

**INTERGRATION OF WATER SUPPLY AND  
MUNICIPAL LAND USE PLANNING IN LUSAKA  
CITY, ZAMBIA**

**BY**

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## **DECLARATION**

I, **Martin Mulenga**, do hereby declare that this dissertation is my own work to the best of my knowledge and that it has never been produced or submitted for any degree, diploma or other qualification at the University of Zambia or any other university for academic purposes. I further declare that all other works of individuals used in this research have been duly acknowledged.

**Author's Signature**.....

**Date**.....

***MARTIN MULENGA***



**DEDICATION**

**To Comfort, Zendaya and Tiffany Mulenga**

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## ABSTRACT

This study aimed at assessing the integration of water supply and municipal land use planning in Lusaka City. The study was guided by three objectives, which were to determine how water supply managers and municipal land use planners integrate water supply and land use plans in Lusaka City, to identify the barriers faced in the integration of water supply and land use plans in Lusaka City and to assess the level of integration between water supply plans and municipal land use plans in Lusaka City. A total of 22 key informants were interviewed using interview guides. Informants were purposively selected, then using a snowball selection approach, additional individuals to participate based on the recommendations of their colleagues was requested. The key informants comprised professionals responsible and involved in water supply and municipal land use planning in Lusaka City. These were selected from Lusaka City Council (LCC), Lusaka Water and Sewerage Company (LWSC), Ministry of Local Government (MLG), Ministry of Water Development Sanitation and Environmental Protection (MWDSEP), and Water Resource Authority Management (WARMA). Collected data was coded and analyzed using thematic and content analysis.

The results of the study indicated that, urban planners and water supply managers in Lusaka City are set by legislation to integrate water supply and land use plans through cross sector involvement, consultation, collaboration and taking into account the requirements specified under the legislations governing both sectors when developing plans. However, there has been lack of cross sector involvement and consultation, poor collaboration, less consideration of cross sector requirements and water-land use interaction in the development of plans, especially municipal land use plans. Water supply and municipal land use plans have been prepared in a silored manner. Main barriers leading to this were institutional and personnel behavioral in nature. Institutional barriers were grounded mainly on differing, fractured and fragmented legal and institutional governance structures of water supply and municipal land use planning in the city, whereas personnel behavioural barriers were grounded on differing professional perspectives, interest and education backgrounds; limited knowledge and lack of care and attention to integration and water-land use interactions. The study further revealed and concluded that, integration of water supply and municipal land use plans in Lusaka city was not happening. The need for integration was only emerging then.

In view of the aforementioned, the situation on the ground was posed to have far-reaching and increasingly undesirable consequences/developments if not addressed. Thus, remedying required innovative ways of allocating responsibility, accountability, and innovative structures for the coordination and management of sectors. It also required shifts in professional cultures, which might be realised through education and training

**Key Words:** Water Supply, Land Use, Planning, Integration, Collaboration, Lusaka

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## **Abbreviations And Acronyms**

<b>CBD</b>	Central Business District
<b>CSO</b>	Central Statistics Office
<b>IDP</b>	Integrated Development Plan
<b>IWRM</b>	Integrated Water Resource Management
<b>JICA</b>	Japan International Cooperation Agency
<b>LCC</b>	Lusaka City Council
<b>LWSC</b>	Lusaka Water and Sewerage Company
<b>MLG</b>	Ministry of Local Government
<b>MWDSEP</b>	Ministry of Water Development Sanitation and Environmental Protection
<b>NWASCO</b>	National Water and Sanitation Council
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>UNZA</b>	University of Zambia
<b>URPA</b>	Urban and Regional Planning Act
<b>WARMA</b>	Water Resource Management Authority
<b>WSSA</b>	Water Supply and Sanitation Act
<b>ZEMA</b>	Zambia Environmental Management Agency

# CHAPTER ONE

## RESEARCH BACKGROUND

### 1 Introduction

The globe is experiencing escalating pressures and challenges regarding the provision of sustainable water supply in many cities. The said pressures and challenges range from a decline in water quality and quantity due to increased land use activities and transformation, ongoing population growth through to climate change impacts (Hurlimann & Wilson, 2018, Serrao-Neumann et al., 2017; Fu & Tang, 2013). Correspondingly, Cisneros et al., (2014) indicate that increased activities on land and land transformations generate hydrologic and water quality changes that significantly impact water supply in urban settlements. In light of that, integration of water supply and land use planning have been suggested as a key to facilitate sustainable city's land use/transformation in a water-sustainable manner (Li, Li & Endter-Wada, 2016). Serrao-Serrao-Neumann et al., (2017) note that integrating water supply and land use plans is essential to both enhancing and supporting urban systems in the continuation of existence while reducing their effects on water resources and supplies. Added to that, the approach is known to lead to greater resiliency and reliability, optimization of infrastructure, sustainable community development, and economic growth (Paulson et al., 2017; Desouza & Flanery, 2013).

In view of the above, countries around the world have adopted the alluded to approach as guiding principal to water supply management and land use planning in their cities (Plummer et al., 2011). The adoption, as noted by Fidelis and Roebeling (2014) has required significant reforms, leading to adjustments in water supply/land use policies, planning approaches and water supply/land use legislations (Lieverink et al., 2011). The imprint and expression of water supply and land use planning integration approach in Zambia is enshrined and traceable in the national development policy, the Water Supply and Sanitation Act (WSSA), the Water Resource Management Act (WARMA) and the Urban and Regional Planning Act (GRZ, 1997, GRZ, 2015; Wragg & Lim, 2015; GRZ, 2017). However, it is most notable that the integration of water supply and land use planning comes with its own challenges which vary from context to context (Carter, Kreutzwiser & de Loë, 2005). Besides that, Fedak et al., (2018) posit that despite the widespread appeals and adoptions in many cities, the pathway for water supply and land use planning integration has not always been clear.

In Lusaka City, the capital of Zambia, land use planning is conducted by the local planning authority- Lusaka City Council (LCC) while the management of water supply in the city has been commercialized and is being handled by the commercial utility company called Lusaka Water and Sanitation Company (LWSC). Regardless of this arrangement, both institutions are set and required to assimilate their planning domains and operations to ensure efficiency, effectiveness and water-land use sustainability in the city. However, in the face of the city's rapid population growth and urbanization, coupled with cumulative environmental challenges attributed to climate change (LCC & ECZ., 2016), Lusaka city has seen an increase in land use decisions, activities and conversions with implications on water quality and quantity (Nkhuwa et al., 2015; Chandipo, 2014) which distresses water reserves and in turn supply. Examples of these, have been citing of land use developments in hydrologic sensitive areas like underground recharge zone areas, marshlands and river banks (Nkhuwa et al., 2015). Besides that, the city has been experiencing lagging water supply services or connections especially in new development areas (Simukonda et al., 2018), which ostensibly leads to heightened on site sanitation and self-water provision (boreholes) especially in new development areas (Nkhuwa et al., 2015; Ndongwe, 2013). Furthermore, the city has been witnessing infrastructure and property encroachment cases such as siting properties/plots on top of water supply pipes or installation of water supply pipes under committed properties/plots (Ndongwe, 2013), especially in new development areas as well as low quality of urban development and service delivery in relation to water supply services. These factors, among others question the effectiveness of water supply and land use planning integration in the city of Lusaka, thereby instigating the need to understand how water supply and municipal land use plans are integrated, the challenges faced and the need to assess the level of integration between water supply and municipal land use planning in the city of Lusaka.

## **1.1 Problem Statement**

Appeals for integrating water supply and land use planning have been frequent, emphasized and acknowledged in Zambia (Chandipo, 2014; Nkhuwa et al., 2015; GRZ, 2015). Additionally, the requisite for collaboration between water supply and land use planning spheres is clear (NWASCO, 2018; Nkhuwa et al., 2015). However, the actual integration of water supply and land use planning in Lusaka City seems problematic and leaves much to be desired. Indications pointing to this inference are increased incidences of unsustainable use and allocation of land, vis a vis, water supply exhibited through

various land use decisions with deleterious implications on water sources, quality and quantity; heightened and uncoordinated self-water supply especially in new municipal initiated development areas; and finally, increased cases of unoptimized infrastructure exhibited through various encroachment cases such as siting properties/plots on existing water supply lines or installing water supply lines under already allocated properties or plots (Chandipo, 2014; Ndongwe, 2013; Nkhuwa et al., 2015). In view of the aforementioned issues, the researcher was yet to come across research that had interviewed practicing water supply managers and municipal land use planners on how they integrate water supply and municipal land use plans and assessed the level of their integration in Lusaka City. This study therefore attempted to fill this gap in knowledge by conducting interviews with a range of Lusaka City's experts in water supply and municipal land use planning to find out how they integrate water supply and land use plans, the challenges they face in the process and assessed the level of integration achieved then in land use and water supply planning. Stated as a question therefore, the problem under investigation was: How is the integration of water supply and land use plans done in Lusaka City?

### **1.1.1 Aim of the Study**

The aim of this study was to assess the integration of water supply and municipal land use planning in Lusaka City.

### **1.1.2 Research Objective**

1. To determine how water supply managers and municipal land use planners integrate water supply and municipal land use plans in Lusaka City.
2. To identify the barriers faced in integrating water supply and municipal land use plans in Lusaka City.
3. To assess the level of integration between water supply plans and municipal land use plans in Lusaka City.

### **1.1.3 Research Questions**

1. How do water supply managers and municipal land use planners integrate water supply and land use plans in the city of Lusaka?
2. What are the barriers faced in the integration of water supply and municipal land use plans in Lusaka City?

3. What level of integration is being achieved between water supply plans and municipal land use planning Lusaka?

## **1.2 Significance of the Study**

The results of the study will provide contextual details on the state of water supply and land use planning integration in Lusaka City, as well as the challenges being faced in the process. This will help water supply and land use planners/agencies/authorities, policy makers and other stakeholders in water and land use management to develop viable integration policy interventions, options or procedure to effectively harmonize water supply and land use planning, thereby enhancing sustainable water supply and city development. Furthermore, the results of this study will also be of much use to city land use planners and water managers as it will review current practical insights of water supply-land use integration in Lusaka, what is missing and what can be done, which will better their understanding and enhance their practices. Besides that, it is also hoped that, the findings of this study will provide a contribution to the scholarly works on the integration of water supply and land use planning and that this will serve as reference for students, researchers and academicians in future.

## **1.3 Organisation of the Dissertation**

This dissertation is divided into six chapters. Chapter one discusses the background and basis of the study. Chapter two discusses the relevant literature related to this study and the theoretical foundations of water supply and land use planning integration, while Chapter three describes the study area in terms of the location and size, drainage, climate, population, and socio-economic activities. Chapter four presents the research methodology employed in terms of research design, sample size and sampling procedure, data collection methods, data presentation, analysis and limitations. The study findings are presented in chapter five, with their discussions following in chapter six. Both are presented from a perspective of how municipal land use planners and water supply managers integrate water supply and land use plans in the city of Lusaka, the barriers faced in the integration of water supply and municipal land use plans in Lusaka City and the level of integration is being achieved between water supply plans and municipal land use plan in Lusaka. The seventh chapter looks at the conclusion and recommendations arising from the findings and discussion in chapters five and six.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2 Introduction**

Many scholars have deliberated the integration of water supply and land use planning as being an operative approach to effective, efficient and sustainable city water supply and growth (Gober et al., 2012; Carter, 2007; Bao & Fang, 2012; Niemczynowicz, 1999), yet its implementation and pathway in most urban environments remains unclear and unquestioned (Fedak et al., 2018; Carter, Kreutzwiser & de Loë, 2005; Angelo 2001). This chapter deliberates related literature publications to the study made by other researchers, both in academic and professional practice. The chapter is divided into three subsections. The first section gives an overview of the land use and water supply nexus and the historical approach under which the two have been conceived and conducted. The second subsection looks at what integration of water supply and land use planning is, the tools for integration and the barriers faced in the integration of the two domains. The third subsection gives a synopsis of the water supply and land use planning sector in Zambia, the theoretical underpinnings of the study, case studies of cities where integration is happening, with the last part providing a conceptual framework that was developed to assess the level of integration between water supply and municipal land use plans in the city of Lusaka.

#### **2.1 Land Use and Water Supply Nexus**

There is a connection between land use and water supply. Stoker (2016) study reveals that when land is transformed from its natural state to various uses in any urban environment, water is needed to support the alteration. In urban locations, land use is linked to water supply because additional development of various uses requires additional water to meet the requirement of those uses (Stoker, 2016). Certain land developments require more water than other forms of development. Land development also affects water supply and quality through the transformation of permeable to impermeable surfaces (Baker, 2003). In highly impermeable watersheds, water quality and supplies deteriorate due to pollution runoff from impermeable surfaces. When water supplies become scarce, the relationship between land use and water supply is even clearer; thus urban development is either restricted or supported by the availability of water (Stoker, 2016). Hence it is determined that, activities on land and transformation

to the landscape have a significant impact on water supply and vice versa (Mitchell, 2005). Land use has been identified as one of the key areas capable of disrupting or contributing to sustainable water supply management (Simms, Lightman, & de Loë, 2010). Water quality, quantity and supply issues are generally tied to urban land use (Simms, Lightman, & de Loë, 2010). Thus, land use decisions potentially affect both water quantity and water quality which compromise supply; similarly, decisions regarding water management can potentially affect land use (Lucero & Tarlock, 2003).

## **2.2 Water Supply and Land Use Planning Approaches**

Water supply and land use planning approaches have been conceived out of different scientific contexts (Fidelis and Roebeling, 2014) and the two have typically been developed and historically managed as separate and parallel processes (Serrao-Neumann et al., 2017; Toteng, 2002). The main reasons for this have been organizational and cultural differences between water utilities designed to provide water services to the public and planning agencies designed for land use planning (Gober et al., 2013; Lucero & Tarlock, 2003). Bates (2011, p.7) recognizes and coined this disconnect between water supply and land use planning as a “governance gap - lack of integration in planning processes and a failure to examine and communicate the consequences of both land use and water supply choices at various levels of government”. Behind this scenario as observed by Stoker et al., (2018) have been divergences in the governing bodies, legal mandates, social networks, professional cultures, stakeholder’s priorities, geographies, and finances of responsible departments.

Water management is often seen as the realm of engineers who are focused on the requisite to support future land development and population growth, and are reactive to a consumer base, while land use planning is seen as the realm of land use planners who regulate the use of land and developments to avoid land use conflicts; and whose field is essentially influenced by public values, political and economic interests deliberated in the municipal arena of land use guidelines (Carter et al., 2005; Gober et al., 2013). Besides that, water planning has often been seen as subordinate to land use planning in the sense that water managers seek to obtain water to meet the demands of population growth, and rarely question where or how much growth occurs (Gober et al., 2013). When and where growth happens, water supply managers respond by building new

infrastructure, augment supply, and acquire new water rights (Larson et al., 2013). It is not surprising then that land development has sometimes been allowed to occur in places with uncertain or inadequate water supplies (Gober et al., 2013); and in some cases, existing land uses have been established to affect water sources and raising questions about their future reliability, and water officials are beginning to face the high social, environmental, and economic costs of obtaining water to meet rising urban demands (Bates,2011).

In view of that, many traditional scholars have determined the above traditional approach as being one of the essential factors contributing to urban water problems and unsustainable growth in cities (Serrao-Neumann et al., 2017; Fidelis & Roebeling, 2014; Plummer et al., 2011; Carter et al., & de Loë, 2005; Lucero & Tarlock 2003), a situation posed to have far reaching and gradually undesirable developments in many urban areas if not addressed (Bates, 2011).

### **2.3 Integration of Water Supply and Land Use Planning**

Ideas of integrating water supply and land use planning arose with the advent of sustainable development as deliberated by the United Nations (UN) and consequent efforts to integrate environmental issues into other areas of development planning (Stoker et al., 2018). The idea grew and has been referred to as Water Sensitive Urban Design, Integrated Water Resource Management(IWRM), Integrated Urban Water Management (IUWM), and it is now best captured by the ideals of One Water, including the importance of integrating urban planning and water management strategies (Stoker et al., 2018 p.4). Currently, there is a widespread consensus within urban planning and water community literature that integration of water supply and land use planning is essential for effective and sustainable water supply and urban development (Plummer et al., 2011; Hurlimann & Wilson, 2018; Pahl-Wostl, 2007; Jeffrey, 2006; Lebel et al., 2005). Integration is regarded as being essential to both enhancing and supporting urban systems in continued existing while reducing their effect on water resources and supplies at city region scale (Serrao-Serrao-Neumann et al., 2017., 2017; Paulson et al., 2017). To this effect, the integration of water supply and land use planning has become a guiding principle for water and urban growth management in many cities around the world (Plummer et al., 2011).

Remarkably, the description and connotation of water supply and land use planning integration is often inconsistent between sources and the mode of its implementation is not precise and explicit (Hurlimann & Wilson, 2018; Fedak et al., 2018). Studies by Bates (2011; 2007), explain and connote water supply-land use planning integration as a water conscious land use planning, where land use decisions take into account the source of the required water, and at what cost; a kind where land use decisions are harmonized across jurisdictional boundaries to incorporate the water supply plans/sector. This means the kind of planning in which land use planning is mindful of water supply constraints, and prioritizes development that is most consistent with maintaining water quality and ensuring sustainable supplies. Serrao-Neumann et al., (2017) on the other hand, also explains water supply-land use planning integration in their work as a phenomenon where land use planning mechanisms address land use and hydrological connections in urban areas and their regions. This is due to the reason that urban systems and land use activities are not secluded entities, they depend on and impact water resources and supplies within and beyond their jurisdictional boundaries (Pincetl, 2012; Lin & Grimm, 2015).

Furthermore, Carter et al., (2005) explains integrated planning as the development of policies, programs and activities that consider the relationships between increased development/land uses and the availability of ground and surface water supplies. These activities/policies ensure community's resilience to future challenges and uncertainties (Desouza & Flanery, 2013) in the face of rapid population growth, urbanization and climate change (Brown et al., 2009b), which are anticipated to escalate the frequency and intensity of extreme events that are directly related to water supply such as droughts and floods (IPCC, 2014). Additionally, Serrao-Neumann et al., (2017) further describe the integration of water supply and land use planning as one that takes the whole of land scape perspectives and may be facilitated by emerging land use planning trends such as integrated development planning and values-led planning (Ormerod & Scott, 2013; Faehnle et al., 2014). Thus, the integration of water supply and land use planning among various sources is expressed as an act of efficiently and equitably matching land use developments with their required water supplies in an effective and sustainable manner.

## **2.4 Ways and Means of Integrating Water Supply and Land Use Plans**

Water supply and land use planning occurs mostly at different levels of government, across sectors and with various key stakeholders involved in the process (Carter et al., 2005). To this regard, scholars have pointed out collaboration amongst players in urban planning and water supply management sectors as a prominent form of integration (Healey, 2006; Simms & de Loë, 2010; Stoker et al., 2018; Buekens, 2018). Collaboration is based on the concept that problems need to be managed holistically across a range of physical, political, and socio-economic boundaries (Buekens, 2018). Collaboration incorporates other collective approaches, such as communication, consultation, consensus building, cooperation, and coordination (Margerum, 2011). The efficient deployment of the said collective approaches among players in both sectors during the development of plans, generates collaborative actions that enhance the integration of plans (Stoker et al., 2018), a rationale which informs this study. Beukens (2013) however observed that, while collaboration can be a form of integrating water supply and land use plans, groups can also work collaboratively without integrating all of their goals and actions. This implies that it is possible for water managers and urban planners in Lusaka City to collaborate without integrating water supply plans and land use plans. Gober et al., (2013), on the other hand argues and concludes that, greater collaboration between urban land use and water sectors is a promising first step and means of integrating water supply-land use strategies and achieving more sustainable land and water development patterns in the long run (Stoker et al., 2018). Other than collaborated actions of players in the water supply and land use sector, other scholars indicate that the integration of water supply and land use plans can be achieved through extensive consideration of public input and both sectors planning needs/requirements in the developments of plans (Stoker et al., 2018; Simms & de Loë, 2010; Healey, 2006; Carter et al., 2005).

## **2.5 Tools for Integration of Water Supply and Municipal Land Use Plans**

A number of tools that can be used to facilitate the integration of water supply strategies and municipal land use plans have been introduced (Buekens, 2016). Simms et al., (2010) recognized land use planning as one of the tools that can be used in integrating the two domains. Within land use planning several, mechanisms can be used to ensure integration. These mechanisms include policy frameworks comprising regulatory land

use policies and land use frameworks, regional land use plans, including general development plans and zoning by-laws, municipal subdivision and development regulation and by-laws, public land use policy frameworks and public land use programs (Simms et al., 2010). Besides that, frameworks or procedural guides for ensuring effective integration can also be as tools to aid the process. These could be documents focusing on how to integrate water supply plans with municipal land use plans, and encourages municipalities and water utilities to work across boundaries.

## **2.6 Barriers to Water Supply and Land Use Planning Integration**

While the integration of water supply and land use plans have become the prescribed norm in managing water supply and development in many cities, there are various challenges which hinder its efficient actualization (Buekens, 2013). A number of scholars have looked at integration and provide considerable reasons cited as leading to the failure to acknowledge water supply and land use planning linkages in cities (Gober et al., 2013; Cater et al, 2005; Ivey et al., 2006; Beukens, 2013; Turlock, 2015). The prominent barriers to the failure to acknowledge water supply and land use linkages in cities as identified in literature include different and possibly divergent professional and disciplinary backgrounds, institutions of domain, language and culture of water supply managers and land use planners (Gober et al., 2013; Potter et al., 2011; Hurlimann & Wilson, 2018). This leads to conflicting perspectives and interests which makes collaborative planning difficult, especially on controversial development decisions (Gober et al., 2013).

On the hand, Howes (2017) observed privatization leading to either concentration or fragmentation of water suppliers to be one of the factors contributing to the disjoint between water supply and land use planning. Other common barriers identified in literature include lack of precedents to follow in integrating the two planning domains (Mitchell, 2006), insufficient knowledge about integration, institutional arrangements that do not facilitate integration, and a lack of clear goals and targets towards integration (Beukens, 2013). Furthermore, limitations in time, financial, technical, and human resources have been found to bar integration in many scenarios (Carter et al., 2005; Schulz et al., 2012; Carter, 2007) as well as a lack of tools like procedural guides and institutional authority (Ivey et al., 2006). The cited barriers vary from context to context,

hence Stoker et al., (2018) suggest that it is imperative to understand the contextual barriers to water supply and land use planning integration in a particular environment. This is due to the reason that strategies for promoting integration can only be determined relatively by understanding the factors that impede integration efforts, and then finding strategies that can bridge planning efforts in a given setting.

### **2.6.1 Classifications of Barriers**

Due to citation of multiple barriers as being factors that impede the efficient integration of water supply and land use plans, there has been considerable literature on the classification of factors which inhibit the coming together of agencies and actors in the integration of plans. Based on a review of key literature on policy integration, cooperation and coordination, Stead and Meijers (2009) classified factors that inhibit efforts for integration into five categories. These categories are political factors institutional/organisational factors; economic/financial factors; process, management and instrumental factors; and behavioral, cultural and personal factors. Similar taxonomies observed by Stead and Miljers (ibid) have been published by Ferguson et al., (2013), who classify the factors as cultural, normative, and regulative, as well as by Smith (2014) who classifies factors into those that are substantive, procedural, and administrative. These categories as noted by Stoker et al., (2018) identify similar inhibiting factors noted in categories from other studies which looked at integration efforts to achieve water supply and land use planning integration goals such as leadership, planning, culture/knowledge, economics/financial, and regulation/legislation (Mukheibir et al., 2015). The recurrence of these themes across studies lends insight into consistent barriers for water supply and land use planning integration, and collaboration between water managers and urban planners (Stoker et al., 2018), which could inform or aid strategic interventions. In view of the above, Stead and Meijers's taxonomies of policy integration inhibitors informed the categorization of barriers to water supply and land use planning integration in Lusaka city.

## 2.7 **Zambian Water Supply and Land Use Planning Sector**

### 2.7.1 **Water Supply**

#### 2.7.1.1 **Policy and Legal Framework**

The main documents encompassing the water supply sector policy and the related legal frameworks in Zambia are shown in Table 1

**Table 1: The water sector policy and legal framework**

<b>Policy and Legislation</b>	<b>Major Containment</b>
<b>The Water Act 1948</b>	<ul style="list-style-type: none"><li>✓ Use of surface water resources within Zambia but not applicable to shared water courses</li><li>✓ Distinction of primary and secondary water uses</li></ul>
<b>Environmental Management Act 2011</b>	<ul style="list-style-type: none"><li>✓ Establishment and functions of The Zambia Environmental Management Authority</li><li>✓ Prohibition of water pollution</li><li>✓ Provide for integrated environmental management, protection, conservation of the environment and the sustainable management and use of natural resources</li></ul>
<b>National Water Policy 1994</b>	<ul style="list-style-type: none"><li>✓ The seven sector principles</li><li>✓ Full cost recovery tariffs</li><li>✓ Emphasize the holistic approach to water management</li></ul>
<b>Water Supply and Sanitation Act 1997</b>	<ul style="list-style-type: none"><li>✓ Establishment and functions of the National Water Supply and Sanitation Council (NWASCO)</li><li>✓ Establishment of water supply and sanitation utilities, by local authorities.</li><li>✓ Provision of efficient and sustainable supply of water and sanitation services</li></ul>
<b>National Water Policy 2010</b>	<ul style="list-style-type: none"><li>✓ Review of the 1994 National Water Policy</li></ul>

	✓ Realignment of the water sector's legal and institutional framework with modern international trends
<b>Water Resources Management Act 2011</b>	✓ Establishment of the Water Resources Management Authority
	✓ Provision for water resources management principles

*Source: NWASCO 2014.*

### 2.7.1.2 Institutions Managing Water Supply in Zambia

The major sectors involved in the Zambian urban water supply sector are Ministry of Local Government (MLG) and the Local Authorities (LA), whose responsibility is for water supply and sanitation (WSS) – both in urban and rural, policy guidance, technical and financial control, and facilitating resource mobilization for capital development (Simukonda, 2018). Secondly, is the Ministry of Water Development, Sanitation and Environmental Protection (MWDSEP) whose responsibilities are reflected in its name; National Water Supply and Sanitation Council (NWASCO), which regulates the water supply and sanitation sector, and advises the two ministries on water supply and sanitation issues. Last but not least, as stated by Simukonda (2018) is the Water Resources Management Authority (WARMA), whose main purpose is to serve as the regulatory body for the management and development of water resources in the whole country, ensure equal access to water for the various stakeholders and provision of comprehensive advice to the minister responsible for water on policies for utilization, management and development of water resources.

### 2.7.1.3 Lusaka Water and Sewerage Company (LWSC)

In line with the Local Government Act CAP 281, section 61 part 60 the mandate to provide and maintain water supply in Lusaka City lies with the local authority-Lusaka City Council (LCC). However, Water supply and sanitation infrastructure and services were deteriorating under the management of Lusaka City Council. To address this, commercialization of the water supply and sanitation services was considered as a solution of increasing efficiency and reducing the fiscal burden on the state (Chitonge 2011). Lusaka's water supply and sewerage services were thus

commercialized in 1988, an action which gave birth to a commercial utility company - Lusaka Water and Sewerage company (LWSC). The water infrastructure and water supply responsibility in Lusaka was taken over by LWSC, which started functioning as a limited company in 1990 (Simukonda,2018). Currently Lusaka Water and Sewerage Company is operating as a commercial utility company responsible for managing and supplying water to Lusaka City.

## **2.7.2 Land Use Planning**

### **2.7.2.1 Policy and legal framework**

Land Use Planning in Zambia has been influenced by the Town and Country Planning Act Cap 283 of 1962 which was repealed by the Urban and Regional Planning Act No. 3 of 2015 which is now the principal legislation for urban land use planning. The new Act introduces the concept of a comprehensive 10-year Integrated Development Plans (IDPs) to be prepared for all municipalities. Though IDPs are being rolled out, urban land use (Layout and Master) Plans are available in most Local Authorities as it is a statutory requirement for all Councils to prepare these Plans. Other Legislation that affect land use planning and development include the Lands Act of 1995, Land and Deeds Registry and Land Survey Acts, which are the main pieces of legislation for land administration and management which also determine urban land ownership. The Local Government Act of 1991, Public Health Act, the Environmental Management Act of 2011, Mines and Minerals Act and National Heritage Conservation, Water Supply and Sanitation, and the Water Resource Management Act all have an effect on how urban land should be used and developed.

### **2.7.2.2 Institutions Managing Land Use Planning in Zambia**

The Ministry of Lands Natural Resources and Environmental Protection (MLNREP) is the principal ministry responsible for land administration and for the formulation and coordination of all legislation that is related to land management in the country (Mulolwa, 2016). This ministry has a mandate to administer land and manage natural resources within the ministry's mandate for sustainable land use and climate resilient low emission systems. On the other hand, the Ministry of Local Government (MLG) and through its various local planning authorities is responsible or spatial planning in Zambia. Under the Urban and Regional Planning Act No 3 of 2015, one of the

responsibilities of the Minister of Local Government relating to Spatial Planning is to appoint planning authorities and to delegate these functions to them.

### **2.7.2.3 Lusaka City Council**

Lusaka City Council has been delegated the power to deal with state land, in which they act as agents of the state under the direction of the Commissioner of Lands (Lusaka City Council,2019). Besides that, the City Council, under the general direction of the Ministry of Local Government, is responsible for spatial planning (Land use planning) and controlling the use and development of land in Lusaka City. The Forward planning section in the City Planning Department is in charge of preparation of land use plans for the City, which in general terms involves distribution of land uses, determination of which part of land of the city is to be used for housing, industry, or other urban uses, and which parts are to be retained as open spaces (Lusaka City Council,2019).

## **2.8 Theoretical Concepts that Underpin the Study**

### **2.8.1 Concepts of Integrated Development Plan**

Integrated Development Planning (IDP) is defined as “a participatory approach to integrate economic, sectoral, spatial, social, institutional, environmental and fiscal strategies in order to support the optimal allocation of scarce resources between sectors and geographical areas, and across the population in a manner that provides sustainable growth, equity and the empowerment of the poor and the marginalized” (FEPD,1995, as cited in Harrison,2001. p.185). The key elements of IDP concept that inform this study are participation, strategic focus, integration/holistic approach, prioritizing those in greatest need, and a delivery-orientation approach (Oranje et al., 2000). Participation in this concept is about ensuring that all the relevant stakeholders or affected parties have a say in determining and prioritizing needs, preparing strategies to address them, and monitoring the delivery and outcomes of such strategies. Strategic focus means that planning should have a long-term horizon, and that planning should be focused on those prioritized interventions that will have maximum impact on the development of a locality. A holistic approach implies taking account of linkages between sectors and of linkages between various stages in the planning process (Oranje et al., 2000).

Prioritizing the greatest need and a delivery-oriented approach is about ensuring equitable and practical planning.

### **2.8.2 Integrated Water Resource Management Concept**

Integrated Water Resource Management (IWRM) is a process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment (Global Water Partnership – Technical Advisory Committee (GWP-TAC) 2000). The concept calls for the alignment of urban development and river basin management to achieve sustainability (Bahri, 2012). Integration is the working word in IWRM, as such, it joins various diverse aspects of water management, with many different sectors, stakeholders and institutions, all striving to operate in an integrated and coordinated system (Clausen and Fugl 2001, Braga 2001, Beukens, 2013). This takes into account more coordinated development and management of land use and water supply, surface water and groundwater (GWP, 2004). The IWRM concept is premised on the principles of economic efficiency, equity and ecological sustainability which requires that aquatic ecosystems are acknowledged as users and that adequate allocation is made to sustain their natural functioning.

Operationally, IWRM is a comprehensive, participatory planning and implementation tool for managing and developing water resources in a way that balances social and economic needs, and that ensures the protection of ecosystems for future generations (GWP, 2004). It is an open, flexible process, bringing together decision-makers across the various sectors that impact water resources and supply, and bringing all stakeholders to the table to set policy and make sound, balanced decisions in response to specific water challenges faced.

The successful implementation of IWRM is indicated to rely on three components which include clear national policies that are backed by an enabling legislative and policy environment that sets up and empowers the process. The second component is an appropriate institutional framework that is composed of a mixture of central-local and public-private organizations that provide the governance arrangements for

administering decisions, and the third is a set of management instruments for gathering data and information, assessing resource levels and needs, and allocating resources for use (GWP-TAC, 2004).

Other important conditions for implementing IWRM include an Integrated Basin Management Plan with a clear vision that puts in place ‘rules of the game’ for water management that use IWRM principles; participation and coordination mechanisms, fostering information-sharing and exchange; capacity development and training prioritized at all levels (GWP, 2004). Lenton and Muller (2009) further added sound investments to water infrastructure with adequate financing available – to deliver progress in meeting various water demands and needs.

A key aspect of the IWRM concept that informs this study concerns the linking of water management to land use planning. Thus, in achieving water supply and land use planning integration in Lusaka City, the tenets, operational and implementation requirements of IWRM, which are political will and support via legislation and policies, stakeholder participation, cross sector collaboration, effective information sharing platforms, adequate capacity and resources should be put in place. This can be between institutions responsible for water supply and land use planning in the city.

## **2.9 Conceptual Framework: Factors Facilitating Effective Integration**

A conceptual framework as presented in Table 2 was developed from factors facilitating the integration of water supply with municipal land use planning. This framework was developed using the analysis and synthesis of publications by (Buekens, 2018; Carter et al., 2005; Healey, 2006; Simms & de Loë, 2010; Stoker et al., 2018) to provide an outline of the factors contributing to effective integration between water supply and municipal land use development plans. The framework was used to assess the level of integration between water supply and land use planning in Lusaka. The factors used are: water supply and land use planners/organisation consultation and involvement, Legislation, policy; Resources-human/financial/technical; experience of experts in water supply and land use planning/integration; guiding principle/guidelines for integration; knowledge/education/Skills of the personnel in both domains; presence of lead agency for integration and support networks/information sharing platforms.

**Table 2: Conceptual Framework - Factors Contributing to Effective Integration**

Factor	Level of Integration		
	Low	Medium	High
Water supply and land use planners/organisation involvement and consultation in the development of plans	No involvement and consultation in the planning process of the other.	One party is involved and consulted in the planning process of the other.	Both parties involved and consulted in the Planning process, development, review, and implementation of both plans.
Legislation/Policy	No legislative or policy basis for water supply and land use plan integration.	Legislative basis for water supply and land use planning, policy direction for managing land and water supply.	Legislation / policy mutually supportive and requires consideration between plans, strong authority.
Resources- Human, financial, technical, scientific	Inadequate financial resources, technical expertise and scientific knowledge to build linkages between plans.	Moderate financial support, technical expertise, and scientific information to build linkages between plans.	Adequate financial support, technical expertise, and scientific information to build linkages between plans.
Experience with water supply and land use planning processes/integration	0years	1 – 10 years	Above 10years

Guidelines for water supply and land use plans integration	No policy or guiding framework.	Weak and limited guiding policy and framework.	Strong and adequate policy and guiding framework for integration.
Education/Knowledge/Skill	Little knowledge/understanding of ecological functioning and ties to land use planning	Moderate knowledge/understanding of ecological functioning and ties to land use planning.	Strong knowledge/understanding of ecological functioning and ties to land use planning.
Lead agency that coordinates integration	No chosen responsibility for ensuring integration.	Informal crossover of managers ensuring integration.	Combined panels or managers aware of both plans who ensure integration.
Support networks/Information sharing platforms	No formal platform for facilitating integration and sharing information	Informal linkages and sharing of data	Strong and active platform for facilitating integration and sharing data

**Adapted from Beukens, 2013.**

## 2.10 Conclusion

Many scholars have deliberated the integration of water supply and land use planning as being an operative approach to effective and sustainable city water supply and growth. Many cities have embraced this as a planning principle and approach in the development of water supply and land use policies. Regardless of that, its connotation and mode of implementation is not consistent among sources, but what is most prominent among many sources is that, the integration of water supply and land use planning is about efficiently and equitably matching land use developments with water supply in an effective and sustainable manner. This chapter showed that integration of water supply and municipal land use plans is mostly achieved through collaborated actions of

government, community and non-governmental players in the water supply and land use sector. This approach, however, comes with challenges, some of which are consistent among source and others which varies from context to context. The chapter further provides a range of factors that facilitate and enhance integration as derived from contexts where integration has been happening. A conceptual framework to assess the extent of integration between water supply and municipal land use planning in Lusaka city was thus developed based on these factors.

## **CHAPTER THREE**

### **DESCRIPTION OF THE STUDY AREA**

#### **3 Introduction**

This section provides a description of the study area in terms of location, population and growth/expansion, climate, hydrology, water service coverage, sources, demand and supply, land use and economic activities.

#### **3.1 Location of Study Area**

The study was undertaken in the Zambian City of Lusaka which is part of Lusaka Province. It lies at an altitude of about “1200 metres to 1280 metres above sea level and covers an area of about 360 km<sup>2</sup> of mostly relatively flat relief (Central Statistical Office -CSO, 2010: p. 29)”. The City shares boundaries with Chongwe District to the East, Chibombo District to the North, Kafue to the South East and Chilanga to the South West (UN-Habitat, 2007). Figure 1 on the next page shows the Location map of Lusaka.

#### **3.2 Population and Growth/Expansion**

According to the Central Statistical Office Report (2010), Lusaka City’s total population stood at 1,747,152 which accounted for 79.7 per cent of the provincial population (CSO, 2010: p.27). The report also shows that the City of Lusaka’s annual population growth rate and population density for the inter-censal period 2000 to 2010 were 4.9 per cent and 4853.2 persons per square kilometre respectively. The population is projected to be 2,627,716 and 4,560,560 in 2019 and 2035 respectively (CSO, 2013), thereby showing a high level of urbanization. Population growth and urban influx have strained the ability of the City’s service providers to provide adequate service facilities.

#### **3.3 Climate**

In terms of climate, the average temperature of the city throughout the year is 20.7°C. The average maximum temperature reaches 30.6°C in October, and drops to a minimum of 10.1°C in July. The rainy season lasts between October and April, with a monthly average rainfall of 114 mm. The average annual rainfall over the past 30 years is 802 mm (JICA, 2009).

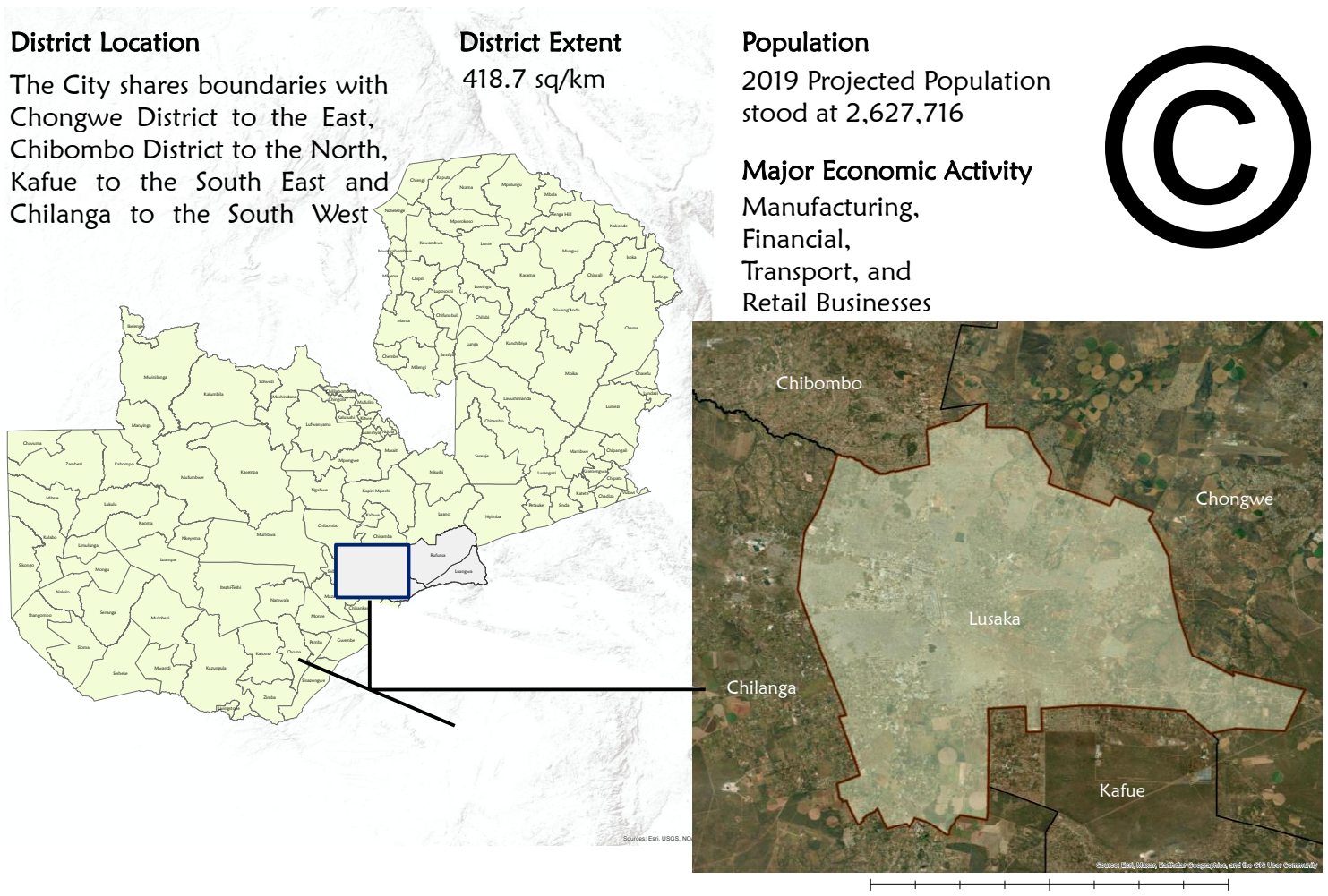


Figure 1: Location of Lusaka City  
 Author, 2019

### **3.4 Hydrology**

#### **3.4.1 Water Resources**

The hydro-geological features of Lusaka City and adjoining areas are characterized by an aquifer having a unique karst, cavities, and fissures formed in soluble carbonate rocks. The City's climatic condition has clear classification of rainy season from November to April and dry season from May to November and which has also influenced the hydro-geological features of the city (JICA, 2009).

#### **3.4.2 Surface Water**

Lusaka City is divided into three drainage basins namely Chongwe, Chunga-Mwembeshi and Kafu-Basins (JICA, 2009). The City only has small-scale rivers and the prominent ones are Ngwerere, Chunga and Chalimbana streams which flow to the North-Eastern and North-Western directions respectively (LCC, 2008). The Ngwerere and Chalimbana streams drain most of the North-East of the City into the Chongwe River, a tributary of the Zambezi River. Other rivers of the City are drained to the Kafue River by the Chunga stream in the North-West and a series of small streams to the south of the City. The Kafue River flows about 50 km south of Lusaka, outside the city boundaries. Water is obtained from the Kafue River at an extraction rate of 10, 500 m<sup>3</sup> /day, to supply the city (Ndongwe 2013).

#### **3.4.3 Underground Water**

The City's underground hydrology is built over a karstic dolomite aquifer comprising an ancient basement complex overlain by limestone and dolomite (JICA, 2009). However, its porous and soluble characteristics render it susceptible to pollution. The water table in Lusaka is generally close to the surface, making the extraction of ground water easy. However, increased rates of urbanization and slow rate of connectivity to piped water supply systems by Lusaka Water and Sewerage has resulted into the exploitation of underground water sources through the construction of private boreholes, thereby exerting enormous pressure on the Lusaka aquifer (LCC, 2008).

### **3.5 Water Service Coverage, Sources, Supply and Demand in Lusaka City**

The level of service coverage is reported to be 70 percent, but those with house connections are only about 30 percent (UN-Habitat, 2007; Lusaka Water and Sewerage

Company, 2014). Lusaka’s water is supplied from both ground- and surface- water sources (Simukonda et al., 2018). Both types of sources are considered to be good, but in some areas the groundwater is polluted by sewage and other contaminants (e.g. solid waste dumps or industrial spills) percolating down to the aquifer. Treatment and disinfection of borehole water is not always adequate and some boreholes are regarded as unsafe sources. However, with proper control of sources of pollution in the recharge areas combined with chlorination of water from Lusaka Water and Sewerage Company’s (LWSC) boreholes, groundwater is considered to be an economic and reliable source of water (Republic of Zambia 2011). More than 116 LWSC’s boreholes within and around the city provide 57percent of the total supply. The remaining 43 percent is surface water abstracted from the Kafue River and treated at Iolanda water treatment plant (WTP), about 50 km from the city (Ndongwe 2013)

### 3.6 Land use in Lusaka City

In terms of land use, the City of Lusaka has ten (10) major land uses with residential being the major land use covering an area of 21,176 hectares of the total city land mass as shown in Table 3 (JICA,2009). Most of these land uses are scattered around the City in conformity with the zoning ordinances of the Doxiadis Plan of 1975 which was the first development plan of the City and was largely anchored on the principles of master planning.

**Table 3: Land Use Categories in Lusaka City**

	LAND USE	HECTARE (HA)
1	Residential	21,176
	I <i>Formal Settlements</i>	6,847
	ii <i>Informal settlements</i>	4,851
	iii <i>Proposed Housing Area</i>	1,155
	iv <i>Small Holdings</i>	8,323
2	Commercial	1,064
3	Industrial	1,350
4	Roads and Utilities	863
5	Institution	1,252
6	Parks and Recreation	415
7	Administration	525
8	Cemetery	319
9	Agriculture	2,856
10	Open spaces	6,373
	Total	57,369

(Source: JICA, 2009)

Inadequate land within the City boundary has constrained the re-development of Lusaka, especially in the peri-urban areas. This has resulted into increase in change of land use and subdivisions especially of farmlands and small holdings into residential uses especially, commercial land various uses (LCC and ECZ, 2016).

### **3.7 Economic Activities**

Lusaka City is one of the major economic centers in Zambia which also provides a significant market for agricultural products from other provinces. Manufacturing, financial, transport, and retail businesses are the most important economic activities in Lusaka. Despite the concentration of economic activities or wealth (value-added) in the city, economic structure is still dominated by the informal sector (UN-Habitat,2007). It is estimated that only “9 percent of the city’s population is engaged in formal employment” (UN-Habitat, 2007 p.12). A major reason for this is that the local economy has been drifting towards the private sector and self-employment since the liberalization of the economy in the early 1990s. The majority of households in Lusaka have been severely affected by poverty, as approximately 70 percent of the population is categorised as being among the poorest of the poor (LCC, 2005b in Hampwaye, 2008).

## **CHAPTER FOUR**

### **RESEARCH METHODOLOGY**

#### **4 Introduction**

This section focuses on the methodology of the study. It presents the research design, selection of the study area, methods of data collection, sampling procedure, sample size, data presentation and analysis, limitations of the study and data validity/reliability.

#### **4.1 Research Design**

This research was exploratory in nature because from the literature available, this was the first time this kind of research was undertaken in Lusaka City. The research employed a case study in order to acquire in-depth knowledge of the study area.

#### **4.2 Selection of the Study Area**

The selection of Lusaka City as a study area was because of it being one of the cities in Zambia with rapid growth rate (3%), high demand for land, coupled with a lot of water supply challenges and heightened on sight/self-water provision. Furthermore, water supply and land use planning in the city is managed under segregated jurisdictions and institutional arrangements. These conditions drove the need for probing how and to what extent the plans of the two domains are integrated and the barriers faced in the process. Additionally, Lusaka City was selected because no comprehensive study had been done in the City to assess the extent of integration between water supply and municipal land use plans in the city.

#### **4.3 Methods of Data Collection**

Both primary and secondary data sources were used in this study. Primary data was obtained by way of interviews with the key informants who included representatives of institutions dealing with land use planning and water supply, and water management in Lusaka City. The interviews were based on the use of the interview guides (refer to Appendix I, II, III, IV, and V for interview guides) which made the interviews flexible and enabled the interviewees to freely express their own opinion. Added to that, the researcher was able to collect rich data from the interviewees. Secondary data was collected by reviewing relevant documents which included published peer reviewed

articles, institutional reports, brochures and records, sector policies, legislations, layout Plans, Google Earth Images and other relevant documents.

#### **4.4 Target Population and Size**

A total sample of 22 key informants were interviewed, this was to attain saturation. Study participants included professional experts responsible or involved in water supply management and land use planning from institutions that deal in water supply and land use planning in Lusaka City respectively. The sample size and population target constituted nine (9) urban planners from Lusaka City Council (LCC)–which had 12 town planners allocated into Lusaka’s 5 zones with a zone having a minimum of two (2) planners. Three (3) Urban Planners from Ministry of Local Government (MLG), four (4) Water Supply Managers from Lusaka Water and Sewerage Company (LWSC), three (3) Water Supply Managers from Ministry of Water Development Sanitation and Environmental Protection (MWDSEP), and three (3) Water Supply Managers from Water Resource Management Authority (WARMA).

#### **4.5 Sampling Techniques**

The initial key informants were selected based on their job title and organizational affiliation. Job titles that included water supply, or water resource management, urban/land use/forward planning or those which connoted expertise in water supply and land use planning were selected first. Then, using a snowball sampling, additional individuals were interviewed based on their colleagues’ recommendations. This sampling method assisted in collecting rich information from key informants that are of central importance to the purpose of the research as the participants were closely linked to water supply management and land use planning in the City.

In view of the aforementioned, Six (6) urban planners from Lusaka City Council (LCC), Three (3) Urban Planners from Ministry of Local Government (MLG), Three (3) Water Supply Managers from Lusaka Water and Sewerage Company (LWSC), Two (2) Managers from Ministry of Water Development Sanitation and Environmental Protection (MWDSEP) and (2) Managers from Water Resource Management Authority (WARMA) were picked purposively.

Whereas Six (3) urban planners from Lusaka City Council (LCC), One (1) Water Supply Managers from Lusaka Water and Sewerage Company (LWSC), One (1) Managers from Ministry of Water Development Sanitation and Environmental Protection (MWDSEP) and one (1) Manager from Water Resource Management Authority (WARMA) were added using snowball sampling.

#### **4.6 Data Analysis**

Data collected in this study was analysed using content analysis, thematic analysis, and Geographic Information System (GIS). Data relating to how water supply and municipal land use plans are integrated was analysed using content analysis. content analysis is a research tool used to determine the presence of certain words or concepts within texts or sets of texts (Colorado State University, 2004). White and Marsh (2006) identify that the notion of inference is especially important in content analysis as it (content analysis) involves making conclusions from the text to the context (research questions). The analytical constructs in this research were derived from existing concepts and practices, the experience and knowledge of experts and previous research.

Data concerning barriers to water supply and land use planning integration, and the extent of integration between water supply plans and municipal land use plans was analysed using thematic analysis. Thematic analysis was used to identify patterns and to group the data into themes. According to Maguire and Delahunt (2017), the goal of a thematic analysis is to identify themes, i.e. patterns in the data that are important or interesting, and use these themes to address the research or say something about an issue. Furthermore, the Geographical Information System (GIS) tool has also used to analyse and present data that was collected from reviewing Google Earth Images and the land use layout plans.

#### **4.7 Limitations and Data Validity**

The main limitation was the physical unavailability of the majority of key informants with long experience in Land use planning in Lusaka City; that is, 5 urban planners from Lusaka City Council due to staff transfers and resignations. In view of that, the researcher had to make several calls to interview some of the long serving urban planners at Lusaka City Council who were recently transferred at the time of the data collection, which had financial and time implications due to their busy schedules in their new stations.

To ensure the validity of the data, thorough notes were kept during the interviews. After the interview, the notes were written into coherent passages summarizing the interviews. These interview summaries were then sent back to the participants to ensure accuracy. At this stage, the participants were encouraged to add new content, and suggest revisions or omissions to improve the quality of the data. Most participants made revisions and clarifications on the interview summaries. To encourage thoughtful and open responses, the research design assured anonymity in the analysis and dissemination of the interview results.

## **CHAPTER FIVE**

### **RESEARCH FINDINGS**

#### **5 Introduction**

This chapter aims at presenting the study findings. To achieve that, the findings have been presented according to the following order of objectives: (i) to determine how municipal land use planners and water supply managers integrate water supply and land use plans in Lusaka City, (ii) to identify the barriers faced in integrating water supply and municipal land use plans in Lusaka City and (iii), to assess the level of integration between water supply plans and municipal land use plans in Lusaka City. Findings under each objective have further been broken down and presented under a number of aspects as evidenced in this chapter.

#### **5.1 How Water Supply and Municipal Land Use Plans are Integrated in Lusaka City**

With respect to how integration is done, the results are presented in terms of means and methods of integration in Lusaka City. Presentation of findings under this objective has been sub-divided into four parts. The section begins by discussing the legislation and policy findings regarding integration of water supply and municipal land use plans in Lusaka City so as to provide a base for the reader's understanding of what is slated and what is actually prevailing on the ground. The findings are then presented under the following order of themes: cross sector involvement and consultation in both plan's development, consideration of cross sector requirements/water Supply-Land use interactions, and finally, collaboration between water supply and land use planning.

##### **5.1.1 Legislation and Policy**

Integration findings with regard to legislation and policy showed that water supply managers and land use planners in Lusaka City follow the provisions of the current water supply and urban planning legislation with regard to ways of integrating water supply and municipal land use plans. The pieces of legislations provide means of ensuring the two domains are adequately integrated. For instance, to ensure integrated planning and decision-making process when preparing land use plans, the principal land use legislation – the Urban and Regional Planning Act (URPA) Number 3 of 2015, demands planning authorities/urban planners liaise with appropriate regulatory authorities (who in this case are the water supply utilities and regulatory bodies,

amongst others) and take into account the requirements/standards specified under the laws relating to water supply.

Besides that, the URPA provides a planning process that requires planning authorities/urban planners to consult water utilities and regulatory authorities responsible for water supply, and have them participate in the preparations of land use development plans. Similarly, the Water Supply and Sanitation Act (WSSA) Number 28 of 1997 also calls for consultation and the need for establishing procedures for consultation between the local planning authorities and the water utilities before any change in land use or zoning is approved by the responsible authority, and before any consent is given for any new development. Furthermore, the Water Resources Management Act (WRMA) number 21 of 2011, provides and calls for harmonisation in the preparation of a catchment management plan with the land use plans of any jurisdiction area to enhance sustainable water extraction and supply. It also demands consultation with the local authority when carrying out land use planning to ensure that no use of land compromises water resource quantity and quality. In view of these legal provisions, one urban planner from Lusaka City Council further explained that:

*The law provides the means and ways of ensuring and going about integration which we the technocrats follow and should follow. For stance, the law stipulates that we attain integration by consulting the water utility company and the water regulatory bodies, and involving them in the preparation of land use plans. The principle behind this is to create a stage or environment where land use planners, water supply managers and regulators could sit down together, provide and ensure that adequate technical advice, inputs and strategies from both ends are assimilated in the plans before they are approved and implemented. Other than that, the act guides direct us to integrate water into land use plans by way of considering and incorporating water supply planning requirements during land use plan preparation and of course through collaborative actions with the utility provider and service regulators during plan preparation and implementation. (Pers Com., 2019a).*

### 5.1.2 Cross Sector Involvement and Consultation in both Plan's Development

Despite the pieces of legislations setting the ways and means of integration and these means being known by practitioners in both sectors, what has been obtaining on the ground is divergent from the ideal or set situation. The study revealed that, there is lack of stakeholder participation and consultation during the development of city plans, especially land use plans. A sizable majority (20 out of 22) of interviewed informants, both urban planners and water supply managers revealed that, land use plans in the city are prepared separately without the consultation and involvement of the water utility company and water supply regulators. One urban planner from Lusaka City Council (LCC) indicated that:

*We are supposed to involve and consult the water utility company when making land use plans to have their inputs into our plans before opening up any land, but this never happens. Land use planning here is and has been done in a separate and less consultative manner with respect to water supply planning especially. Water supply planning in my view is also done separately by the utility company and in most cases, comes after land has been planned, developed and occupied, and we are not involved in that too (Pers Com., 2019b).*

This response resonated with the observations of all the water supply managers from Lusaka Water and Sewerage Company (LWSC) who complained of urban planners at LCC not consulting or seeking their expert input when making land use plans in the city as can be noted in the explanation below:

*Planners at the Council rarely work with us when it comes to land use planning, they do not consult or involve us in the planning process. They do their planning without our input or technical advice (Pers Com., 2019c).*

*Ideally, we are supposed to have consultative and participatory meetings with council planners to have our technical inputs and water supply strategies incorporated into their land use plans and vice versa. The law says so, but it is not practised, Planners at the council have been preparing land use plans in seclusion, we only receive already designed, implemented plans and request to service them, that's when we start finding ways of doing so (Pers Com., 2019d).*

The study findings further revealed that, while the pieces of legislation governing urban planning have to a greater extent stated who is to be consulted and involved in the land use planning, urban planners at LCC generally lack an operational formal criterion for specifying which stakeholders are to be involved in land use planning, a clearly thorough and existing roles for stakeholders, and a strong role for stakeholders in land use planning process. Besides that, there exists no official meetings or platforms for consultation and participation, where specifically both urban planners and water supply managers could develop, review the integrated land use or water supply plans before it is finalized or approved, and where land use planners can use or get the recommendations from a water supply perspective to assist with land use decision making and in development plan creation/updates.

### **5.1.3 Consideration of Cross Sector Requirements/ Water Supply – Land Use Interactions**

When asked about what and how water supply requirements/standards are considered during the development of land use plans, the resounding answer from the majority of informants (20 out of 22) from both sides was that there has been less consideration of water supply and land use interactions and planning standards/requirements in the preparation of plans especially land use plans. Some key informants attributed this to the reason that water supply and land use plans are most often prepared separately and at different time scales. It was further revealed that there has been inadequate explicit and compiled water supply planning regulation or standards which could be easily considered in the development of plans. In view of that, one informant from LCC indicated that:

*There is less attention given to water supply and land use interactions in the developments of plans. The consideration of water supply standards or regulation is practically minimal during the preparation of plans. This is evident and reflective in most of the layout plans we have here. Besides that, there has been fragmented or simply lack of detailed consolidated specifics of standards and regulations pertaining to water supply to consider when preparing land use plans. Of course, we recently got the standards and requirements for boreholes which would possibly be incorporated in the near future plans as we have signed a memorandum of understanding with WARMA to do that (Pers Com., 2019e).*

Another informant from LWSC observed that:

*The consideration of water supply plans and requirements in land use planning is something that is theoretically prescribed, desired and only exists on paper and not in practice. The law prescribes that too, but observing and translating what is written into practice has been the problem in Lusaka (Pers Com., 2019f).*

However, some key informants from LCC indicated that, they, to some extent consider water supply requirement and provide room for water plans in land use planning using what one key informant referred to as “Common and basic knowledge and assumption of water supply in urban areas”. This can be evidenced in the explanation below:

*We use common and basic knowledge and assumption of water supply in urban areas to consider water supply plans and requirements in land use layout plans. It is known that in an urban area like Lusaka, obviously the channel of water supply is piped water from the water utility company. Therefore, with this knowledge at hand, we consider creating wider road reserves as much as possible in any land use layout plan to accommodate space for water supply pipes; and in some cases, we request for water layout plans from the water utility company showing existing water pipes in or near a particular area we intend to work on in order to accommodate them in land use layouts (Pers Com., 2019g)*

Some water supply managers from LWSC shared a similar perspective of sharing existing layout plans in some instances with urban planners at LCC. However, it was observed that the water utility provider has been often used only as sources of existing layout plans for spatial references, not for any technical input in land use plan preparation. In view of that, one water supply manager opined:

*We sometimes share our network layouts with the urban planners at LCC when they request for them to be used as references in planning and vice versa, but in relation to incorporation of sector strategies and requirements, I feel it has to be more than that. There are a number of parameters which are put into consideration when planning for water supply in an area. These factors among others include water sources, terrain of the area, projected demand of the proposed area, land uses and their potential impact on water sources in the*

*area, working spaces, environmental concerns and many more. All these have to be put into consideration and synched with land use plans. In my view, planners at LCC do not comprehensively look at all these in their assessments and surveys, they do in isolation prior to land use plan preparation. They don't consider all these parameters in the development of land use plans. Hence, the more reason we have to work together and do the assessments of proposed development areas together, if possible, rather than just sharing layout plans (Pers Com., 2019h).*

Furthermore, a look at the subdivisions and development approval requirements, and management practices within Lusaka city revealed that attention or focus is more on public health issues/requirements and less on water supply. Failure to indicate the means and sources of water, and other water supply planning essentials do not necessarily limit the approval of proposed development/land application, unless on major developments within development plans which require an Environmental Impact Assessments. Besides that, water supply managers/utility/regulators have no role in the scrutiny of applications for development to determine the suitability of proposed developments with regard to their water supply requirements, unless large scale developments which are also rarely forwarded for their comment as observed by informants from both sectors.

A synopsis of major municipal residential development plans initiated and developed by Lusaka City Council in the past 15 years revealed that none of these development areas had water supply strategies considered or incorporated at the time of their preparation. Besides that, none of them had Environmental Impact Assessment done before their approval and implementation which could have taken care of water supply issues. Informants from LCC and LWSC further indicated and pointed out that land use plans for these areas were developed, approved, implemented and allocated without the consultation or participation of the water utility provider/regulators. Creation of water supply plans have been in line with these developments in these areas, or responding to the increasing demand coming from these areas. Table 3 lists and provides details of these areas, and Figure 4 shows the spatial locations of these development areas in Lusaka.

**Table 4: Major Residential Development Areas Opened in the Past  
Fifteen Years in Lusaka City**

<b>Name of Development Area</b>	<b>Year Planned</b>	<b>Approximate Number of Plots Created</b>	<b>Environmental Impact Assessment</b>
Rockfield	-	1478	Was Not Done
Woodlands Extention	1997	910	Was Not Done
Kamwala South	1997	3100	Was Not Done
Libala South	2002	430	Not Applicable
South of Chilenge South	2005	1354	Was Not Done
Woodlands Extension	2012	910	Was Not Done

Source: Field Data, 2019

Results of the study further revealed that the lack of consideration of water supply plans and requirements/regulations have been most prevalent under public initiated land use planning in the city, that planning is done and initiated by LCC. One urban planner from the Ministry of Local Government observed that:

*We have in the recent past seen a few private led and designed land use plans like those for private housing development schemes coming with the integrated package here and there. Examples of these Housing development complexes are areas like Foxdale Residential Estate and Roma Park whose initial land uses were private farms and were later changed, re-planned (subdivided) into residential developments or housing complexes under private engagements. These areas' land use plans had water supply strategies considered and incorporated in them at the time of planning before they were submitted to the local planning authority, that is LCC for approval. However, for public development plans and areas that are planned by the local planning authority-LCC, there has been lack of consideration of water supply strategies and planning requirements (Pers Com., 2019 i).*

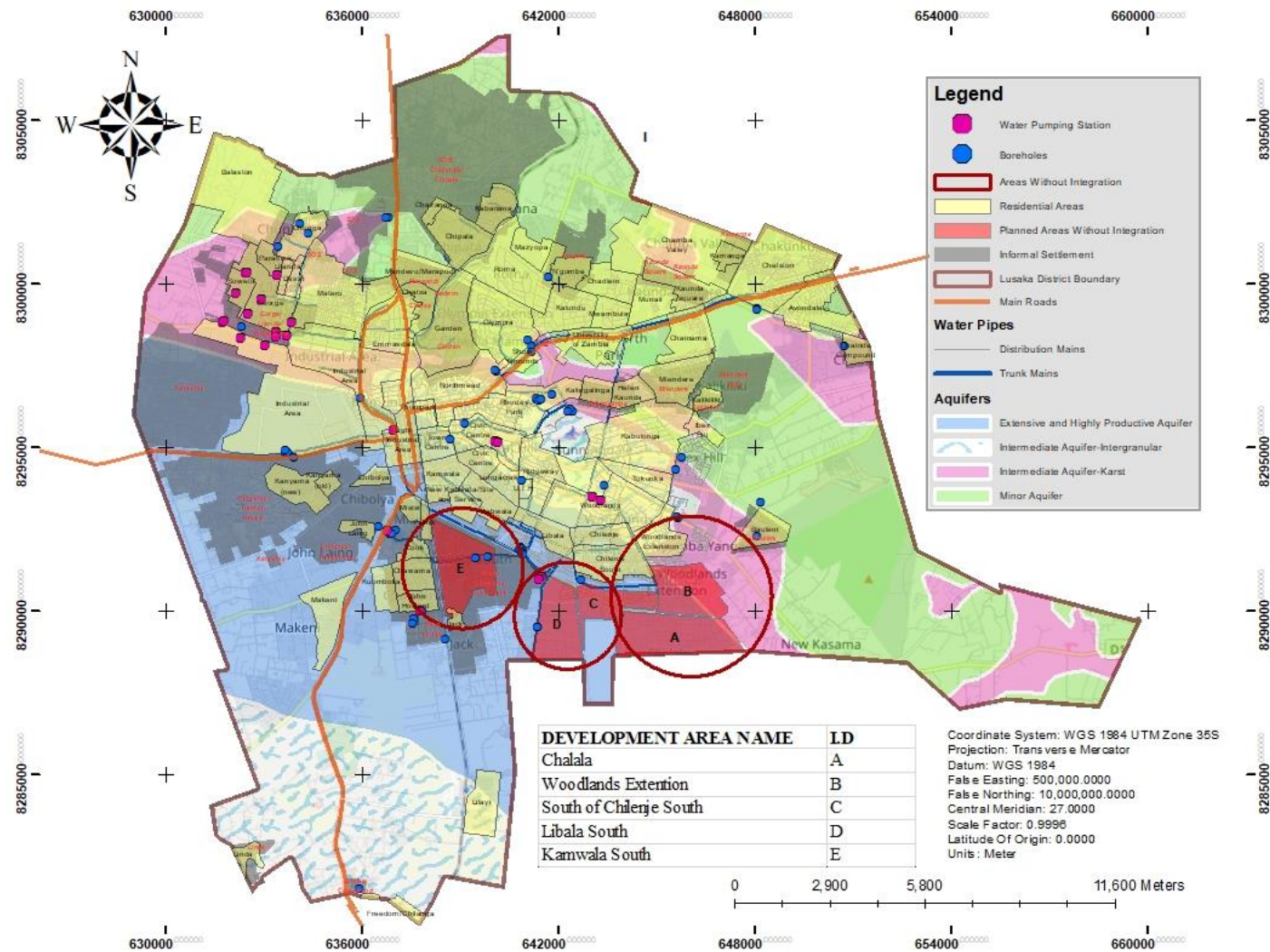


Figure 2: Major Development Areas Planned in the Last Fifteen Years without Integrating Water Supply Plans

Source: Author 2019

#### 5.1.4 Collaboration between Water Supply and Land Use Planning

With regard to collaboration, both water supply managers and land use planners strongly indicated that collaboration with one another was one general way that could enable them integrate water supply and municipal land use plans effectively. However, more than half informants (18 out of 22) from both sectors revealed that the current level of collaboration is not enough. Informants from both sectors observed and confirmed poor communication, cooperation and coordination between water supply managers and land use planners in land use planning and water supply management practices. One key informant from Lusaka Water and Sewerage Company LWSC indicated that:

*There is poor collaboration in as far as water supply and land use planning is concerned. Planners at the Lusaka City Council rarely communicate or involve us in anything to do with land use planning. We have only been receiving already planned and implemented layout plans and requests to service them, and in some cases, we only learn of newly planned areas through customers as they request for water service from us and not through the council itself (Pers Com., 2019j)*

Another key informant from the Ministry of Local Government observed that:

*Integrating water and land use plans requires adequate collaboration between planners and the water utility company, which is lacking. I have worked with both of them before and I can tell you there is poor coordination and cooperation between them. Even the happenings on the ground like encroachment cases which happens almost every now and then testify to that (Pers Com., 2019k).*

Another water supply manager described collaboration between water supply and land use planning as “zero collaboration.” When asked if additional collaboration would be helpful, the informant responded that it would be pleasant to collaborate with the land use planners. However, some officials (3) from the water utility company indicated to have had worked together with land use planners in some other projects, especially when responding to a particular disaster or cases in the city but less on anything to do with land use planning.

## **5.2 Barriers to Water Supply and Land Use Planning Integration in Lusaka**

Findings under this objective have been grouped and presented according to Stead and Miljeirs (2009) taxonomies of factors that hinder policy integration. This has been covered under the following order of factors: political factors, economic factors, institutional/organizational factors, process management and finally, behavioural factors.

### **5.2.1 Political Factors**

Under this category, local politics and short-term economic needs, and political aspirations were noted as factors that hinder integration in some instances. Key informants especially land use planners revealed that some land use developments are politically ordered and hurriedly; a situation which does not allow time for consultation with water supply managers/utility or incorporation of their technical inputs. One planner revealed that:

*In some situations, we are just directed to do something from high political offices, especially when Committee or Full Council meetings are near so that they get approved quickly. You will just be commanded to report for approval a particular land use development application on which you have not even done adequate due diligence and survey. And we end up doing wrong things in fear that if you refuse or try to guide that you need more time to do some due diligence, you may be cited as anti-government and may qualify for a transfer (Pers Com., 2019a).*

### **5.2.2 Economic Barriers**

Insufficient finances and other resources to support joint activities for integration were identified as some of the prominent barriers to water supply and land use planning integration in Lusaka City. In this regard, one key informant from Lusaka City Council (LCC) indicated that:

*Sometimes funds aren't available to support an effective joint planning between us and the water utility company, so waiting and pushing for funds just to have an integrated output delays the works (Pers Com., 2019b)*

Another informant highlighted that:

*Integration requires adequate finances and other resources, which in most cases are constrained. This to some extent slows down the work as funds are*

*always a challenge to mobilize here. So to avoid process delays, we most of the times do the planning without bringing the water utility company on board. By the way, the water utility company have no money to support the joint planning or implement the integrated plans there and then even if they were to be engaged in that, they always depend on external funding. So, any resources involved in the whole process have to come from our side, after all we initiate the whole thing (Pers Com., 2019c).*

### **5.2.3 Institutional/Organisational Factors**

Under this category, the study identified lack of time by both professionals due to many other priorities to deal with, especially urban planners. One informant from LCC indicated that:

*There is no time for integration, we have a lot of things to do (Pers Com., 2019d).*

Another indicated that:

*sometimes we just lack the time to sit down and link the two planning fields, probably because we are overwhelmed with a lot of tasks and priorities to deal with in our offices (Pers Com., 2019e)*

Water supply managers and urban planners felt they have many other priorities to deal with and could not invest the effort and time to make integration happen. This may have been due to limited staff or technical expertise especially at Lusaka City Council. Other than lack of time, a lack of a synergised and explicit mechanism for integrating the two domains was indicated as one of the barriers to adequate integration. The majority of urban planners indicated that despite the institutional arrangements under which both planning domains are set and there being legislations providing for integration and collaboration, there are no explicit ways, policies or mechanisms of how water supply land use planning should be integrated. A key informant from Lusaka City Council observed that:

*There are no clear and comprehensive guidelines or let me say mechanisms of how the integration of water supply and land use planning in the city should be done. Of course, the urban and regional planning act talks about integration and stakeholder consultation, but I think there is need for a clearer documented system (Pers Com., 2019f).*

Besides that, study revealed bureaucracies in both institutions to be one of the major impediments to integration as one informant from Lusaka City Council (LCC) observed that:

*The bureaucracies between our two institutions discourage the need to communicate and collaborate, more especially if the issue you are working on is urgent. It just takes ages to have a formal letter or request responded to in our institutions. Hence one would rather execute some work and communicate later if need be (Pers Com., 2019g).*

Stead and Miljers (2009) observed that Bureaucratisation generate increased communication costs, fragment communication which lead to low levels of internal or inter-organisational communication that makes it difficult to maintain inter-organisational networks. For water to be integrated adequately in land use plans, there is need for a proper network between the institutions dealing with both sectors.

Furthermore, it was revealed that, conflicted, fractured mandates and responsibilities in both land use and water supply management were also observed to be amongst the barriers to water supply and land use planning integration. In as much as Lusaka City planning authority has been accorded the agency for land use planning and allocation, it was revealed that some land uses in the city have been directly allocated by ministry of lands who equally would not consult the water utility or critically consider water supply in land development plans. Besides that, urban planners observed that there is more than one agency in the water sector dealing with different components which are all related and will be required for adequate water supply and land use planning integration. One urban planner from the Ministry of Local Government observed that

*There is too much fragmentation of agencies with different mandates in the water sector itself. You have the utility company, WARMA, the parent Ministry of Water Supply, Sanitation and Environmental Protection issues and Water Trust in peri-urban areas under LWSC, this also affects coordination and adequate integrated land use and water planning to some extent... (Pers Com., 2019h).*

Besides that, nonexistence of persons responsible or leadership for integration was also highlighted as one of the barriers.

#### 5.2.4 Process, Management and Instrumental Factors

Process/management related barriers identified included infrequent or inadequate communication and communication platforms between the two planning domains. Key informants from both professions acknowledged and identified poor communication between them despite knowing the need for each other. One informant from Ministry of Local Government (MLG) opined that:

*There is no adequate communication between the council and the water utility company, planners and water managers don't often talk to each other, unless there is an urgent or big problem in the city. So, it becomes difficult to integrate the two in this case (Pers Com., 2019i).*

Furthermore, the lack of a formal communication platform and an open forum for sharing data was another barrier identified with regard to integrating water supply and land use planning. An informant from Lusaka City Council (LCC) observed that:

*There has been a lack of a well-established formal platform to meet and address these issues. Maybe if there was that specific platform, it would help, otherwise, it has just been upon the understanding of the individual planner on the task to take collaborative steps by consulting the water utility company, which in most cases doesn't happen. It would have been better if the water utility company was part of the Plans Works Development and Real Estate (PWDRE) Committee Meetings where land use plans are discussed and initially approved, but they don't attend those meetings. I think the law does not provide that they be part of the committee. Maybe with the coming of decentralization, things may improve (Pers Com., 2019j).*

A similar view was further expressed by another informant from Lusaka Water and Sewerage Company (LWSC) who said that:

*There is no platform for us to meet and discuss planning issues with the council. Though there is a meeting were council invites us called District Development Coordinating Committee (DDCC), it is some kind of a meeting were all government departments in the city meet to discuss and give reports of development issues in their respective departments, but that's not a planning meeting were we can engage with town planners and integrate plans efficiently. There is need for a specific meeting for this issue. In the DDCC meeting, we*

*usually present reports on our works, and usually, our presence there doesn't even matter, hence we don't even go there sometimes (Pers Com., 2019k).*

In the same light, another informant from Water Resource Management Authority (WARMA) indicated that:

*There is no open platform or forum where data can be shared across sectors. It would be better to have an open platform where we are able to see what the others are doing and be able to have our inputs incorporated (Pers Com., 2019l).*

A lack of communication and platform to share information impedes integration of urban planning and water supply planning which leads to disjointed plans and outputs.

### **5.2.5 Behavioural Factors**

The revealed barriers under this category were centered on the behavioral characteristics of professionals in water supply and land use planning institutions of Lusaka city. Barriers revealed included unprofessional conducts expressed through failure to adhere to the professional regulations and standards, selfish interest and lack of care and attention to integration and water-land use interactions especially on the side of urban planners. In this light, an official from the Ministry of Local Government (MLG) stated that:

*We have the legislations which stipulate collaboration between water utilities and local authorities, and the integration of water supply and land use planning in place. Besides that, the planning process for land use planning is clear, it requires stakeholder consultations, and the water sector is amongst those key stakeholders in land use planning who should be adequately consulted with a notion of having their expertise incorporated. However, enforcement is lacking, or let me say it is the failure of the individual planners and local authorities in their respective areas to understand, adhere and enforce these issues which is a problem (Pers Com., 2019m).*

Another official from the Ministry of Water Development, Sanitation and Environmental Protection shared the same thought as expressed below:

*The laws are in place already and I think they are sufficient to get us going. The challenge has been failure to follow the provisions of the law and enforce them.*

*Other districts have begun doing this and I would say they started embracing the aspect of integrating water supply and land planning a long time ago (Pers Com., 2019n).*

Another key informant from Lusaka water and Sewerage Company opined that:

*There is too much selfish interest and unprofessional conduct exhibited by majority of city planners, except maybe for a few here and there. Planners have a tendency of doing something that is off the stipulation of the law, that act of theirs, demands that they consult and involve us when opening up areas, but because of their selfish interest they do not, I don't know, maybe they think we would demand land from them when they engage us to work with them (Pers Com., 2019o).*

Another informant from Lusaka City Council further acknowledged the absence of water supply land use planning integration. He indicated that:

*The failure to adequately integrate water supply and land use planning in the city has just been negligence on our part, and the jack of all trades attitude exhibited by some planners. We have not taken this important issue seriously and given it the attention it deserves (Pers Com., 2019p).*

Furthermore, limited knowledge about water supply-land use planning integration, hydrological systems of the city and little regard for each other's professional role and expertise were noted as key barriers to water supply and land use planning. Limited understanding, knowledge and attention to the city hydrological system, water supply land use ecological functioning, and the need for their integration amongst professionals, especially urban planners, were noted as most of them were caught up searching themselves as they were interviewed, while with others, the realisation of their significance and what they have not been doing came to light during interviews.

### **5.3 Extent of water supply and land use planning Integration in Lusaka City**

This section presents findings for objective three, which aimed to assess the level of integration between water supply plans and municipal land use plans in Lusaka City. To realize that, the section employs the conceptual framework developed in Chapter Two to summarize the research's key findings which were categorized under the following aspects: legislation and policy, water supply and land use planners' involvement and

consultation in the development of both plans, educational knowledge/skill, human, financial, technical and scientific and finally, lead agency and leadership.

### **5.3.1 Legislation and policy**

Findings showed that informants (6 out of 22) felt there was need to refine the legislations and potentially over-arching policy for guiding both planning processes and specifically address the integration of water supply and land use planning in an explicit way. However, the majority of key informants interviewed (15 out of 22) indicated that, the available legislations were adequate legislations to drive the integration of water supply and land use planning in Lusaka city. It was observed by some informants that while the current legislation may set the stage for integration as indicated, it is still ultimately in the hands of the urban planners, water supply managers, politicians, and people to ensure that integration is realised. Informants from LCC indicated that:

*There are no clear and comprehensive guidelines, or let me say mechanisms of how the integration of water supply and land use planning in the city should be done. Of course, the urban and regional planning act talks about integration and stakeholder consultation, but I think there is need for a clearer documented system (Pers Com., 2019a).*

Regarding adequacy of legislation, an official from the Ministry of Water Development, Sanitation and Environmental Protection indicated that:

*The laws are in place already and I think they are sufficient to get us going. The challenge has been failure to follow the provisions of the law and enforce them. Other districts have begun doing this and I would say they started embracing the aspect of integrating water supply and land planning a long time ago (Pers Com., 2019b).*

### **5.3.2 Water supply and Land Use Planners' Involvement and consultation in the development of both plans**

Findings reveal that water supply managers are not involved in the creation, review and potentially the implementation of land use plans. Informants (20 out of 22), both urban planners and water supply managers revealed that, land use plans in the city are prepared separately without the consultation and involvement of the water utility company and water supply regulators. All the water supply managers from Lusaka

Water and Sewerage Company (LWSC) complained of urban planners at LCC not consulting or seeking their expert input when making land use plans in the city. Below are explanations from two informants:

*Planners at the Council rarely work with us when it comes to land use planning, they do not consult or involve us in the planning process. They do their planning without our input or technical advice (Pers Com., 2019c).*

*Ideally, we are supposed to have consultative and participatory meetings with council planners to have our technical inputs and water supply strategies incorporated into their land use plans and vice versa. The law says so, but it is not practised. Planners at the council have been preparing land use plans in seclusion. We only receive already designed implemented plans and requests to service them, that's when we start finding ways of doing so (Pers Com., 2019d).*

### **5.3.3 Education/Knowledge/Skill**

It was established that majority of urban planners left wider road reserves as consideration of water supply plans in land use plans. This coupled with the planning and allocation of plots in sensitive hydrologic zones areas by planners, exhibited a limited level of knowledge regarding land and water ecosystem functions in the city. However, it was also observed that some respondents exhibited understanding of water supply and land use interactions, and few respondents sounded very knowledgeable. A respondent from LCC explained as below:

*We use common and basic knowledge and assumption of water supply in urban areas to consider water supply plans and requirements in land use layout plans. It is known that in an urban area like Lusaka, obviously the channel of water supply is piped water from the water utility company. Therefore, with this knowledge at hand, we consider creating wider road reserves as much as possible in any land use layout plan to accommodate space for water supply pipes; and in some cases, we request for water lay out plans from the water utility company showing existing water pipes in or near a particular area we intend to work on in order to accommodate and integrate them in land use layouts (Pers Com., 2019e).*

#### **5.3.4 Experience**

Findings revealed that the average working experience of land use planners in the city was at 4.5 years while that of water supply managers stood at six years. Besides that, there was limitation of experience due to infrequent practices of integration processes. The working experience depicted was due to change of staff attributed to staff resignations and staff transfers, especially planners at Lusaka City Council. Some informants observed that:

*transfers have seen planners at the local authority with experience in land use planning processes and obviously integration issues being transferred to other councils outside of the province, thereby leaving and bringing in new officers with less working experience and exposure to land use planning and integration issues (Pers Com., 2019f).*

Others however, pointed out that

*water supply managers and land use planners in Lusaka City have had less experience in integrating water supply and land use planning because issues of integrating the two have only started getting momentum recently due to massive challenges the city has been facing in the recent past (Pers Com., 2019g).*

#### **5.3.5 Guidelines for Integration**

The study established that there has been no guide to explicitly stipulate how the two can be integrated and what should be involved. One respondent indicated that:

*There are no clear and comprehensive guidelines, or let me say mechanisms of how the integration of water supply and land use planning in the city should be done. Of course, the urban and regional planning act talks about integration and stakeholder consultation, but I think there is need for a clearer documented system (Pers Com., 2019h).*

#### **5.3.6 Human, Financial, Technical, and Scientific**

Study findings established that extent of integration with regard to adequate finances, technical expertise, and solid scientific application for Lusaka could be rated as low.

In this regard, a key informant from Lusaka City Council (LCC) indicated that:

*Sometimes funds aren't available to support an effective joint planning between us and the water utility company, so waiting and pushing for funds just to have an integrated output delays the works (Pers Com., 2019i)*

Another informant explained that:

*Integration requires adequate finances and other resources which in most cases are constrained. This to some extent slows down the work as funds are always a challenge to mobilize here. So, to avoid process delays, we most of the times do the planning without bringing the water utility company on board. By the way, the water utility company have no money to support the joint planning or implement the integrated plans there and then even if they were to be engaged in that, they always depend on external funding. So, any resources involved in the whole process have to come from our side, after all we initiate the whole thing (Pers Com., 2019j).*

### **5.3.7 Lead Agency and Leadership**

Results under this aspect of extent of integration indicated lack of a person or agency responsible for integration as one of the barriers to integration in Lusaka City. One urban planner from the Ministry of Local Government observed that:

*There is too much fragmentation of agencies with different mandates in the water sector itself. You have the utility company, WARMA, the parent Ministry of Water Supply, Sanitation and Environmental Protection issues and Water Trust in peri-urban areas under LWSC, this also affects coordination and adequate integrated land use and water planning to some extent (Pers Com., 2019k).*

## **CHAPTER SIX**

### **DISCUSSION OF FINDINGS**

#### **6 Introduction**

This chapter discusses the findings presented in chapter five. The discussions will follow the order of objectives as presented in Chapter Five as follows: (i) to determine how municipal land use planners and water supply managers integrate water supply and land use plans in Lusaka City, (ii) to identify the barriers faced in integrating water supply and municipal land use plans in Lusaka City and (iii), to assess the level of integration between water supply plans and municipal land use plans in Lusaka City.

#### **6.1 How Water Supply and Municipal Land Use Plans Are Integrated in Lusaka City**

Paulson et al., (2017) posits that achieving sustainable water supply, greater city resilience and reliability, and development and economic growth requires a critical integration of water supply management and land-use planning, particularly to ensure that water quality and availability is not compromised by incompatible land uses and development (Plummer, 2013). Several procedures of collective efforts related to how water supply and land use plans are integrated were acknowledged in the literature. Some touched on collaboration and its collective approaches such as communication, consultation, consensus building, cooperation, and coordination. Collaborative planning has been evolving to meet the need to better address complex interconnected problems (Booher 2010, Margerum 2008, 2011, & Healey 2006). Water supply and land use are intertwined, meaning that solutions must be reached through holistic solutions that acknowledge these interconnections (Kidd & Shaw, 2007). The results of the study in Lusaka City show that water supply managers and municipal land use planners are guided by legislations for integrating water supply and land use plans through cross sector consultation and participation, considerations of planning requirements or set standards of each sector during plan preparations and by way of cross collaborative practises in the planning and management of the two domains.

Despite the relevant laws setting the means of integration and these means being known by the responsible personnel's, what is obtaining on the ground is different. The research revealed that there has been lack of cross sector consultation and involvement in the development of plans, especially land use plans. Besides that, collaboration and its other

collective approaches like communication, consensus building, cooperation, and coordination between water supply and land use planning sectors was revealed to have been poor. Land use planning has been conducted separately without the participation and involvement of water supply managers/utility/regulators. This has led to most of land use development plans being developed and implemented without the consideration and incorporation of water supply strategies and the water land use interactions. Perhaps, the happening of things may also rest with the fact that water supply management and land use planning in Lusaka are conducted by different and separate agencies/institutions which makes coordination a challenge as Stoker et al., (2018) noted. Barriers behind this disjunction are presented and discussed in the next section. The findings of the research in this regard conform to a number of studies that have addressed similar concerns in other cities around the world. For instance, the survey results of Gober's et al., (2012) study in Portland, Oregon, and Phoenix, Arizona in the United States of America (USA) showed that despite water managers and land planners generally being aware of the physical interconnections between water and land use, there is little cross-sector involvement in their management and the two domains are poorly integrated.

Similarly, in evaluating the extent to which planning mechanisms support integration between land-use and water resource sectors in Australia, Serrao-Neumann et al., 2017 (2016) observed that urban planning and water supply and resources management have typically been carried out separately, and that the two are not adequately integrated despite their close relationship. Additionally, another study conducted in Botswana by Toteng (2002) revealed that contemporary urban planning in Botswana focuses attention on conventional land-use planning activities to the exclusion of important urban development issues, such as water planning and management, a situation which tends to accentuate the divergence of urban planning and water planning. It can thus be reasoned that the state of affairs regarding water supply and land use planning integration in Lusaka city has been a challenge faced by many cities around the world, both in developed and developing countries.

The prevailing situation in Lusaka is foreseen by Bates (2011) to have far-reaching and increasingly undesirable consequences in urban environments if not addressed. Already the NWASCO (2007, 2008, 2012, and 2015) annual water sector reports point out poor cooperation between urban planning and water supply management to be one of the

challenges the water sector is facing regarding proper service delivery in Zambia's urban areas. Furthermore, Simukonda (2018) reports poor coordination between the two domains as being one of the reasons behind the unplanned water system extensions which contributes to sustaining intermittent water supply in Lusaka City. Moreover, lack of collaboration, stakeholder participation and less consideration of water supply and land use interactions in the development of plans has seen increasing land use decisions and developments that are perceivably against or pose negative implications on water quality, quantity and sources, thereby causing concerns about the sustainability of water supplies, health and wellbeing of Lusaka residents, and generally the quality of urban development in the city.

One water manager gave an example of a residential area in Meanwood Kumwemena which was initially planned without the involvement of water supply managers/utility and consideration water supply strategies. The plots in the area were allocated and people started developing and occupying the area, thereby raising high demand and pressure for water supply connection on the utility company. In response to that, the water utility company had to prepare a water supply plan from the ground/already implemented land use layout plan - after lots of development had been done. In the assessment and preparation of the water supply strategy for the area, a communal borehole was determined to be the ideal and affordable source of water for the area. However, after assessments, it was discovered that the point which was ideal for high and sustainable water yields for the borehole was already taken and had a fully developed and occupied residential high cost property on it. To avoid costs and litigations, water supply managers had to go for another vacant space in the area with less water yield as an alternative point for the communal borehole, which may not be sustainable. Here is where an important linkage where collaboration, stakeholder participation and consideration in the development of land use plans could have happened and helped in the first place. Land use planners and water managers/utilities should together evaluate the feasibility of new developments from both water supply and land use perspective. Or, if one development is inconsequential on system-wide water supply, the collaboration should determine what will be the cumulative impacts of growth on water supply in a city.

Other reported and documented decisions and developments of that nature in the city range from citing developments along the city streams like Kalikiliki stream, wetlands, marshlands or flood-prone or low lying areas (Nchito, 20072). Besides that, citing and intensifying of new housing and other developments in Libala South and Chalala area - an area known to be an underground water recharge zone for the Lusaka dolomite (Simengwa et al., 2015; Bäumle & Nkhoma 2008; International Water Stewardship Programme 2016; Simengwa et al., 2015) are other good examples. As the intensity of land use increases on these sensitive aquatic ecological zones, infiltration and the ability to recharge underground water decreases because percolation of surface water into the aquifer is inhibited. This potentially threatens the water security and sustainable growth of the city (Nkhuwa et al, 2015) as 57 percent of the city's water supplies is extracted from underground water sources (Ndongwe 2013). Furthermore, it has been observed that the increased runoff that results in these areas built on sensitive ecological zones leads to increased water flooding and pollution, which have health implications in the city (FRACTAL and LuWSI, 2018).

Lack of cross sector consultation, participation and consideration between the water supply and land use planning in the development of plans, have on various cases seen urban planners creating and allocating plots of various developments on water supply Infrastructures. Similarly, water supply managers are also found in situations of laying water supply pipes under committed properties (Ndongwe, 2013). Rectifying these issues on the ground raises a lot of challenges and have cost implications on the implementations, optimisation of plans and infrastructure on the ground due to rerouting, re-planning and cancellation of plots and reallocation which brings a lot of conflicts and ligations (Ndongwe 2013). These situations could be avoided with adequate cross sector collaboration, involvement and consideration of planning requirements.

Additionally, lack of cross sector collaboration between the two domains in the city has also been found to play a big role behind delays in water service provision, especially in new development areas of the city (Simukonda et al., 2017). This situation leads to heightened self-provision (boreholes) and shallow wells (Nkuwa et al, 2015) which thereby threatens the sustainability of ground water due to large scale abstraction of underground water as each plot in a particular area will need to dig a borehole. Apart from that, the situation is recorded to be behind the unplanned distribution system

extensions which reduce supply duration and water volumes for areas that were supplied originally because limited new water sources have been created, while there are many new extensions (Simukonda, 2017). Finally, the prevailing situation has seen the percentage of developments and areas without piped water in the city increase, a situation which to a greater extent reduces the quality of life and status of the city in terms of service provision and quality of urban development.

## **6.2 Barriers Faced in Integrating Water Supply and Municipal Land Use Plans in Lusaka City**

The range of identified barriers to integration of water supply and land use planning in Lusaka makes it clear that achieving water supply and land use planning integration is dependent on a multitude of different types of factors that encompass individuals, organisations, cultures, processes, instruments and politics. In light of that, Stead and Miljers (2009) indicate that it is difficult to identify the exact weight of barriers to integration. Hence, none of the barriers in Lusaka City are virtually sufficient in themselves to fully promote integration if worked on and hardly any single barrier is likely to completely thwart the process. However, many of these factors can have a powerful influence on the integration of plans when acting in parallel or in combination. It can be inferred from the research results that institutional and behavioural barriers were the most cited impediments to water supply and land use plans integration in the city as compared to the other categories. This suggests that institutional barriers caused by the legal and institutional governance structure and behavioural barriers caused by conflicting perspectives, interest coupled with deferring education backgrounds of experts are more common barriers than the political, financial and management barriers. This conforms to stoker's et al., (2018)'s establishment that organizational barriers mostly impair integrated land and water management in the USA. Toteng's (2002) study in Botswana pointed out a fragmented institutional and legislative framework to be one of the major reasons behind the divergence of water supply planning and land use planning. Other than that, Gober et al., (2013) observes that, conflicting perspectives and interests of experts in water supply and land use planning make collaborative planning difficult, which affects integration of plans, especially on controversial development decisions.

Political barriers cited included local politics and short-term economic needs and aspiration. Interviewees noted the urgency of politicians to acquire and develop land while they are in office. This has seen certain land use decisions in the city being politically ordered and hurriedly, which does not allow time for proper assessments and cross sector consultation or participation. To ensure integration of both plans and to make the integration real on the ground takes political will that acknowledges the balance needed between short term and long-term needs (Buekens, 2013). Strong political will and support to integration comes by adequate understanding of ecological functioning and ties of water supply to land use planning amongst politicians, experts and the public at large. However, this knowledge, as the study reveals is currently limited even in some of the individual experts responsible for planning of the two domains, especially land use. This to some extent explains why despite most land use development plans not incorporating water supply strategies and land water interactions, they still get approved by the council/civic leaders. Besides that, political support as noted by Bueken (2013) is often facilitated by community support, which is low in Lusaka City due to poor participation and their involvement in the land use planning process. Ivey et al. (2006) note that when members of the public are involved in the development of community plans and programs, there is a strong support for planning initiatives and increased understanding of the purpose of planning

Continuous change in staff at Lusaka City Council was also considered to be a barrier to integration. It was observed that the Council have been experiencing staff changes due to transfers and others resigning to join other firms. The change in staff has a bearing on the work experience which was linked to integration outcomes. Informants at the council indicated that some old staff with experience in land use planning of the city have been transferred and new staff being transferred from rural councils may not have adequate experience and knowledge in land use planning and integration processes. However, one method of working around this as suggested by Bueken (2013) is the inclusion of the key stakeholders and public in planning processes. Public involvement lends increased credibility and increases the chances of implementation; if staff change, new staff can still recognize the weight of a plan that comes from public involvement.

Furthermore, the current conflicted, fractured mandates and responsibilities, or rather fragmentation of governance with different mandates in both domains, especially the water sector, represents a key challenge for water supply and land use planning integration in Lusaka. In light of this, Plummer (2011) and Lucelo, and Turlock (2003) equally observed that the governance of water supply and land use planning by different levels of government sectors/agencies with different statutory authorities and sometimes-conflicting goals potentially leads to a disconnection between plans and results of the two planning domains. Working around this calls for a strong and efficient collaborative activities across sectors or institutions.

However, as noted by Stoker et al., (2018) cross sector collaborative activities can be time consuming and contentious as professionals from both ends have different perceptions, interest, education backgrounds, goals, work plans and budget lines. In the same way, water supply managers and urban planners in Lusaka City work under different institutional arrangements and organisations where their everyday duties are tied to different work plans, goals and budget lines and have different interests, perspectives and education backgrounds. Integrating the two planning domains, thus implies both professions take on new collaborative undertakings across sectors, which demands resources and time while at the same time, they are challenged to keep up with multiple existing duties at their respective work places. Hence, the more the agencies in the water sector dealing with various issues tied to land use, the more complicated and involving integration will be. Thus, Overcoming the identified barriers hindering efficient integration of water supply and land use planning in Lusaka City is no easy task. It will require innovative ways of assigning responsibility, accountability and power, and inventive structures for the coordination and management of sectors. It will also require shifts in professional cultures, which might be realised through education and training.

### **6.3 Extent of water supply and land use planning Integration in Lusaka City**

The findings of the study show that, there is a moderate legislative basis for integrating water supply and land use planning in Lusaka City. This is through pieces of legislations governing water supply and land use planning in Zambia. The Acts of Parliament for urban planning and water supply management require that in developing water supply and land use plans, there must be cross sector involvement, consultation and

consideration of each other's planning requirements to ensure the assimilation of each other's technical strategies in plans. Despite that, a few informants (6 out of 22) felt there was a need to refine the legislations and potentially over-arching policy to guide both planning processes, and specifically address the integration of water supply and land use planning in an explicit way. However, the majority of key informants interviewed (15 out of 22) indicated that the available legislations were adequate legislations to drive the integration of water supply and land use planning in Lusaka city. Some informants also observed that while the current legislation may set the stage for integration as indicated, it is still ultimately in the hands of the urban planners, water supply managers, politicians and people to ensure that integration is realised. Legislation and policy that encourages or requires the integration of watershed plans and land use plans is important for achieving integration (Buekens, 2013). Besides that, Plummer et al. (2011) conclude that in Ontario, having The Clean Water Act which requires consistency between source water protection plans and official community plans, has led to greater levels of integration.

To achieve effective integration, it is important for water supply and land use planners/organizations to be involved throughout the planning processes in plan development, review, and implementation of both sectors (Buekens, 2013). Stakeholder participation and consultation enhances the integration of plans for both sectors. In Lusaka, this factor could be assessed as Low. The findings of the study reveal that, water supply managers are not involved in the creation, review and potentially the implementation of land use plans. The absence of formal team meetings or platforms, where the two professions can develop and review the integrated plan together before it is finalized partly plays a critical role in this situation. This is in line with a similar study by Lucelo and Turlock (2003) who established that, the absence of formal structure or platform for harmonisation between the state agencies assigned with water management and counties delegated with land use decisions in Mexico, was amongst the issues causing the water and land use integration problems.

Knowledge of ecosystem functions and how land use decisions affect aquatic ecosystem health are very important in achieving effective integration. Secondly, integration is more effective when the public, land owners, elected officials, and others involved have an understanding of land-water ecosystem functions, and how land use decisions affect

aquatic ecosystem health (Buekens, 2013). In Lusaka City, the knowledge/education could be assessed as low to medium, as apparent knowledge levels in this regard are limited. Majority of urban planners, giving an example of leaving wider road reserves as consideration of water supply plans in land use plans, coupled with the planning and allocation of plots in sensitive hydrologic zones areas by planners exhibits a limited level of knowledge regarding land and water ecosystem functions in the city. However, it was observed that some respondents exhibited some understanding of water supply and land use interactions. A few respondents sounded very knowledgeable, but as (Bueken, 2013) observed, improvements could be made by experts understanding how to translate this knowledge and skills into practice, which can be through policies and by-laws in a development plan. Limited knowledge and education leads to weak support for integration by the players who are involved in the process. This explains why there has been poor public and political will and support to integration in the city. When the experts, politicians and public understand the water supply-land use nexus, and need for integration, it becomes easier to respect and support integrated decisions and activities.

Expert experience in water supply and land use planning processes, as well as with integration, is apt to increase the support and capacity for planning and integration. Lusaka would be around Medium for this factor. The average working experience of land use planners in the city was at 4.5 years, while that of water supply managers stood at six years. The working experience depicted was due to change of staff attributed to staff resignations and staff transfers especially planners at Lusaka City Council. Some informants observed that transfers have seen planners at the local authority with experience in land use planning processes and integration being transferred to other councils outside of the province, leaving and bringing in new officers with less working experience and exposure to land use planning and integration issues. Others however, pointed out that water supply managers and land use planners in Lusaka City have had less experience in integrating water supply and land use planning because issues of integrating the two have only started recently gaining momentum due to massive challenges the city has been facing in the recent past. Example of these challenges have been cholera cases caused by water pollution attributed to land use activities and heightened on sight sanitation and oneself water provision, physical damage to the aquatic systems all enhanced by uncoordinated water supply and land use planning (Nkhuwa et al., 2015).

Having a framework or set of guidelines on how to integrate water supply plans with land use plans can help facilitate the process of integration. For this factor, Lusaka City could be assessed as low to medium. The integration of water supply and land use planning is implicitly encouraged and provided for through Urban and Regional Planning Act Number 3 of 2015, the Water and Sanitation Act Number 23 of 1993, and the Water Resource Management Act Number 27 of 2013. However, there has been no guide to explicitly stipulate how the two can be integrated and what should be involved.

Having available staff, adequate finances, technical expertise, and solid scientific information to support policies and regulations is important in achieving effective integration between watershed and land use development plans (Buekens, 2013). In Lusaka, this factor could be rated as low. Lusaka city has extensive water supply and land use planning. In this regard, there is a sizeable number of capable land use planners and water supply managers, planners, as well as various technical experts – engineers, groundwater specialists, health inspectors etc. – who can contribute to water supply and land use plans. The presence of such staff though not adequate is a strength. Furthermore, the study revealed that finances in the two organisations dealing with water supply and land use planning are limited. In this regard, Stoker et.al (2018) observed that working through funding issues across multiple agencies can be time consuming and contentious. Similarly, securing funds and resources for activities leading to integrated water supply and land use planning in Lusaka has been challenging due to budgetary constraints of both institutions, especially Lusaka City Council which initiates the planning process in most cases. This impedes adequate integration of the two planning domains as both professionals will opt to do their planning activities in isolation in fear of process delays and in an attempt to catch up with their work plans or institutional goals. The limitedness of finances contributes to fewer staff than would be ideal, and also can be linked to limited scientific knowledge. For example, some development plan recommendations would be greatly strengthened by certain types of scientific information which will require a lot of money and expensive equipment to gather. Precise surface and underground hydrologic situation is one such example of scientific information.

Having a lead agency or knowing who is responsible, for ensuring that integration between water supply plans and land use plans takes place increases the likelihood of integration occurring (Stocker et al, 2018; Buekens 2013). Lusaka City could be assessed as low for this factor. The results of the study indicated lack of a person or agency

responsible for integration as one of the barriers to integration in Lusaka City. In as much as urban planners were assumed to be responsible for initiating integration as they open up areas for development, some informants including urban planners themselves discussed the difficulty in promoting integration when no one is responsible for initiating it, bringing the right people together and putting professionals to task if they choose to work in isolation in that regard. Stoker et al., (2018) attributed this difficulty to a lack of central authority over both planning and water professionals, and limited time and budget resources allocated for this role. They observed that, when there is a lack of time, or no one defined as responsible for integration, then integration becomes a lower priority.

## **CHAPTER SEVEN**

### **CONCLUSION AND RECOMMENDATIONS**

#### **7 General Introduction**

This chapter concludes the research by showing how the objectives set in chapter one have been met. This will be realized by tackling an objective at a time in chronological order.

##### **7.1 Objective 1**

The aim of this study was to assess the integration of water supply and municipal land use planning in Lusaka City. The first objective therefore, was to determine how water supply managers and municipal land use planners integrate water supply and municipal land use plans in Lusaka city. To help achieve this objective, the research question asked was: How do water supply managers and municipal land use planners integrate water supply and land use plans in Lusaka City?

The study has shown that legislations governing land use and water supply sets the means and ways of how water supply managers and municipal land use planners integrate water supply and land use plans in Lusaka City. The pieces of legislations prescribe or provide for the need of water supply utility/sector involvement and consultation in the preparation of land use plans; land use planning authority/planners close liaison with the water supply utility/sector during the planning process and taking into account the requirements specified under legislations governing water supply, and the water-land use interactions in land use plans. It is through these set mechanisms by which water supply and land use plans are to be integrated.

Regardless of the above policy and legislative demands, what has been obtaining on the ground is divergent from the ideal or set situation. The study revealed that amongst others, planners at the council have been preparing land use plans in seclusion and that water supply managers receive already designed implemented plans with requests to service them. Secondly, that there is minimal attention given to water supply and land use interactions in the development of plans as reflective in the plans at the council and thirdly, that consideration of water supply plans and requirements in land use planning is something that is theoretically prescribed, desired and only exists on paper and not in practice as observing and translating what is written into practice is a problem. The study findings equally revealed that planners at LCC use common basic knowledge and

assumption of water supply in urban areas to consider water supply plans and requirements in land use layout plans as evidenced in their assertion that they consider creating wider road reserves as much as possible in any land use layout plan to accommodate space for water supply pipes.

In a nutshell, it could be concluded that there has been lack of cross sector involvement and consultation, less consideration of each sectors planning requirements/regulations and water-land use interactions in the development of plans, especially land use plans. This has been coupled with poor collaboration between water supply and land use planning in the city. Hence, water supply and land use plans in the city are and have been developed and managed in a siloed manner regardless of their close relationship.

## **7.2 Objective 2**

The second objective was to identify the barriers faced in integrating water supply and municipal land use plans in Lusaka City. To help attain this objective, the study was guided by the question: What are the barriers faced in the integration of water supply and municipal land use plans in Lusaka City?

The study established that barriers hindering the integration of water supply and municipal land use plans in Lusaka City, to cite a few, include: no open platform or forum where data can be shared across the two sectors, inadequate communication between the two sectors, unless in cases of urgent or big problems, no time for integration due to overwhelming tasks and priorities in offices of both sectors, and no clear and comprehensive guidelines or mechanisms of how the integration of water supply and land use planning should be done in the city. Other barriers included lack of funds to support effective joint planning between the two sectors, where waiting and pushing for funds to have an integrated output delays works, and last but not least, too much fragmentation of agencies with different mandates in the water sector, thereby affecting coordination and adequate integrated land use and water planning to some extent.

In summary, and grouped according to Stead and Miljer's (2009) taxonomies of hurdles to policy integration, the barriers to integration are of different types and encompass individuals, institution structure, organisations, cultures, processes, instruments and politics. However, the main barriers have been institutional and personnel behavioral in nature. Institutional barriers are grounded mainly on the differing, fractured and

fragmented legal and institutional governance structures of water supply and land use planning in the city, whereas personnel behavioural barriers are grounded on differing professional perspectives, interest and education background; limited knowledge and lack of care and attention to integration and water-land use interactions. If these issues are not addressed, the city is yet to see far-reaching and increasingly undesirable consequences/developments which will compromise water security and stifle sustainable and quality development of the city.

### **7.3 Objective 3**

The third objective was to assess the level of integration between water supply plans and municipal land use plans in Lusaka City. The question that aided attainment of this objective was: What level of integration is being achieved between water supply plans and municipal land use plans in Lusaka City?

A conceptual framework (Table 2 in Chapter Two) focusing on factors facilitating the integration of water supply with municipal land use development plans, was used to assess the level of integration between water supply plans and municipal land use planning in Lusaka City.

The study findings, to cite a few, revealed that collaboration between planners and the water utility company is lacking and that there is no time for integration due to overwhelming tasks in offices for both sectors, lack of consideration of water supply strategies and planning requirements, and failure by individual planners and local authorities to understand, adhere and enforce issues of integration. Other findings regarding extent of integration include planners' use of common basic knowledge and assumption of water supply in urban areas to consider water supply plans and requirements in land use layout plans, urban planners doing their planning without bringing the water utility company on board due to constrained funds and process delays, and last but not least, bureaucracies between the two institutions discouraging the need to communicate and collaborate as it takes ages to have a formal letter drafted or request responded to in their institutions.

In conclusion, the results and discussions of the factors as per conceptual framework rated or revealed moderate legislations and policies supporting integration; low stakeholder involvement and consultation in the development of plans; low-medium education/knowledge/skill about integration; medium experience in integration; low

human, financial, technical, and scientific capacity for integration; low central overview/lead agency for integration; low-medium guidelines for integration and low support networks/ information sharing platforms.

With regard to the findings above, the final conclusion of the research therefore, is that integration of water supply and municipal land use planning in Lusaka city is and has not been happening. The need for practical integration is only emerging now.

#### **7.4 Recommendations**

The significant outcome of the study is that integration of land-use and water supply planning approach in Lusaka City is yet to be accomplished. Enabling such an achievement will require overcoming the identified barriers to integration. Therefore, the suggested recommendations to improve water supply and land use planning integration in Lusaka City include:

**i. Ensuring the involvement and consultation of water supply managers/utility/regulators in the preparation and management of land use plans.**

There is need to ensure adequate formal involvement and consultation of water supply managers/regulators in the preparation, review and approvals of land use development plans. This should also include the approval of proposed land use changes and subdivisions in the city. This would help to ensure that technical input and recommendations from water supply managers/regulators are included or at least properly considered during the creation of a land use development plans, change of land use and subdivision. The enforcement should be facilitated by Lusaka City Council, and the parent ministry should play the role of inspecting key stakeholder involvement and consultation before approval of land use plans.

**ii. Building capacity and skills of professionals and policy makers involved in water supply and land use planning integration.**

Capacity building should be jointly facilitated by The Ministry of Local government, Zambia Institute of Planners, Ministry of Water Development Sanitation and Environmental Protection, Zambia Environmental Management Authority and Water Resource Management Authority by doing the following:

- ✓ Organizing joint tours, training events, field trips, or workshops were integration of water supply and land use planning processes can be taught, or creating knowledge networks (or learning alliances) that help practitioners realize the connections between their roles and the benefits of working with others to solve problems.
- ✓ Work with education institutions to create professional development/ training or certification in water supply and land use integration which practicing professions should undergo, and making integration a required course in planning programs.
- ✓ Provide informational sessions for land use planners in Lusaka on integrated water supply management planning, and how it should be incorporated into city development planning. This would build the knowledge of public, private, and non-profit sector planners, thereby enhancing their ability to integrate elements of water management into a city integrated development plan.
- ✓ Provide workshops or informational sessions for elected officials on their role of overseeing the integration of water supply and land use plans. This could take place at future Lusaka Planning Conferences, orientation workshops, or other appropriate settings. These sessions would include brief overviews of each process, how the plans can overlap, and things to pay attention to in order to ensure the processes are mutually supportive of one another.

iii. **Create more opportunities/platforms for information/knowledge exchange between water supply managers/utility and land use planners/planning authority.**

This can be achieved by creating special communication units or establishing integration commissions at the city scale, through which water supply managers and urban planners can jointly meet regularly to determine how to better integrate their plans and operations, discuss and report work progress periodically to the commissions at city wide scale. The commission may also be responsible for reviewing and evaluating existing legislation and regulatory controls to determine the degree of conflict, duplication, and overlap that presently exists, and to identify appropriate integration methods. Other means would be to embrace the use of computer technology to enhance communications and data sharing between planners and water managers. This can be done jointly by the Lusaka City Council, Lusaka Water and Sanitation,

Ministry of Local Government and Ministry of Water Development, Sanitation and Environmental Protection.

iv. **Developing a guide on integrating water supply and land use plans.**

This guide should be written with a wide range of individuals in mind, including water supply managers and land use planners, water supply regulators, environmentalists elected officials and the public at large. The guide should outline what integration of water supply and land use planning is, requirements and standards, and guidance for how to integrate effectively. The guide should be co-developed by Ministry of Local Government, Lusaka City Council, Lusaka Water and Sanitation Company, Ministry of Water Development Sanitation and Environmental Protection and Water Resource Management Authority.

v. **Enforce the monitoring and inspection of professional practices and adherence to planning standards and regulation with regards to water supply and land use planning.**

There is need to establish periodical inspection of plans, processes and professional practices and conducts with regards to planning and enforcement of laid down planning procedures, guidelines and standards. This should be coupled with taking disciplinary actions on practitioners practicing outside the professional conduct and requirements. The realization of this could be through accreditation or certification bodies in conjunction with parent ministries for both sectors. For land use planners, Zambia Institute of Planners and Ministry of Local Government should facilitate that.

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## 9 Appendices

### APPENDIX (I)

#### LUSAKA CITY COUNCIL (LCC) INTERVIEW GUIDE

THE

UNIVERSITY OF ZAMBIA

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND NATURAL SCIENCES

MASTER OF SCIENCE IN SPATIAL PLANNING

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**NOTE: The answers provided to this interview will be purely for academic purposes and meant to help the candidate to write his final year dissertation required in partial fulfilment of the completion of the Masters of Science in Spatial Planning at the University of Zambia. Your responses will be treated with utmost confidence. Therefore your quick and honest responses will be highly appreciated.**

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**Research Topic:** Integration of Water Supply and Land Use Planning In Urban Areas, A Case Of Lusaka City In Zambia

#### GENERAL INFORMATION

- a. Department .....
- b. Designation of respondent.....
- c. Phone number.....
- d. Emails address.....
- e. Working/Years of Experience.....

1. How do you integrate water and land use plans?
2. Who do you think needs to be involved to effectively integrate watershed plans with municipal/inter-municipal plans? (e.g. organizations, individuals)
3. How is would you describe collaboration between water supply planning and land use planning sector in Lusaka City?
4. Which new development areas have been opened in the past 15 years? How was water supply and land use planning integrated in each and every area?
5. In your opinion, how would you describe the integration of water supply and land use planning in Lusaka city?
6. What Barriers are faced in the integration of water supply and land use planning in Lusaka?
7. In your opinion, what should be done to enhance the integration?

## APPENDIX II

### LUSAKA WATER AND SEWERAGE COMPANY (LWSC) INTERVIEW GUIDE

THE  
UNIVERSITY OF ZAMBIA  
SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOGRAPHY AND NATURAL SCIENCES  
MASTER OF SCIENCE IN SPATIAL PLANNING

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**NOTE: The answers provided to this interview will be purely for academic purposes and meant to help the candidate to write his final year dissertation required in partial fulfilment of the completion of the Masters of Science in Spatial Planning at the University of Zambia. Your responses will be treated with utmost confidence. Therefore your quick and honest responses will be highly appreciated.**

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**Research Topic:** Integration of Water Supply and Land Use Planning In Urban Areas, A Case Of Lusaka City In Zambia

#### GENERAL INFORMATION

- a. Department .....
- b. Designation of respondent.....
- c. Phone number.....
- d. Emails address.....
- e. Working/Years of Experience.....

1. What factors do you consider when planning for water supply in relation to land use? (e.g. for new development area)
2. How do you ensure the integration of water supply into land use plans?
3. How is would you describe collaboration between water supply planning and land use planning sector in Lusaka City?
4. Do you know any new development areas planned and opened in the past 15 years? How was water supply plans integrated in the development plans in these areas?
5. In your opinion, how would you describe the integration of water supply and land use planning in Lusaka city?
6. What are the main challenges/barriers of collaboration and integrating water supply and land use planning in Lusaka city?
7. What do you think should be done to enhance the integration of water supply and land use planning in Lusaka?

**APPENDIX III**  
**MINISTRY OF LOCAL GOVERNMENT INTERVIEW GUIDE**

**THE**  
**UNIVERSITY OF ZAMBIA**  
**SCHOOL OF NATURAL SCIENCES**  
**DEPARTMENT OF GEOGRAPHY AND NATURAL SCIENCES**  
**MASTER OF SCIENCE IN SPATIAL PLANNING**

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**NOTE: The answers provided to this interview will be purely for academic purposes and meant to help the candidate to write his final year dissertation required in partial fulfilment of the completion of the Masters of Science in Spatial Planning at the University of Zambia. Your responses will be treated with utmost confidence. Therefore your quick and honest responses will be highly appreciated.**

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**Research Topic:** Integration of Water Supply and Land Use Planning In Urban Areas, A Case Of Lusaka City In Zambia

**GENERAL INFORMATION**

- 
- a. Department .....
  - b. Designation of respondent.....
  - c. Phone number.....
  - d. Emails address.....
  - e. Working/Years of Experience.....
- 

1. How do you look at the need to incorporate water supply plans into land use planning, and how is it done in Lusaka City?
2. In your opinion, how can you describe the integration and Collaboration of water management and land use planning in Lusaka city?
3. What policies do you have in place which specifically promotes integration of water management in land use planning? And collaboration of land use planning authorities and water Agencies?
4. What challenges do you think are faced in integrating water supply and land use planning in Lusaka?
5. In your opinion what do you think should be done to enhance the integration of land use planning and water management?

**APPENDIX IV**

**MINISTRY OF WATER DEVELOPMENT SANITATION AND ENVIRONMENTAL PROTECTION (MWDSEP) INTERVIEW GUIDE**

**THE**

**UNIVERSITY OF ZAMBIA**

**SCHOOL OF NATURAL SCIENCES**

**DEPARTMENT OF GEOGRAPHY AND NATURAL SCIENCES**

**MASTER OF SCIENCE IN SPATIAL PLANNING**

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**NOTE: The answers provided to this interview will be purely for academic purposes and meant to help the candidate to write his final year dissertation required in partial fulfilment of the completion of the Masters of Science in Spatial Planning at the University of Zambia. Your responses will be treated with utmost confidence. Therefore your quick and honest responses will be highly appreciated.**

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**Research Topic:** Integration of Water Supply and Land Use Planning In Urban Areas, A Case Of Lusaka City In Zambia

**GENERAL INFORMATION**

- a. Department .....
  - b. Designation of respondent.....
  - c. Phone number.....
  - d. Emails address.....
  - e. Working/Years of Experience.....
- 
1. How do you look at the need to incorporate water supply plans into land use planning, and how is it done in Lusaka City?
  2. In your opinion, how can you describe the integration and Collaboration of water management and land use planning in Lusaka city?
  3. What policies do you have in place which specifically promotes integration of water management in land use planning? And collaboration of land use planning authorities and water Agencies?
  4. What challenges do you think are faced in integrating water supply and land use planning in Lusaka?
  5. In your opinion what do you think should be done to enhance the integration of land use planning and water management?

**APPENDIX V**

**WATER RESOURCE MANAGEMENT AUTHORITY (WARMA) INTERVIEW  
GUIDE**

**THE  
UNIVERSITY OF ZAMBIA  
SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOGRAPHY AND NATURAL SCIENCES  
MASTER OF SCIENCE IN SPATIAL PLANNING**

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**NOTE: The answers provided to this interview will be purely for academic purposes and meant to help the candidate to write his final year dissertation required in partial fulfilment of the completion of the Masters of Science in Spatial Planning at the University of Zambia. Your responses will be treated with utmost confidence. Therefore your quick and honest responses will be highly appreciated.**

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**Research Topic:** Integration of Water Supply and Land Use Planning In Urban Areas, A Case Of Lusaka City In Zambia

**GENERAL INFORMATION**

- f. Department .....
- g. Designation of respondent.....
- h. Phone number.....
- i. Emails address.....
- j. Working/Years of Experience.....

1. How do you look at the need to incorporate water supply plans into land use planning, and how is it done in Lusaka City?
2. In your opinion, how can you describe the integration and Collaboration of water management and land use planning in Lusaka city?
3. What policies do you have in place which specifically promotes integration of water management in land use planning? And collaboration of land use planning authorities and water Agencies?
4. What challenges do you think are faced in integrating water supply and land use planning in Lusaka?
5. In your opinion what do you think should be done to enhance the integration of land use planning and water management?