FEASIBILITY OF COLLABORATION BETWEEN WATER, SANITATION AND HYGIENE AND THE NEGLECTED TROPICAL DISEASE CONTROL PROGRAMMES IN RWANDA

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A dissertation submitted to the University of Zambia in partial fulfilment of the requirements of the degree of Masters in Public Health, Health Promotion and Education with Implementation research

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DECLARATION

I, Sharon Mukankaka, hereby declare that this dissertation being presented for the degree of Master of Public Health in Health Promotion and Education with Implementation Research has never been submitted for any degree or examination at any university.

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APPROVAL

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ABSTRACT

Water, Sanitation, and Hygiene (WASH) interventions, in addition to Mass Drug Administration (MDA), are necessary for controlling and eliminating many neglected tropical diseases (NTDs). Collaboration between disease control programmes and stakeholders in WASH is a critical next step as Rwanda has met the WHO treatment targets and is well positioned to be among the first countries in Africa to control intestinal parasites as a public health problem. This study investigated the feasibility of NTD and WASH coordination in order to identify barriers and opportunities of widespread multisectoral collaboration and make recommendations about possible areas of engagement critical to future integrated programmes.

Seventeen key informant interviews were conducted with national ministry stakeholders, donor organizations, United Nations agencies and international NGOs in the NTD and WASH sectors to explore challenges and opportunities in a multi-sectorial collaboration.

Intersectoral collaboration feasibility was assessed in terms of acceptability, practicality, implementation and integration. A multisectoral collaboration approach was highly acceptable at the national level due to stakeholders clear understanding of the linkage between WASH and NTD sectors. Opportunities and possible ideal conditions for collaboration were identified around four general domains: capacity building; research; policy and communication; mapping. The most frequently mentioned barriers characteristics of inner setting and program implementation process included: 1) varied programmes priorities in the two sectors, including organizational objectives and donor driven priorities; 2) Poor coordination structures and lack of information sharing between the two sectors and 3) differences in the scale of funding.

The feasibility of integrated WASH and NTDs has been examined in a number of countries mainly focusing on implementation and integration. There must be increased advocacy for and awareness among policy-makers of development projects that foster successful programme implementation. Opportunities include having established coordination structures at national and district levels. Through expanding and enhancing WASH interventions for NTD control, it could be feasible for both sectors to take an integrated approach to health and development.

Key Words: Neglected Tropical Disease, Water, Sanitation, and Hygiene, Program, Collaboration, Integration

DEDICATION

I dedicate this work to all the people who have at one point in their life shaped me through their encouragement, advice and support. I also dedicate this dissertation to the Rwanda Biomedical Center team. I hope this work will contribute towards better partnerships as well as improved implementation strategies for the elimination of WASH-related NTDs in Rwanda.

ACKNOWLEDGEMENTS

I wish to acknowledge the Special programme for Research and Training in Tropical Diseases (TDR) for providing me with the scholarship to conduct my studies in Implementation Research at the University of Zambia.

I also wish to acknowledge the support of my supervisors, Dr. Hikabasa Halwiindi, Dr. Joseph M Zulu and Dr. Eugene Ruberanziza. These prove to be the best mentors a student can never have, I would have been incapable of developing this work and seen it to fulfilment. I further wish to acknowledge the RBC team, thank you for facilitating the process of data collection. Many thanks to my friend and research assistant Delphine Nikuze for accompanying me to research sites and assisting me with data collection.

Finally, I wish to sincerely thank Patricia Maritim for editing my work and guiding me throughout the whole research write-up process.

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ABBREVIATIONS AND ACRONYMS

CBEHPP	Community-Based Environmental Health Promotion Programme
CFIR	Consolidated Framework for Implementation Research
JICA	Japan International Cooperation Agency
MDA	Mass Drug Administration
MINECOFIN	Ministry of Finance and Economic Planning
MINALOC	Ministry of Local Governance
MINEDUC	Ministry of Education
MININFRA	Ministry of Infrastructure
MIDIMAR	Ministry of Disaster Management and Refugee
MoH	Ministry of Health
NGOs	Non-Governmental Organizations
NTDs	Neglected Tropical Diseases
RBC	Rwanda Biomedical Center
STHs	Soil-transmitted helminths
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASAC	Water and Sanitation Corporation
WASH	Water, Sanitation and Hygiene

CHAPTER 1: INTRODUCTION

1.1. Background Information

Neglected tropical diseases (NTDs) are communicable diseases common in subtropical and tropical countries and they cause significant morbidity and mortality rates (Liese et al., 2010). These infectious diseases cause chronic suffering and disabilities, impede physical and social development, and result in stigmatization of people living in poverty without adequate water and sanitation and in close contact with infectious vectors (Hotez et al., 2006) . These infections disproportionately affect people in extreme poverty in countries at all levels of income but primarily affect impoverished populations in the developing world. Twenty NTDs are prioritized by the World Health Organization (WHO) and they are contrasted with the big three infectious diseases (HIV/AIDS, tuberculosis, and malaria), which generally receive greater treatment and research funding (WHO, 2017).

1.1.1. Prevalence of Common Neglected Tropical Diseases

Approximately, 40% of the global NTD burden is in Africa (Fenwick, 2012). The world's highest prevalent NTDs which include soil-transmitted helminths (STHs), lymphatic filariasis, schistosomiasis, trachoma and onchocerciasis, contributing to 52.1 million disability-adjusted life years annually (Barry et al., 2013). It is estimated that more than one billion people, or one-sixth of the world's population, suffer from one or more NTDs and that all low-income countries are affected by at least five NTDs (Mathers et al., 2007). The most common NTDs worldwide are the STHs with an estimated over 1.75 billion people worldwide (Mascarini-Serra, 2011). Similarly, schistosomiasis also known as bilharzia remains one of the most prevalent NTDs, causing significant morbidity in Sub- Saharan Africa (Leslie et al., 2011).

In Rwanda, 4.4 million people are at risk of infection from NTDs (Rujeni et al., 2017). The country has made progress in fighting against NTDs in recent years, however STHs mostly intestinal worms were found to be highly endemic in the majority of districts, and schistosomiasis was found to be endemic around main water bodies (lakes, large swampy areas, rice fields). A baseline survey revealed that more than 65% of children had intestinal worms with high levels of concurrent multiple parasite infection. Within a year of MDA, the prevalence of STH has declined from 65.8% (2007-8) to 45% (2014), while the prevalence of

schistosomiasis has declined from 2.7% (2007-8) to 1.99% (2014) (Ruberanziza et al., 2010, Staudacher et al., 2014).

1.1.2. NTD Control Programme in Rwanda

The NTD programme was established in June 2007, with support from other partners such as the Schistosome Control Initiative, Geneva Global, the Global Network for NTDs, Colombia University and the Access Project (Ruxin and Negin, 2012). Through the Rwandan Ministry of Health (MoH) with the above partnership, the programme focused on training of laboratory technicians on NTDs diagnosis and training of nurses and physicians on clinical management of NTDs. Furthermore, efforts were made by the MoH and the Access Project to build support for the NTD treatment activities throughout the country, including training community health workers, primary school teachers, as well as distribution of educational materials and mass media campaigns to increase awareness of NTDs.

Since 2008, MDA against intestinal worms for high risk population (children from 1 to 15 years) and against bilharzia (children from 5 to 15 years) have been deployed in endemic areas such as lakes and marshes. Poor sanitation is a major contributor to transmission of STHs and schistosomiasis and causes rapid re-infection among treated children (Molyneux, 2004). This mass treatment campaign is implemented mainly via the Maternal and Child Health's Week organized every 6 months. NTD grant through The Access Project ended in June 2010 while three years of control efforts simply were not enough to significantly reduce the disease burden given the high prevalence of NTDs in Rwanda and the re-infections that normally occur (MoH, 2010).

With the guidance of WHO experts, the MoH through Rwanda Biomedical Centre (RBC) has developed a new NTD strategic plan covering a six-year period July 2012 – June 2017. This plan has been developed in line with the MoH's vision to transform Rwanda into a nation free from preventable diseases and ill health and in line with the country Economic Development and Poverty Reduction Strategy and Vision 2020 (RBC, 2014).

1.1.3. WASH programme and its stakeholders

The WASH sector is a diverse group of stakeholders that includes national governments, international, and local non-government organizations (NGOs). The WASH programme contribute directly to increasing coverage through implementation of WASH interventions in national areas with insufficient access. Rwanda has met millennium development goal targets

for water and sanitation with coverage of improved water supply and sanitation at 85% and 83%, respectively, in 2014 (WHO/UNICEF, 2014).

The Sustainable Development Goals (SDGs), adopted in September 2015 by the United Nations, have sparked a renewed focus on what strategies will be necessary to achieve universal access to safe water and basic sanitation by 2030. To achieve SDGs targets, Rwanda will require US$134 million to build and maintain universal basic coverage and an additional $286 million to build and sustain safely managed services each year up to 2030 (GoR, 2017). Recognizing the key role of water and sanitation in protection of public health and socio-economic development, the Government of Rwanda (GoR) has committed itself to reaching very ambitious targets for water supply, sanitation and hygiene, with the vision to attain 100% service coverage by 2020 (MININFRA, 2013). Since 2008, responsibility for water supply and sanitation in Rwanda has been shared between the Ministry for Infrastructure (MININFRA) and the MoH. MININFRA is responsible for national policies, guidelines and strategies, enhancing human resource capacity at the district level and the monitoring and implementation of government policies. MoH leads primarily on the promotion of sanitation at the community level and provides preventive, curative and training services. MoH also promotes hygiene behavior change.

The Ministry of Education (MINEDUC) is involved in implementing hygiene programmes at school level. Other ministries involved include the Ministry of Finance and Economic Planning (MINECOFIN), which is responsible for budgeting and financing sanitation, the management of external funds and external aid coordination, and the Ministry of Local Government (MINALOC), which coordinates local actors and ensures effective service delivery on community development and socio-economic development. MINALOC also funds small scale water supply and sanitation projects. The districts (local government) are responsible for providing access to basic sanitation services at the local level. Private sector actors operate under contracts with the district governments and play a major role at the local level.

1.1.4. Need for collaboration between WASH and NTD programmes

As earlier mentioned, the lack of access to clean water and adequate sanitation, coupled with poor hygiene habits and other characteristics associated with low socioeconomic development, often allows infection rates to return to baseline levels within a year of drug administration. The health sector alone cannot address the multi-faceted determinants of NTDs. Control and

eventual elimination of WASH-related NTDs will require moving beyond preventive chemotherapy to address the root social and ecological causes of transmission (Savage et al., 2012, Ziegelbauer et al., 2012). Addressing this challenge requires implementation of a multisectoral approach with the health sector. Efforts for collaboration and coordination between the NTD and WASH sectors are not new (Hunter et al., 1993). In fact, over the last decade, various governments and development partners have joined hands to end the plague of NTDs. For example, pharmaceutical companies have increased their donations of deworming medicines to help ensure that all children at risk for STHs and schistosomiasis are treated (WHO, 2003).

There is growing consensus based on evidence that coordination, implementation strategies and activities for a range of NTDs and for other interventions is both feasible and beneficial (Bangert et al., 2017). At the same time, WHO was requested to promote a new partnership to steer and implement this coordination strategy (WHO, 2017) for countries to prioritize collaboration and integration, inclusion of WASH with existing NTD control strategies, as part of health systems strengthening. A study by Esley et al (1991) suggests that sanitation and water-related diseases could be reduced by more than 43% if people had full access to water and always wash their hands after defecation (Esrey et al., 1991). This as well attract a strong need for collaboration between WASH and the diseases control programmes for better elimination of water-related NTD infections.

1.2. Statement of the problem

Preventive chemotherapy treatment is one of the methods to maintain low levels of the WASH-related NTDs, but this approach alone is not enough to ensure these diseases are no longer a public health threat. Chemotherapy programmes only temporarily reduce NTDs transmission because they cannot prevent reinfection (Campbell et al., 2014). Although the WASH and NTD sectors work in the same communities, they have historically worked in parallel rather than coordinating their efforts for programmatic collaboration and integration. Integration hasn't happened and yet it is the next step Rwanda needs to manage the control of common WASH- related NTDs (Mupfasoni, 2016).

Persistent challenges to collaboration between the WASH and NTD sectors must be acknowledged and confronted (Boisson et al., 2016). Thus, collaboration between disease control programmes and stakeholders in WASH is a critical next step as Rwanda has met the WHO treatment targets and is well positioned to be among the first countries in Africa to

control intestinal parasites as a public health problem. The little collaboration between NTD control programmes and the WASH sector at either the national or international levels which is due in part to the different health outcomes on which each sector focuses on (Johnston et al., 2015). For both sectors, and for the populations they seek to serve, there are, arguably, several clear opportunities and mutually reinforcing advantages to collaboration (Freeman et al., 2013).

People involved in WASH and NTD programmes should work closely together, in a coordinated manner. This might involve forming local and global partnerships, sharing information and research about disease impact, combining efforts when advocating for resources and political commitment to action, and planning sustainable programmes that meet goals for both the elimination of NTDs and the provision of adequate WASH services.

1.3. Significance of the study

The strategies, programmes and interventions used to address WASH-related NTDs are closely aligned with the goal for achieving universal health coverage (WHO, 2017). WASH interventions as a primary prevention strategy is a fundamental determinant of STHs and schistosomiasis (Campbell et al., 2017). Since the ambitious goals to eliminate and control NTDs were launched, the crucial role of multisectoral collaboration has been emphasized as a pathway to ensure success. The Rwandan NTD control programme needs more external funding to synergize with externally funded WASH resources because it was proven in the London declaration that this can specifically address WASH requirements (Declaration, 2012).

At national level, WASH services provision remains separate from NTD control. Part of the slow progress in achieving collaboration between the WASH and NTD sectors could be attributed to the approaches that have been undertaken to date. Additionally, both sectors are undergoing transition. For example, the NTD community has more recently coalesced around integrated NTD programming, and control and elimination targets, rather than within disease-specific silos, but harmonization of collaboration, coordination and partnering approaches with key messages is just beginning (Lo et al., 2017).

The study findings may be used to support/strengthen advocacy to increase resourcing and collaboration for WASH as a central component of NTD control. Through this study we also hope to promote a multi-sectorial approach to the implementation of NTD programme goals that improve national coordination, facilitates partner collaboration, and improves the

management of technical and financial contributions. Additionally, results may help inform planning and scale up for WASH and NTD actions in Rwanda through better coordination.

All in all, the purpose of this study in part is to reflect gaps in existing knowledge concerning collaboration between WASH and NTDs programmes in Rwanda and elsewhere and in part to inform policy makers and academicians on the benefit of that collaboration.

1.4. Research question

What is the feasibility of promoting collaboration and coordination among stakeholders in WASH and NTD programmes in Rwanda?

1.5. Study objectives

1.5.1. General objective

To explore the feasibility of collaboration between WASH and the NTD control programmes in Rwanda

1.5.2. Specific objectives

i. To identify and explore stakeholder roles in implementation of WASH and NTD programmes
ii. To identify strengths and weaknesses in the coordination process of NTD and WASH programmes
iii. To explore opportunities and challenges for collaboration between WASH and NTD programmes
iv. To document possible areas of engagement and collaboration between WASH and NTD programmes

CHAPTER 2: LITERATURE REVIEW

The neglected tropical diseases (NTD) sector consists of stakeholders in multi-lateral organizations that contribute directly to the treatment and prevention of the NTDs in order to achieve global elimination and control targets (WHO, 2015a). Collaboration across countries, between non-governmental development organizations; across government departments and sectors, between WHO and its partners; and across organizations with differing but complementary priorities, is a unique feature of NTD programmes and a key driver of progress in the fight against NTDs (Bush and Hopkins, 2011). A multi-sectoral collaboration approach involving WASH interventions is important towards effective prevention and control of helminth neglected tropical diseases (Ault, 2008, Nakagawa et al., 2015).

2.1. Collaboration strategies in WASH and NTD programmes

Gray defined collaboration as a process through which parties who see different aspects of a problem can explore constructively their differences and search for solutions that go beyond their own limited vision of what is possible (Gray, 1989). According to the Ottawa Charter for Health Promotion, there is a great need for 'intersectoral' collaboration in public health (Axelsson and Axelsson, 2006). It stands to reason that collaboration with the WASH sector is the most efficient route to improving WASH services in water related diseases-endemic areas.

The WASH and NTD sectors have a strategic opportunity to work together to address multiple needs of those in their common target population who are vulnerable to various WASH-NTD preventable diseases (Campbell et al., 2014). The WASH sector must make a concerted effort to target appropriate WASH interventions to communities where NTDs are most prevalent. This will require them to increase their coordination with governments, NGOs, and donors to fund sufficient and appropriate interventions, targeting, and progress tracking in NTD-endemic communities (Campbell et al., 2017). As control programmes scale-up their efforts to control NTDs, Collaboration between WASH and NTDs stakeholders is essential to meet many of the NTD roadmap targets, and offers important co-benefits to both communities (WHO, 2015c).

WHO launched 'Water, Sanitation and Hygiene for Accelerating and Sustaining progress on Neglected Tropical Diseases: A Global Strategy 2015–2020' in August 2015. The strategy calls for joint WASH and NTDs efforts and, together with a strategic action plan, represents an unprecedented effort by the WHO to guide collaboration on WASH and NTDs across the agency at all levels, and among endemic countries and their partners. A closer collaboration

between WASH and NTD programmes can greatly improve the lives of populations affected by NTDs (Freeman et al., 2013). Most countries including Rwanda welcome the new WHO strategy which can only serve to strengthen the collaboration between the NTD and WASH sectors, towards the common goal of meeting the WHO Roadmap targets for NTDs. For both sectors, and for the populations they are serving, there are, arguably, several clear opportunities and mutually reinforcing advantages to collaboration (Gass et al., 2014).

While the evidence base of which WASH improvements most efficiently leverage the most effective and sustainable NTD control or elimination, there are multiple areas ripe for informed, active collaboration (Waite et al., 2017). To focus on both prevention and curative measures, the Rwandan NTD programme is, therefore, advocating for an inter-sectoral approach to prevent and control NTDs (Ruxin and Negin, 2012). Additionally, Rwanda has not yet publicly launched a National Master Plan for the NTDs. Once developed, this document will provide national targets for controlling the NTDs, including ways of better collaboration and coordination involving stakeholders of both programmes (Ogden et al., 2013).

2.2. Interventions and involvement of stakeholders

Links between WASH and NTDs programmes were described 100 years ago when the Rockefeller Sanitation Commission defined the challenges associated with hookworm elimination in the United States (Hotez et al., 2005). The effort highlighted sanitation's role in interrupting STH transmission routes. Europe's elimination of trachoma without using antibiotics further points to the need for comprehensive disease control approaches (Moszynski, 2012). However, most large-scale community-based parasitic disease control programmes focus almost exclusively on mass or targeted chemotherapy without investing in WASH improvement; primarily because of the perceived high costs of providing infrastructure, but additionally, in some settings, due to the lack of coordination between the health and the infrastructure development sectors (Asaolu and Ofoezie, 2003).

The key interventions to control both STH and schistosomiasis are simple, safe and cost effective. These include preventive chemotherapy, clean water and sanitation, and hygiene education. Several recent systematic reviews have found evidence supporting improvements to water supply and quality, access to and use of basic sanitation, and adequate personal hygiene as relevant to reducing burdens of disease (Nery et al., 2015, Lima et al., 2013).

The WASH/NTD meta-analysis by Strunz et al (2014) estimated the average association of WASH variables on infection with STH. The main findings were that sanitation is associated

with reduced risk of helminthiases transmission to humans. Access to improved sanitation should be prioritized alongside preventive chemotherapy and health education (Strunz et al., 2014). Moreover, in a systematic review by Grimes et al (2014), it was found that access to, and use of, adequate sanitation will catch most schistosome eggs and prevent miracidia the infecting stage from infecting intermediate host snails. Authors added that sustained transmission requires only a few eggs to enter fresh- water, and these do so without people defecating or urinating into the water where suggestions were that water supply should be as close to the home as possible and WASH programmes should emphasize hygiene education to encourage people to use more water for personal and domestic purposes (Grimes et al., 2014).

Among the public-health interventions that are recommended in the roadmap to accelerate the work on prevention, control, elimination, and eradication of neglected tropical diseases include preventive chemotherapy and the provision of safe drinking-water, basic sanitation and hygiene (WHO, 2005, Savioli et al., 2013). Although one approach may predominate for the control of a specific disease or group of diseases, evidence suggests that more effective control results when several approaches are combined and delivered locally (Carmen et al., 2013). The launch of the WHO NTD roadmap has given renewed efforts for collaboration between WASH and NTD actors. International organizations, academics, donors, practitioners, and countries have started mobilizing forces to work together. It is time to build on the momentum in the health and development community to reinforce joint WASH and NTD actions to accelerate progress towards control, elimination and eradication of NTDs (WHO, 2012).

Face to face meetings between WASH and NTD sector experts with a clear purpose of informing wider sector discussions, and the development of actionable joint work plans, have been particularly critical in supporting progress and collaboration. Priority next steps include building capacity for WASH programming among NTD control teams, coordination at the country level, and strengthening the epidemiological evidence and operational research for joint WASH and NTD interventions (Waite et al., 2016).

2.3. Factors shaping collaboration

Increasing collaboration and coordination may entail the national authorities making a financial contribution to a third party, surrendering some operational control or programming activities jointly with respective authorities (Jansen et al., 2008). A study in Bangladesh to assess the coordination of WASH and the country STH control programme showed that political will to engage in WASH for STH control is high, and a degree of coordination between government

entities responsible for WASH and STH exists, particularly at the central level. The Government of Bangladesh has prioritized water and sanitation, and stakeholders throughout the government see WASH as a critical component of national development (Zhang et al., 2010). China has successfully collaborated across sectors to control Schistosomiasis japonica, a host of agricultural sector activities, including removing cattle from snail-infested grasslands and providing farmers with mechanized farm equipment. This was implemented in conjunction with improved water supply and sanitation, provision of faecal-matter disposal containers to boats and implementation of intensive health promotion programmes. As a result of these activities, *Schistosoma japonicum* infection rates rapidly declined to levels below 1% in intervention areas, whereas in control sites no changes were observed (Wang et al., 2009).

The successful Ghana Trachoma control programme involved joint planning, implementation and monitoring between WASH and NTD actors, as well as sharing of national data to drive innovative approaches such as inclusion of trachoma in school curricula. The establishment of a strong commitment and collaboration of national task force with full representation of health and WASH stakeholders was a key success factor (Yayemain et al., 2009). From the perspective of political influence, the NTD community has, until recently, operated on a small budget in comparison with the WASH sector, and so may have had little resulting leverage to push influence of WASH donors, organizations, and government stakeholders in targeting WASH activities to NTD-endemic areas.

A key factor to ensure successful planning of multi-disease, multi-sectoral helminth NTD control interventions is prioritization of diseases and sectors coordination strategies. Challenges to past collaboration between the two sectors were acknowledged, including: differences in the scale of interventions, indefinite timelines for WASH investments, and community engagement on one hand, and a large disparity between costs of WASH services in comparison to a primarily treatment-based control approach (Freeman et al., 2013). Mass Drug Administration (MDA) is usually coordinated at the national level, and requires intense periods of community mobilization for short, punctuated periods of time throughout the year. Contrarily, WASH interventions most often occur at the district or community levels, and require consistent engagement and funding from national, district, civil society, and household levels for entire life cycles of services (Campbell et al., 2016).

As a result, and because of the need for improved infrastructure, in the short-term, the cost of WASH implementation is exponentially higher than that of drug distribution, and the costs are

often diffused over a number of stakeholders (WHO, 2014). This leads to incongruences in service provision over both space and time; in the WASH sector, the majority of funds are still spent in urban areas on reticulated infrastructure projects, rather than small-scale solutions or infrastructure in rural and peri-urban areas, where the burden of NTDs is highest and WASH access is lowest (Jansen et al., 2008). A qualitative research case study carried out by Johnston et al (2015) explored possible barriers or challenges to intersectoral collaboration of NTD and WASH programmes. Using a semi-structured interviews, participants identified barriers and ideal conditions for collaboration. Common barriers were differing programmatic objectives, over emphasis on MDA, funding discrepancies and siloed funding, and a lack of information sharing. For the purposes of this analysis key stakeholders included donor organizations, United Nations agencies, international NGOs, and academic institutions. The study did not include feedback from in-country Ministry representatives that are connected to NTDs or WASH or programme beneficiaries. Moreover, National ministry stakeholders were not included in the current analysis (Johnston et al., 2015).

Challenges could be overcome by taking advantage of existing resource and on-going projects in each sector and identified synergies among sectors. For example, on-going water and sanitation projects could be persuaded to prioritize areas with high NTD endemicity (Campbell et al., 2017). Equally, on-going broader health educational activities could be used to disseminate specific information on helminth NTDs at minimal additional cost (Nakagawa et al., 2015).

2.4. Areas for collaboration

Focused efforts on WASH are urgently needed if the global NTD roadmap targets are to be met. This is especially needed for WASH-related NTDs where transmission is most closely linked to poor WASH conditions such as STHs, schistosomiasis, trachoma and lymphatic filariasis (WHO, 2015a). The WASH/NTD Roundtable discussion hosted by the Bill and Melinda Gates Foundation in December 2012 identified mapping and monitoring as one of four important areas for collaboration (WHO, 2013).

Several documented collaborations between WASH and NTD stakeholders have helped to target WASH implementation in communities where WASH-preventable NTD burden is highest. These collaborations have helped to increase the visible impact of the WASH sector. Four key areas of collaboration were identified and discussed by Freeman et al (2013) and these included advocacy, policy, and communication; capacity building and training, mapping, data

collection, and monitoring and finally research. However, they have been largely ad hoc, minimally formulated, and have not yet led to more deliberate long-term collaborations or joint post-implementation monitoring (Freeman et al., 2016). Advocacy, policy, and communication was shown to be important to leverage support from both sides to engage policy-makers and donors, and create common platforms for dialogue, develop harmonized messages, and share knowledge on issues of joint concern for WASH and NTD programmes. Fostering pathways of communication is also a valuable result of these meetings. Although continual engagement with local partners is often difficult, those working in the WASH sector should strive to accept invitations from potential partners and participate in stakeholder group meetings (Daumerie et al., 2010).

Capacity Building and Training on the other hand helps to address knowledge gaps among stakeholders from each sector and to create effective information exchange mechanisms between the WASH and NTD sectors in order to enable more informed collaboration. Mapping, data collection, and monitoring in NTD and WASH communities will help identify areas that are at greatest need of interventions, to ascertain the required frequency of treatment in light of WASH coverage and other risk factors. The last key factor is that of research, which help to identify gaps, barriers, and technical obstacles to collaboration; and directly improve efficacy and impact of WASH and NTD control programmes. The authors have highlighted barriers to collaboration but the only problem with the article is that it fails to state exactly how some of the challenges outlined can be dealt with. The authors also failed to exactly show the cost and timeframe of implementing such as a programme collaboration and coordination.

Partnering with the NTD sector can increase the impact of WASH interventions on health through targeting areas at high risk for NTDs (Marchal et al., 2011). In addition, joint monitoring can generate powerful data that provides the WASH sector with significant opportunities to conduct more effective advocacy for policy change and fundraising. Once the WASH sector gains awareness of the NTDs in program areas of intervention, local partners may be able to help define the links between WASH interventions and NTDs in the communities served. WASH workers should approach relevant organizing bodies, other NGOs, and government partners to set up meetings to get acquainted (Savioli et al., 2013, Tristao and Cali, 2014). Areas of a potential program's current and planned activities to conferences, training, monitoring and impact evaluation methods, and funding opportunities. Some meetings may lead immediately to joint activities, while others may require further dialog to produce measurable change. Both NTD and WASH actors seek to promote shared

values of equity and inclusion, and both aim to serve the poorest and most marginalized communities. Collaboration between NTD and WASH actors can increase the effectiveness of programmes towards their individual and common goals.

Provision of safe water, sanitation and hygiene is critical for the prevention and care for many NTDs, but has often received little attention in NTD control programmes. These institutions have been constrained by limited financial and human resources (WHO, 2015b, Zhang et al., 2010). In order to sustain collaboration, benefits for both sectors must be clearly articulated. While the NTD sector is dependent on WASH improvement for the prevention, sustained control, or elimination of many NTDs, the WASH sector is not mutually dependent on the NTD sector to achieve its primary programmatic or outcome goals, which tend to relate to universal coverage of water supply and sanitation services (Meier et al., 2013). Ultimately, improved collaboration, communication and coordination will support accelerated progress towards universal access to WASH and NTDs control, elimination and eradication targets.

2.5. Conceptual framework

Feasibility is based on the measure of finding the relationship within and across the levels and different types of determinants (Nilsen, 2015). To conduct this study, the aim was to identify factors at organizational level that affect a multi-sectorial collaboration between disease control and WASH programmes and to promote a collaboration approach between WASH and NTD programmes at organizational level.

Proctor and her colleagues defined feasibility as an implementation that explores or identifies the extent to which a new treatment, or an innovation, can be successfully used or carried out within a given organization or setting (Proctor et al., 2011). Using Bowen et al' s guide on feasibility studies, the study sought to identify what aspects of the collaboration between WASH and NTD programmes meet the needs of program providers and implementers and still remain feasible and effective (Bowen et al., 2009). Four areas of feasibility (acceptability, implementation, practicality, and, integration) as described below, were used as domains for the framework analysis.

Acceptability is the extent to which those delivering and receiving the intervention find it appropriate and satisfying (Bowen et al., 2009). We measured the extent to which the WASH activities are judged as suitable and satisfying to program deliverers for NTD control and elimination. For example, various implementation research studies (Carmen et al., 2013, Smith et al., 2014, Tristao and Cali, 2014) have measured feasibility outcome to explore how

interventions can be varying levels of feasibility as well as acceptability to different stakeholders. Implementation refers to the degree to which the intervention can be put into practice as proposed within existing contexts (Bowen et al., 2009). This construct was used to measure extent to which WASH interventions can be successful implemented to NTD endemic areas. Practicality is to the degree to which a new idea, program, process can be carried out with intended participants using existing means, resources, and circumstances and without outside intervention (Bowen et al., 2009). Integration was defined as the extent to which the delivery of a range of interventions through coordination across a variety of sectors and with participation of all relevant stakeholders to achieve a common goal. Integration focuses on the system change needed to implement an intervention into existing infrastructure (Bowen et al., 2009).

This study also aimed to identify barriers to a better collaboration. This was done using contextual domains of the Consolidated Framework for Implementation Research (CFIR) that have been widely used to measure implementation outcomes (Damschroder et al., 2009). The specific domains of the CFIR that were used in the study to identify challenges to multisectoral collaboration between NTD and WASH programmes were characteristics of the inner setting and implementation climate.

CHAPTER 3: STUDY METHODOLOGY

3.1. Study design

A qualitative exploratory case study design was employed to answer the research question on the feasibility of collaboration between Water, Sanitation and Hygiene (WASH) and the national NTD control programmes in Rwanda (Crewell, 2007). Qualitative data was collected through key informant interviews to understand different perspectives from research participants of how a multisectoral collaboration can strongly contribute towards the elimination and control of water-related diseases, and explore opportunities and challenges to a strong collaboration between the two programmes.

3.2. Study setting

The study took place in Kigali, Musanze and Burera districts in Rwanda. Kigali is the capital city of Rwanda and houses national headquarters for the Ministry of Health which is in charge of NTD control programme. Furthermore, the Division of NTD and other Parasitic Diseases Division of the Rwanda Biomedical Center and most NGOs headquarters are also found in Kigali. Musanze and Burera districts which are in the Northern Province were chosen for their poor access to safe water supply and sanitation, incidence and highest overall intestinal worms' prevalence rate as compared to national figures and there are continuing WASH intervention implementation efforts. Musanze is Rwanda's most mountainous district, containing the largest part of the Volcanoes Park. Burera District is a rural District; agriculture and mining are the main activities in the District; It is a highlands district, home to Lakes Burera, Ruhondo and different rivers from Volcanoes park. In many of the sectors of the district, people do not have access to clean water.

3.3. Study population and sample size

In Kigali city, the target population were NTD control programme staff drawn from the Ministry of Health staff working under RBC and WASH specialists who initiate the policies for reducing WASH-related diseases through access to WASH interventions. These included NGOs programme managers and WASH technicians at ministerial levels. In Musanze and Burera districts the target population were staff from the District Health office including water and sanitation officers and Hygiene and sanitation officers. In total, seventeen (17) participants were included in the study. Table 1 provides the details of the sector levels that were involved for both programmes and the people who were interviewed.

Table 1*:* List of key informants interviewed

Level and location		**Area of Expertise**	**Number of interviewees**
National Ministry Headquarter	MoH	NTDs	1
		NTDs	1
		Hygiene and behavior change	1
	MINALOC	Community Health	1
		Environmental health	1
	MINEDUC	School health	1
	MININFRA	WASH	1
		WASH	1
	WASAC	WASH	1
Field	Musanze District	WASH	1
		Community Health	1
	Burera district	Behavior change	1
NGOs	WHO	WASH	1
	UNICEF	school health and community health	1
	WaterAid	WASH	1
	World Relief	WASH	1
	World Vision	WASH	1
Total number of respondents			**17**

3.4. Sampling strategy

The recruitment of participants applied non-probability, purposive sampling method. Respondents were programme implementers in chosen organizations who are experienced with the interventions in place and who are working closely with the government. This was because the person to be interviewed needed to have enough knowledge to be able to provide appropriate information on the subject.

Key individuals in these organizations were contacted with an invitation to participate, or to recommend other individuals who may be more appropriate and are able to provide enough information on how programme interventions are coordinated among different stakeholders.

3.5. Data collection

Primary data was collected through key informant interviews. Secondary data was collected through reviewing documents and records from selected Ministries and NGOs. Qualitative data information was collected through face-to-face interviews. The interviews were conducted by the lead investigator either at the interviewees' office or at another chosen quiet place based on the interviewee's preference. The key informant interviews were conducted using the aid of an interview guide adopted from questions validated from the consolidated framework for implementation research (CFIR) (Keith et al., 2017).

This framework provides a comprehensive overview of all aspects that can affect implementation and was helpful in creating the interview guide to ensure that all relevant aspects were covered in interviews. Key informant interviews were conducted with 17 different programme stakeholders. Interviews with ministry staff and NGOs were done in English whereas those with district staff were done in Kinyarwanda which is the common language. The interviews lasted between 20 and 60 minutes, they were recorded with a digital recorder and transcribed verbatim, except for three of the interviews in which notes were taken by the interviewer during the interview because the respondents did not allow use of a voice recorder.

As a research method, document review is particularly applicable to qualitative case studies (Bowen, 2009). Different documents were reviewed ranging from reports, strategic plans, policies and other relevant documents in draft form. Documents of this type helped us to uncover meaning, develop understanding, and discover insights relevant to the research problem. Key strategies and some of the identified challenges and gaps to eradicate WASH-related diseases especially NTDs in Rwanda were coded and followed up through interviews. Table 2 shows the list of documents reviewed.

Table 2*:* List of reviewed documents

S/N	Name of Document	Areas of focus identified
1	Rwanda Health Sector Strategic Plan 2012–2018	• Strategies to control NTDs • Policy focus areas • Partnership and Coordination structures
2	Draft Rwanda NTD strategic Plan 2017-2020	• Strengthening a Government driven program • Advocating for an integrated approach to control NTDs • Needed WASH Activities to prevent NTDs and involved stakeholders • Economic benefits of WASH for NTD control
3	National School Health Strategic Plan 2013/14- 2017/18	• School Health Program management • Access to safe drinking water • Sanitation and Hygiene practices
4	Roadmap for CBEHPP - 2010	• Training Community Health Workers in deworming program • Community mobilization
5	National Sanitation Policy Implementation Strategy -2016	• Sustainable WASH services • Infrastructure • Support and strengthen the participation of local communities in improving water and sanitation management
6	UNICEF strategy for Water, Sanitation and Hygiene 2016-2030	• Use of Existing Systems and WASH in Institutions • Linkage between poor WASH and NTDs • Working inter-sectorally • Leverage sustainable resources for WASH

3.6. Data analysis

Data collected from key informants were treated with strictest care and privacy. Each interview form and audio file was given a unique identification number for different study participants. All data audio files and notes were kept privately by the principle investigator. First**,** audio recordings were listened to carefully and transcribed verbatim into Microsoft Word. The transcripts were proof read against the audio files to ensure accuracy and validity and then exported to Nvivo version 11 for organizing the data. This helped to bring out the differences between mere opinions and facts. A thematic analysis approach was used to identify and analyze patterns within the data that was collected. This is a method for identifying, analyzing, and reporting patterns (themes) further interprets various aspects of the research topic within data and assist in the analysis.

During the analysis process, a code manual was generated by the lead investigator and finally a coding list was generated based on the key questions that were asked for outcomes or intended results predictions (Gustafson et al., 2003, Mendel et al., 2008, Feldstein and Glasgow, 2008, Greenhalgh et al., 2004). In the second phase of analysis, data was also organized according to a framework analysis. The framework creates a new structure for the data (rather than the full original accounts given by participants) that is helpful to summarize/reduce the data in a way that can support answering the research questions (Gale et al., 2013). By using CFIR to analyze results, we facilitated synthesis with other feasibility domains findings, and we better identify common patterns of implementation determinants common across settings. The coded data was then organized and summarized into initial themes based on feasibility areas of focus by Bowen et al as seen in Table 3.

Table 3*:*Data analysis coded examples

Theme	**Construct**	**Example of coded text**
Acceptability	Perceived demand	Reaching low prevalence of WASH-related NTDs through coordination
	Perceived appropriateness	Clear association between WASH and NTDs
	Organizational culture	Perceptions and mindset towards interventions

		Change in behavior at community levels
Practicality	Needs & Resources of those served by the Organization	Advocate for increased access to e WASH
	Ability of participants to carry out interventions	Coordination between institutions
	Access to knowledge and information	Policy development and organizational action plans Established WASH and NTD guidelines
Implementation	Planning	Policy development and organizational action plans Established WASH and NTD guidelines
	Available resources	Government ownership and support Time and space given to staff Training community club hygiene committees using the CBEHPP roadmap
	Readiness for change	Work under a single line ministry
Integration	Perceived fit with existing system structures	Quarterly meetings with technical and sector working groups
	Sustainability	WASH as a cross-cutting issue

3.7. Dissemination plan

The findings of the study will be published in a peer reviewed journal. A copy will also be made available in the UNZA school of Public Health Library. Relevant stakeholders will be shared with results. The participants of this research will also be availed with the findings.

3.8. Ethical considerations

Independent review approval was given by the University of Zambia Biomedical Research Ethics Committee (UNZABREC) indicating that the study protocol was compliant to the code of ethics according to both international standards and Zambia's National Health Research Act (REF No. 046-06017). Second Review approval note was obtained from the Rwanda National Health Research Committee (REF No: NHRC/2017/PROT/037). Final approval was obtained from Rwanda National Ethics Committee (RNEC) after the review of the study protocol (REF No. 062/RNEC/2018). Hard copies of the approved consent forms were submitted to the RNEC's office for signature and stamping before presenting them to study participants.

Permission letters were obtained from organizations working both in WASH and NTD programmes. In addition, permission letters were provided by the two districts allowing the study to be conducted at district offices. The selection of participants was done representatively by including major ministries and NGOs. Furthermore, participant information sheets were provided giving the full details of the study. The study participants were given opportunities to ask questions to clarify participation in the any emerging issues. The participants were also informed that there was no immediate benefit that was to accrue to them by participating in the study. It was explained to them that the results will help improve future organizational interventions aimed at promoting a multisectoral approach to reach NTD control targets.

Consent were sought to confirm their voluntary participation. Refusals and withdrawals were accepted and coercion dissuaded. Participants were given contact details through which they may raise any concerns they have from the study. A bilingual research assistant was recruited to cater for study participants who may want to be interviewed in another language other than English. The electronic data and the forms will only be accessible to the research team. All the study records are being kept safely by the principal investigator for a period of one year after the study and destroyed thereafter. The study is beneficial as the data obtained from the study could be used to formulate more comprehensive implementation interventions in Rwanda.

3.9. Strengths and limitations

The downside of this study was that it relied heavily on the views and experiences of the headquarter staff where the final sample included fewer field-level respondents than headquarters staff. However, all interview participants had deep knowledge of NTD and/or WASH interventions were occurring, and several of the interviewees reported spending significant time conducting site visits to their representatives at field level. Moreover, this qualitative study explored the perspectives of a diverse group of stakeholders (program implementers, administrators, policy analysts, sanitation and water specialists). Despite the above limitation, most of the data collected was triangulated with national level reports and available data statistics. We also endeavored to use two different methods of data collection and this helped validate the data that we collected.

CHAPTER 4: RESULTS

This study found that stakeholders in the WASH programme and the health sector have started advocating for an inter-sectoral collaboration. This collaboration was initiated by the NTD control programme which is found under Rwanda Biomedical Center, an implementing agency under the Ministry of Health. We identified stakeholders who more likely to influence the extent to which the NTD and WASH programmes can work together. Current stakeholders in both sectors were identified by mapping their roles as summarized in *Table 4*. This section details the different strategies that are being implemented together with challenges and opportunities that are believed to influence and lead to a strong collaboration.

4.1. NTD and WASH stakeholders

NTD sector consists of stakeholders in multi-lateral organizations, national and district level governments, NGOs, and donors, that contribute directly to the treatment and prevention of the NTDs in order to achieve global elimination and control targets. The primary focus of much of the NTD sector has been the periodic distribution of drugs to at-risk groups to prevent morbidity. The Ministries of Health and Education are well placed to demonstrate the feasibility of inter- sectoral coordination since they are often already involved in joint coordinated activity in the control of NTDs during the mass preventive chemotherapy for the most common NTDs (STH and schistosomiasis). This activity has been implemented through the school infrastructure for treating school-age children. The technical, logistical and financial support is mobilized from different stakeholders including WHO, UNICEF, END Fund, World Vision and World Food Programme.

The WASH sector is a diverse group of stakeholders that includes national governments, international, and local NGOs, and multi-laterals, that contribute directly to increasing coverage of water, sanitation, and hygiene education in national areas with insufficient access. The Government of Rwanda (GoR) is making steady progress towards Vision 2020 targets for water supply and sanitation. The water and sanitation sector is a cross-sectorial domain. Many intervening parties such as state institutions, international organizations, NGOs, civil society and private sector are concerned.

Table 4 shows the roles of each stakeholders as identified during the interview and document review.

Table 4*:* Current sector stakeholders

Stakeholder	Stakeholder level	Role
NTD		
MoH	Government	plays the lead and has overall responsibility for the NTD programme. The NTD&OPDs Unit can be used to build partnerships for WASH and NTD control
MINEDUC	Government	fight all socio-cultural factors hindering children learning process, such as illnesses including NTDs in school health programmes like MDA
END Fund	Private sector	Primary funding Stakeholder, partnering to end NTDs in Rwanda.
UNICEF, WHO, WV, WR, WFP	International NGOs	Provide community sensitization around national deworming campaign
WASH		
MININFRA	Government	Develop, promote, and address the legal and regulatory conditions relevant to water and sanitation infrastructure, urbanization and settlements.
MoH	Government	Control and monitor health services, develop policies, strategies and guidelines for households' sanitation and hygiene

MINEDUC	Government	Responsible for school WASH policy and plans
MINECOFIN	Government	Responsible for mobilizing funds; national budgeting process and budget allocation, coordination of development partners
Water and Sanitation Corporation	Government	Overall responsibility for water and sanitation services in both urban and rural.
DFID, World bank , African development bank DB	Private Sector	Development partners and donors
UNICEF, UNDP,WV, JICA,USAID, Netherlands government (through SNV and AQUAVIRUNGA Ltd)	District level WASH-focused NGOs	Advice, design, execute and supervise the establishment of WASH activities

4.2. A SWOT analysis for coordination between WASH and NTDs

Existing NTD and WASH coordination structures

The study established that there is already a strong collaboration between WASH actors and the Health Sector in Rwanda at all levels with an increasing awareness of the linkages between WASH and WASH-related diseases as evidence by the government initiative like the established 'Community Based Environmental Health Promotion Programme' (CBEHPP) Roadmap. A review of the draft document found that the CBEHPP has been designed and is implemented through a strong coordination mechanism involving all relevant sectors at central, district, and community levels as stated below:

> *'Implementation of CBEHPP calls for inter-sectoral collaboration. Such collaboration and coordination mechanisms will be established and made functional at National, District, Sector and Community levels'.* ***p.2***

The government in the School Health Strategic Plan 2013 – 2018 (MINEDUC, 2014), prioritized inter-sectoral coordination of the education, health, nutrition, sanitation, and child protection sectors. Building on this strategic plan, the ministry of education's school health strategies aimed at ensuring that there is a way public institutions collaborate with development partners through annual forum, it's a kind of joint planning where government indicate needs and priorities, and development partners are ready to fund those needs.

> *Collaboration among all stakeholders is a key for the successful implementation of SH strategies and activities at national, district and community levels. The work of the Steering Committee forum will be supported by an SH Technical Working Group, chaired by MINEDUC and composed of technical staff from key ministries/institutions, UN agencies, and NGOs.* ***National School Health Policy p.32***

In addition, the Ministry of Health has developed the third Health Sector Strategic Plan 2012-2018 (MoH, 2012) and has included NTDs as a priority area of focus. The plan also details the country's plans towards long-term NTD control by improving water, hygiene and sanitation, an effort that has to be done in collaboration with other sectors. ***National Health Plan p.41***

Table 5 below shows a summary of the key factors that were identified during the interview and document review.

Table 5: Strengths, Weaknesses, Opportunities and Threats

Strengths	**Weaknesses**
- Political will to reach 100% coverage in WASH before 2020 - Availability of reviewed National NTDs Strategic plan - Existence of technical staff and SWGs for programme coordination and implementation - Improved Mapping of NTDs countrywide leading to data sharing - Well-coordinated social cluster ministries for WASH activities	- Over-emphasis on chemotherapy, MDA currently considered primary control measure. - Not involving all key stakeholders in planning - Lack of coordination between NTD department and WASH stakeholders - Knowledge gaps and lack of monitoring and sharing of information - Lack of a forum coordinating NTD activities with WASH interventions

Opportunities	Threats
- Funding agencies willingness - Capacity building for the technical staff with funding from partners - Utilization of operational research findings to inform policy and actions on scaling up interventions - Advocacy for increased financial and technical support in WASH for NTD control	- Sustaining the impact of NTD interventions after end of donor funding. - Limited support for some NTDs - Inadequate skills for resource mobilization, financial management and planning - Cross-cutting interventions in WASH and NTDs programme

Presence of NGO programmes

International and local NGOs are very active in Rwanda in areas related to WASH. A number of programmes are integrated including WASH and nutrition, and in some cases, the addition of early child development activities. These programmes also promote hygiene practices at community levels. The NGOs were acknowledged more in provision of financial and technical support in building sanitation infrastructures in schools and health centers. Some NGOs even provide sanitation facilities like soap, and water. There are two major NGOs that are providing what is known as tippy-taps to some districts for distribution to community members who belong in the first category of ubudehe (classification of Rwandans based on economic status). Another NGO is coordinating with the ministry of Health to train community health workers and creating community hygiene clubs.

> *"…. So, our programme when it comes to health, we have that outcome of increasing Maternal and Child Health week services, we help the government in the construction of health services but also training the community health workers so that they can be able to deliver what they are supposed to..."* (P 4).

4.3. Feasibility of collaboration between WASH and NTD sectors

4.3.1. Acceptability

In this study, acceptability focus was from the participants' level of understanding of the synergies between water, sanitation, and hygiene (WASH) for the control of Neglected Tropical Diseases (NTDs). Acceptability stemmed from stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes and this was measured through perceived demand of intervention, perceived appropriateness, fit within organizational culture and perceived positive or negative effects on organization. To adopt multisectoral response to combat NTDs, the idea of multisectoral collaboration for NTD control was acceptable to the diverse stakeholders in WASH sectors. Fortunately, the necessity of sectorial collaboration approaches is well recognized by many organizations and initiatives.

Perceived appropriateness and Demand

The need to address the determinants of NTDS was acknowledged. Again, the association between WASH and NTDs, and the benefits of WASH for broader health and development outcomes, was clearly recognized by majority of WASH stakeholders. In addition to the government institutions, several non-governmental organizations working in WASH and NTD sectors similarly supported the overall acceptability and high degree of satisfaction with the multisectoral approach, with many positive comments about the impact at country level.

> *"There is a strong indirect connection between the two programmes. So, working on WASH or improving WASH conditions can also significantly reduce the prevalence of NTDs and the burden that they cost to the country"* (P 15).

Several interviewees pointed out that successful collaboration between the WASH and NTD communities will depend on mutual benefits between the two sectors. The demand for intersectoral collaboration is largely dependent on current priorities in each sector. Stakeholders working in both WASH and NTD governmental institutions felt that bringing together diverse WASH and NTD stakeholders to align goals and review common challenges would result in a relative advantage for the NTD sector, hence building a strong evidence base for a multisectoral collaboration approach to eliminate water-related diseases

*"… In coordination, the outcomes are very high. First of all, the government is setting the orientation and direction of what we are doing. So that we know that we are putting together our efforts. Otherwise without collaborating with the government everyone should do whatever they think is good and then the impact would be hard to measure or to achieve…" (*P5*).*

Fit with Organizational conditions

The Ministry of Health considers WASH as a critical foundation for the provision of health care in Rwanda and promotes access to WASH especially in health facilities and in public services. According to study participants, established technical working groups and high quality of formal communications contributes to effective implementation of the multisectoral collaboration. It was also revealed during the interviews that, both NTD and WASH guidelines have been developed with both the technical and sector working groups from diverse organizations working in WASH and are awaiting approval and operationalizing.

*"When we felt a need of WASH, we developed like a concept note or a proposal for a specific intervention but without a long term document to support our interventions and also to mobilize funds but last year we started developing the national strategic plan for NTD and other Parasitic Disease and the document is now available ready for approval by the Ministry of Health but it was already approved by the technical working group (TWG) involving all these stakeholders" (*P2*).*

Institutional complexity is likewise a challenge. Water and sanitation are often handled by different line ministries NGOs working in the WASH sector could easily relate their organizational goals with the collaboration perceived outcomes. The addition of the NTD control component to the setting specifically would be a change in organizational culture, reported WASH specialists in NGOs. However, lack of a single line ministry where they can report, makes it hard for some organizations to collaborate or to know who is doing what. Suggestions were that one government ministry could be in charge of all communications to deliver effective WASH interventions for NTD control and elimination by mapping stakeholders with clear milestones are developed and implemented in collaboration with other sectors.

*"…Let me call it a mapping. Map all organizations working on WASH and knowing where they are and their line ministries because as I said we may have some WASH stakeholders who report only to the ministry of education, others and I know they are many reporting to the ministry of infrastructure without no connection to the ministry of health. So, it's better to all those people who are contributing to the reduction of NTDs and coordinate with other different ministries" (*P15*).*

4.3.2. Implementation and Readiness for the implementation process

Type of resources needed to implement

WASH investment plans are being developed that reflect the true level capacity to bring districts to full WASH infrastructure coverage, and funding is being sought. The level of resources mentioned by respondents for implementation and ongoing operations include mostly money allocated in WASH interventions by the government through the Ministry of Finance and Economic Planning (MINECOFIN) and time that different stakeholders are willing to dedicate towards the specific intervention. For the NTD sector, it was mentioned by the Director Manager that 90% of the budget comes from the END Fund while the government intervenes for staff payments only. However, when it comes to districts being able to implement an intersectoral approach was described as a bit tricky as they always have to wait the budget. Therefore, the districts are argued to mobilize funds for community sensitization and health education. The multisectoral collaboration is possible by involving partners according to priorities in each districts.

"we have the district budget from own revenues of WASH. From this budget, we prioritize the need in the population. However, the budget is limited to satisfy all needs and that is where NGOs help. Sometime they (NGOs) do their own projects or give the budget to the district for implementation" (P7).

Factors affecting ease or difficulty of implementation

It was agreed by respondents that newly established NTD coordinating committees might be a facilitating factor. Suggestions were that, ministries and their affiliated agencies, NGOs, religious and civil society organizations should officially be involved in the implementation of the collaboration. The NTD sector has initiated dialogues with WASH sector to get a practical consideration to collaboration between the two sectors. However, Once the WASH sector gains awareness of the NTDs in program areas of intervention, local partners including opinion

leaders may be able to help define the links between WASH interventions and NTDs in the communities served.

> *"Another thing I can tell is that MINALOC (Ministry of Local Government) is the one the one to take a lead. So, from my point of view…, I see that we need decision makers and opinion leaders in the community so that the collaboration should be strong and yield impact" (*P14*).*

4.3.3. Practicality

Positive and negative effects on target population

All WASH specialists interviewed felt that the collaboration approach between the two sectors would yield positive health outcomes within the communities in which their interventions were being implemented. The capacity and infrastructure necessary to support collaboration between the two sectors depends on national objectives and actions, and budgetary issues.

Ability of participants to carry out interventions

Additionally, district WASH officers suggested social cluster ministries should be led by the Ministry of Local Government through the decentralization system and should be at the centre of the implementation process because it is already in charge of implementing approved policies from central levels and that instead of taking part in the final activities, all districts staff need to be involved at early stages for the collaboration to be strong.

> *"At the central level the collaboration is there as MINALOC is working closely with the Ministry of Health. They are the ones who try to solve those issues. One day they sent even the format of report as the work together. But on our level, at the districts level, the collaboration to be strong, it needs all district staff to be involved" (*P7*).*

Respondents noted that successfully intersectoral programming need a champion to lead the effort and that approval from leadership of programmes. Implementation will be more effective when key individuals are dedicated. Some participants felt that, even if they are given enough trainings on how the collaboration is to be carried out, if respective institutions don't give it enough time, it won't be ready for implementation. Participants mentioned that having to submit institutional performance measures keeps them busy and the execution takes time.

Cost analysis

There is a large disparity between costs of WASH services in comparison to a primarily MDA for NTDs control approach. The MDA campaign is conducted two to three times a year depending on the available resources for instance, the NTD program struggling with donor money as fiscal resources and drug donations but the country need to pay for the distribution of the drugs and incur extra costs. The WASH interventions are continuous activities. Needs and resources of WASH programming are perceived very costly compared to NTD programming. For NTDs to be eliminated, more efforts need to be put in WASH interventions, thus for WASH to reach 100% coverage of water supply and sanitation infrastructure, they need a lot of money compared to the NTD control.

> *"For instance, let me tell you if you go to the Ministry of Infrastructure, they will tell you that it is estimated to 600 million USD are needed for all of Rwanda to have 100% coverage so it's a lot of money"* (P 14).

4.3.4. Integration with existing mechanisms and forums

Perceived fit with infrastructure

Integration was promoted as a cost-effective approach that maximizes use of limited resources. The need to use existing infrastructures, rather than form new structures for collaboration, was highlighted by the majority of WASH experts. Participants recognized that full-scale collaboration and sectoral integration is difficult. Reasons for insufficient integration include the lack of awareness and information sharing between the WASH and NTD sectors, and a short-term view of disease control which fails to recognise, and invest in, the necessary long-term comprehensive activities required for sustainable WASH implementation activities.

Participants who explored the need to develop an integrated strategy for NTDs affected by water and sanitation believe that it would set up the framework for integration to work more holistically and effectively. Many of them also believed that it would give NTDs like STH, Schistosomiasis more efforts for control and elimination.

Perceived Sustainability of programmes

The sustainability of health-sector interventions for the long-term sustainable control of NTDs alone appears not to be clear at this point because few programmes have specific WASH targets and approaches. However, some interview participants emphasized that If there is an integration of policies and plans at higher level and there is proper communication to

decentralized decisions. There is nothing can be a barrier to partnership. Thus interventions need to respond to the perceived needs of individuals and communities to ensure their sustainability.

> *"…. Then, the sustainability of what have been implemented is the base. If WASH project has worked in volcano's districts and it works, there for six years. The sustainability of WASH facilities there should be ensured by the districts communities. But there some places where we find that it is not ensured" (*P6*).*

4.4. Perceived challenges to multisectoral collaboration

All 17 interviewees explored possible barriers or challenges to intersectoral collaboration of NTD and WASH programmes. Investigated potential barriers were grouped and presented from among CFIR domains and sub-domains.

4.4.1. Characteristics of Inner Setting

Implementation climate

A number of interview respondents specifically referenced the varied programmes goals and different program relative priorities between sectors, as common barriers to a strong collaboration. Some of the respondents mentioned specific organizational objectives while others referred to them as different donor goals.

> *"I can say that the two sectors come from very different backgrounds and it depends on the objectives and the target you have for your business. For us we need just to see people having access to clean water and improved sanitation facilities" (P14).*

STH and schistosomiasis control programmes are made possible by the pharmaceutical donations. It was mentioned that some program implementers working in the WASH sector are focused on sanitation hardware facilities and supplying of water, therefore not aware of the link and health impact they are making to the health sector particularly WASH related diseases (NTDs). Moreover, few ministries focus on preventive services than curative approaches making it hard for donor agencies to show interest. A discussed example was small funding in health education interventions because all funds go to the buying of drugs.

Available resources

Limited resources were in two forms; budget or funding and inadequate water and sanitation infrastructure. Challenges associated with funding were described in terms of discrepancies

and mechanisms. Participants said that disparities in budgeting in WASH versus NTD projects would hinder both sectors to work together in partnerships. This is a common theme often impacting the programmes in the form of halting activities or preventing the execution of some important interventions.

> *"It is not only with our partners but also to our donors within the organization because sometimes also we are asked to join another intervention by another partner but we are limited financially" (P 13).*

Water supply and Sanitation facilities have no yet reached the set 2020 target yet also partly due to limited financial capabilities. Many participants mentioned that the maintenance of already existing facilities is alarming. There is a perception that these things belong to the sponsors and hence they should take care of them. The community needs to be educated on how to maintain installed facilities. There was, however, some discrepancy between respondents as to whether this was a true factor keeping the community from hygiene practices. A WASH expert working in environmental health and hygiene sector claimed that sometimes water and sanitation facilities are freely locally available from public areas, but that people still do not wash their hands.

> *"People may have even water but their behavior to wash hands after toilet or even before breastfeeding, or before preparing the food; is also a challenge. So there is a challenge to change the behavior or attitude of people but if the interventions are well coordinated, they will be committed also in education/behavior change communication" (P13).*

Networks and communications

Information sharing is a challenge for large organizations with more than one intervention being implemented. According to participants, there is a huge opportunity for the country to kick-start the multisectoral collaboration among all health and stakeholders but data information often is not shared between the respective sectors and because of that, there isn't a clear plan on how to ensure that the benefits of collaboration or integration between multiple parties are exploited. What is available is just loose affiliations rather than establish networks for coordination.

> *"So, I find huge opportunities I think Rwanda is one of the countries where collaboration, partnership environment is really conducive, but the challenges I see is*

*that the coordination between NTD departments and WASH stakeholders is not really there" (*P8*).*

Interview participants who discussed this barrier mentioned that once the ministry of health has not yet established standard documents regarding household sanitation facilities. Therefore, there are no established documents that can be shared with stakeholders.

"As for now, we don't have standards. Approaches such as latrine construction require sharing of information related to standards of what needs to be constructed. Probably programmes which focus on promoting sanitation and building informed demand are more effective than those which focus on the supply of latrines" (P15).

4.4.2. Implementation Process

Planning

Additionally, Participants identified that measures to tackle barriers to behavior change are often neglected in planning processes. It is believed that WASH programmes focus on behavior changes through hand washing to reduce diarrheal diseases but less focus was given to prevalent NTDs in the communities. This barrier can also be linked back to issues related to varied programmatic objectives between the sectors, where WASH implementers tend to focus on preventative services and those working in NTDs tend to focus on curative services and also to lack of health indicators of effective NTDs.

4.5. Possible areas of engagement and collaboration

During their interviews participants discussed several possible areas of engagement that they believe would allow for collaborating for NTD control. Collectively agreed-upon possible areas of engagement include funding advocacy, Synergies across programmes and sectors for the prevention and control of helminth NTDs (joint activities), research and mapping.

i) Funding advocacy

Funding comes primarily from the government and bilateral donors as far as WASH is concerned. As it was shown earlier, WASH organizations' ability to target implementation is often limited by donor restrictions, suggesting that funding advocacy towards donors to raise awareness of the coordinated partnership between WASH and NTDs. In this regard, participants said that joint resource mobilization advocacy would be an ideal condition for cross-sectoral collaboration.

"There are some projects that need joint mobilization, joint planning but when it comes to mobilize funds for this project, it is the problem. Each agency/ institutions, it is supposed to mobilize funds for its own activities not for the others activities and that's also the challenge" (P12).

The purpose of improved advocacy is to leverage support from both sides to engage policy-makers and donors on issues of joint concern for WASH and NTD programmes. Once the donor environment begins to change, government and affiliated organizations can start to prioritize multisectoral collaboration with appropriate funding and resources.

Participants said that advocacy speaks to donor priorities such as value for money needed across programmes for cross-sectoral collaboration emphasizing that once the donor environment begins to change, organizations and government institutions can begin to prioritize multisectoral collaboration with appropriate funding and resources.

ii) Ministerial joint activities

By joint activities, respondents related to the different ministries that potentially need to be included in the NTD and WASH programmatic collaboration at the country level through proven and understandable synergies. Moreover, the Water and Sanitation Sector Working Group composed of the relevant ministries, donors, and NGOs meets regularly. The only issue is that the NTD programme has not yet introduced the idea of integration for NTD control to all stakeholders. Both the NTD staffs interviewed gave an example of how the Ministry of Health does not reach refugee camps for the deworming campaign as it is the role of the Ministry of Disaster Management and Refugee (MIDIMAR) to implement such activity.

iii) Research and Mapping

NGOs mainly focusing on WASH interventions complained about not being able to measure the impact they are making in reducing NTDs. There is no forum at national level that could coordinate all NTD and WASH communications but at least for capacity building and training, dialogs have begun. Research between the WASH and NTD sector was also among the main ideal conditions for multi-sectorial partnerships because participants explained that it would help to identify gaps, barriers, and technical obstacles to collaboration and in a direct manner improve efficacy and impact of WASH and NTD control programmes.

*"I don't think many WASH stakeholders do follow up on previous researches that have been done on NTDs in the countries so that they get informed even on the design of behavior change communication messages that are given to communities" (*P5*).*

One key example discussed was investigation of a deeper understanding of the role of WASH on reinfection patterns, and associated cost-benefit of WASH interventions for NTD prevention being useful for policy and planning of MDA and for advocacy. It was speculated from the interviews that both the WASH and NTD sectors conduct mapping through data collection. Mapping within the WASH sector has been largely done at the program level by NGOs or at the national level by surveys but without a shared value to NTDs and few NGO program managers felt that this would be a vice versa situation.

CHAPTER 5: DISCUSSION OF THE FINDINGS

Strengthening intersectoral collaboration and partnerships for sustaining elimination of WASH-related NTDs in endemic countries like Rwanda involves a multiplicity of factors and domains. Within the landscape of current coordination structures existing between the NTD and WASH activities, stakeholders at national and district levels mentioned barriers to be related to specific organizational implementation climate, limited resources, lack of communication strategies and poor planning processes. Opportunities and possible ideal conditions for collaboration were identified around four general domains: Advocacy; capacity building; research; policy and communication; mapping.

Results from this study have shown that the will of government ministries to engage WASH stakeholders for NTD control is high. The Government of Rwanda (GoR) has prioritized water and sanitation, and stakeholders throughout the government see WASH as a critical component of national development (MININFRA, 2009). The study findings suggest that in order to fasten integrated and intersectoral approaches, the strength lies in existing Health and WASH policies, strategies, campaigns and collaboration approaches. Past collaboration between the WASH and NTD sectors at various levels has met with mixed results. There is a perception that, if WASH achieve a higher profile with government and donors and if we can show that it is feasible to intervene for NTD control, funds will flow and control will follow. Therefore, as endorsed by the WHO roadmap for NTDs, access to safe WASH services are key for the prevention, intensified control, management and elimination of NTDs by 2020 (WHO, 2012).

The study found that the government has put in place guidelines and policies to strengthen partnerships among government and international organizations and the health sector in general. The approved National Health Policy has emphasized the strengthening of WASH interventions. This has immense advantages not only for the health system which is struggling to eliminate water-related diseases but also helps to encourage the involvement of stakeholders like NGOs in the provision of water and sanitation services. The importance of government commitment in improving and strengthening the health system for the control NTDs was also supported by Ndayishimye and others (Ndayishimiye et al., 2014) who explored the factors that shaped the feasibility and acceptable success of integrated NTD control in Burundi. These authors found that the intersectoral work plans and technical support from WASH would be the next steps to achieve an effective coordination of multidisciplinary activities.

Additionally, we learnt from this study that NTD guidance to the WASH sector is required to inform planning, resource mobilization, and specific WASH interventions targeted to endemic districts. It is therefore important that roles and responsibilities of the different stakeholders be carefully defined and that close collaboration and communication are ensured to avoid duplication of efforts. Failure to involving all stakeholders in the planning process happen to be the weakness of the NTD sector. In the organizations where our study took place, this was supported by a number of stakeholders who focus on water and sanitation activities at all levels. These findings are consistent with the findings of other authors (Campbell et al., 2017, Johnston et al., 2015, Gyapong et al., 2010) who also support interactive discussion on NTDs and WASH programmes and their joint implementation. They argue that implementation climate at organizational level is either an opportunity or threat to a better collaboration at all government levels. It must however, be noted that each level is tasked with a different activity where for example the district is considered as an implementation agency of already approved policies.

To explore the areas of collaboration, we based on the two-day roundtable that brought together WASH and NTD experts. This Roundtable dialogue was a part of an ongoing series of discussions between the WASH and NTD control sectors in 2012. The goal of the dialogue was identifying opportunities for collaboration and ensure progress towards overlapping goals. The study found that creating a forum that would be in charge of utilizing existing research and explore new research opportunities to enhance the evidence base of effective NTD prevention and control programming and its link to WASH. Information sharing is key as it shows that the intersectoral approaches are acceptable and practical as potential interventions for NTD control. It is also an indicator of government commitment. Encourage the inclusion of organizations from other sectors including health, WASH and education to participate in national taskforces for NTDs. Advocate for WASH in these forums, recognizing it as a foundation of health and necessary for the prevention and control of NTDs. Reinforce the communication channels by making them two-way.

A study done in Bangladesh (Zhang et al., 2010) showed that joint activities should bring together WASH and NTD actors at national and local levels. This was also one of the areas of collaboration in our study as participants mentioned joint activities as a way forward to multisectoral collaboration. Further, a number of areas for consideration to assure the multisectoral collaboration and potential synergy of these two sectors was discussed by participants in the study. Few of them can also be found in the paper WASH: The Silent Weapon against NTDs a joint publication between WaterAid and the NTD Stakeholders

Network (Savage et al., 2012). An opportunity to identify infrastructure-related capacity needs, inform programming, and align WASH and NTD sector goals lies in joint data collection, monitoring and mapping. The NTD sector should build on foundation activities such as mapping to inform integrated program planning, implementation and sustained NTD prevention and control. Freeman et al. discuss integration of NTD and WASH initiatives and describe the importance of stakeholders having a common goal and understanding the impact integration can have on health outcomes (Freeman et al., 2013). The challenges of working multisectorally are well recognized and are not unique to the WASH sector in Rwanda. Another current research study that focused on challenges and opportunities associated with integrated global health programmes specifically WASH and NTD integration and collaboration is supported by the findings of our study analysis (Teague et al., 2014).

One of key impediments to collaboration is the mismatch in sector objectives. The NTD community looks for reductions in disease prevalence, while WASH actors are accountable to improve access or coverage. It is proposed that the WASH sector's current work contributes to intestinal parasites control, thus the NTD sector can contribute to increased advocacy for more funding in WASH to ensure that wash coverage is scaled up. I would suggest that rather than trying to persuade one another to adopt the other's target and goals, joint objectives can be developed. As it was shown earlier, WASH organizations' ability to target implementation is often limited first by donor restrictions, suggesting funding advocacy towards donors to raise awareness of the coordinated partnership between WASH and NTDs. It can be proposed that the Rwanda water and sanitation sector working group (SWG) be tasked to conduct this exercise. In practice, the SWGs need to identify interventions and activities that would help define current data with the aim of strengthening quality and availability of information in order for donors to support integrated programmes, there needs to be evidence of the impact.

Implications on Research, Programmes and Policy

Most programmes, Non-Governmental Organizations (NGOs) and partners interested in NTD control activities are governed by specific disease goals. Previous information on integration through systematic reviews has shown that there are areas where programmatic collaboration for NTD control is possible and areas where it is not. Therefore, it is necessary to initially set an overall and more unifying national goal to foster integration.

A multiplicity of stakeholders engages in hygiene promotion in communities and in schools, and these programmes offer potential platforms to which NTD control can be added at marginal cost. Hygiene promotion and behavior change are a comparatively weak component of the

WASH approach as cite by some interviewees. The government of Rwanda can explore this weakness and put organizational policies in place. A policy implication is to develop guidelines for Rwanda to determine whether they move forward integration or continue with morbidity control. The results of this study suggest that the CFIR might be useful frame identifying barriers at organizational level. Future research could examine diverse determinants at community levels including health centers at district level. This study also highlights the significance of communication in promoting collaboration. Future studies could explore communication strategies that would match and make the communications for both programmes easier and effective.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusion

As NTDs are associated with unsafe water and sanitation, their prevention, control and elimination will depend on overall improvements in WASH-related projects. There must be increased advocacy for and awareness among policy-makers of development projects that foster successful programme implementation. Through expanding and enhancing WASH interventions for NTD control, it is feasible for both sectors to take an integrated approach to both health and development contexts. However, the NTD control programme requires extra efforts and discussions to reach a coordination with all WASH stakeholders.

People involved in WASH and NTD programmes should work closely together, in a coordinated manner. Discussions will address coordination, government commitment and ownership, partnerships, planning, advocacy and resource mobilization. In order for this to happen, this study identifies on a national level, areas of collaboration that are in line with the global strategy for NTD control. The multi-sectoral collaboration of WASH with NTD control intervention will not be a rapid solution but a feasible one and a lasting one.

6.2. Recommendations

i. Advocate collectively by bringing government stakeholders and NGOs together to promote WASH as the main strategy for NTD control.
ii. Identify opportunities of collaboration together basing on mapping and research data
iii. The benefits of collaboration for each sector need to be clearly established and articulated, and common goals institutionalized in national policies. WASH platforms are recommended to incorporate NTD-specific indicators and messages to identify mutual benefit

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APPENDICES

APPENDIX A: Participant Information Sheet

The University of Zambia
School of Public Health
Department of Health Promotion, Economics and Health Policy
BOX 50110
Ridgeway
Lusaka

Research Project Title: Feasibility of collaboration between Water, Sanitation and Hygiene (WASH) and the Neglected Tropical Disease (NTD) control programmes in Rwanda

Principal Investigator: Ms. Sharon Mukankaka

Hello, my name is Sharon Mukankaka and I am a student at the University of Zambia, School of Public Health. I am currently conducting my research project under the supervision of Dr Hakibasa Halwiindi and Dr Joseph Mumba Zulu where I will be exploring and outlining barriers and opportunities of collaboration between WASH programme and NTD programme. We know that collaboration between NTD control programme and stakeholders in WASH is a critical next step that will help the country to reach the goal of eliminating the common neglected tropical disease (NTD). Hence it is very important for you or another person in your department to be part of this project to promote coordination among sectors related to WASH and/or NTD collaboration and coordination.

Aims of the study

This study will investigate the feasibility of collaboration between NTD and WASH programmes in order to identify barriers to widespread collaboration and make recommendations about ideal conditions and best practices critical to future programmes. You have been invited to take part in this study because you are among implementers of the programme who are willing to initiate collaboration between NTD and WASH programmes and can apply the results to create conditions for more effective programmes and mitigate barriers to success. Donor agencies should consider funding more collaborated efforts to further test the proof of principle, and additional support from national and local governments is recommended if collaboration efforts are to succeed.

Study procedures

If you agree to take part in this study, you will be first required to sign a consent form that shows you have given your permission. An interview will be conducted where you will be asked questions, notes will be taken, your responses will tape recorded and in case you don't want to be tape recorded, then the responses will be hand written. If at any point you feel that some of the questions being asked are too sensitive or personal you are free not to answer them. A transcript of your answers will be read back to you at the end of the interview for you to confirm that what has been written is true. The interview will take about 45 minutes to 60 minutes to complete.

Confidentiality of the study records

All the information that you provide will be kept private at all times and will only be used for the purposes of this study. The information will be stored in a locked cabinet belonging to the Principal Investigator. All electronic data will be saved on the principal investigator's personal computer which is password protected. All the study records will be kept safely by the principal for a period of one year (1) after the study and destroyed thereafter. At no point of the study will your name be used or made public.

The results of this study may be published in scientific journals and presented at scientific and professional conferences. However, they will not contain any names or identifiers of the study participants. The results of the study will be available to you upon request.

Risks

We do not think that you will have any major problems from taking part in the study. However, some of the questions that will be asked during the interview may be sensitive and may cause

some emotional stress. In such a circumstance you are free to ask the interviewer to skip these questions. Additionally, some of the information if traced back to you could affect your position at your work place. To prevent this from happening you will be assigned a unique identification number that will hide your true identity.

Benefits

There are no direct benefits that will accrue to you individually by participating in this study. However, by participating in this research, the information you provide will be used to improve both the intersectoral collaboration, opening doors for future opportunities tailored towards your area and other similar settings.

Right to withdraw from the study

You are free to choose whether or not you would like to take part in the study. Participation is voluntary, if at any point of the interview you feel like withdrawing from the study you are free to do so without giving any reason. You will not be in any problems if you decide not to participate.

Questions regarding the study: If you have any questions about this study: please contact

1. The Principal Investigator, Sharon Mukankaka via post University of Zambia, Ridgeway Campus, P.O. Box 50110 Lusaka, Zambia, on telephone +260950877255/ +250785675282 or via email (sharon.muky2013@gmail.com)
2. If you feel that Principal Investigator and her team conduct the study in a way that is illegal or likely to cause you harm you should contact the Chairperson of the Biomedical Research Ethics Committee at University of Zambia, Ridgeway Campus via post P.O. Box 50110 Lusaka, Zambia, on telephone at +260-1-256067 and email unzarec@zamtel.zm or the local supervisor to the principal investigator Dr Eugene Ruberanziza**,** +250 78 830 6388, Email address: ruberanzizaeugene@gmail.com/ eugene.ruberanziza@rbc.gov.rw.
3. The chairperson of Rwanda National Ethics Committee (RNEC) Dr Jean-Baptiste Mazarati will be contacted for the case of rights of the participants, Tel: +250 788309807 or the secretary of RNEC Dr David Tumusiime will be contacted on +250788749398 when there is a problem related to your rights in the study.

Do you have any questions? Thank you for taking the time to read this!

Ms. Sharon Mukankaka, lead Investigator.

APPENDIX B: Consent Form

Project title: The feasibility of collaboration between Water, Sanitation and Hygiene (WASH) and the Neglected Tropical Disease (NTD) control programmes in Rwanda.
Principal investigator: Sharon Mukankaka

What does your signature on this consent form mean?

It means that you have read and understood the subject of the information sheet dated .....…..... for the above study, asked questions and all of your questions have been answered to your satisfaction.

You understand that taking part in this study is voluntary and you are free to withdraw at any time, without giving any reason and without your medical care or legal rights being affected. If you feel some of the questions are too sensitive or personal you can skip them without giving any reason.

You understand that the information you provide may be looked at by responsible individuals from University of Zambia and that you give permission for these individuals to access your records.

I agree to take part in the above study.

_____	_____	_____
Print name of Participant	Signature of Participant	Date
_____	_____	_____
Print name of Person Obtaining Consent	Signature of Person Obtaining Consent	Date

For more information contact the Principal Investigator, Sharon Mukankaka on +250785675282 or via email Sharon.muky2013@gmail.com or the local supervisor Dr Eugene Ruberanziza RBC, +250 78 830 6388 Email address: ruberanzizaeugene@gmail.com/ eugene.ruberanziza@rbc.gov.rw. The chairperson of Rwanda National Ethics Committee (RNEC) Dr Jean-Baptiste Mazarati will be contacted for the case of rights of the participants, Tel: +250 788309807 or the secretary of RNEC Dr David Tumusiime will be contacted on +250788749398 when there is a problem related to your rights in the study.

APPENDIX C: Interview guide

Title: FEASIBILITY OF COLLABORATION BETWEEN WATER, SANITATION AND HYGIENE (WASH) AND THE NEGLECTED TROPICAL DISEASE (NTD) CONTROL PROGRAMMES IN RWANDA

- **Participant Information**

Name of the organization:

Job title:

Role in the programme:

Expertise:

Interview log

	VISIT 1	VISIT 2	VISIT 3
Date			
Interviewer's comments			

Instructions

(For the Interviewer)

Participants must read through, understand and sign the consent form provided before they participate in the interview. Remember to probe and get concrete examples. Let the informant speak at length and make sure that you use this only as a true guide in the interview process, and not as a list of questions to be covered one after the other.

(For the Interviewee)

After the completion of the consent process which explains the study in detail and gives us permission to discuss with you, you are requested to provide answers to all the questions, if uncomfortable you may move to other questions. The interview will last about an hour. Please note that we shall be recording the information for our analysis. In case you feel there is anything that is important that has not been highlighted feel free to bring it up during the interview.

Before we start the interviews do you have any questions that you would like to ask?

Interview Guide questions:

Domain	**Guiding question**
Intervention Characteristics	1. Can you tell us in detail on the NTD programme is structured in Rwanda? • When this program started? / how mature is this program? • Who funds the programme? 2. I would like to get your opinion on the collaboration between WASH and NTD programme in this country. 3. What is the general level of receptivity in your organization to implementing the intervention (Multi-sectorial collaboration)? • Why? Is there a strong need for this intervention? Why is a new strategy needed? why not? o Do others see a need for the intervention? • How essential is this intervention to meet the needs of the individuals served by your organization or other organizational goals and objectives? 4. To what extent a new idea of intersectoral collaboration is attractive to program deliverers? 5. How did the idea of collaboration between this program and other stakeholders start? 6. What do you perceive as positive or negative effects of the collaboration idea on organization and NTD program in general?
Individual Characteristics	7. Who are the key individuals to get on board with the intervention of eliminating NTDs through a collaboration of WASH partners? 8. Who are the key influential individuals to get on board with this implementation? 9. How will the intervention fill current gaps?

	• To what extent do current programmes fail to meet existing needs? Will the intervention meet these needs?
Inner setting	10. How hard is it to implement the intersectoral collaboration between NTD and WASH sectors? 11. In collaboration with its partners' RBC, can you describe the plan for implementing the multisectoral collaboration? • How detailed is the plan? Who knows about it? Is the plan overly complex? Understandable? Realistic and feasible? • What is your role in the planning process? • Who is involved in the planning process? What are their roles?
Outer Setting	12. Are there open communication channels between the different stakeholders? 13. What do you think are the advantages of the collaboration? 14. According to you, in which way collaboration between WASH and NTDs stakeholders can be strengthened? 15. What do you think is the quality of outcomes from of the collaboration between your program and other stakeholders?
Implementation process	16. What barriers or challenges is program(s) encountering in collaboration with WASH program? 17. Multi-sectorial collaboration is complex; what are some examples of unforeseen challenges in coordination with different partners and solutions for overcoming them? **Possible areas of engagement and collaboration** • What would ideal conditions be in order to improve coordination activities • How are these activities decided upon? • What processes in headquarters or field offices?