.7 WASH Action Plan and Strategies

8.7.1 Development of action plan

The action plan was proposed and formulated according to the findings of each phase covered in the study. This action plan was standardised to fit the scope of the practices of WASH at local and national governance levels, which meant that the plan had to be presented at both the macro (national level) and micro levels (local level). The macro-level referred to those action plans that could be implemented at a national level in any of the informal urban settlements of Namibia. The micro-level referred to those action plans that could be implemented at grassroots or community level in the Havana informal urban settlement of Windhoek.

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(i) *Micro-WASH Strategies*

The following micro-WASH strategies were proposed for the Havana informal urban settlement:

- Maintaining the upkeep of public toilets with specific guiding rules and regulations;
- Promoting awareness of how to build good toilets, use of the toilets, cleaning and maintaining the toilets;
- Improving awareness of the safe containment of faecal waste in river beds.
- Promoting handwashing practices and facilities near toilets and washing hands with soap at key times;
- Managing wastewater and grey water disposal;
- Increasing awareness among households of safe water collection and storage;
- Promoting sanitation and the marketing of good hygiene to recognise the unique and equal roles of the men and women of the Havana informal urban settlement in addressing poor WASH conditions;
- Strengthening relationships between WASH service providers and households to improve the sustainability of WASH interventions;
- Establishing a WASH committee selected from community members that were trained and tasked to keep up with ongoing consultations with households on WASH-related issues;
- Initiating an increased engagement with and empowerment of informal urban settlements through Community Mobilisers, WASH Committees and Community Focal Points;
- Strengthening community participation, accountability and monitoring of WASH interventions.

(ii) *Macro-WASH Strategies*

Integrated WASH solutions and strategies must be implemented concurrently with the focus on strengthening urban governance and service delivery capacity at national and local levels (Dreibelbis et al., 2013). The integrated WASH solutions and strategies must be incorporated with city-wide urban-planning processes because of the unique social, spatial and financial characteristics of informal urban settlements. The national government must highlight the importance of funding policies, scoping and the implementation of WASH programmes. A

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holistic approach to implementing a combination of interventions nationally for urban informal settlements should be the underpinning principle for funding policies.

The national government must facilitate the collaboration of WASH practitioners, funders and all stakeholders to fund the implementation of WASH interventions. Government has to involve local informal urban settlements early in the initiation and implementation stages to ensure increased community ownership and support. Geographical mapping and the understanding of the relative significance of poor WASH conditions should inform national scoping of WASH programmes for urban informal settlements. The following are proposed macro-WASH strategies on a national level in any informal urban settlement of Namibia:

- Enforcing community by-laws on the compulsory provision of communal toilets; the sanitary inspection directorate at the City of Windhoek and/or relevant ministry can monitor the reinforcement of by-laws;
- Providing of additional water tanks for communities that cannot dig or easily access piped water; water tanks provided by the national government should be refilled more frequently to ease the burden of distance and cost in informal urban settlements;
- Introducing and providing of low-cost handwashing facilities near the toilets; the national government must stress the importance of handwashing in preventing sickness and infections after defecation and toilet use;
- Developing and piloting of low-cost toilet models for self-building households in poor settings;
- Piloting and providing of alternative equitable water-supply service delivery options for informal urban settlements;
- Facilitating the involving of all relevant stakeholders to improve WASH in informal urban settlements;
- Conducting community awareness campaigns on WASH in informal urban settlements by including national leaders, service providers and relevant stakeholders;
- Reviewing and updating the country's national WASH policy;
- Identifying and assessing peri-urban and informal settlements which are underserviced and overlooked for WASH services; there is a need to provide affordable and appropriate services as well as improved health and living conditions in informal urban settlements;

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- Developing WASH behaviour-change communications strategy that is aimed at informal urban settlements;
- Linking national urbanisation, housing ownership, land issues, employment and socio-economic development to WASH strategies for informal urban settlements;
- Conducting ongoing research in informal urban settlements to understand the conditions, aspirations, barriers and opportunities to improve water, sanitation and hygiene for informal urban settlement;
- Reviewing the appointment of councillors and politicians that represent their constituent informal urban settlements who must live in the informal settlements themselves by national government; the role of the local councillor and/or community leaders in mobilising and coordinating community resources is as important to both helping the poor but also to solving sanitation and water supply issues;
- Speeding up the relocation process of some settlements into more formalised land with basic WASH services by local government; current attempts at relocating or providing the land title to informal urban settlements were complex and time-consuming;
- Harmonising the national collection of WASH data through common mapping tools to enable targeting and prioritisation; criteria of mapping included types of WASH needs, service provision, types of interventions and geographic locations;
- Promoting health extension programmes among informal urban settlements that included hygiene information, menstrual hygiene practices, handwashing knowledge, water contamination, waste disposal and good sanitation practices;
- Reviewing the Community-Led Total Sanitation (CLTS) programme in rural informal settlements of Namibia, which could also be implemented in informal urban settlements, urging households to reject the practice of open defecation, realise the need for good sanitation and choose the best sanitation options;
- Exploring the construction of one toilet per household as a common minimum standard for informal urban settlements and, where possible, to match user preference, cultural practice and increase ownership and responsibility;
- Conducting a market study on sanitation hardware for low-cost sanitary products and services, considering low-cost on-site sanitation options for urban informal settlements that focus on the safe containment of faecal waste with the elimination of odour and being convenient and safe for households;

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- Introducing and implementing the capitalisation of existing entrepreneurship in the informal urban settlements through formalised water-vending or water-selling points/water kiosks, which would provide jobs in poor communities;
- Reviewing and standardising water tariffs and charging mechanisms for informal urban settlements to ensure equity and value for service by developing a policy on fees and charging mechanisms for informal settlements that was nationally consistent for all informal settlements;
- Providing water meters at taps to see which water points were being used excessively or not in use and which were in high demand to foster speedy repair and maintenance of water points/taps;
- Supporting and adopting an integrated WASH-based approach to address WASH needs amongst all informal urban settlements; and
- Supporting and reinforcing inter-sectoral and inter-ministerial WASH forums at a national level.

8.7.2 Aim of the action plan

The aim of the action plan was focussed on the strengthening of grassroots communities in informal urban settlements through the delivery of a micro and macro WASH action plan. The action plan would be coordinated with integrated actions for all stakeholders by focussing on:

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- Safe and manageable WASH activities,
- Improved WASH interventions for environmental quality, and
- Sustainable outcomes.

8.7.3 Rationale for the development of the action plan

Action plans are imperative because of poor communities that are living in poor WASH conditions. The current poor WASH conditions are a health risk such as increasing environmental contamination and the outbreak of WASH-related diseases.

8.7.4 Description of the Action plan

The description of the action plan emanated from the feedback session and workshop that were conducted with the community and stakeholders. The proposed actions plan was

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reviewed by a panel of experts, which included a health practitioner, a social worker and key informants for clarity, simplicity, generality and usefulness.

Four overarching action plans were developed, based on the pattern of areas of concern as presented in the feedback session. The OSA (Objectives, Strategies and Actions/Activities) framework was presented (Nagy, Fawcett & University of Kansas, 2009).

The OSA framework is a three-step process that focusses on: identifying measurable objectives as markers of success that indicate 'how much' of 'what' is to be accomplished by 'when'. These three steps determine strategies or methods for attaining the objectives and developing action plans or activities that identify specific community changes to be sought that indicate what is to be done to facilitate the priority changes in the community and by whom. According to Watson-Thompson, Fawcett and Schultz (2008), action development and strategic planning are an effective mechanism for stimulating community change and addressing locally determined goals in an urban neighbourhood and informal urban settlements.

8.7.5 Strategic objectives of the action plan

The two strategic objectives of the proposed action plan were proposed as follows:

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8.7.5.1 Objective 1: To develop tailor-made WASH guidelines for the Havana informal urban settlement to implement WASH projects or programmes by 2025.

The current Namibian WASH policies and guidelines dealing with informal urban settlements are absent or out-dated. The available guidelines do not focus on the design and utility of WASH service provision for informal urban settlements. There are limited pro-development WASH policies that deal with the upgrading of informal urban settlements and advocacy activities.

The actions to be taken to effect the outcomes of Objective 1 entail the following:

- Prioritise the WASH themes: WASH must be the thematic priority or element detailed in the proposed WASH guidelines. The WASH priorities should be focussed on the availability and quality of water, appropriate use and access to sanitation and application of hygiene knowledge, skills behaviour and practices.
- Draft practical guidance for COMWAP WASH interventions: The WASH guideline has to guide the communities' approach to implementing COMWAP activities and

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interventions. The proposed COMWAP intervention must have a measurable impact on the health of the informal urban settlements. The Havana informal urban settlement must be willing and able, with suitable WASH knowledge and capacity, to take ownership of the COMWAP intervention programme. The sustainability of WASH interventions is dependent upon the degree of community ownership and participation.

- Advocate improved WASH interventions: WASH interventions need to be a high priority in the policy agenda of the City of Windhoek and the national government. The WASH guidelines are a framework for advocacy that may influence public and institutional policies on WASH.
- Build stronger and robust collaborations: The collaborations and broad consultations with key stakeholders and local communities are an important aspect of effective WASH interventions. The inclusion and involvement of all role players with diverse skills can offer financial, technical and institutional support.

The outcome of Objective 1 is that user-friendly WASH guidelines must be used as a tool for implementing WASH interventions and programmes in informal urban settlements.

8.7.5.2 Objective 2: To develop a training manual for WASH peer educators and health promoters residing in the Havana informal urban settlement by 2025.

The capacity building and training of WASH peer educators and health promoters residing in informal urban settlements is a key component for national development and poverty reduction, especially in Namibia. The training manual provides informal urban settlements with knowledge and the capacity for offering WASH and health promotions, which will develop peer education skills and improved performance ability.

- The training manual will aim to reduce poverty and vulnerability by improving the poor WASH conditions of informal urban settlements. The WASH training manual will strengthen the ability of communities to contribute to the improvement and sustainability of their WASH conditions. The WASH training manual presents methods and approaches to assist WASH peer educators and health promoters residing in informal urban settlements in the promotion of community engagement in WASH activities and processes;
- Healthy living

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- Good WASH practices and behaviour
- Waste and waste recycle management;
- Social entrepreneurship that uplifts poor WASH conditions.

The principal aim of this manual is to enable peer educators and health promoters to adopt innovative methods for learning, planning with groups and working with communities. The manual must be designed with a flexibility that could be adapted according to the conditions of poor communities. The action to be taken to effect the outcomes of Objective 2 should be to assess the knowledge and performance levels of peer educators and health promoters.

The following will be assessed in each informal urban settlement:

- Basic knowledge on WASH
- Education levels of reading and writing;
- Inter-cultural communication skills and experiences
- Residing in an informal urban settlements.

The researcher and local resource person will conduct a community mapping which must include the WASH hotspots to identify and recruit potential WASH peer educators and health promoters. The community leaders and relevant stakeholders will be consulted in the recruitment process to ensure that candidates possess the minimum standards for being peer educators and health promoters. According to Luchenski, Maguire, Aldridge, Hayward, Story, Perri and Hewett (2018), there is a growing evidence base showing that peer support programmes and peer education have positive effects on peer workers and communities. Peer education programmes are effective ways of involving the target population that promotes health and community empowerment.

The printing of training manuals will be finalised, which will serve as a tool for peer educators and health promoters to provide them with training and facilitation skills and techniques for effective task performance.

The peer educators and health promoters candidates will be orientated on the first day of the training in the presence of community leaders and relevant stakeholders who will participate

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in the orientation day. The training will follow up with fieldwork under the supervision of the training instructor. The progress of implementation will be monitored to ensure that WASH activities have been satisfactorily completed. After the completion of the WASH activities, an evaluation will be conducted to determine the impact of the WASH activity. Refresher training will be provided to WASH peer educators and health promoters to prepare them for more fieldwork without supervision. A field report will be written by the WASH peer educators and health promoters that will be included in the proposal that is written for the purposes of fundraising and sustainability.

Kok, Dieleman, Taegtmeyer, Broerse, Kane, Ormel and De Koning (2014) state that WASH peer educators and health promoters are also labelled as being 'close-to-community providers' and are characterised as:

- WASH health volunteers and workers who are based in communities;
- Conducting WASH outreach from their homes and beyond primary health care facilities;
- Those who are either paid or who are volunteers; monetary remuneration (such as salaries, financial incentives or income from selling WASH commodities) and non-monetary incentives (such as respect, trust, recognition and opportunities for personal growth, learning and career advancement) are important motivators;
- Those who are not health professionals but having less than one year WASH training or two years of field experiences; the completion of primary school should be a minimum educational requirement for registering for the training of WASH peer educators and health promoters;
- Possessing an awareness of the social and political determinants of health in an informal urban settlement;
- Owning problem-solving skills.

WASH health volunteers and workers can make important contributions to improving the health of poorer communities residing in informal urban settlements. They can only meet their potential in performing these roles and improving health outcomes when supported by a range of health system enablers (Kok et al., 2014). The training of WASH peer educators and health promoters should seek to impart both technical competency and socially orientated capacities such as skills in communication and counselling as well as awareness of the

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importance of confidentiality. Competencies such as monitoring and evaluation can be introduced during the training sessions, but require supportive supervision and hands-on practice in the field (Scott, Beckham, Gross, Pariyo, Rao, Cometto & Perry, 2018).

The training manuals for WASH peer educators and health promoters is divided into five sections that are aimed at improving the knowledge and skills of peer educators and health promoters residing in informal urban settlements. The five sections of the training manual comprise an introduction to WASH, Waste Recycling Management and WASH, WASH Peer Education and Health Promotion, Social Entrepreneurship and WASH and WASH Programming (Steps of Execution). The five sections of the training manual are displayed in APPENDIX L: Training Manual Structure.

8.5 Summary

The feedback workshop that was conducted in the Havana informal urban settlement succeeded in capturing the unique perspectives of the community participants with regard to the findings of Phases 1–3. The validation process that took place during the workshop highlighted key recommendations related to the development of an action plan(s) and strategies that would address the poor WASH conditions in the Havana informal urban settlement. The feedback workshop yielded action plans that were formulated and proposed with the focus at local community and national government levels. The action plans comprised the development of tailor-made WASH guidelines and a training manual for WASH peer educators and health promoters residing in the Havana informal urban settlement.

The outcome of the action plans focussed on an increased knowledge of WASH for peer educators and health promoters that would improve WASH conditions for informal urban settlements.

The research study will be concluded in the next chapter with summaries of the research findings and key recommendations.

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CHAPTER 9: RECOMMENDATIONS AND CONCLUSIONS

9.1 Introduction

This chapter presents a summary of the research study that investigated the poor WASH conditions in the Havana informal urban settlement and developed, implemented and evaluated a joint action plan to improve WASH through a participatory process. The chapter reiterates the key research findings across the phases, explains the limitations of the study, discusses the recommendations for the study and concludes with the contributions of the study.

9.2 Summary of the key research findings

The study consisted of four phases, namely the scoping review and situation analysis of the study (Phase 1), the participatory action research (Phase 2), the development, implementation and evaluation of a WASH intervention (Phase 3) and the reflections and development of an action plan (Phase 4). The key research findings from each phase are presented in turn.

9.2.1 Scoping review and situation analysis of the study

Phase 1 of the study consisted of a scoping review in Chapter 3, which aimed at exploring the interventions that addressed the poor WASH conditions experienced by poor communities in resource-constrained settings in a developing country. The objective of the scoping review was to explore known interventions for addressing poor WASH conditions in developing countries. The scoping review revealed that behavioural-change interventions could address the WASH challenges that were experienced by poor communities, such as those in informal urban settlements. The review found that behavioural interventions at the community level to address multiple WASH conditions might be the key to improved water, sanitation and hygiene (WASH) practices in resource-constrained settings in developing countries.

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Phase 1 of the study continued with a situation analysis in Chapter 5 which investigated the WASH conditions in the Havana informal urban settlement in Windhoek. The aim of the situation analysis was to describe the WASH conditions in the Havana informal urban settlement and explore which interventions would improve the conditions in the study setting. The key findings of the situation analysis indicated that water and sanitation services and facilities were inadequate for the healthy living of community members residing in the study area. The health and security of the inhabitants of the Havana informal settlement were affected by overcrowding, poverty, unemployment and corrupt leadership. The findings of the situation analysis revealed the on-going challenges of inequitable distribution of water points and the poor maintenance of existing water-taps despite the provision of quality drinking water by the City of Windhoek. In addition, the situation analysis clearly illustrated that communities migrating to Windhoek informal urban settlements had access to entrepreneurial opportunities, health services and facilities.

The key findings that emerged from the situation analysis in Chapter 5 were the identification of five themes, which comprised the following:

- The experiences of living in an informal urban settlement, such as overcrowding, health risks and disease outbreaks, poverty and unemployment, insecure land tenure and corrupt leadership;
- Provision of water services, such as the adequate supply of water to poorer communities, provision of quality drinking water, safe water storage by households, insufficient water supply to poorer communities, poor maintenance of water-taps, inequitable water points, poor behavioural practices of water storage and the costs of subsidised water;
- Sanitation infrastructure and services, such as the provision of communal toilets, provision of waste management services, community action against open-defecation, the unfit state of toilets and facilities, inadequate sewerage systems, the practice of open defecation and public urination, and limited knowledge of waste management;
- Community practices related to hygiene, such as makeshift bathrooms, hygiene and handwashing;
- Environmental health services and education, such as sub-standard health inspections and limited behavioural-change communication on WASH.

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9.2.2 Participatory action research

The aim of Phase 2 (in Chapter 6) was to implement a Participatory Action Research (PAR) approach as a means to address poor WASH conditions in the Havana informal urban settlement of Windhoek. A PAR approach was employed as the overall conceptual framework with a clear reference to the main concept or principle of PAR. The PAR approach involved all stakeholders, particularly the community who were affected by the poor WASH conditions in the informal urban settlements, employing a workshop and community meeting. The research team succeeded in achieving a fully participatory process by capturing the unique perspectives and experiences of the communities of their WASH conditions. The participatory process was a means of measuring the level of participation that produced very rich and in-depth data on the living conditions of an informal urban settlement. The findings of the qualitative research in this phase confirmed the findings of the situation analysis of Phase 1.

The PAR confirmed the five themes, namely:

- Living environment and conditions of an informal urban settlement, such as extreme poverty and insufficient housing, inadequate municipal services, uninhabitable habitat and hostile geographic locations;
- Provision of quality drinking water, such as the provision of water tanks, inadequate water points, alternative water sources and water storage practices;
- Sanitation facilities, such as limited toilet facilities, open-defecation practices, vandalism and theft of toilet facilities;
- Hygiene and handwashing practices, such as inadequate personal cleanliness and poor handwashing practices;
- WASH conditions that could be improved, such as provision of adequate and quality drinking water, provision of sufficient sanitary facilities, combating open defecation and urination, improving community knowledge of the care of communal toilets, promoting handwashing, personal hygiene and cleanliness, and strengthening of existing municipal services and infrastructure.

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9.2.3 Development, implementation and evaluation of a WASH intervention

In Phase 3 the development, implementation and evaluation of a pilot WASH intervention were conducted and described in Chapter 7. The first objective of Phase 3 was to pilot the Community WASH action plan (COMWAP). The COMWAP was a pilot WASH intervention that consisted of a two-day community training workshop, which educated and equipped the participating community members with information on how to address the poor WASH conditions in the Havana informal settlement. The two-day community training workshop focussed on community health education and social entrepreneurship of the inhabitants of informal urban settlements.

The key outcomes from the pilot intervention were:

- Community participants learnt to restore and maintain their health by developing a positive attitude towards behavioural change. The community supported on-going interventions of Community Health Education in the Havana informal urban settlement.
- Communities were empowered with knowledge on how to prevent faecal-oral transmission and oral-hand contact after defecation.
- Communities were equipped with the knowledge that entrepreneurial activities added social-economic value to poor communities and contributed to poverty alleviation and employment opportunities. The training participants embraced their role of catalyst-of-change as social entrepreneurs to address the socio-economic challenges of the Havana informal urban settlement.
- Community members who participated in the entrepreneurial module acquired knowledge of how to work for themselves by becoming owners of small-scale businesses. The contents of the module on entrepreneurial opportunities equipped communities with the knowledge of how to create start-up capital, measure performance in profit and achieve a return on investment.
- The waste recycling training contributed to the reduction of waste pollution in the Havana informal urban settlement.

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The second objective of Phase 3 was to evaluate the impact of the COMWAP activities through rapid appraisal. The rapid appraisal provided evidence that WASH interventions could empower community members in informal urban settlements to address poor WASH conditions. The key findings from the rapid appraisal provided three themes, namely the geographic and socio-demographic characteristics of an informal urban settlement, the reflections on previous interventions, such as COMWAP, and proposed future WASH interventions.

9.2.4 Reflection and development of action plan

Phase 4 of the study in Chapter 8 included a collective reflection on the research process and a validation of the research study findings which culminated in the joint development of an action plan to deal with the poor WASH conditions.

The first objective of Phase 4 was to validate the findings generated by the three phases of the study during a feedback session. The feedback session was a validation process that captured the unique perspectives of the community participants concerning the findings of the preceding Phases 1–3. The findings of the feedback session indicated the corrections to previous findings and the need for an improved WASH action plan.

The second objective of Phase 4 was to facilitate a joint action plan by developing WASH guidelines and a training manual for WASH peer educators and health promoters residing in informal urban settlements. This phase yielded action plans that comprised the development of tailor-made WASH guidelines and a training manual for WASH peer educators and health promoters residing in the Havana informal urban settlement. The WASH guidelines and training manual focussed on increased WASH knowledge for peer educators and health promoters that would be working towards the improvement of WASH conditions for informal urban settlements.

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9.3 Limitations

There are several limitations to the study. The study was restricted to the Havana informal urban settlement of Windhoek and therefore might not be able to be generalised or transferred to other sites or settings. The language barrier was an issue since communication between the research team and respondents became difficult in situations where some research team members could not understand some of the local indigenous languages. The data collected from a few key stakeholders and informants were limited because of their unavailability and because of time-constraints. The four phases of the research study were a time-consuming process with a labour-intensive approach, which could have compromised the quality and results of the study. The study was conducted as a full participatory action research study and was limited by human and financial resources.

9.4 Recommendations

The major recommendations that emerged from the study are discussed and applied to the experiences of living in an informal urban settlement, where there is a provision of quality drinking water and water services, sanitation infrastructure and services, community practices related to hygiene and handwashing, environmental health services and education, and a COMWAP. Recommendations based on community views will be submitted to the relevant authorities and Namibian governments.

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9.4.1 The experiences of living in an informal urban settlement

The recommendations concerning the living environment and conditions of an informal urban settlement, namely overcrowding, extreme poverty and unemployment, insufficient housing, inadequate municipal services, uninhabitable habitat and hostile geographic locations, insecure land tenure and corrupt leadership are as follows:

- The creation of entrepreneurial opportunities for income generation and job creation for unemployed community members;
- The provision of increased informal markets by the City of Windhoek in all informal urban settlements for the inhabitants to conduct their entrepreneurial activities;
- Periodic meetings that are open and transparent on issues related to socio-economic, health and political factors to be conducted by local councillors with the inhabitants of informal urban settlements;

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- The rights to legally occupy land with secure tenure and land rights to avoid eviction to be granted to the community in the informal settlements by the Windhoek municipality;
- Housing supply shortages to be addressed by the City of Windhoek by providing quality and affordable housing;
- Official recognition of the informal urban settlements by the City of Windhoek and the granting of individual legal status and inclusion in formal population censuses;
- The provision of basic and infrastructural services such as proper roads, streetlights, and sewerage systems, refuse-removal services and land servicing by the City of Windhoek.

9.4.2 Provision of quality drinking water and water services

The following recommendations are presented regarding the provision of water services which include the adequate supply of water to poorer communities, provision of quality drinking water, safe water storage by households, sufficient water supply to poorer communities, maintenance of water-taps, equitable water points, improved behavioural practices of water storage and the costs of subsidised water:

- The City of Windhoek has to explore alternative and equitable water supply service-delivery options for informal urban settlements;
- The Ministry of Health and Social Services in partnership with the City of Windhoek must provide water containers to poor communities, in the absence of effective containment and treatment of drinking water by households;
- The water tanks that are currently provided by the government should be refilled more frequently to ease the burden of distance and cost incurred by informal urban settlements;
- Increased awareness campaigns should be conducted with households about safe water collection and water-storage;
- The city of Windhoek in partnership with communities must introduce the selling of drinking water by vendors residing in informal urban settlements to encourage social entrepreneurship among poorer communities;
- The review and standardisation of water tariffs and charging mechanisms for informal urban settlements must be revisited to ensure equity and value of water services.

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9.4.3 Sanitation infrastructure and services

The following recommendations are presented regarding the sanitation infrastructure and services-such as the provision of communal toilets, provision of waste management services, community action against open-defecation, the unfit state of toilets and facilities, inadequate sewerage systems, vandalism and theft of toilet facilities, the practice of open defecation and public urination and limited knowledge of waste management :

- The knowledge levels of informal urban settlements need to be improved concerning faecal contamination, open defecation and ownership in their residential environment;
- The provision of communal toilets must be increased to ensure the accessibility to sanitation facilities by poorer communities;
- The provision of sanitation facilities must be accompanied by guiding rules and regulations on the management of sanitation facilities;
- Communities must select key trusted community representatives to reinforce good sanitary practices and behaviour with regard to sanitation facilities;
- Communities must maintain the upkeep of public toilets with stricter rules and regulations;
- The City of Windhoek must facilitate the reinforcement of community by-laws on the upkeep and management of communal toilets;
- The City of Windhoek must introduce low-cost toilet models and facilities for households in poor settings;
- The City of Windhoek needs to strive towards a water network and sewerage solution in the Havana informal urban settlement as part of its urban planning and design.

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9.4.4 Community practices related to hygiene and handwashing

The following recommendations are presented regarding community practices related to hygiene and handwashing such as makeshift bathrooms, inadequate personal cleanliness and poor handwashing practices:

- The promotion of good handwashing practices needs to be reinforced with available handwashing facilities provided at all communal toilets;
- The City of Windhoek must expand its handwashing campaign to the rest of the informal urban settlements.

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9.4.5 Environmental health services and education

The following recommendations are presented regarding environmental health services and education such as sub-standard health inspections and limited behavioural-change communication on WASH:

- The environmental health inspectors from the City of Windhoek must conduct regular and consistent health inspections at informal urban settlements, including informal markets and vendors;
- The behavioural-change communication campaigns, billboards and education materials must be presented in local languages to address the illiteracy and the language barriers at informal urban settlements.

9.4.6 Community WASH Action Plan (COMWAP)

The following recommendations are presented regarding COMWAP, such as community health education and social entrepreneurship:

- COMWAP must be introduced to foster community ownership and sustainable WASH interventions in informal urban settlements;
- COMWAP must be all-inclusive by involving all role players such as local governments, urban planners, water and sanitation service providers, community groups, civil society organisations and financiers;
- The proposed WASH peer educators and health promoters' training needs to be implemented as part of the action plan.

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9.4.7 Current WASH policies and strategies

The following recommendations are made regarding current WASH policies and strategies:

- The current Namibian strategies, policies and legal frameworks on Water, Sanitation and Hygiene (WASH) need to be reviewed and updated;
- The government needs to develop a WASH behaviour-change communication strategy for informal urban settlements;
- The government needs to introduce security of tenure policies that support land ownership, affordable municipal rates and taxes for community improvement of informal urban settlements.

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9.5 Conclusion

The purpose of this research study was to develop action plans and strategies that could be used by communities residing in informal urban settlements to address their poor WASH conditions. The action plans and strategies that were developed in the current study were found to be implementable, understandable, clear, simple, applicable and important to informal urban settlements.

The study provides several unique contributions to the field of WASH in poorly resourced settings and informal urban settlements, as listed below:

Firstly, the study provided an improved in-depth understanding of the poor WASH conditions of the Havana informal urban settlement despite challenging interventions of the City of Windhoek to address the lack of sanitary infrastructure and services, inadequate water supply and safe drinking water, and the unhygienic practices of community members. The researcher has developed extensive WASH knowledge through community sharing and active engagement.

Secondly, this is the first structured research study that provided a situation analysis and scoping review of the emerging and occurring WASH themes in poor settings and informal urban settlements. This study underscores the importance of behavioural change as an effective and proven strategy to address poor WASH conditions.

Thirdly, the pilot study was evaluated using a rapid appraisal design to determine the outcome and impact of future WASH interventions. The COMWAP, which was piloted in the Havana informal urban settlement is a unique and resourceful programme to be used for WASH interventions in poor communities.

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Fourthly, the use of a structured and evidence-based framework such as the OSA (Objectives, Strategies and Actions/Activities) framework, underpinned the development of sustainable and strategic action plan(s) to address the poor WASH condition.

In conclusion, healthy and good WASH conditions are a basic human right for all humans, especially those who are residing in informal urban settlements. The researcher believes that the proposed WASH action plan (COMWAP) in this study is a unique and key action to improve citizen participation and accountability. Trained WASH peer educators and health promoters in the informal urban settlements of Namibia could implement the WASH action plan (COMWAP).

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APPENDIX A: PARTICIPANTS' INFORMATION SHEET

UNIVERSITY OF THE WESTERN CAPE
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-9592274 Fax: 27 21-959 2271
E-mail: m.mulondo@ium.edu.na

Title of Research Project: Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia

What is this study about?

I am Michael Mulondo, registered for a PhD degree in Public Health at the University of the Western Cape with Prof. Van Wyk as my supervisor. I am inviting you to participate in this research project because you are directly involved in the Havana informal settlement of Windhoek which is affected by poor Water, Sanitation and Hygiene (WASH) conditions. The purpose of this research project is to develop strategies to address the poor water, sanitation and hygiene (WASH) conditions among the Havana informal urban settlement community of Windhoek, Namibia.

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WESTERN CAPE

What will I be asked to do if I agree to participate?

You will be asked to participate in an interview/focus group discussion that will last between 30–60 min. Written consent for the interview/focus group discussion is needed. All information and data will be securely stored for the duration of the study, with restricted access to the researchers only. After 5 (five) years all the results of the project will be destroyed.

Would my participation in this study be kept confidential?

The researchers undertake to keep your personal information confidential. To help protect your confidentiality, all names of participants will be anonymised and job designations and organisational affiliations will be concealed when presenting results. If we write a report or

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article about this research project, your identity will be protected to the maximum extent possible.

What are the risks of this research?

There may be some risks from participating in this research study. You may find yourself to be uncomfortable/embarrassed or tired. However your participation in this research is completely voluntary and you may stop participating at any time. Counsellors will be available for support, if necessary. We will provide details of counsellors for referral.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the researcher to learn more about the poor water, sanitation and hygiene (WASH) conditions in the Havana informal urban settlement community of Windhoek. We hope that, in the future, other health researchers might benefit from this study through improved understanding of the poor water, sanitation and hygiene (WASH) conditions.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalised or lose any benefits to which you otherwise qualify.

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WESTERN CAPE

What if I have questions?

This research is being conducted by Michael A. Mulondo, registered at the University of the Western Cape. If you have any questions about the research study itself, please contact:

PhD candidate: Michael A. Mulondo
International University of Management, Dorado Campus
Tunana Building, 11-14 Hercules Street, Dorado Park extension 1
Windhoek
Namibia
Cell Phone: +264 81 248 3272
Email: m.mulondo@ium.edu.na / michaelinnamibia@gmail.com

http://etd.uwc.ac.za/

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

School of Public Health

Prof Brian Van Wyk

Tel.: 021-9692173

Email:- bvanwyk@uwc.ac.za

Dean of the Faculty of Community and Health Sciences:

Prof Anthea Rhoda

University of the Western Cape

Private Bag X17

Bellville 7535 chs-deansoffice@uwc.ac.za

This research has been approved by the University of the Western Cape's Biomedical Research Ethics Committee.

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APPENDIX B: INFORMED CONSENT

UNIVERSITY OF THE WESTERN CAPE
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-9592274 Fax: 27 21-959 2271
E-mail: m.mulondo@ium.edu.na

CONSENT FORM

Title of Research Project: Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia

The study has been described to me in language that I understand. My questions about the study have been answered.

I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone.

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WESTERN CAPE

I understand that the study will involve voice recordings of data and field notes.

I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

Participant's name……..

Participant's signature…….

Date……

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APPENDIX C: PERMISSION LETTERS: MINISTRY OF HEALTH AND SOCIAL SERVICES

REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198 Ministerial Building Tel: 061 – 2032150
Windhoek Harvey Street Fax: 061 – 222558
Namibia Windhoek Email: shimenghipangelwa71@gmail.com

OFFICE OF THE PERMANENT SECRETARY

Ref: 18/3/3 MM
Enquiries: Mr. J. Nghipangelwa

Date 9 January 2018

Mr. Michael Mulondo
University of the Western Cape
South Africa

Dear Mr. Mulondo

RE: Participatory Action Research Approach to address the poor water sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**

3.1 The data to be collected must only be used for academic purposes;
3.2 No other data should be collected other than the data stated in the proposal;
3.3 Stipulated ethical considerations in the protocol related to the protection of Human Subjects' should be observed and adhered to, any violation thereof will lead to termination of the study at any stage;
3.4 A quarterly report to be submitted to the Ministry's Research Unit;
3.5 Preliminary findings to be submitted upon completion of the study;
3.6 Final report to be submitted upon completion of the study;
3.7 Separate permission should be sought from the Ministry of Health and Social Services for the publication of the findings.

Yours sincerely,

Dr. D. Uirab
Acting Permanent Secretary

"Your Health Our Concern"

UNIVERSITY of the WESTERN CAPE

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APPENDIX D: PERMISSION LETTERS: KHOMAS REGIONAL COUNCIL

KHOMAS REGIONAL COUNCIL

Tel No: +264 61 247920/983
Fax No: +264 61 247987
E-mail:
gnamagumbo@khomasrc.gov.na
Address: Outapi Street no: 670
Havana. Katutura

MOSES GAROEB CONSTITUENCY

Khomas Regional Council
P.O. Box 3379
Windhoek

Our Ref: .....
Your Ref: .....
Enquiries: ***Mr. G. Namagumbo-0813037669***

Date: 08 December 2017

SUBJECT: PERMISSION FOR THE RESEARCH

In reference to the above subject matter, I am pleased to inform you that Mr. Michael Mulondo a student from University of the Western Cape and his other groups of student, Mr. Wilson Mwandingi, Ms. Albertina Shaanika and Ms Hendrina Martin have granted a permission to conduct the research in Havana within Moses Garoeb Constituency.

I am confident in granting a permission to conduct the survey and I am convinced that they will make a valuable contribution to the disadvantaged local communities by assisting them after this research.

The topic is Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal settlement in Windhoek, Namibia.

Research is scheduled to take place from 08th December 2017 till 15th of December 2017

Thus, the Community humbly requested to co-operate in giving information where it is required.

I trust all above are in order

MOSES GAROEB CONSTITUENCY
KHOMAS REGION
2017 -12- 08
P.O. BOX 3379
WINDHOEK

Yours in Development

Hon/Martin David-Regional Councilor

UNIVERSITY of the WESTERN CAPE

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APPENDIX E: PERMISSION LETTERS: CITY OF WINDHOEK

Department of Human Capital
& Corporate Services
✉ 59
Corner of 5378 Independence Avenue and Garten Street
WINDHOEK, NAMIBIA
Tel: (+264) 61 290 2911 • Fax: (+264) 61 290 3212 • www.cityofwindhoek.org.na

ENQ: Ms CN Lilungwe
DATE: 09 February 2018

PHONE: 09 264 61 290 2356
FAX: 09 264 61 290 3212
EMAIL: cnl@windhoekcc.org.na

RE: PERMISSION TO CONDUCT RESEARCH TITTLED "PARTICIPATORY ACTION RESEARCH APPROACH TO ADDRESS THE POOR WATER, SANITATION AND HYGIENE CONDITIONS IN AN INFORMAL URBAN SETTLEMENT IN WINDHOEK, NAMIBIA" – MICHAEL MULONDO (STUDENT NUMBER: 3568794)

This letter serves as confirmation that Mr. Mulondo, a PhD student doing a Doctoral Thesis through the University of Western Cape, has been granted permission to conduct his research on the above subject within the City of Windhoek.

Respondents to the study are therefore requested to render the student their cooperation and assistance. Should there be any queries, please feel free to contact the Human Resources Development Division on the above contact details

Yours Sincerely

MA Nikanor
Manager: Organisational & Human Resources Development

CITY OF WINDHOEK
HUMAN RESOURCES
DEVELOPMENT
2018 -02- 09
NAME: CN LILUNGWE
SIGNATURE:

UNIVERSITY of the
WESTERN CAPE

All official correspondence must be addressed to the Chief Executive Officer

http://etd.uwc.ac.za/

APPENDIX F: PERMISSION LETTERS: UNIVERSITY OF WESTERN CAPE

UNIVERSITY of the WESTERN CAPE

OFFICE OF THE DIRECTOR: RESEARCH
RESEARCH AND INNOVATION DIVISION

Private Bag X17, Bellville 7535
South Africa
T: +27 21 959 2988/2948
F: +27 21 959 3170
E: research-ethics@uwc.ac.za
www.uwc.ac.za

13 October 2017

Mr MA Mulondo
School of Public Health
Faculty of Community and Health Sciences

Ethics Reference Number: BM17/8/3

Project Title: Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia.

Approval Period: 11 October 2017 – 11 October 2018

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The permission from the Namibian Health Department must be submitted for record-keeping

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

PROVISIONAL REC NUMBER -130416-050

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APPENDIX G: INTERVIEW SCHEDULE SAMPLE

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274 Fax: 27 21-959 2271

E-mail: m.mulondo@ium.edu.na

Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia SEMI-STRUCTURED INTERVIEW SCHEDULE

(COMMUNITY MEMBERS)

Interview code:

No	Gender & Age	Employment status	Contact number
1			
2			
3			
4			
5			
6			
7			
8			

UNIVERSITY of the WESTERN CAPE

What are the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? Please elaborate.

Do you experience any health-related problems due to the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? If so, give detailed examples.

What are the possible solutions (interventions), in your own opinion that will address the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? Please explain or give more recommendations.

The pilot (TESTING) and evaluation of the selected/Identified WASH interventions is an important phase of the research study. What need to be considered as priorities? How will this phase benefit the communities in the informal urban settlement? Please give reasons for your answer(s).

Who needs to be involved in the intervention phase and the action plan in order to address the poor Water, Sanitation and Hygiene Conditions? Please give reasons for your answer(s)

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APPENDIX H: TRANSCRIPT VERBATIM SAMPLE

University of Western Cape
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-9592274 Fax: 27 21-959 2271
E-mail: m.mulondo@ium.edu.na

COMMUNITY INTERVIEWS

Key:

1. **R:** Researcher
2. **P:** Participants
3. **Date of Interviews:** 8 December 2017 – 23 March 2018
4. **Place:** Havana Informal urban settlements households,
5. **Number of participants :** 058

QUESTIONS (Interview Schedule):

1. What are the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? Please elaborate.
2. Do you experience any health-related problems due to the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? If so, give detailed examples.
3. What are the possible solutions (interventions), in your own opinion that will address the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? Please explain or give more recommendations.
4. The pilot (TESTING) and evaluation of the selected/Identified WASH interventions is an important phase of the research study. What need to be considered as priorities? How will this phase benefit the communities in the informal urban settlement? Please give reasons for your answer(s).
5. Who needs to be involved in the intervention phase and the action plan in order to address the poor Water, Sanitation and Hygiene Conditions? Please give reasons for your answer(s)

Date: 8 December 2017
Place: Havana Informal urban settlements households, Zambia Street
Participant number: 01

SPEAKER	DIALOGUE	COMMENTS
R	*I'm very grateful that you're prepared to take part in this interview. I'm giving you the assurance of confidentiality and anonymity that nobody will be able to disclose the information on this audio recording. As soon as the interview has been transcribed and written up, it will be kept in a safe place. Please tell me about yourself and your experiences in the informal settlements?*	
P	Not much just that I Stay here for 3 years	
R	*What are the poor Water, Sanitation and Hygiene conditions in your informal urban settlement?*	
P	Poor water conditions could be water from a dirty environment. This could be people not taking acre of the environment where they get their water from. This is dirty water that cannot be used for cooking and drinking. The residents of Zambia Street in Havana informal settlement use tap water. They have a public tap that is used by the entire community. The tap water is always not available, hence there is no water at the tap sometimes. The residents keep water in covered containers with the aim to prevent water from being contaminated. Adults and children uses separate cups for drinking water.	
R	*Please elaborate*	
P	Members of this household make use of the public toilet, the toilet can be flushed. The toilet is nearby this household and there is a tap next to it. There is no sink for washing hands in the toilet, there is no soap for hands washing nor do they have toilet papers. Each person who have to use the toilet, has to take along his/her toilet paper. Most of the times they use newspapers after defecation. Children do not use the same toilets as adults. Children urinate and defecate outside and after the child has defecate outside, adults sometimes remove the waste and throw at the nearby dumpsite. Approximately 10 households make use of this toilet and the toilet is not locked and it can be used by anyone from anywhere at any time.	
R	*Tell me about your hygienic conditions*	
P	Hygiene is about cleanness of the body and the environment. Poor hygiene conditions involve not taking care of yourself and your environment. When to wash hands. wash hands before and after eating, before food preparation as well as after using the toilet. **Example of unhygienic practices include: handling food with an** open wound on the hands, pouring dirty water near the tap or within the house surrounding as well as eating without washing hands. During food preparation: wash food if necessary, wash	
R	*Do you experience any health-related problems due to the poor Water, Sanitation and Hygiene conditions in your informal urban settlement?*	
P	I haven't experienced any health problem. Health related problems involves getting sick after drinking contaminated water and also developing skin rashes after bathing with contaminated water.	
R	*Give detailed examples*	
P	none	
R	*What are the possible solutions (interventions), in your own opinion that will address the poor Water, Sanitation and Hygiene conditions in your informal urban settlement?*	
P	We want more taps. We also want toilets for each household	
R	*Please explain or give more recommendations.*	
P	Our councillor must come and visit us to see our problems	
R	*What interventions need to be considered as priorities?*	
P	Toilets first because it is not good to share a toilet with the entire community, yet again nobody wants to clean the toilet.	
R	*How will this interventions benefit the communities in the informal urban settlement*	
P	Very much. We will be healthy	
R	*Please give reasons for your answer(s)*	
P	Nothing more	
R	*Who needs to be involved in the intervention phase and the action plan in order to address the poor Water, Sanitation and Hygiene Conditions?*	
P	The constituency councillor because it is his community and then the Windhoek municipal because it is his city.	
R	*Please give reasons for your answer(s)*	
P	nothing	
R	*Is there anything else you want to add or say or ask?*	
P	The municipality must come here to see our problems	
R	*Thank you for your time and willingness to share..*	

University of Western Cape
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-9592274 Fax: 27 21-959 2271
E-mail: m.mulondo@ium.edu.na

STAKEHOLDERS INTERVIEWS

Key:

1. **R:** Researcher
2. **P:** Participants
3. **Date of Interviews:** 06 February – 28 June 2018
4. **Place:** Havana Informal urban settlements households,
5. **Number of participants :** 06

QUESTIONS (Interview Schedule):

1. What are the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? Please elaborate.
2. Do you experience any health-related problems due to the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? If so, give detailed examples.
3. What are the possible solutions (interventions), in your own opinion that will address the poor Water, Sanitation and Hygiene conditions in your informal urban settlement? Please explain or give more recommendations.
4. The pilot (TESTING) and evaluation of the selected/Identified WASH interventions is an important phase of the research study. What need to be considered as priorities? How will this phase benefit the communities in the informal urban settlement? Please give reasons for your answer(s).
5. Who needs to be involved in the intervention phase and the action plan in order to address the poor Water, Sanitation and Hygiene Conditions? Please give reasons for your answer(s)

Date: 6 February 2018
Place: Ministry of Health and Social Services
Participant number: 01

SPEAKER	DIALOGUE	COMMENTS
R	*I'm very grateful that you're prepared to take part in this interview. I'm giving you the assurance of confidentiality and anonymity that nobody will be able to disclose the information on this audio recording. As soon as the interview has been transcribed and written up, it will be kept in a safe place. Please tell me about yourself?*	
P	My name is Dr Liliane Kahuika from Ministry of Health and Social Services. The Medical Epidemiologist based in Windhoek.	
R	*What are the poor Water, Sanitation and Hygiene conditions in your informal urban settlement?*	
P	The Ministry of Health and Social Services is responsible for all epidemiological surveillance especially the outbreaks of Hepatitis E that is link to poor sanitation and hygienic practices. Unfortunately, the surveillance unit within the Ministry of Health and Social is not fully capitated that affects early detections and timely cases of WASH-related outbreaks. Since 1 February 2018, 619 cases have been reported with 2 miscarriages and 3 deaths. The City of Windhoek in partnership of the Ministry of Health and Social services took food samples from street vendors at informal settlement to determine the sources of the hepatitis E outbreaks. The affected areas are located within the Havana and Goreangab informal settlements. Samples were taken in the affected area to confirm the hepatitis cases and the causes of the outbreak. Preliminary results proof that the water-storage containers were contaminates with the contamination of 55% point-of-use. Communities need to receive education and awareness on ongoing cleaning of water-storage containers. These water-storage containers refers to home-made water tanks, drums and plastic bottles. The communities of the Havana and Goreangab informal settlements are using open water-sources such as the Goreangab dam and other greywater and sewerage water sources. The Ministry of Health and Social Services teamed up with UNICEF, WHO, City of Windhoek, NAMWATER, Redcross society, Ministry of Agriculture, Water affairs and rural development to address the outbreak of Hepatitis E and WASH related outbreaks such as cholera. The Ministry of Health and Social service through their epidemiology surveillance teams discovered that communities of the Havana and Goreangab informal settlements do not have good hand washing practices and facilities.	
R	*Please elaborate*	
P	The new cases of Hepatitis E is on the increase and the Health authorities are concern that more environmental health problems might arise.	
R	*Tell me about other WASH conditions or problems*	
P	The Ministry of Health and Social Services have also discovered that approximate 60% of 250 households in Havana and Goreangab informal settlements are practicing open defection due to poor and lack of sanitary facilities. Many community members put their faeces in plastic bags ("flying toilets") due to lack of toilet facilities that discard in open places that are exposed to children placing them at risk for endemic diseases such as cholera and hepatitis E. It is estimated that 40% of Windhoek residents are residing within informal settlements that is evident of poor WASH conditions which is a breeding ground of endemic diseases	
R	*Do you experience any health related problems due to the poor Water, Sanitation and Hygiene conditions in your informal urban settlement?*	
P	Hepatitis E that is link to poor sanitation and hygienic practices	
R	*Explain*	
P	The health problems became serious since the outbreak of Hepatitis E within the informal settlements in Windhoek	
R	*What are the possible solutions (interventions), in your own opinion that will address the poor Water, Sanitation and Hygiene conditions in your informal urban settlement?*	
P	The interventions are already taken place such as: The Ministry in partnership with UNICEF, WHO, City of Windhoek, NAMWATER, Namibia Red Cross society, Ministry of Agriculture, Water affairs and rural development embarked on WASH interventions and strategies during December 2017 through the establishment of National Health Emergency Committees (NHEC). The Terms of references of the NHEC comprised of WASH-related surveillance, social mobilization (IEC), laboratory services, case management and infectious control.	
R	*Please explain or give more recommendations*	
P	The exploration of long term and sustainable solution and interventions	
R	*What interventions need to be considered as priorities?*	
P	The following long-term WASH solutions is proposed: - Community ownership and initiative to address poor WASH conditions within informal settlements - Long-term awareness raising and WASH education among informal settlements - Working towards sustainable solutions that will address poor WASH conditions.	
R	*How will the interventions benefit the communities in the informal urban settlement*	
P	It will not just benefit the informal settlements but the whole City of Windhoek, and the rest of the country where the outbreaks of hepatitis E is evident.	
R	*Please give reasons for your answer(s)*	
P		
R	*Who needs to be involved in the intervention phase and the action plan in order to address the poor Water, Sanitation and Hygiene Conditions?*	
P	The Ministry of Health in partnership with UNICEF, WHO, City of Windhoek, NAMWATER, Namibia Red Cross society, Ministry of Agriculture, Water affairs and rural development, and the communities residing in informal urban settlements	
R	*Please give reasons for your answer(s)*	
P	NONE	
R	*Is there anything else you want to add or say or ask?*	
P	Nothing	
R	*Thank you for your time and willingness to share.*	

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APPENDIX I: SITUATION UPDATE: HEPATITIS E

Republic of Namibia
Ministry of Health and Social Services

OUTBREAK OF Hepatitis E in Windhoek
Situation Report (SITREP No 37) , 05/08/2018

Situation Update epidemiological week 31

Highlights:

- As of the 05th August 2018, a cumulative total of **2102** cases were reported and classified as follows: **122** Lab confirmed, one **(1)** Equivocal, **1868** suspected/probable/Epi linked, **42** discarded and **69** cases has pending results
- A total number of **93** patients were reported during epidemiological week 31 (30 July-05 August 2018) compared to the previous weeks when fewer cases were seen. During epidemiological week 30 (23-29 July 2018) a total of **89** cases were reported compared to **77** recorded during week 29 (16-22 July 2018).This is a clear indication that cases are on the increase.
- Of the cumulative total of **2060** cases (suspected/epilinked and confirmed), Havana and Goreangab informal settlement remain the most affected with **1121 (54.42%)** and **476 (23.12%)** of the total reported cases, respectively. Other residential areas such as Hakahana, Okuryangava, Ombili, Greenwell Matongo and Otjomuise have reported a combined total of **268 (13.01%)**, ranging between **22-76 cases**. The remaining **208(10.09%)** are from other informal settlements within Windhoek.
- A total of **18 deaths** have been reported thus far of which **8** are maternal deaths, **2** non-pregnant female and **8** males.
- The most affected age groups are those aged 25-34 years **974 (47.28 %)** followed by 35-44 years **542 (26.31%)** years; and **327 (15.87%)** among adolescents and young adults (16-24 years). The least cases **83 (4.03%)** were reported among children under the age of 15 years. Most of the patients affected are males **1256 (60.97%)** compared to females **846 (41.07%)**.

Table 1: Cases seen in Windhoek district, Sept 2017 – 05th /08/2018 & during week 31

No	Summary of cases	Cum total Sept '17 to 5th August '18	Total seen during this week (week 30)
1	New cases seen:	2102	93
2	Laboratory Confirmed cases	122	
3	Number of Maternal cases reported to date (Pregnant, Postpartum)	110	
4	Total number of cases admitted		7 on admission
5	Number of pregnant /maternal cases admitted		5
6	Date last confirmed case admitted	21/06/2018	0
7	Lab Pending results	69	7
8	Cum total deaths-suspect&confirmed	18 (8 maternal)	1

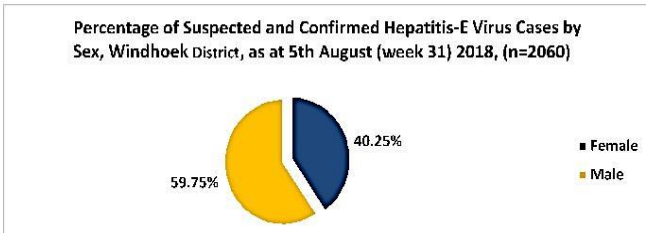

Figure 3: Proportion of Hepatitis E Virus cases by sex in Windhoek district, September 2017 – 5th August 2018

The above chart illustrates that males are more affected by Hepatitis E virus 1256(59.75%) compared to females 846 (40.25%).

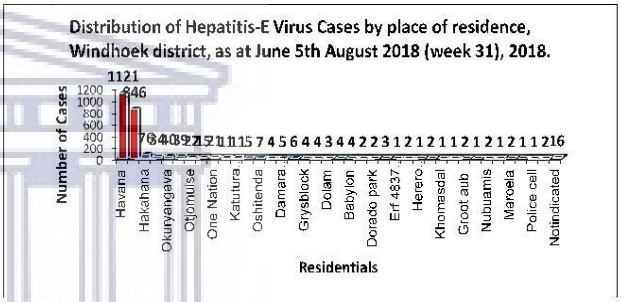

Figure 4: Distribution of Hepatitis E Virus cases by place of residence Windhoek district, September 2017 – 5th August 2018

- The above graph (figure 4) shows that majority of cases are reported from Havana and Goreangab informal settlement remain the most affected with **1121 (54.42%)** and **476 (23.12%)** of the total reported cases, respectively. Other residential areas such as Hakahana, Okuryangava, Ombili, Greenwell Matongo and Otjomuise have reported a combined total of of **268 (13.01%)**, ranging between 22-79 cases respectively

Generally other locations mainly in Katutura continue to report few sporadic cases ranging from 1-5 cases weekly suggestive of possible ongoing active transmission in the area.

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APPENDIX J: RAPID APPRAISAL QUESTIONNAIRE

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E-mail: m.mulondo@ium.edu.na

RAPID APPRAISAL EVALUATION QUESTIONNAIRE

Key:

1. **R:** Researcher
2. **P:** Participants
3. **Date of Interviews:** January – 8 February 2019
4. **Place:** Havana Informal urban settlements households,
5. **Number of participants:** 45

EVALUATION QUESTIONNAIRE:

1. Describe the informal urban settlement community profile
2. Describe the Rapid appraisal process as implemented in the informal urban settlement community
3. Assess the informal urban settlement community's progress in increasing its planning capacity
4. Describe the WASH interventions carried out in the informal urban settlement community as a result of the Community WASH Action Plan(COMWAP) Pilot-test
5. Assess the impact of each Community WASH Action Plan(COMWAP) intervention on the individual, household, and informal urban settlement community
6. Make recommendations for future improvements to WASH activities such as COMWAP in the informal urban settlement community or others where similar activities may be carried out

Date:
Place:
Participant number:

SPEAKER	DIALOGUE	COMMENTS
R	*I'm very grateful that you're prepared to take part in this rapid appraisal. I'm giving you the assurance of confidentiality and anonymity that nobody will be able to disclose the information of this rapid appraisal.*	
R	*How will you describe the informal urban settlement community profile? What about Havana informal urban settlement?*	
P		
R	*Please elaborate*	
P		
R	*What is the informal urban settlement community's progress in increasing its planning capacity to implement WASH interventions? Explain?*	
P		
R	*What WASH interventions are carried out in the informal urban settlement community as part of the Community WASH Action Plan (COMWAP)?*	
P	1. Community health education • Basic Knowledge on WASH • Basic Knowledge on Hepatitis E 2. Introduction to Social (public health) Entrepreneurship in the context WASH • Recycling of Waste Materials • Other income-generation projects	
R	*How was the WASH interventions carried out in the informal urban settlement community as a result of the Community WASH Action Plan (COMWAP)?*	
P		
R	*What were the impact of each WASH intervention (Community WASH Action Plan (COMWAP) on the Individual?*	
P		
R	*Please give reasons for your answer(s)*	
P		
R	*What were the impact of each WASH intervention (Community WASH Action Plan-COMWAP) on the Household?*	
P		
R	*Please give reasons for your answer(s)*	
P		
R	*What were the impact of each WASH intervention (Community WASH Action Plan-COMWAP) on the Informal urban settlement community?*	
P		
R	*Please give reasons for your answer(s)*	
P		
R	*What recommendations can be given for future improvements to WASH activities in the informal urban settlement community or similar activities such as Community-Led Total Sanitation (CLTS) approach that might be carried out?*	
P		
R	*How can the WASH interventions for future improvements be implemented?*	
P		
R	*What are the costs of the COMWAP interventions? Is it sustainable?*	
P		
R	*Who will bear the costs ?*	
P		

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APPENDIX K: Typed-up field notes sample

TYPED-UP FIELD NOTES SAMPLE

Date:
13 October 2018
Site:
Max Mutongolume community hall, Havana informal urban settlements
Activity:
Community meeting
Participants:
Community members, community leaders, stakeholders

Length of Observation/Meeting:
3 hours

Summary
Engaging the community for a robust research enquiry process aiming towards improved health outcomes. The Havana informal urban settlements that provided insightful and unique information on the community WASH perspectives and experiences.

Narrative (Observation)
All participants actively participated in group work, discussions and presentations. The free-flow of information sharing and comments were voluntary with no cohesion.

Questions/Things to follow up with

Other Activities

Photos and Audio recordings
(Include an index of all of the photos or audio recordings.)

Other Notes

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APPENDIX K: Training manual structure

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Training manual structure

WASH peer educators and health promoters

Prepared By: Michael Mulondo
Prepared For: WASH peer educators and health promoters residing in the Havana informal urban settlement
Date: 2020

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About the Manual

The capacity building and training of WASH peer educators and health promoters residing in the informal urban settlements are key components for national development and poverty reduction, especially in Namibia. The training manual provides informal urban settlements with knowledge capacity on WASH and health promotions, which will develop peer education skills and improved performance ability

Manual Layout and Structure

SECTION A: ***Introduction to Water, Sanitation & Hygiene (WASH)***

1. WASH Concepts:

1.1 The basic meanings of Water, Sanitation and Hygiene (WASH) concepts to improve the community's knowledge, skills and levels of the understanding of WASH.

1.2 Community engagement in WASH processes.

2. WASH and Health:

2.1 The links between WASH and poor health conditions,

2.2 Healthy living in informal urban settlements

2.3 WASH-related diseases.

3. WASH practices:

3.1 The critical WASH practices and behaviours that can help improve the health and wellbeing of communities.

3.2 The tools and techniques for changing hygiene and sanitation behaviour at the individual, household and community levels.

3.3 Good WASH practices that promote the prevention of open defecation, handwashing, decent excreta disposal, safe water containment and storage

SECTION B: ***Waste Recycling Management & WASH***

1. The impact of the Waste and Waste Recycle Management in informal urban settlements:

1.1 The principles of Waste Recycle Management: a meaningful and strong social contract between the City of Windhoek, relevant stakeholders and the Havana informal urban settlement community.

1.2 Waste recycle management and poor WASH conditions in informal urban settlements.

1.3 The impact of waste: a basic problem of low livelihood opportunities, lack of facilities and services such as insufficient water, inadequate sanitation and poor hygiene.

2. Waste and Community health:

2.1 Waste in informal urban settlements: Waste is associated with littering of waste in open spaces and public places. The waste is a result of inadequate waste-collection and illegal dumping (littering) that result in potential disease vectors and disease outbreaks.

2.2 Community health concerning waste

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3. Waste Management: Disposal, Collection and Controlling of Waste:

3.1 The core focus of waste management: Waste management focusses on the minimisation of waste throughout the initial stage of waste disposal, collection and control. The traditional end-of-pipe clean up by the City of Windhoek must be complemented by informal urban settlements through community initiatives of waste management.

3.2 Smart Partnership in Waste management: The shared responsibility or partnership between the City of Windhoek and the informal urban settlement communities will increase the level of recycling and thus decrease the level of waste impact.

4. Informal waste collectors:

4.1 Waste collection/collector as a business and job-creation opportunity: Informal waste collectors are people who obtain their livelihood or means of gaining a living through activities such as picking up and collecting of waste and eventually trading and recycling waste for financial gain.

4.2 The role of waste collectors: The perceived link between a clean living environment and increased livelihood opportunities underscores the important role of informal waste collectors.

5. Waste recycling models and methods:

5.1 Waste recycling as a business and job-creation opportunity: Waste recycling promotes local business ventures

5.1 Recycled materials to re-saleable products for profitable gain. The establishment of local and informal markets in the Havana informal urban settlement.

SECTION C: *WASH Peer Education & Health Promotion*

1. The fundamentals of WASH Peer Education:

1.1 The definition of WASH Peer education: Peer education is a process that involves similar people or community members learning from each other about WASH in an informal way.

1.2 The meaning of peers: Peers are people or community members who are similar to other people according to their background, experiences, interests and values.

2. The role of a peer WASH educator:

2.1 The characteristics of a WASH peer educator: a peer educator is someone who shares similar attributes with his or her peers and is trained to facilitate discussions on issues affecting the community such as poor WASH conditions in informal urban settlements and leads the peers (community members) in examining possible WASH solutions.

2.2 The skills and qualities of a WASH peer educator as a role model and leader, team player and member, a friend and support.

2.3 Peer educators and the community: Conduct face-to-face and small group sessions with community members to discuss traditional beliefs and practices that might prevent households from adopting correct sanitation or hygienic practices. Improved interpersonal communication skills with communities are needed in particular during home visits and small peer group educational meetings.

3. Steps in establishing a WASH-based peer group education programme :

3.1 Sensitise and seek approval from community leaders and gate-keepers

3.2 Involve and collaborate with relevant stakeholders and WASH partners

3.3 Involve the community in defining the criteria for selection of WASH peer educators and peers (participants).

3.4 Conduct regularly meetings with the WASH peer educators to receive feedback and offer support where needed.

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4. WASH and Health Promotion/Promoters:

4.1 Equipping the health promoters with skills and knowledge to use participatory tools and approaches on health, hygiene and sanitation promotion. Health, hygiene and sanitation promotion focusses on the sustainable change in attitude, practices and behaviour among households and communities of informal urban settlements.

4.2 Identify at least five key issues of concern for health, hygiene and sanitation promotion and demonstrate how to plan suitable interventions (Action Plan) to address them within the informal urban settlements. Intervention strategies include community training, health promotion campaigns, social marketing and health messaging through printed and electronic media. Entertainment education is a strategic intervention that includes street theatre, radio dramas, school plays, songs, games and stories to promote sanitation and hygiene messages.

4.3 List ways of identifying and developing target health, hygiene and sanitation promotion messages for informal urban settlements. Messages are developed from the information collected from the informal urban settlement's community.

4.4 List steps in making a Communication Plan for the health, hygiene and sanitation promotion messages. Explore the channels of communication that are currently used in informal urban settlements and identify the preferences of community members in terms of what, who, how, when and where they like to receive information on health, hygiene and sanitation.

SECTION D: ***Social Entrepreneurship & WASH***

1. The concept of Entrepreneurship and Social Entrepreneurship

Social Entrepreneurship is all about recognising the social-economic problems of informal urban settlements in Windhoek and achieving a social change by employing entrepreneurial principles, processes and activities. Social Entrepreneurship focusses on social change through the improvement of the existing poor Water, Sanitation and Hygiene (WASH) conditions in the informal urban settlements. Social Entrepreneurship also focusses on creating social capital without measuring the performance in profit or return in monetary terms. Social Entrepreneurship is a response to complex social and health needs, limited public funding, resulting in the use of business practices and innovation to address the poor Water, Sanitation and Hygiene (WASH) conditions in the poor communities of the informal urban settlements. Local entrepreneurs that are emerging from the Havana informal urban settlement provides goods and services to low-income consumers and poor communities.

2. The Challenges and barriers of Social Entrepreneurs

These social entrepreneurs have barriers and challenges to overcome, such as land tenure, limited capacity, no start-up capital and poor regulatory frameworks. The City of Windhoek has to create incentives for social entrepreneurs in informal urban settlements to develop their businesses and make a profit to contribute to Namibia's National Development Programme.

3. The Links of Social entrepreneurship and WASH

As poor communities of the informal urban settlements are capacitated as social entrepreneurs, the socio-economic challenges in the society will be addressed such as poverty and unemployment. Social Entrepreneurship is the solution for poor individuals and communities to strengthen their capabilities and resilience when facing poor Water, Sanitation and Hygiene (WASH) conditions. The social entrepreneurs use entrepreneurial behaviour, business practices and the informal

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market as tools to meet explicit social goals, such as serving the general interest and common good for the benefit of the Havana informal urban settlement.

SECTION E: ***WASH Programming (Steps of Execution)***

1. Outlining and assessing WASH conditions:

1.1 To identify the existing WASH situation in terms of the water, sanitation and hygiene needs of the informal urban settlements.

1.2 The various available tools for use in WASH assessments and most appropriate investigations of the current WASH conditions and context. The available assessment tools are Participatory Rural Appraisal, Participatory Action Research, Knowledge Attitude and Practice Survey.

1.3 Techniques and methods to detect and determine poor WASH conditions.

2. Planning and preparation for a WASH intervention:

2.1 The process of combining the findings of the WASH assessment.

2.2 Draft WASH objectives and determine available resources for the most suitable WASH intervention.

2.3 Finalise the type of intervention, the location of the intervention, the objective and aims of the intervention, the activities and output of the intervention,

2.4 Determine the expected outcome and results of the WASH intervention.

3. Implementing WASH intervention:

3.1 The process of executing the WASH project logical framework and plan of action.

3.2 The implementation of COMWAP action plan.

4. Monitoring and evaluation of WASH intervention:

4.1 Monitoring: The regular monitoring of the WASH interventions and activities are in line with the WASH project logical framework and plan of action. The monitoring procedures are participative and include the informal urban settlements and relevant stakeholders, which comprise the gathering of information and analysing the effects on the WASH intervention.

4.2 Evaluation: The evaluation of the WASH intervention identifies what impact the interventions have had on the informal urban settlements. The evaluation determines what has changed as a result of WASH implementation compared to what the WASH conditions were in the absence of any WASH interventions.

4.3 Monitoring and Evaluation tools and techniques

5. Sustainability of WASH Intervention:

5.1 Resources: The WASH interventions require an ongoing source of funding for implementation and maintenance.

5.2 Sustainability strategy and plan: A sustainability strategy is important and needs to be prepared during the planning phase of the intervention

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APPENDIX L: LETTER OF PROOFREADING AND EDITORIAL SERVICES

DECLARATION

DR CA ROBERTSON

MA (Critical Linguistics *cum laude*). DPhil (Curriculum Studies) (Stellenbosch)

LANGUAGE PRACTITIONER: WRITING, PROOFREADING AND EDITING SERVICES

Research Associate: Stellenbosch University
Journal Administrator: JOVACET[1]
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Date: 16 July 2020

Editing of PhD dissertation for Michael Mulondo

I confirm that I have edited the following document submitted by Michael Mulondo in fulfilment of the requirements for the degree of Doctor of Public Health, School of Public Health in the Faculty of Community and Health Sciences at the University of the Western Cape, South Africa.

Research title	*Participatory action research approach to address the poor water, sanitation and hygiene conditions in an informal urban settlement in Windhoek, Namibia*
Document type	PhD thesis
Editing services	Editing of chapters 1 – 9: correcting spelling and grammar mistakes; editing for consistency, style and flow; inclusion and accuracy of references, cross-referencing and citations.

The edited document was emailed to Michael Mulondo on 16 July 2020 with all the changes marked up using MSWord's Review (Track Changes). Michael Mulondo is responsible for accepting the editor's changes and finalising the references. He is also responsible for the quality and accuracy of the final submission.

Yours faithfully

C A ROBERTSON

[1] Journal of Vocational, Adult and Continuing Education and Training

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