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The use of the systems thinking approaches to develop a holistic model to improve stakeholder management in the eThekwini water and sanitation unit (EWS)

by

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DEDICATION

To my children, Sithembele Zondi and Ndumiso Zondi, I pass the baton to you. Take it and continue running the race of knowledge search and pass it on to the next generations as I do to you. It should not end with me.

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*"**Delight yourself in the Lord, and he will give you the desires of your heart"***

Psalm 37:4

ABSTRACT

Challenges faced by the eThekwini Municipality's Water and Sanitation Unit (EWS) in implementing water and sanitation projects include competing interests among various stakeholder groups who see water services from different perspectives and have varying expectations from infrastructure project execution. Soft issues, including stakeholder relationships, communication, and community participation, have been ignored. The study places more attention on soft issues and relationship management since it sees project stakeholder management in the water service as a complicated and messy system. This study employed qualitative research, together with soft systems methodology (SSM), for data collection and analysis. SSM was chosen because of its flexible, but systematized, process that is useful in clarifying the issues in a problematic situation. In-depth semi-structured interviews were used to collect data in this qualitative research. A total of thirty-four participants were involved in this study. This involved conducting intensive individual interviews with fourteen participants to explore their perspectives on stakeholder management in the EWS infrastructure projects. The other twenty participants, divided into four focus groups, participated in the SSM workshop. Data was analysed using NVivo 12, which assisted the researcher in thematic analysis. The combination of qualitative methodology and SSM facilitated a meaningful interaction between the researcher and the study participants, by providing a chance for participants to understand each other's perspectives, challenges and opportunities, in infrastructure projects. The study found that there is a lack of proper communication between the EWS officials and project stakeholders, as well as the fragmentation of social facilitation systems within the unit. This was confirmed by the findings from the SSM workshop. Stakeholder management was also identified as a crucial soft issue and the lack thereof hinders the progress and sustainability of infrastructure projects. The study, therefore, recommends the implementation of the developed holistic model and formalisation of systems. This model consists of the implementation process, which includes identifying stakeholders prior to project implementation; communicating project boundaries with stakeholders; and ensuring that project stakeholder committees are in place to enforce consistency and improve relationships; as well as ensuring that risk mitigation is prioritised.

Key Words: systems thinking; stakeholder management; eThekwini Municipality; Water and Sanitation.

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ABBREVIATIONS AND ACRONYMS

ANC	African National Congress
CLO	Community Liaison Officer
CPG	Contractor Participatory Goal
CSH	Critical Systems Hauristics
EM	eThekwini Municipality
EWS	eThekwini Water & Sanitation
GEAR	Growth Employment and Redistribution Programme
GHS	General Household Survey
HSRC	Human Science Research Council
LGDA	Local Government Developmental Agenda
LMs	Local Municipalities
NDP	National Development Plan
NWRS	National Water Resources Strategy
PESTLE	Political, Economic, Social, Technical, Legal, and Environmental
RDP	Reconstruction and Development Programme
RET	Radical Economic Transformation
SDG	Sustainable Development Goals
SSM	Soft Systems Methodology
WRC	Water Research Commission
WSA	Water Service Authority
WSP	Water Service Provider

CHAPTER ONE: INTRODUCTION

1.1 Introduction

The philosophical shift in the domain of development planning that generally had been a hierarchical top-down process owes its origins to the apartheid era (van Eeden, 2014). This top-down or centralised approach to development policy making, policy planning, and implementation, drew various objections from neoliberal institutionalists (Kahila-Tani, Kytta & Geertman, 2019). Such scholars argue that exclusive governance of social systems is ineffective, compared to participatory governance (Madero & Morris, 2016; Wilson, Tewdwr-Jones & Comber, 2019). According to the neo-institutionalist literature, a dynamic civil society promotes good governance and democratisation by increasing public engagement in policymaking, development planning, and implementation (Kahila-Tani et al., 2019). In theory, the transition to participatory governance offers several benefits in the water and sanitation sector. These include strengthening good governance, sustainable development, democracy, and stakeholder empowerment.

These benefits reveal themselves in the application of local knowledge to improve water resource management. Other advantages include the empowering of marginalised people that have been excluded from water and sanitation management decision-making, strengthening the legitimacy of water policies and results, and improving institutional accountability in water governance. Can the eThekwini Municipality's Water and Sanitation Unit realise these theoretical benefits? Can stakeholder participation be a solution to policy planning, policy making and policy implementation for water resource management in South Africa? This study examines stakeholder management in the eThekwini Municipality in KwaZulu-Natal to develop an integrated model that may improve stakeholder management in the EWS unit.

The integrated model for stakeholder management in Water and Sanitation infrastructure projects may help to facilitate stakeholder management and promote the socio-economic growth and development, subsumed under the National Development Plan (NDP) 2030 vision (Derakhshan, Turner & Mancini, 2019). The EWS unit is one of the municipal units that represents the Water Services Authority (WSA) of the local government system. Currently, the EWS unit is facing a myriad of challenges with regard to stakeholder management, which require a systems thinking

approach to deal with the existing complex and unique stakeholder management systems (Sulemana, Musah & Simon, 2018). This chapter provides an overview of the study; the study's background; the research problem; a summary of the research aim, purpose and significance; the research objectives, and research questions. The chapter also provides a brief explanation of the study's research strategy, conceptual foundation, study limits, thesis structure, and summary.

1.2 Background of the study

Stakeholders presently play a significant role in almost every project's environment, influencing job completion in significant ways (Mease, Erickson & Hicks, 2018). Stakeholder decisions and actions are very responsive to the project. Clients; the final consumer; contractors; consultants; trade associations; line organisations; government agencies; financial institutions; insurance providers; controlling organisations; journalists; third parties; and rivals, are just a few examples of project stakeholders.

The atmosphere surrounding any project is challenging and dynamic (Li, Zuo, Jiang, Zhang, Ma & Wang, 2022). Unexpected challenges and uncertainty about the project may arise if stakeholder management is not handled appropriately. For instance, if it is impossible to come up with a thorough description of what constitutes a successful or failed project, the project manager may try to attain objectives that the stakeholders had never imagined (Meredith, Shafer, Mantel & Sutton, 2020). Stakeholder problems and uncertainties that lead to project failure include poor communication; insufficient project resources; changes in the scope of work; adverse project press coverage; and negative community reactions to the project. During the project, certain stakeholders will cause a great deal of uncertainty. It is crucial to determine which stakeholders normally bring the project the most worry and difficulty, while trying to decrease or restrict the likelihood of uncertainties and concerns produced by stakeholders.

Stakeholder management is frequently lacking in projects in terms of strategy, plans, and processes (Li et al., 2022; Ndaguba & Hanyane, 2019; Barnes, 2018). It is frequently characterised by spontaneity and spontaneous acts that are not typically managed and handled within the project team. The outcome of this approach is often uncertain. A variety of stakeholder management guidelines and practices have been created to solve this issue (Li et al., 2022; Ndaguba & Hanyane,

2019; Barnes, 2018). These standards include managing the resources needed to respond to stakeholder strategies, including planning, inspiring, directing, organising; and regulating them.

1.2.1 South Africa as a nation

South Africa, formally known as the Republic of South Africa (RSA), is Africa's southernmost country. It is bounded on the south by a coastline that stretches along the South Atlantic and Indian Ocean coastlines; on the north by Zimbabwe, Botswana, and Namibia; and on the east and northeast by Mozambique and Eswatini, as well as the landlocked Lesotho. It is the most populous country completely south of the equator and the southernmost country on the Old World's continent (Govender, Pillay, Siwela, Modi & Mabhaudhi, 2021). South Africa is a biodiversity hotspot with diverse biomes, plants, and animals. The country is home to over 60 million people and has an area of 1,221,037 square kilometers (471,445 square miles) (Stats SA, 2020). South Africa's legislative, judicial, and executive arms are based in Cape Town, Bloemfontein, and Pretoria, respectively. Johannesburg is the most populous city.

Figure 1.1: Location of South Africa on the African Continent (Catana, 2020:172)

Black South Africans account for around 81% of the entire population (Stats SA, 2020). The remaining population is made up of the continent's largest populations of White South Africans from Europe; Indian and Chinese South Africans from Asia; and mixed race/Coloured South Africans. South Africa is a diverse ethnic community with a broad mix of cultures, languages, and religious beliefs. The constitution recognises 11 official languages, the fourth-most in the world, reflecting the country's multiculturalism (Mathinya, Franke, van de Ven & Giller, 2022). The two most-spoken first languages in South Africa, according to the 2011 census, are isiZulu (22.7%) and isiXhosa (16.0%). The next two most-spoken are of European origin: Afrikaans (13.5%) evolved from Dutch and is the primary language of the majority of Coloured and White South Africans; while English (9.6%) is a legacy of British colonisation and is widely used in public and business life (Stats SA, 2020).

The nation is among the few in Africa that has not experienced a coup, and it has held regular elections for almost a century (Mathinya et al., 2022). However, until 1994, the great majority of Black South Africans were denied the right to vote. Throughout the twentieth century, the black majority fought for more rights against the dominant white minority, which had a considerable impact on the nation's recent political and historical development. Apartheid was introduced by the National Party in 1948, formalising earlier racial segregation (Rogerson, 2022). After a protracted and often violent fight by the African National Congress, and other protesters both inside and outside the country, the repeal of discriminatory legislation began in the mid-1980s. Nelson Mandela believed that 'nation-building' in South Africa required bridging the gaps between the ethnically distinct 'nations' (Seekings, 2008). Since 1994, all linguistic and ethnic groups have been allowed to participate in the country's free democracy, which includes a parliamentary democracy and nine provinces, which have had political representation (SSA, 2014). In 1998, the then deputy-president Thabo Mbeki stressed racial disparity in a contentious speech in which he defined South Africa as possessing 'two nations, the one black and the other white'. To highlight the country's multicultural richness, the RSA is commonly referred to as the ‘rainbow nation,’ particularly in the aftermath of racial segregation.

South Africa is a strong regional power in global relations, as a member of the Commonwealth of Nations, as well as the Group of 20. It is a developing nation, ranking 114th on the Human Development Index (Govender et al., 2021). The World Bank classifies it as a newly industrialised

country, having the second-largest economy in the continent, and the world's 33rd-largest. In Africa, South Africa has the most UNESCO World Heritage Sites.

1.2.2 Study location

The eThekwini Municipality is a Water Service Authority (WSA) in South Africa, as per the Water Services Act 108 of 1997 (Act 117, RSA, 1997). According to the Act, the WSA is responsible for ensuring access to water service. It may undertake the tasks of a water service provider (WSP), and it may form a partnership with another water services institution to provide water services (Kahila-Tani et al., 2019). According to Section 195 (e) of the 1996 South African Constitution, "people's needs must be responded to and that the public must be encouraged to participate in policy- making". The Water Research Commission (WRC) was established as a national organization in accordance with the Water Research Act (1971) to provide leadership for creative ideas to ensure that water is managed sustainably to meet the demands of tomorrow's environment and society. According to the WRC, water is projected to be one of the most limited resources in the twenty-first century (Griggs, 2019).

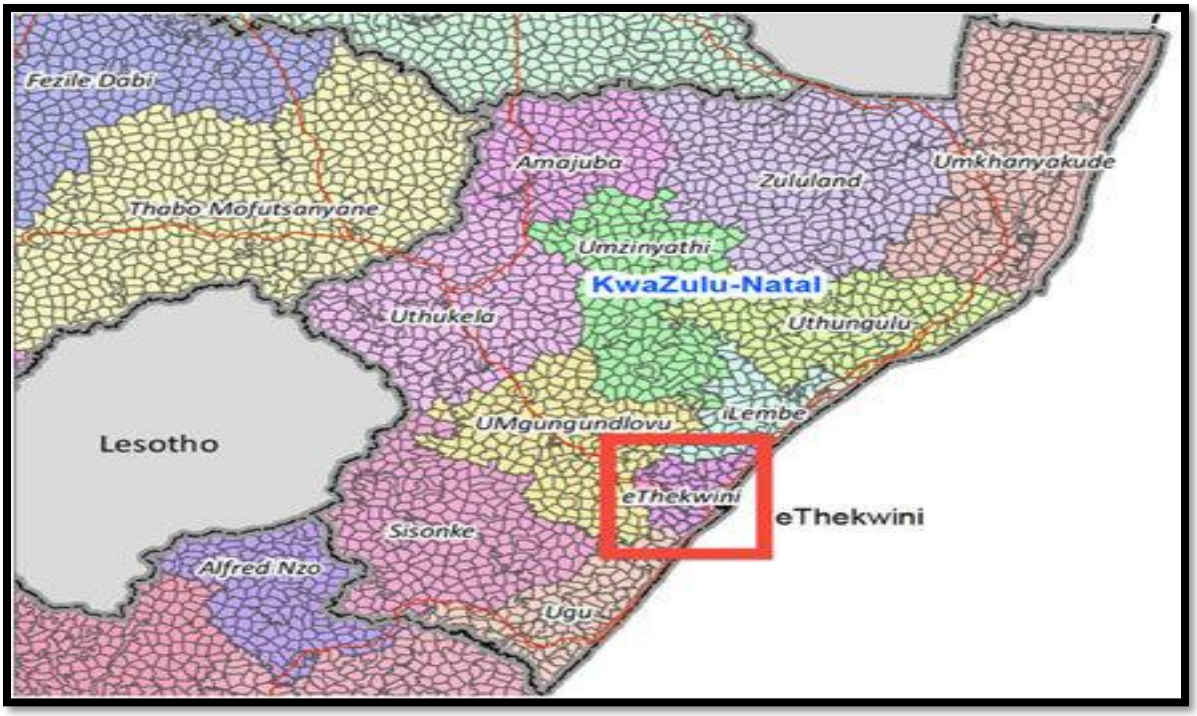

Figure 1.2: Location of eThekwini Municipality in South Africa (McPherson, Brown & Downs, 2019:182)

The eThekwini Municipality is a category A municipality, according to the Municipal Structures Act (1998). In South Africa, a Category A municipality is a metropolitan municipality that performs all local government tasks for the city. This contrasts with other, rural, regions, where local governance is organised into local municipalities and district municipalities. A metropolitan municipality is responsible for water management and regulation, and it has water services provision (WSP) status. As both a WSA, and with WSP status, the municipality must deal with the backlog in enforcing the constitutional mandate, to provide access to basic water and sanitation services to communities (Saleth, 2018). This can be done through planning, designing and implementing infrastructure projects.

Municipalities are viewed as a complicating element in this study, owing to the number of interactions involved and the number of interested and potentially impacted entities participating in the implementation of water and sanitation projects (El Gafy, Grigg & Reagan, 2017). Simply put, the lack of an integrated approach to manage stakeholders effectively in water and sanitation project execution is considered to be the root cause of the water and sanitation project implementation crisis confronting the municipal water and sanitation services (Barnes, 2018). Municipalities have used a variety of techniques to encourage stakeholder management, while still struggling to offer the promised services. Approaches include social facilitation during the project implementation, employing a community liaison officer (CLO) through the project contractor, and communication with the local leadership through the ward councilor.

As a result, the EWS Unit has completed multi-million-rand water and sanitation infrastructure projects in recent years; and some are still being developed. There are also other large water and sanitation infrastructure projects which are planned for future years. The study will focus on four infrastructure projects, two of which are water infrastructure projects, and two are sanitation infrastructure projects. Of the four projects, two are at construction stage; one of them is at the beginning of implementation, and one is at the planning stage. One is in the north of Durban; the second in west of Durban; the third south of Durban; and the fourth in the centre of the city (eThekwini Municipality, 2018). The existing stakeholder challenges may derail the four infrastructure projects. This study focuses on these four projects in order to evaluate the present

stakeholder management method, in order to design an integrated and holistic stakeholder management model utilising systems thinking approaches.

The study was conducted in the surrounding communities which are within the jurisdiction of eThekwini Municipality, which is located in the Province of KwaZulu-Natal, situated on the east coast of South Africa, with an estimated population of 3 161 844 people (eThekwini Municipality, 2018).

1.2.3 Brief project description

A network of potable bulk water delivery pipelines that service the north-eastern portion of the EWS area of supply make up the current Northern Aqueduct system, which is operated by EWS. In order to provide business and residential customers in the northern districts, the Northern Aqueduct transports potable water from the Durban Heights Waterworks to a number of terminal reservoirs and high-level pressure zones (eThekwini Municipality, 2018). However, because of increased demand from significant new projects and urbanization to the north-east of Durban, the Northern Aqueduct pipeline system has reached its flow capacity at various parts of the main trunk system.

Therefore, EWS has determined that a new bulk water gravity supply pipeline from the Durban Heights Waterworks in Reservoir Hills, as well as several other improvements and alterations to the bulk network, are necessary in order to ensure a reliable and sustainable supply of water to fulfill future needs in the northern parts of Durban (Amadi, Carrillo & Tuuli, 2018). These upgrades and changes are to be executed in various phases. This second endeavor is referred to as the Northern Aqueduct Augmentation Project (NAA).

The Phase 5 of the Northern Aqueduct Augmentation Project, which is the proposed development, calls for the construction of a new, big bore, 1 200 mm ND welded steel pipeline from Durban Heights in Reservoir Hills to the northern side of Duffs Road (eThekwini Municipality IDP, 2017). The projected northern aqueduct pipeline begins just downriver from the Durban Heights Waterworks, near the EWS valve chamber on Pridley Road. The pipeline descends into the uMngeni Valley from the bulk connection point in Reservoir Hills, crosses the uMngeni River, and travels through the Newlands and Avoca Hills regions before arriving at Duffs Road, where it

will connect to the blank flange of the Phase 4 NAA pipeline, which runs from Duffs Road to the Phoenix 2 Reservoir (eThekwini Municipality, 2018). Overlooking the 1:100-year flood line, a new bridge will be built over the uMngeni River. At the uMngeni River crossing, the proposed pipeline will be constructed on the new bridge. The proposed pipeline route passes through a variety of land uses, including the following: densely populated, built-up areas; narrow roads and road reserve widths; high traffic routes; existing underground services; major roads and railway lines; and areas of the Durban Metropolitan Open Space System (D'MOSS).

1.3 Statement of the problem

Conflicting interests among different stakeholder groups, who understand water services from different perspectives and have different expectations from the implementation of infrastructure projects, are among the challenges faced by the eThekwini Municipality in implementing water and sanitation projects (eThekwini Municipality, 2018). The unit has received several complaints and concerns from the public regarding opportunities to participate in the implementation of water and sanitation projects (eThekwini Municipality, 2018). These complaints come from community members; local business forums, such as local contractors; unemployed youth; and other community groups, who believe that they need to benefit from the projects.

Over the last five years, the eThekwini Municipality has been dealing with public demonstrations and project work stoppages. These are expressions of dissatisfied project stakeholders and, as a result, unfavorable publicity dominates (eThekwini Municipality IDP, 2017). The city has lost a significant amount of money as a result of project delays caused by service delivery protests, project disruptions, and wasted time on projects, as a result of stakeholder demands (eThekwini Municipality, 2016). The findings of the Auditor General have also raised concerns about both irregular expenditure and underspending on the capital budget. The EWS was unable to execute the projects on schedule, within the authorised capital budget, for the fiscal year 2016/2017.

Currently, EWS unit is managing stakeholder interactions through various methods such as social facilitation; community liaison; public involvement; and citizen focus groups. As a result, the degree of knowledge in the community has developed, and previous techniques to managing stakeholders are no longer applicable (Amadi, Carrillo & Tuuli, 2018). The following are some of

the unique difficulties encountered in the eThekwini Municipality water and sanitation unit that demand understanding:

- Water and sanitation projects suffer from a lack of, and inefficient, engagement of project stakeholders, which has a detrimental influence on service delivery (eThekwini Municipality, 2018).
- As a result of the deterioration in service delivery, many stakeholder groups are protesting.
- Protests have enveloped the city in recent years, badly impacting the city's image and reputation (eThekwini Municipality IDP, 2017).
- The negative publicity generated by these difficulties can have a long-term impact on the economy, resulting in a drop in the country's GDP and competitiveness (Marks & Breen, 2021).
- There are inadequate methods to manage project stakeholders in infrastructure project implementation (eThekwini Municipality, 2018).

There is a scarcity of empirical studies on stakeholder management in South African water and sanitation projects. Many academics have investigated stakeholder management levels in water and sanitation in a variety of other industry scenarios (Marks & Breen, 2021), but few have studied stakeholder management in municipal and developing country contexts (Ndaguba & Hanyane, 2019). As a result, to encourage strong water leadership and governance within the unit and municipality, it is necessary to increase awareness of stakeholder management techniques or systems thinking approaches (Sulemana, Musah & Simon, 2018). This information may offer management an empirical foundation for building a successful stakeholder management programme for EWS infrastructure projects. The problem of stakeholder management, highlighted above, may be tracked using one of the systems thinking approaches, SSM, to study the research problem in a holistic manner (Fardet & Rock, 2018).

1.4 Research aim

This study aims to explore the use of systems thinking approaches in the development of a holistic model to improve stakeholder management in the EWS unit, Durban, South Africa.

1.5 Research objectives

Based on the above aims, the study will strive to meet the following specific objectives:

- to identify the stakeholder management challenges in the EWS projects
- to determine the stakeholder management systems that are being used in EWS projects
- to determine how SSM can assist in creating an enabling environment for effective stakeholder management in EWS
- to develop a holistic model aligned to systems approaches to facilitate stakeholder relationships and management in EWS projects.

1.6 Research questions

The research purports to provide answers to the following questions:

- What are the stakeholder management challenges in the EWS projects?
- What stakeholder management systems are being used in EWS?
- How can SSM assist in creating an enabling environment for effective stakeholder management in EWS?
- How can the development of a holistic model, aligned to systems approaches, facilitate stakeholder relationships and management in EWS projects?

1.7 Purpose of the study

The study investigates the gap in stakeholder management practices employed in the eThekwini Municipality's EWS infrastructure projects. The research hopes to provide a model for the municipality to manage and strengthen stakeholder interactions. Furthermore, the study may help to bridge the gap that exists between technocrats and the social components of water service delivery (Amadi et al., 2018). This gap is further complicated by the adoption of the Local Government Developmental Agenda (LGDA) in developed nations like the United States of America and the United Kingdom (Kahila-Tani et al., 2019). Following the adopted UK and USA Local Government Development Agenda framework, eThekwini Municipality, as a local government sphere is conceptualised, familiarised and implemented using First World or

developed countries' political; economic; social; technical; legal and environmental (PESTLE) values. These are inappropriate in South Africa.

1.8 Study motivation

Given the LGDA framework adopted from the UK and USA, there is a tendency to neglect stakeholder management in implementing sustainable water services activities and projects (El Gafy et al., 2017). The argument is that water services are focusing more on engineering value, generated using modern technology, than the soft skills required for stakeholder management and communication. The arguments by engineering and technocrats using engineering feasibility studies, water master plans and engineering analysis, often reject consultation and communication with stakeholders; or stakeholders are only involved when the project has been completed and when users are required to pay for services (Ndaguba & Hanyane, 2019).

There is compelling evidence from the literature, supported by public protests by citizens and various economic forums, that the current engineering approach to project management excludes key project stakeholders from the planning, implementation, operation and maintenance of various infrastructure projects; and associated risks have been identified by researchers (Lindgren, Toll & Melin, 2021). It is further argued that bringing in project stakeholders at a later stage on the project threatens any development project, and can cause serious damage to the project and to the municipality (Marks & Breen, 2021). This is because of the likelihood that some project stakeholders can be left out. The omitted stakeholders are the ones who can cause havoc. Therefore, in this study, project stakeholder management in water services projects is identified as one of the risk mitigation approaches for infrastructure project implementation (Li et al., 2022).

As reflected in the 2017/2018 EWS monthly report and literature from other South African municipalities, it is evident that there is lack of, and inefficient, involvement of project stakeholders in water and sanitation projects, resulting in a negative impact on service delivery. Limited studies have been conducted on local government, using systems thinking approaches, and using qualitative methods (Pezza & Pinto, 2019; Fardet & Rock, 2018). More research has been conducted on water resource management than on water services. While municipalities are responsible for the provision of access to drinking water services to communities, water resource management has its focus on raw water and water sources like dams and rivers (Kerzner, 2018).

The development of the integrated stakeholder management model will be used as risk mitigation control between the water services sector and the social groups which exist within the department and the municipality. The lack of proper integrated stakeholder management has a negative impact (Begg, 2018). In cases where the stakeholders are engaged at a later stage of the project, their views are not genuinely considered. A substantial revision of the project principles usually prevails and that leads to delays in project implementation; equally so, if the stakeholders are engaged too early, decisions get complicated, and roles and responsibilities get confused (Watermeyer & Lewis, 2018). Stakeholder management practice starts with stakeholder identification. When that exercise has not been performed properly, the wrong stakeholders might be brought into the project and that may negatively impact the project by reducing the value of stakeholder contributions (Watermeyer & Lewis, 2018).

For stakeholder management and participation, the eThekwini Municipality employs a variety of tactics and initiatives. One of these techniques is public/community engagement, which is concerned with communities in general. These techniques are silo-driven, leading to increased misunderstanding among stakeholder groups inside communities (Lindgren, Toll & Melin, 2021). Some of the tactics utilised by municipal executives and project managers are frequently driven by political interference, party political disagreements, and a lack of knowledge of systems approaches to co-ordinate and manage many stakeholders' interests and conflicts in projects (Clark, 2018). In most situations, CLOs and project managers approach stakeholder management from the top down, resulting in on-going, unresolved disagreements and a lack of readiness to learn. Using a bottom-up approach, as embedded into systems theory, will assist the municipality to address the stakeholder management challenges at the eThekwini Municipality.

1.9 Significance to the study

Systems thinking approaches, in particular SSM, has rarely been used in local government and water services sector research. As a result, this research should contribute methodologically to the body of knowledge concerning the application of soft systems techniques to address difficult issues in the water and sanitation sector (Jackson, 2016). Other academics can utilise the information in studying complicated infrastructure projects and other local government development initiatives. The research offers a unique case study and a baseline study for future studies in other South

African water organisations. While the study's conclusions can be generalised, it should be able to demonstrate some inter-relationships between numerous complex factors and values in the local government system. The research should help to improve WSA governance and boost the prominence of stakeholder relationship management within the municipality. The study should, in particular, create a stakeholder model informed by systems methods in order to improve stakeholder interactions and management in EWS infrastructure projects. The model should be valuable to practitioners, corporations, governments, and others involved in infrastructure project delivery. Several complicated variables and values exist in the local government system.

1.10 Definitions of key terms

Word clouds: "Word Clouds demonstrate the most frequently used words. The larger the font implies the more the word was used. This helps to identify key areas/themes" (Dhakal, 2022:270).

Cluster analysis: "Bubble diagrams were used. These diagrams illustrate the data (key words) in the form of bubbles. The larger the bubble, indicates the higher frequency of words/references. Furthermore, the closeness of the bubbles shows that there was a relationship between those words" (Dhakal, 2022:271).

Tree maps: "These show the data (frequently used words) in terms of size of blocks. Hence the larger blocks reflect those words mainly used. The entire map gives a holistic view of how data is placed in terms of size of reference" (Dhakal, 2022:270).

Hierarchy charts: "These reflect the size of the nodes. The larger the size implies the more volume/concentration of responses in that area" (Dhakal, 2022:271).

Word Trees: "These are used to depict key words and the words/sentences connected to that word". It enables you to examine how these words relate to other words, phrases, and viewpoints (Dhakal, 2022:270).

Systems: "Collective entities are formed by groups or combinations of interconnected, interdependent, or interacting parts" (Arnold & Wade, 2015:670).

Systems thinking "is a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours, and devising modifications to them in order to produce desired effects. These skills work together as a system" (Arnold & Wade, 2015:675).

Synergy: This is defined by the interaction of components in such a way that, when combined, the total impact is larger than the sum of the separate elements.

Analytical skills: "Skills that provide the ability to visualise, articulate, and solve both complex and uncomplicated problems and concepts and make decisions that are sensible and based on available information. Such skills include demonstration of the ability to apply logical thinking to gathering and analysing information, designing and testing solutions to problems, and formulating plans" (Arnold & Wade, 2015:675).

Stakeholders: "the groups or individuals that affect firm performance, and also they may be affected by firm activities as well" (Khan et al., 2021:6).

Stakeholder management: the "constant communication with stakeholders to understand their requirements and hopes, addressing problems when they occur, handling conflicting interests, nurturing suitable stakeholder engagement in project decisions and activities" (Khan et al., 2021:6).

1.11 Overview of the thesis

The summary, below, indicated the flow of each chapter and gives an analysis of its key ideas. The thesis is structured in the manner described below:

Chapter one: Introduction

The first chapter introduces the study and covers the study's background, the research problem, the study's goal, the research objectives, the research questions, and the study's relevance and thesis structure.

Chapter two: The management of project stakeholders

The chapter outlines the development of the stakeholder idea; the different types of stakeholders; management of the project stakeholders; the challenges in public infrastructure projects; the roles

of stakeholders and project management and some details regarding stakeholder critical success factors (CSFs).

Chapter three: A systems thinking approach

In this chapter, the literature that pertains to systems thinking approaches, as a theoretical framework, is presented. The chapter presents the definition of a system; gives an outline of systems thinking; discusses systems approaches; and places a particular focus on SSM as one of the important methodologies from the family of systems approaches.

Chapter four: Research design and methodology

This chapter provides an overview of all the components and features of the research employed in this study. It addresses data collection, processing, and analytic techniques, as well as research methodologies, research philosophies, instruments, and sample strategies. Qualitative methodology was used. This chapter goes into the interviews and SSM workshop, the data collection processes and the tools utilised for analysis in greater depth.

Chapter five: Findings and discussions from interviews

In this chapter, the study's qualitative findings are given based on the data acquired during the interviews. The chapter presents and discusses the first two objectives of the study supported by additional research and literature. The data interpretation and analysis aim to address the important issues stated in the first chapter.

Chapter six: Findings and discussions from SSM workshop

This chapter presents the findings from the analysed qualitative data which was collected during the SSM workshop.

Chapter Seven: Conclusions and recommendations

This chapter draws conclusions and makes recommendations for changes from the findings of the study, which need to be explored in order to ensure that the holistic management of stakeholders

is in place. These emerged from the findings presented in Chapters Five and Six, and also from the theory discussed in Chapters Two and Three.

1.12 Chapter summary

This chapter has provided context for the study, as well as the issues, research objectives, and research questions. This chapter provided a summary of the issue under consideration, explanations in the following critical areas: research challenges; the motivation for the study; and objectives. The next chapter provides information about the relevant literature and also the theoretical framework used in this study.

CHAPTER TWO: THE MANAGEMENT OF PROJECT STAKEHOLDERS

2.1 Introduction

The previous chapter gave an overview of the problem at hand and explanations for three crucial points: the research challenges, the study objectives and the motivation for the study. The purpose of this literature review is to give direction and provide the right framework for process- and practice-oriented research through a thorough knowledge of the notion of stakeholder management. Dealing with people or groups who might influence, or be influenced by, the project's methods, content, or consequences, has long been recognised as a key responsibility in project and service management (Mashali, Elbeltagi, Motawa & Elshikh, 2020). However, several stakeholder-related concerns may be seen in numerous public sector initiatives. Because various stakeholders may define project success elements differently, many projects exhibit a failure to adequately consider or meet stakeholders' expectations (Nguyen & Mohamed, 2021).

In order to understand how stakeholder involvement may be used to achieve project values and potential stakeholder satisfaction, through a holistic approach, the chapter reviews literature on the notion of stakeholder management (Bahadorestani et al., 2020). Additionally, a number of academics have claimed that poor stakeholder management is the main cause of project failure and miscommunication (Jenner, 2015; Wuni & Shen, 2020; Ndaguba & Hanyane, 2019). The views and expectations of the stakeholders have a significant impact on the success or failure of initiatives. Stakeholders in municipalities have the power to influence scope, regulatory changes, resource allocation, and communication hierarchies (Marks & Breen, 2021).

The chapter outlines the development of the stakeholder idea; the different types of stakeholders; management of the project stakeholders; the challenges in public infrastructure projects; and some details regarding stakeholder critical success factors (CSFs).

2.2 Evolution of stakeholder concept

According to Eskerod, Huemann and Savage (2015), the concept of project stakeholder management originated in theories of strategic management, rather than in project management

itself. Freeman (1984) pushed for a stakeholder perspective on the company. This point of view was necessary to support the conflicting viewpoints on enterprises, the production view of the enterprise, and the managerial view of the enterprise (Freeman, 1984, cited in Eskerod et al., 2015).

Ontita and Kinyua (2020) claimed that Freeman's work, which suggested that a firm's ultimate success depends on satisfying all of its stakeholders, not only those who may profit from its stock, is credited with giving rise to stakeholder theory. According to the idea, a stakeholder is any group or person who has an impact on an organisation's behaviour; its daily operations; and the achievement and performance of its strategic objectives. An organisation is fundamentally a group of stakeholders, and managing those stakeholders' interests, demands, and points of view effectively should be the company's overarching goal. In a highly complex, dynamic, and unpredictable world, stakeholder theory is essential for supporting a realistic, efficient, effective, and ethical approach to organisational management (Nguyen & Mohamed, 2021).

Every management action and choice has an embedded, ethical component. As a result, the ethical reasons in favour of stakeholder management are equally as crucial to the theory as the practical concerns (Freeman, Harrison & Abreu, 2015). Contrary to agency theory, which maintains that managers work for, and serve, the stakeholders, according to stakeholder theory, managers in firms must service a network of ties that includes suppliers, workers, and business partners. Similarly, the stakeholder approach views the availability of resources as crucial to the performance of board members. As a consequence, the company will be able to win over all important stakeholders. When an organisation manages stakeholders, it devotes more resources to meeting the demands and desires of its legitimate stakeholders than is required to merely maintain their voluntary involvement in the firm's effective operations (Ontita & Kinyua, 2020).

The stakeholder groups are directly involved in decision-making and have an impact on how the corporation's policies are developed. As a result of enterprises' conflicting demands for socially useful resources, they may fall short of stakeholder expectations (Nguyen & Mohamed, 2021). However, fulfilling the goals of all the stakeholders is challenging. Decisions, depending on the quantity of operations, may take longer, and operations may be delayed. In order to handle shifting needs in a dynamic corporate environment, stakeholder theory has been widely adopted. An

organisation's goal is to generate profits for its investors, which can only be done in a sustainable manner by upholding its legal, moral, and discretionary obligations (Platonova et al., 2018). In this study, stakeholder management was used as an independent variable as the basis for stakeholder theory.

2.3 The concept of stakeholders

The basic idea of the concept of stakeholders is that project decisions are influenced by interactions between the groups, individuals and organisations in their external environment. The concept of stakeholders considers people who participate in decision-making and those who stand to gain from the decisions made (Ahmad et al., 2017). Similarly, stakeholder theory makes an effort to address the crucial question of which stakeholders require attention in order to meet their expectations. Additionally, it provides a framework for recognising, categorising, and grouping stakeholders in order to effectively manage them (Irfan & Hassan, 2017). Khan et al. (2021) detailed the stakeholder management procedures by concentrating on the identification, categorisation and analysis of stakeholder groups, as well as the management strategy. Stakeholders can be characterised as internal or external, depending on how they are identified (Nguyen & Mohamed, 2021). Through decisions on manufacturing, internal stakeholders contribute to organisational efficiency.

By contrast, external stakeholders support organisational success through participatory decision-making, which entails a review of the organisation’s legitimacy and the provision of resources to the organisation (Khan et al., 2021). Within the project governance framework, the internal stakeholders, which include the project manager, consultants, project team, and contractors, have been purposefully involved in projects in the public sector. On the other side, external stakeholders include those who make political decisions; the general public; project beneficiaries; project delivery units; project developers; and funders. Understanding the obligations of external stakeholders and addressing their concerns is crucial (Nguyen et al., 2019). In order for a project to succeed, it is crucial to understand the impact of external stakeholders. Additional research is needed to examine the broad-based impact of stakeholders on projects. The project’s governance structure may be adaptable enough to accommodate many stakeholders, control their engagement, and respond to their needs (Klakegg et al., 2016).

This approach may be used by the project teams to grasp and address diverse stakeholder groups. By adding the management of stakeholders as an extra standard to the traditional ones of time, cost, and quality, the integration of aspects of stakeholder theory into the primary framework of project management has an effect on the project's performance (Masur & Pisarski, 2015). Stakeholder theory is therefore connected to the field of project management and will be crucial in evaluating project performance (Uribe et al., 2018).

2.4 Stakeholder types

Mashali et al. (2020) classified stakeholders into two types, as internal and external project shareholders. Internal project stakeholders typically comprise the project team, the sponsor, internal clients, and project support workers. The PMBOK (2018) advised that senior management, additional project managers, and more functional managers be considered internal stakeholders because organisations often have limited resources. External project stakeholders include, for example, clients, suppliers, rivals, and other external bodies that may be involved in, or influenced by, the project, such as officials from the government and concerned citizens. Nguyen and Mohamed (2021) suggested that other categories in the literature are based on a stakeholder's level of anticipatory behaviour, their level of engagement in the project, and the nature of their connection with it. They also consider the stakeholder's claim and attitude toward the project.

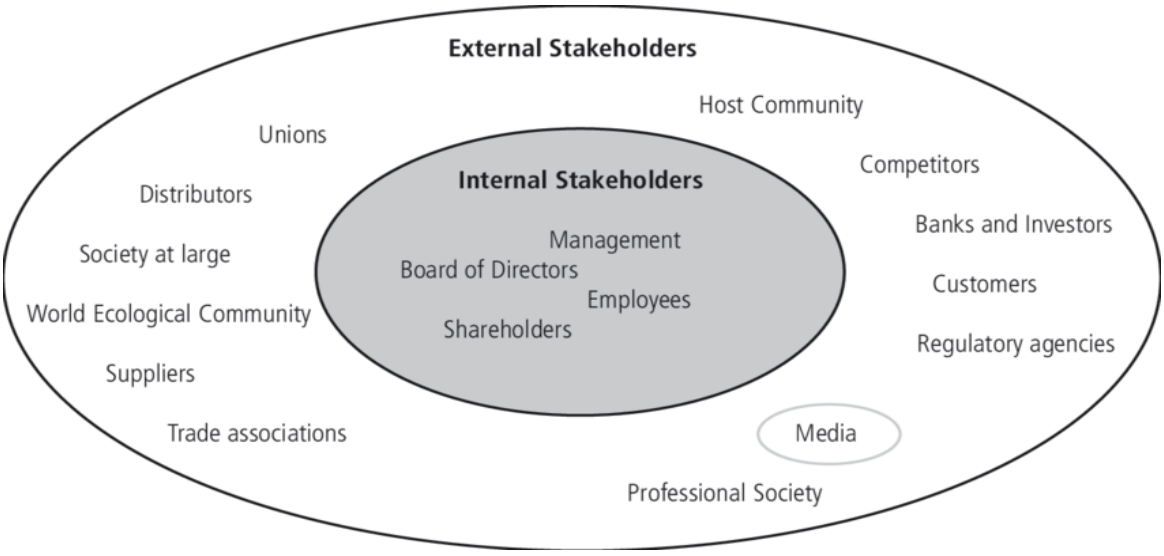

Figure 2.1: Types of stakeholders (Source: Mashali et al., 2020:284)

The main stakeholder groups are those who are regarded as the foundation of the organisation's existence. The majority of these groups frequently have some type of formal agreement with the organisation as owners, workers, consumers, or suppliers. Communities, governments, and competitors are among the group of secondary stakeholders that are crucial in establishing the organisation's legitimacy and approval for its operations (Srinivasan & Dhivya, 2020). A wide range of characteristics, including attitude; interest; impact; power; influence; risk; urgency; and satisfaction, are frequently used to categorise stakeholders (Wuni & Shen, 2020). According to Kerzner (2018), successful projects exhibit great stakeholder management and may adhere to the process of identifying, categorising, analysing, and formulating management strategy for stakeholders.

2.5 Stakeholder management

Stakeholder management is a complex problem in the water services sector, especially in the implementation of water services infrastructure projects. The water services sector in the local government system is responsible for the provision of basic services to communities through the municipalities. The municipalities that are water services authorities (WSA) have the responsibility to supply and provide water to the communities within their jurisdiction (Hammer, 2019). The expectations and perceptions of the stakeholders about the value provided by the projects are typically connected to the success or failure of a project (Nguyen et al., 2018). The success of building projects depends on effective stakeholder management, which may be enhanced by increasing communication with key stakeholders and setting goals and shared objectives with them (Khan et al., 2021). The procedure to establish a well-defined scope for a project should involve full participation from all necessary stakeholders in order to guarantee a successful project and satisfy all stakeholders. Project success is a topic that is widely debated and seldom reaches to consensus (Park et al., 2017).

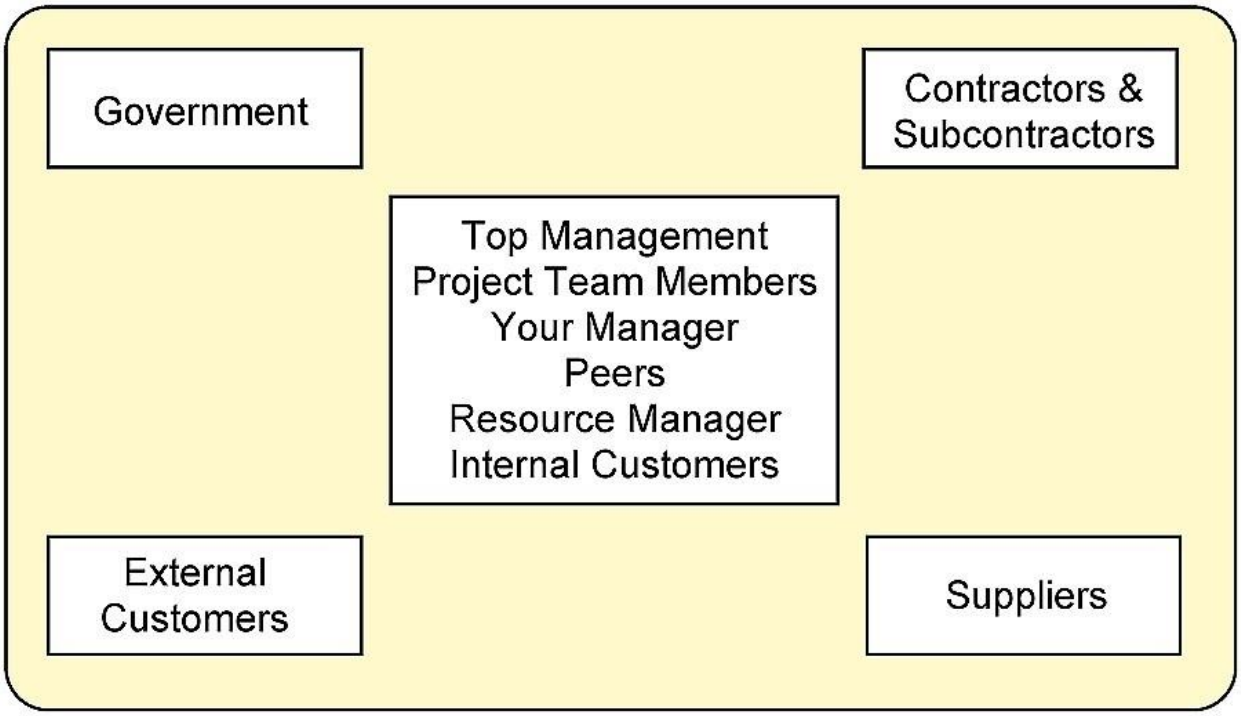

Figure 2.2: Stakeholders management– Project management (Source: Park et al., 2017:2043)

Stakeholder management for a project concentrates on "constant communication with stakeholders to understand their requirements and hopes; addressing problems when they occur; handling conflicting interests; and nurturing suitable stakeholder engagement in project decisions and activities" (Benn, Abratt and O'Leary (2016:7). Stakeholder management, which is a managerial function, may be viewed as an outside moderator. Kerzner (2018:123) used six continual processes to illustrate project stakeholder relationship management, which include "identifying stakeholders, analysing, engaging, identifying information flow, enforcing stakeholder agreement, and stakeholder debriefing". According to Stocker, Arruda, Mascena and Boaventura (2020:2075), five elements have been used to evaluate the success of the stakeholder management process: "stakeholder identification and categorisation, communication, engagement, empowerment, and risk control".

2.6 Identification and classification of stakeholders

The logic behind stakeholder theory is based on a number of presumptions that describe the relationship between an organisation and its environment. These presumptions include that

organisations have relationships with a variety of stakeholders that top managers at businesses make strategic decisions that have an impact on stakeholders that competing interests between organisations and stakeholders can lead to conflict, and that markets in which organisations compete tend to navigate towards equilibrium (Yan & Shang, 2020). Notwithstanding the descriptive nature of the idea of stakeholders, Nguyen and Mohamed (2021) claim that there is little consensus on what Freeman (1984) calls "The Principle of Who or What Actually Matters," which they define as "who (or what) are the stakeholders of the firm? And what or to whom do managers provide their attention? Stakeholders were divided into primary and secondary stakeholder groups by Benn et al. (2016):

According to Benn et al. (2016) a primary stakeholder is "one without whose ongoing participation the firm cannot survive as a going concern". These groups primarily consist of shareholders, employees, clients, and suppliers, as well as the public sector, which consists of local and state governments and other organisations that support infrastructure, control organisational behavior, and collect taxes. The organisation and the key stakeholders are incredibly interdependent. Benn et al. (2016) goes on to discuss the significance of managers generating value for each set of stakeholders in order to maintain the relationship and retain stakeholders. These stakeholder groups have influence over managerial decisions (Rajablu, Hamdi, Marthandan & Yusoff, 2017). They are extremely visible because of the contractual ties that businesses have with their key stakeholders; businesses must make judgments, evaluate their requests, and provide them options (Kerzner, 2018). According to Gazder and Khan (2018), the company has a direct and contractual relationship with its key stakeholders.

Benn et al. (2016) defines Secondary stakeholders as "those who influence or impact, or are influenced or affected by, the corporation, but they are not engaged in transactions with the organisation and are not vital for its survival". Other stakeholder groups include the media, trade associations, and support organisations (special interest). Although though these organisations don't have a formal agreement or authority with the company, and the organisation doesn't depend on them to survive, they can seriously disrupt the organisation (Ferenc, Varmus & Vodak, 2017).

Stocker et al. (2020) argue that the problem is that stakeholder groups have subgroups and individuals who have both varying interests and support multiple roles, where "individuals wear different hats at different times." This is because stakeholder groups are made up of groups of people who have theoretically shared interests. Additionally, Stocker et al. (2020) thinks there is significance in examining empirically how managers and stakeholders interact in order to define what stakeholder groups are. Rajablu et al. (2017) revises the debate over which groups should be allowed to participate in the stakeholder concept. He acknowledges that having a stake in an organisation is an acceptable need for being a stakeholder and further proposes that the idea of having a stake within a firm should be seen as supplying an input to the company and being part of its output, creating a reciprocal link. According to Hargrove and Heyman (2020), nothing has been published about reciprocity in stakeholder relationships, and stakeholder theory has neglected to take into account the reciprocal character of accountability. Gazder and Khan (2018) proposes that stakeholders be divided into "influences" (powerful and significant to the firm) and "claimants" (less powerful and susceptible to the firm's activities), and agrees with Ferenc et al. (2017) that a restrictive definition should omit "influences" and only include "qualified claimants" (those that could exert power over the firm but lack a strong connection). Marks and Breen (2021) proposes the exclusion of rivals, non-governmental organisations, and the media. Begg (2018) concurs that a firm can indirectly touch practically everyone, but he or she views this as insufficient without contributing to or playing a part in the firm. Because of the debate surrounding self-interest, this limited definition of stakeholders includes only management, shareholders, and occasionally consumers, suppliers, employees, and community members (Yan & Shang, 2020).

2.6.1 Stakeholder communication

Since the value flow from engaged stakeholders, communication with stakeholders is essential for the longevity of the business model (Hargrove & Heyman, 2020). This is particularly crucial in emergency situations. The recent disruptive consequences of the Covid-19 outbreak are an example of how a crisis can result in a structural shock that has a substantial influence on the strategic and financial sustainability of company models (Torelli, Balluchi & Lazzini, 2020). This shock can be viewed as an important and extraordinary event since it makes the pertinent information public and so encourages open and positive conversation between businesses and

stakeholders, thereby raising the caliber of sustainability disclosure and stakeholder communication.

Management and external stakeholders often benefit from stakeholder communication, especially when it is conducted with participatory modeling in mind. Through discussions about how and when knowledge will be shared, the determination of what knowledge is most valuable to stakeholders, and the incorporation of those interests into the methods and results dissemination, participatory modeling involves intentional interactions that integrate communication with stakeholders into the research and publication process (Chen, 2020). The achievement of conservation and sustainability goals can be facilitated by managers receiving critical input and information on local systems through effective stakeholder participation in communication (Butt, Naaranoja & Savolainen, 2016). Receiving individualised, readily available, and high-quality data for insight into their system to complement local knowledge benefits stakeholders (Koschmann & Kopcsynski, 2017). Notwithstanding these advantages, there are numerous obstacles that frequently prevent successful stakeholder participation in communication (Butt et al. 2016). The second difficulty is that management frequently lacks the incentives required to interact with stakeholders in an effective manner, mostly because the traditional academic compensation structure is dependent on funds and publications that have undergone peer review (Jun & Kim, 2021). Although good communication necessitates a reciprocal, transparent, and dynamic relationship, stakeholder communication is frequently restricted to project logistics (Bourne, 2016). Yet, management can encourage long-term cooperation and better understanding of a local system by increasing stakeholder investment in the project (Chen, 2020). When managers explicitly include stakeholder knowledge and interests in customised reports and shared code, coding for greater effect fits well into a participatory modeling framework and increases stakeholders' motivation to engage (Cascetta et al., 2015). Jun and Kim, 2021) advise managers to talk about how and when knowledge will be shared and determine what knowledge is most appreciated by stakeholders in order to start these connections.

2.6.2 Stakeholder engagement

The success of a project is critically dependent on stakeholder participation. Early involvement of external and internal stakeholders is very important (Pedrini & Ferri, 2018). The negative influence

of stakeholders is minimised, or at least reduced, with the early participation of interested parties. Openness, participation, and communication, particularly in the early stages of projects, may help to reduce possible problems in the later project phases (Kerzner, 2018). The project's scope, success factors, and ongoing support are all open for discussion with the stakeholders at this point. Throughout the project lifecycle, the PMBOK guide encourages stakeholder interaction as a strategy for getting support from stakeholders and minimising their negative effects (PMI, 2017). In order to benefit the project, effective stakeholder engagement maintains a consistent approach to taking the stakeholders' interests and project requirements into consideration (Kerzner, 2018). Stakeholders may contribute to the success of a project if they are properly engaged and managed. Stakeholder involvement in a project can result in creative ideas and environmentally friendly procedures that save costs, both immediately and over time (Nguyen et al., 2018). According to PMI (2017), successful stakeholder involvement depends on maintaining regular communication with all pertinent stakeholders.

2.6.3 Stakeholder empowerment

Understanding various, interconnected levels and interactions comes with the concept of power. According to Civera, De Colle, and Casalegno (2019), this includes the dissemination of information about, for instance, social and environmental initiatives, employment concerns, and educational issues—all of which are pertinent to people who lack or exhibit less power individually, in groups, organisations, and communities. To engage low-power stakeholders, a corporation must first identify power imbalances, identify their impacts, and then take steps to reduce them through empowerment. The goal of empowerment is to give stakeholders the opportunity to speak up and develop into a stronger and more capable counterpart for the initiation of productive dialogue and active partners for co-creation through enduring and reliable connections (Fetterman, 2019). Pan, Kwak and Deal (2022) believe that the idea of organisational trustworthiness is crucial for stakeholders who have a negligible ability to influence an organisation both politically and economically because it acknowledges that power asymmetries need to be adjusted before achieving effective engagement. Before they can feel engaged, they should be able to tell whether the corporation treats their rights and interests fairly and without engaging in opportunistic behavior. In this view, there is a connection between shareholder value

and empowerment, especially in terms of utility related to organisational justice and a sense of identification (Civera et al., 2019).

Empowerment is a concept in social science that connects personal abilities, innate support networks, and proactive actions to social change and policy (Nederhand & Klijn, 2019). According to Shafieisabet and Mirvahedi (2019), the idea in management literature refers to the transfer of responsibility from those with formal power (such as managers or leaders) to those with informal power and the decentralisation of decision-making, all of which reduce power imbalances. The perception of self-efficacy and control, the accumulation of financial resources, knowledge, and skills, and involvement in group efforts to bring about change are all examples of empowerment (Pan et al., 2022). Although the idea of power is a prominent one in management and social science, it seems underdeveloped and underutilised from a stakeholder theory perspective given the theory's primary emphasis on relational interactions and stakeholder involvement. Civera et al. (2019) recognise that power can affect the nature of relationships and is, thus, an essential step for effective participation, particularly in light of the connections between stakeholder involvement and the establishment of balanced, fair, and trusting relationships.

Increasing stakeholder knowledge of the business and equipping them with industry-specific know-how and skills is another facet of empowerment that will make them better business partners and increase their marketability (Bondy & Charles, 2020). This is related to the growth of stakeholder interaction skills that encourage communication and information sharing among stakeholders along the supply chain, resulting in increased participation in all phases of the decision-making process and the reduction of power imbalances (Khan et al., 2021). Creating start-ups and developing creative entrepreneurial activities through financial support and training, improving cooperation between businesses and stakeholders, and stimulating innovation and product differentiation are all examples of distinct empowerment dimensions (Bondy & Charles, 2020). A number of authors have also emphasised that while processes of private-public partnership can lead to new forms of collaborative governance providing incentives for stakeholders to participate in decision-making processes and policy implementation, the absence of strong governance structures is frequently a barrier to effective stakeholder empowerment (Harrison & Wicks, 2013; Pan et al., 2022). Finally, working together through methods of

collaborative advocacy and intra-stakeholder alliances can help low-power stakeholders strengthen their influence on corporate and public decision makers (Fassin, Colle, & Freeman, 2017).

2.6.4 Stakeholder risk control

Uncertainty and unforeseen events during the project lifetime are referred to as risk (Derakhshan, Turner & Mancini, 2019). Risk could represent a chance or a danger. Stakeholder influence, behaviour, and decision-making that endanger the project and its deliverables are the focus of stakeholder risk management (Rajablu et al., 2017). It is crucial to evaluate the possibility and effect of hazards. The methods of "risk identification, assessment, planning, communication, and monitoring to control risk" have been used by project management experts (Gazder & Khan, 2018:127).

As a result, stakeholder management is essential for enhancing stakeholder interactions and project effectiveness (Nguyen & Mohamed, 2021). Effective stakeholder management must take into account, not just the interests of each stakeholder, but also how those interests are influenced by complex interactions involving several, possibly interdependent, stakeholder groups (Khan et al., 2019b). Project managers must choose suitable ways to address problems brought on by certain stakeholder characteristics, as evidenced in the literature, because stakeholder power and competing interests present a significant barrier for stakeholder management (Dal Maso et al., 2018).

In the literature, stakeholder analysis frequently refers to the two primary qualities of stakeholders: power and interests (Pedrini & Ferri, 2018). Different stakeholder management techniques may be used with various stakeholder groups, depending on these traits. As a result, it is anticipated that stakeholder management techniques would strongly correspond with stakeholder power and interests. Due to the way that stakeholders utilise their clout to advance or defend their project interests, stakeholder interests and power may also be linked to project performance (Platonova et al., 2018). Stakeholder management's fundamental objective is to execute projects within budget, on time, and without sacrificing quality; hence the connection between stakeholder management and project success should not be overlooked.

2.7 Stakeholder characteristics

According to research, competing interests and stakeholder power both affect project performance (Gazder & Khan, 2018). To manage stakeholders who have certain characteristics, project managers must employ the right stakeholder management techniques (Nguyen, Chileshe, Rameesdeen & Wood, 2019). Because they are two of the primary characteristics of stakeholders and are frequently utilised in the literature on stakeholder analysis, power and interests need to be managed closely.

2.7.1. Stakeholder power

Power is one of the fundamental characteristics used to classify stakeholders and is a crucial component of the stakeholder matrices and stakeholder salience model (Nguyen & Mohamed, 2018). The stakeholder salience model was created to categorize and describe stakeholders in accordance with the strength, veracity, and importance of their claims. The model provides managers with an essential tool for deciding what kind of, and how much, management attention a stakeholder needs (Mitchell et al., 1997, cited in Nguyen & Mohamed, 2021). A stakeholder can have varying degrees of influence in the decision-making phase of the project. Hence, the method is valuable for identifying stakeholder impact (Begg, 2018).

Stakeholder power is the capacity of persons in positions of authority to achieve their preferred results (Nguyen & Mohamed, 2021). According to Leung et al. (2013:123), stakeholder power can take five forms, including: “reward power, coercive power, legitimate power, referent power, and expert power”. The capacity of stakeholders to reward desired behaviour, execute effective change in initiatives, and provide permission, direction, and financial resources, is known as reward power (Khan et al., 2021). Coercive power is the term for the use of physical resources such as force, aggression, and threats, such as the brandishing of a gun (Nguyen & Mohamed, 2021). The impression and capacity of a valid right to influence others is referred to as legitimate power (Gazder & Khan, 2018). The main difference between the government and local councils is their legal ability to enact laws and put important problems on the agenda. Referent power, alludes to an attraction and sense of identity with others (persons or groups). The terms expertise and power are used interchangeably (Nguyen & Mohamed, 2021).

According to Rahim et al. (2001), cited in Nguyen and Mohamed (2021), legitimate power may have a detrimental impact on work output through referent power and negotiating style. Coercive power can have an indirect, detrimental impact on work performance through referent power, expert authority, and negotiating style. The 'bargaining style' of a party is how they pursue their own or other parties' objectives (Nguyen & Mohamed, 2021). According to Leung et al. (2013), satisfaction with public engagement is strongly and favorably correlated with reward power.

According to Nguyen and Mohamed (2021), power is the most important factor influencing decision-making and stakeholder salience. In an empirical investigation of construction projects, Srinivasan and Dhivya (2020) discovered a positive correlation between stakeholder power and stakeholder management tactics like compromise and adaptation. Accordingly, managers should use tactful strategies when dealing with powerful stakeholders. Stakeholder power in projects is therefore the capacity to influence the progress and results of the initiatives. Gazder and Khan (2018) concluded that, depending on the stakeholder's position within the project, the power of stakeholders can manifest itself in several ways. Project managers should focus more on power, one of the most important stakeholder traits, in order to achieve project goals.

2.7.2 Stakeholder interests

Kujala, Aaltonen, Gotcheva and Lahdenperä (2020) define stakeholder interest as a stakeholder group's desire to communicate their demands on project decision-making, including the timing, manner, and nature of their involvement or perception of involvement. Expectations, desires, demands, values, and justifications are just a few examples of the various forms that interests may take. A stakeholder may have a variety of interests, including hopes for project results, support from others, societal effects, and group support (Uribe et al., 2018). The same author listed a variety of interests, including ethical, political, physical, and informational interests.

Concerns about how power is allocated and distributed among all external and internal stakeholders are connected to political interests (Kujala et al., 2020). Physical interests, including financial gains; physical health; prosperity; ease; and comfort, are the fundamental needs of stakeholders (Nguyen & Mohamed, 2021). Additionally, physical interests have a detrimental

impact on the success of public involvement (Amadi, Carrillo & Tuuli, 2018). Information interests lead to stakeholders acquiring data, information, and news to enhance their understanding and, as a result, monitor the project's progress. They are characterised by ideas of justice; fairness; environmental accountability; corporate social responsibility; and ethical interests (Caniato et al., 2014).

Project managers must be adept at balancing the interests of several stakeholders in order to properly manage a project (Begg, 2018). Managers must recognise the importance and validity of stakeholders, take note of their interests and concerns, and respond appropriately. Ndaguba and Hanyane (2019) concluded that stakeholder interests are another crucial issue, and they differ from power in that they have distinct goals for projects. To engage and manage a variety of interests in initiatives, or even opposing interests, managers must understand stakeholder interests.

2.8 Project management

In recent decades, researchers and practitioners have attempted to enhance project management processes in order to increase performance (Sirisomboonsuk et al., 2018). This is partly a result of the construction industry's increasing complexity, since traditional project management techniques are insufficient to provide good project outcomes (Luo et al., 2017). A project manager's ability to achieve strategic goals over a major investment period will also increase as project assessment extends to encompass governance and stakeholder management over time (Derakhshan et al., 2019). In a recent study, the idea of governance has also been connected to projects, and certain pertinent issues have been addressed, such as the development of guidelines by project management governance to assist and guide projects (Marks & Breen, 2021).

Project governance has frequently been noted by project management academics as a fundamental condition for solving problems at all phases of project creation and execution. Project governance is "the mechanism through which a project is directed, governed, and managed" (Kujala et al., 2020:14). Project governance is described as "the structure, functions, and procedures that steer project operations in order to develop a distinctive product, service, or outcome to achieve organisational strategic and operational goals" (Project Management Institute, 2017:25). Khan et al. (2019a:46) describe project governance as "a set of management systems, rules, protocols, relationships, and structures that provide the framework within which choices are made for project

development and implementation" in order to achieve the intended commercial or strategic purpose. Executive planning's strategic focus for recognising and addressing various stakeholder groups is project governance (Masur & Pisarski, 2015).

Performance measuring strategies that have been used traditionally include project success and failure. The paradigm proposed by Li et al. (2019) clarifies how performance and project factors are related. The authors identified the time and money-related indicators. Other project managers in the construction industry have offered a list of crucial elements, including time, quality, money, and conflicts, which have been found to have an impact on project performance (Sirisomboonsuk et al., 2018). Quality, time, cost, inter-organisational partnership, and co-operation were the four categories into which scholars divided 67 performance metrics (Derakhshan et al., 2019). Khan, Waris, Panigrahi, Sajid and Rana (2021) proposed two over-riding classifications, namely the criteria for subjective evaluation (satisfaction of contractor, satisfaction of project management team and satisfaction of customer), and the conditions for objective evaluation (quality, cost, disputes and safety). These classifications can be used to measure a project's success.

2.8.1 Project stakeholder management

In previous decades, stakeholder management has not been a popular concept in water management, even in water infrastructure projects. However, in the 21st century, water management has undergone significant changes (PMBOK, 2018). Multi-level, polycentric governance is frequently replacing the conventional function of the national government as the exclusive authority for making decisions. According to Lindgren, Toll and Melin (2021), this transformation recognises the significant contributions that stakeholders from various institutional contexts may make to inclusive, effective, and efficient water management.

Figure 2.3: Project stakeholder management (Source: PMBOK, 2018:13)

The managers and the project leaders in different organisations have a responsibility to ensure a good relationship with their clients and the beneficiaries of the project (Chih & Swikael, 2015). Previously, this was a straightforward task because the external environment in which the project existed was more stable than it currently is. As it is now, the situation is more volatile and the stakeholders are more knowledgeable about their rights. The working environment has become more turbulent and is rapidly changing (Ontita & Kinyua, 2020). This has made the task of stakeholder management both more in demand and more complex. Managers are discovering many groups and individuals in every aspect of their activities; whether in their day-to-day management, different projects, or even in the planning and execution of their projects (Boutilier, 2017). These groups of stakeholders must be satisfied for the organisation to fulfil its objectives. Managers have to maintain the balance between the stakeholders and the organisational objectives and ensure that the mandate of the organisation is not compromised (Sulemana, Musah & Simon, 2018).

Throughout the course of the project, stakeholder involvement serves to achieve project ideals and potential stakeholder satisfaction (Bahadorestani et al., 2020). Furthermore, according to several academics, inefficient stakeholder management is the leading cause of project failure (Aaltonen,

2011; Khan et al., 2021). The expectations and opinions of the stakeholders have a big impact on whether initiatives succeed or fail. Stakeholders in construction projects may have an impact on the project's scope, the communication structure, resource allocation, and regulatory changes (Nguyen & Mohamed, 2021).

The most important element in a building project's success is stakeholder participation. Project performance and project governance are also positively correlated (Li et al., 2019). Through the use of governance techniques, overall project management may be improved, resulting in the successful completion of large-scale construction projects. When making investment decisions and determining the success of infrastructure projects, governance has grown in importance (Park et al., 2017). Khan et al. (2021) also recognised the governance problem as a crucial component for infrastructure development projects in their study. According to Müller et al. (2017), effective projects must be completed using standardised project governance practices.

Concerns about the performance of public infrastructure projects have received a lot of attention in the recent literature. Developed nations have a track record of successfully managing and completing development projects, due to improved governance mechanisms (Klakegg et al., 2016). On the other hand, in developing nations like South Africa, there is a lack of capability in public sector organisations to deliver feasible infrastructure projects because of widespread poverty; antiquated methods; rising circular debts; a lack of working capital; social inequality; a struggling economy; and a low literacy rate. This requires increased awareness of advanced project management practices (Gazder & Khan, 2018). High-value projects play a crucial role in fostering the nation's economic expansion as foreign direct investment rises as a result of extensive financial and technical support.

Good governance is required as an effective and efficient means to enhance projects in order to resolve this problem and improve the dependability, success, and productivity of these initiatives. Studies on project governance and stakeholder management are only now being conducted, and there is a need for research into the stakeholder procedures and actions that are associated with project governance (Gazder & Khan, 2018). The relationship between project governance and the efficiency of public sector infrastructure has been the subject of much research. The integrated

links between project governance, project success and stakeholder management of public sector initiatives is, nevertheless, seldom examined in research (Derakhshan et al., 2019; Irfan & Hassan, 2017).

The evolution of communities and societies, and the development of the stakeholder concept has grown in parallel with the evolution of organisations and projects. Knowledge of the stakeholder concept had previously been limited only to those individuals or groups of people who are rendering some service to the organisation, like suppliers of certain resources or customers of a certain product (de Oliveira & Rabechini, 2019). Individuals, and groups of internal and external stakeholders, have begun to understand their roles in organisations and in development projects that are within their jurisdiction. This brings to the definition of stakeholders those people who have a stake in a particular organisation or project, and those who perceive themselves as interested in and/or affected by the activities or outcome of that particular organisation (Chih & Swikael, 2015).

Although there is no act that provides for the direct promulgation of stakeholder management, it is accepted that the concept is considered crucial, as reflected in the King reports on Corporate Governance, in particular King IV (Masegare & Ngoepe, 2018; Tshipa, Brummer, Wolmarans & du Toit, 2018). The King reports initially had their focus on corporate responsibility. Organisations exist because of people, and they serve people (Freeman, 2010; Governance, 2016). While organisations may appear to be at the centre of the stakeholder concept, its central position is defined by the convergence of the diverse groups and individuals that converge on one stake, with different expectations (Johansson & Andersson, 2014). However, this has not always been the case. As a result, organisations have advanced in their understanding of the stakeholder concept over time.

2.9 Difficulties in public infrastructure projects

It is impossible to exaggerate the value of infrastructure projects in the public sector to the overall economy. However, despite adhering to known project management principles, it has often been found that many initiatives have not generated the desired results (Dal Maso et al., 2018). Infrastructure projects are distinct and intricate, and include engineering, procurement, and

construction, as well as a variety of uncertainties and stakeholder connections. Additionally, these projects are probably going to have extensive expenditures and a lengthy life cycle, which makes them difficult to design, implement, and manage (Patanakul et al., 2016). According to common consensus, public-sector projects typically fall short of their set goals and have a poor success rate (Platonova et al., 2018). Governments are, at the same time, trying to address public requirements while working with restricted budgets. Planning departments and executive government agencies have proved that poor project performance significantly hinders their capacity to deliver public services on time (Khan et al., 2021).

According to the stakeholder theory, an organisation's effectiveness is dependent on how it views its major businesses and competitive drivers, how well it can think strategically, and how well it can lead and interact with its many stakeholders (Cordeiro & Tewari, 2015). To improve their financial performance via efficiency and effectiveness, organisations must meet the requirements of all key stakeholders, and this cannot be done if the stakeholders are disregarded (Sirisomboonsuk et al., 2018). This idea offers a useful technique for incorporating stakeholder pressure to put performance improvement initiatives into action. According to the stakeholder theory, an organisation's structure should support this inclusive approach and make project organisations accountable to a larger group of stakeholders (Freeman, 1984).

Developing nations experience difficulties as a result of complicated procedures in the public sector, a lack of resources and skilled workers, and an ineffective bureaucratic system (Khan et al., 2021). Although these government agencies are working hard to enhance the performance of development projects through a variety of means, significant changes are still needed to meet the intended performance metrics (Khan et al., 2019a). Public sector infrastructure projects have performed poorly, and the main reasons for this include ineffective governance and conflicts of interest among the numerous players, including consultants; contractors; project directors; sponsoring organisations; and various social community groups (Platonova et al., 2018).

2.10 Stakeholder management critical success factors

Some studies have used CSFs as a technique to better understand the management process (Mavi & Standing, 2018; Kiran & Reddy, 2019; Yang et al., 2009b). CSFs are "areas, where outcomes,

if they are satisfactory, will assure strong competitive accomplishment for the company" (Mavi & Standing, 2018:760). Studies on stakeholder management in general, and studies which have examined a specific component in detail, are used to identify CSFs (Tripathi & Jha, 2018). A thorough assessment of the literature led to the identification of six groups, each of which includes a variety of elements important to stakeholder management success. These groups are as follows:

2.10.1 Group 1: Project type

Project characteristics have a big impact on whether it succeeds (Mashali et al., 2020).

• **Industrial:** Projects in the industrial sector tend to be very complicated (Kannan, 2018). Despite the fact that there is research that evaluates project complexity, few of these studies provide an appropriate management plan for controlling project complexity (Liu et al., 2017). A realistic approach that helps speed up the review process is essential for effectively managing the project.

• **Buildings:** The separation of construction responsibility from the design phase harms building construction. Hastig and Sodhi (2020) pointed out that the contractors' exclusion from the design process is the root of the problems.

2.10.2 Group 2: Type of contract

According to Mashali et al. (2020), the organisation needs a detailed construction contract that realises an effective collaboration environment with a balance between vendor and customer.

• **Reimbursable Costs:** A design-build project is one for which a single firm or consortium is legally responsible, for both the design and construction (Wang, Wu, Wang, Chi & Wang, 2018). Design-build has gained popularity, globally, in recent years and has been proven to be an efficient delivery strategy (Hammad, 2013). For a preliminary assessment of the suitability of engaged parties to carry out the project, pre-qualification of implied bids is crucial in design-build projects. In addition, all terms, laws, and contract papers pertaining to the rights and obligations of the parties must be fully in order to provide enough information on the responsibilities at every stage of construction and design (Ndaguba & Hanyane, 2019).

2.10.3 Group 3: Decision making

Despite not being frequently mentioned, this group merits special attention. This idea highlights the necessity of giving the team the ability to make critical decisions on time in order to allow for efficient scheduling of the implementation (Kiran & Reddy, 2019).

• **Open assessment of potential alternatives based on stakeholder concerns:** Building the foundation of confidence necessary for an effective stakeholder management approach will allow managers to evaluate alternative options for improving the construction sector based on stakeholders' concerns (Srinivasan & Dhivya, 2020).

• **Ensuring that the project's stakeholders communicate effectively:** The ability to effectively interact with, and manage relationships among, the many project stakeholders is essential for project success (Mashali et al., 2020). Therefore, in order to assure the project's success, a lot of information, including expectations, goals, and demands, must be consistently communicated to all key stakeholders. Communications encompass the procedures necessary to guarantee the appropriate and correct generation, gathering, storage, dissemination, and recovery of all project data. A bridge between various project stakeholders is also built via good communication, bringing together their disparate cultural and organisational backgrounds, degrees of experience, viewpoints, and stakes in the project's success (Sulemana et al., 2018).

• **Create a stakeholder management approach that you can be proud of:** The method through which project directors respond to the requirements of diverse stakeholders is known as the stakeholder management approach (Uribe et al., 2018). Because of this, several academics have emphasised the need to address the implementation strategy in a stepwise manner (Gupta, 2000; Robey et al., 2002; Rajablu et al., 2017; Nguyen et al., 2019).

• **Project managers decide on how to approach stakeholders:** Stakeholders' reactions to the strategies are a crucial consideration (Mashali et al., 2020; Freeman et al., 2007). As a result, the project team must anticipate stakeholder actions to accomplish its goal, while an efficient project management approach secures the project's success (Bahadorestani et al., 2020). Five key tactics

employed by construction industry firms have been described, ranging from negative to active approaches. The following are some stakeholder management techniques: compromise; adapting; avoiding; influencing; and dismissing (Pedrini & Ferri, 2018).

2.10.4 Group 4: The finest stakeholder management team

Problems with project execution may result from stakeholder attitudes that are unrealistic and incorrectly focused on a project and its anticipated outcomes (Srinivasan & Dhivya, 2020). The conceptual creation of diverse managerial frameworks, instruments and procedures, to recognise, classify, and co-ordinate project stakeholders, as well as research into the function and importance of the stakeholder management process, comprises the majority of project stakeholder research on managerial behaviour (Amadi et al., 2018; Khan et al., 2021).

• **Client team:** There is a requirement for dialogue, gatherings, and discussions with a lot of significant parties, notably with the owner (Cordeiro & Tewari, 2015). In order to avoid mistakes, organisations must tell their owners about their initiatives (Mashali et al., 2020).

Establish a project management team: The establishment of a team comprised of the best and most qualified members of the organisation has been mentioned frequently in the literature. They need to be released to the carry out their out mission full time, and they need established credit for the job at hand (Mashali et al., 2020). When executing the planning phase, the team must possess the expertise needed to research particulars. After the team has been formed, the focus will shift to employee education and training (Derakhshan et al., 2019).

Supervision consultant Team: Numerous studies have backed the need to have a consultant on the executive team (Kujala et al., 2020; Li et al., 2019; Motwani et al., 2002; Kalling, 2003). However, managing the knowledge transfer from the consultant to the company is crucial for this relationship.

• **External party team:** A project management company experienced in comparable projects will assume the role of the construction authority in the absence of a construction authority with

experience in complicated mega-projects (Mavi & Standing, 2018). In order to achieve a balance between stakeholder interests, construction authority control is required in projects.

Team of contractors: Designers may benefit from early contractor involvement, which in traditional procurement techniques and design management systems typically occurs prior to the tender stage (Nguyen et al., 2018). The contractor's involvement in the design process therefore plays a crucial role in ensuring that the design is done correctly the first time and will benefit the project's efficiency, quality, constructability, and speed of construction (Xia et al., 2018). However, even when contractors participate, they have few alternatives, because the majority of designs have already been chosen.

2.10.5 Group 5: Categories of stakeholders during project stages

The majority of academics looking into stakeholder management have emphasised the critical importance of stakeholder identification (PMBOK, 2018; Mashali et al., 2020; Walker et al., 2008). The issue of 'who are the stakeholders?' must be addressed before dividing the project's stakeholders into different categories based on different criteria (Mashali et al., 2020). Stakeholders in the project have an impact on the project management process. Realising the influence of the stakeholders is crucial for developing and putting into practice suitable stakeholder management procedures (Amadi et al., 2019). Therefore, an effectively executed external stakeholder management approach offers a chance for project enhancement.

• **Initiation stage:** Kannan (2018) posits that the performance of projects in terms of schedule, scope, time, safety and quality has been shown to be improved by integrating stakeholder management throughout the early project phases. Early stakeholder classification is crucial for the project management team to ensure the project's success. Identification of the project's stakeholders is essential, as is the process for involving them in the design and construction activities. It is also important to identify any conflicts that may arise between the stakeholders, and any issues with stakeholder management, so that the project can be improved (Weshah et al., 2014a). The commencement phase of project development should provide clear and adequate stakeholder definition, which is frequently regarded as one of the crucial contributors to project success. As a result, the degree of effort put in during this phase will have a significant impact on

success across the following phases. At this crucial point in a project's lifespan, a certain mega-project execution strategy is chosen (Gabriel, 2015).

• **Planning stage:** By taking effective, overall management measures in leading, planning, controlling, and arranging the project activities, the project activities might be safeguarded in a good position (Khan et al., 2021; Mavi & Standing, 2018). Planning should pay attention to the activities to be completed and, as a result, it should contain both internal and external best practices for execution (Amadi et al., 2019). Mega-projects have a set of phases that they progress through in order to complete. The activities that make up each phase of a project change as it moves through them, and the output from one phase is used as an input for the following. Numerous studies have demonstrated that putting more effort into stakeholder management and project planning results in enhanced project success (Gabriel, 2015). In this phase, the design is developed logically in an effort to win permission to move on to the implementation phase. Once the project financing agreement is signed and the customer receives an adequate design solution that meets their demands, things frequently improve (Nguyen et al., 2018). The planning phase strives to ensure that the owner is aware of the scope of the works and that any potential hazards may be foreseen before moving on to the execution phase.

• **Execution stage:** According to Mashali et al. (2020), nearly every aspect of stakeholder management must be taken into account throughout the implementation phase. This phase is divided into two stages: project construction and on-site monitoring and control. The project crew has to be knowledgeable about the area's weather, environmental factors, and geotechnical conditions, which need to be thoroughly verified and analysed (Weshah, et al., 2014a). In this phase, the company creates options and selects the best one. Compared to the earlier phase, scope definition and data dependability are more important. At this stage the project manager is appointed and important project resources are allocated (Gabriel, 2015). In addition, data, statistics, and criticisms are regularly gathered and swiftly given to those with an interest.

• **Monitoring and control stage:** By this point, the project has received full funding, a comprehensive timetable is in place, and the executive team's commitment to following the project's budget and schedule is strong (Xia et al., 2018). When a project is being executed, the

client's team, the executives, and other project stakeholders receive progress and performance reports in which the project team's performance is assessed (Hussain, 2015). Additionally, performance information is acquired, examined, and disseminated in quarterly reports throughout the monitoring and controlling process (Gabriel, 2015).

• **Closing stage:** All project contractors and teams are removed from the project at the closing stage. This also includes the owner's operations teams (Wuni & Shen, 2020). However, project transfer is a drawn-out procedure, particularly when there are intricate tasks. Therefore, this step facilitates a smooth hand-over process. As-built designs are documented and forwarded to the client representative to verify that the teams of end-users are capable of performing operation and maintenance activities (Hussain, 2015).

• **Maintenance stage:** The purpose of this phase is to outline the project's required maintenance (Mashali et al., 2020). Early design stage co-operation from the facility management is crucial for securing the maintenance phase and lowering uncertainty. It will also be less necessary to do property surveys once the project is over if the legacy archive is accurately recorded (Wuni & Shen, 2020).

2.10.6 Group 6: Management support

Effective stakeholder management requires the backing of senior management. People should thus be willing to deploy power and resources that will support the organisation's overall goal in order to ensure successful stakeholder management (Srinivasan & Dhivya, 2020). One of the most-often reported CSFs is top management's dedication and assistance. This idea also implies that top management has the required leadership. Also mentioned is the need for senior management to participate in strategic planning, while also being technically minded; and the need for management to anticipate any potential weaknesses (Yusuf et al., 2004). For a project to be successful, senior management must have dependable and committed leadership (Mashali et al., 2020).

• **Taking care of stakeholders who have business obligations:** The execution plan is continuously managed as part of project management. This means that it includes, not only the

planning stages, but also the job distribution to various team members; the identification of crucial routes and significant milestones; the preparation of human resources; and ultimately the evaluation of success indicators (Nguyen & Mohamed, 2021). It is also important to create a steering committee with representation from top project management, top management in various business roles, and end users (Uribe et al., 2018).

• **Flexible project organisation:** Olander and Landin (2008), as cited in Mashali et al. (2020), explored the influence of the project's flexibile performance in hiring employees to achieve its objectives. A flexible project structure is necessary to go beyond the challenges and executional uncertainties. Since one goal of stakeholder management is to win support from stakeholders for the project's execution, this goal will be met if a business is developed with adequate resources for stakeholder communication and engagement (Ezkerod et al., 2015).

• **Competencies or abilities of a project manager:** Project managers need to be extremely capable in terms of management, technology, and business. (Freeman, Harrison & Abreu, 2015; Sulemana et al., 2018). The majority of the time, project managers are in charge of managing the relationships between stakeholders. As a result, the success of stakeholder management depends on the relationships, expertise, power, and experience of the project managers (Ndaguba & Hanyane, 2019). Additionally, project managers need to be adept communicators and negotiators in order to guide the expectations of many stakeholders and foster a healthy cultural exchange within the larger organisation (Wuni & Shen, 2020). As a result, in addition to being aware of the technical issues at hand, the project manager also has to understand how the environment, community, technology, and locals interact. Additionally, when designing a construction project, project managers should learn about the project site and interact with the local community.

2.11 Project governance

To manage the project life cycle and ensure success, project governance is tied to organisational governance (PMI, 2017). Goals and strategy may be aligned through project governance, which the project sponsor and team can use. Project governance has been recognised and established as a means of achieving the company's operational and strategic objectives. It also serves as a guide by monitoring the project management processes. Through a methodical approach to project

management, it focuses on finding opportunities for project success (Khan et al., 2021). The triple restrictions of the project's objectives have made it extremely difficult to accomplish initiatives. In order to supervise the execution of the project and ensure effective stakeholder participation, project governance is necessary (PMI, 2017).

2.11.1 Project governance elements

The project and organisational environments should be taken into consideration while examining the project governance needs. A project may be managed in one of three ways: as a stand-alone project; as part of a programme; or as part of a portfolio (PMI, 2017). When taking into account these three distinct project governance scenarios, the organisation structure in Figure 2.4, below, serves as an example of project governance. When a project is included in a programme or a portfolio, the governance of the project interacts with that of the programme or portfolio. The project has a distinct, independent governing body when it is a stand-alone project that is not part of a programme or portfolio. The interactions between this governing body, the project and project manager, and subsequently with the various stakeholders, are the next phase in the system (Khan et al.,2021). The prospect of additional governing authorities engaging with the project and project manager is also a case, as shown in Figure 2.4.

Everyone involved in a project has a variety of duties related to project governance. Depending on how complicated the project is, there may be other responsibilities in addition to those of the governing body; the project manager; the project sponsor; other important stakeholders; and the portfolio management office (PMO) (Sirisomboonsuk et al., 2018). The project governance must develop a strategy that outlines the various roles and duties in the project.

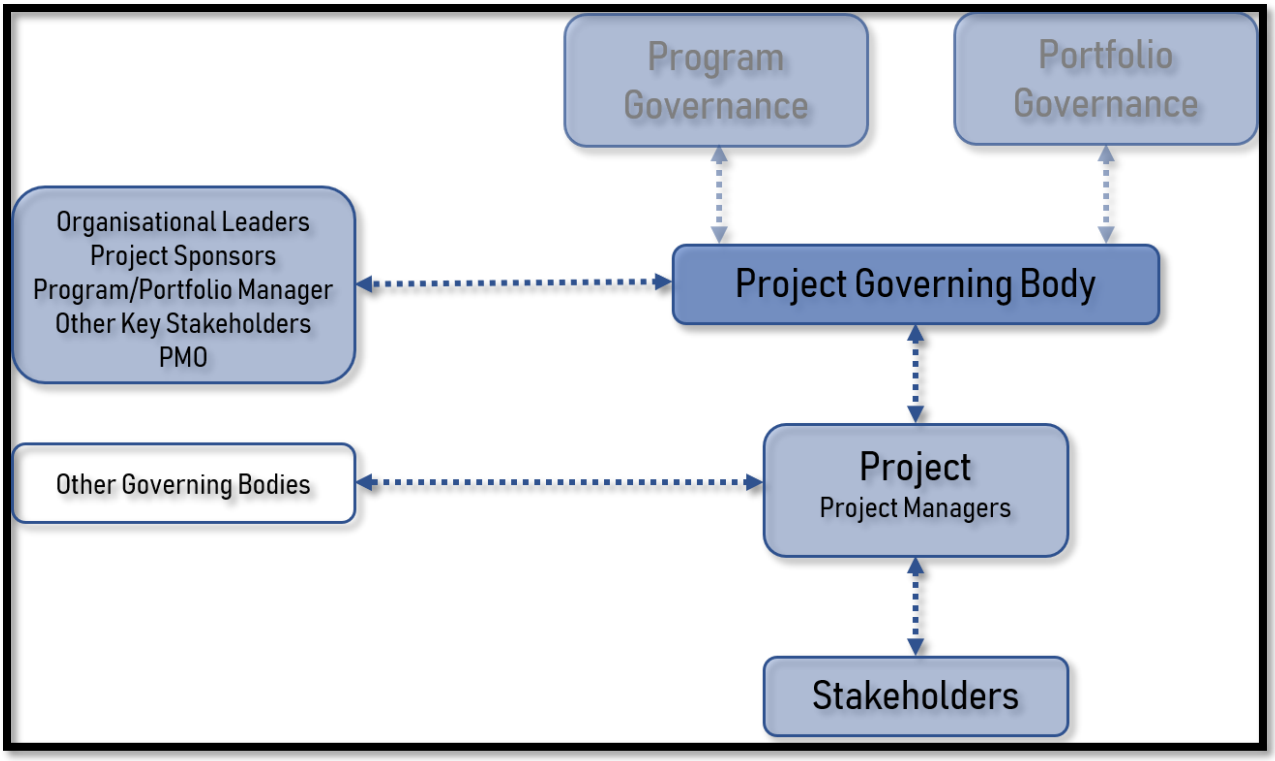

Figure 2.4: Project governance organisation (Source: Khan et al., 2021: 212)

Initially, there are four elements in project governance. These four factors include "portfolio management, project sponsorship, efficiency and effectiveness of project management; and reporting and disclosure" (Khan et al., 2021:213). For projects involving public sector infrastructure, the UK Treasury department has advocated the four project governance traits stated above. The department has placed a strong emphasis on integrating public sector concerns into the project governance structure in order to ensure successful management. Due to the impact of key stakeholders, a project governance mechanism system may therefore guarantee that the demands of the public sector are met at the right moment, which will assist in preventing the project from being delayed or disrupted (Uribe et al., 2021). The following is a succinct summary of these dimensions:

2.11.1.1 Portfolio management

According to Khan et al. (2021), portfolio direction verifies that the specified initiatives are part of a single portfolio. Additionally, it permits project review and allows management to ensure that

they are in line with important business goals and organisational restrictions. Project portfolio management seeks to balance each project in the portfolio, while keeping in mind the firm's capacity, maximising the financial value of a portfolio, and connecting it to the firm's strategy (Platonova et al., 2018). Therefore, it is anticipated that proper portfolio direction for projects will result in improved project management in the public sector.

2.11.1.2 Project sponsorship

Pedrini and Ferri (2018) note that a project sponsor is frequently in charge of the production and maintenance of the project business case document. Maintaining project sponsorship is essential for maintaining the relationship between top-level management and project management, both for guidance and decision-making, as well as for representational accountability (Sirisomboonsuk et al., 2018). According to governance of all kinds, top management and sponsors should take a prominent role and provide the essential support for a project's effective governance (Dal Maso et al., 2018). It is therefore anticipated that proper governance, through project sponsorship, will result in improved project performance.

2.11.1.3 Efficiency and effectiveness of project management

The efficacy and efficiency of project management guarantee that the project teams can accomplish the project's goals with regard to factors like experience; skills; available resources; attitudes toward employing tools; and processes (Khan et al., 2021). According to Nguyen and Mohamed (2021), the strict planning, organised co-ordination, and communication processes in project-based organisations foster the development of frontline managers' leadership abilities. Along with having the right tools and resources, the human aspect is also crucial to the success of project management.

2.11.1.4 Disclosure and reporting

According to Khan et al. (2021), project governance disclosure and reporting give correct information, timely report availability for decision-making processes, and access to key project reports for important stakeholders. The project's information flow, especially on important changes or problems, must be swiftly communicated via official channels of communication. The

project team must establish communication guidelines and ensure that they are followed if they are to deliver information quickly and accurately (Dal Maso et al., 2018). Project team members who report on the real progress of projects are seen as major contributors to project failure. In order to ensure the accuracy of the project reports, executive management must also independently verify the information provided in status reports, which is a constant concern of senior management (Nguyen & Mohamed, 2021).

2.12 Stakeholder analysis

Stakeholder analysis is defined in this study as a process that is undertaken in order to generate information about the stakeholders that have been identified in the project (Eyiah-Botwe et al., 2016). Usually, the exercise is conducted for the purpose of fostering understanding of the stakeholders, which might help in good decision-making. There is a range of tools and techniques that can be used to make analysis easy and more understandable by the team (Boutilier, 2017). After conducting the stakeholder analysis, the project management team gains more understanding of the background of the stakeholders, which enhances sensitivity to their needs, interests, and expectations. It also assists the team in being able to mitigate any perceived negative impacts and stimulate fair participation in the project (Brunet & Aubry, 2016).

Because stakeholder management is complex, it is important for the project managers to develop tailor project management skills with a complexity approach in mind. Stakeholder analysis should provide a pragmatic way of identifying and understanding the complex, often conflicting, claims of many stakeholder groups (Daniel & Eze, 2016). Essentially, stakeholders come in two groups: primary stakeholders and secondary stakeholders. Primary stakeholders are the group of stakeholders that are the direct beneficiaries of, or are directly affected by, the outcome of the project. Water infrastructure projects are designed to solve the water supply shortage. Therefore, the water department becomes the primary stakeholder and the owner of the project outcome (Cordeiro & Tewari, 2015). Secondary stakeholders are all other people or groups of individuals who play an intermediary role. However, this does not mean that the secondary stakeholder has no influence on the project. They can be very influential and powerful, especially if they are affected by the project (Bond-Barnard, Fletcher & Steyn, 2018). Secondary stakeholders have a stake in

the project that is more representative of the public, and they sometimes have a special interest that is not direct (Dal Maso et al., 2018).

As has been indicated earlier, the primary stakeholders keep changing as the project progresses. In the same way, the secondary stakeholders can change and assume the role of a primary stakeholder during the implementation phases of the project (Boutilier, 2017). The power matrix is another tool that assists in stakeholder analysis and provides the stakeholder managers with valuable information. This enables the project management team to determine the weight each stakeholder carries with regard to power and the level of interest (Bahadorestani et al., 2020).

Traditional project stakeholder analysis approaches often involve a number of processes, including stakeholder identification and different stakeholder evaluations, such as determining each stakeholder's required contributions, as well as their needs, desires, and concerns with regard to the project (Eskerod, Huemann & Savage, 2015). These evaluations are used to inform the techniques that will be used to communicate with each stakeholder.

Prioritisation is frequently a crucial component of the strategy planning process, since different stakeholders and the project team may have competing interests (Amadi et al., 2018). Pedrini and Ferri (2018) proposed classifying the identified stakeholders in accordance with an evaluation of three characteristics related to each specific issue (i.e., the concerns that necessitate prioritisation): urgency, power and legitimacy. For instance, a significant stakeholder with a critical interest needs to receive more management focus than a stakeholder who does not meet the three requirements. In order to correctly deploy the limited management resources available, Freeman (1984) differentiates between major and secondary stakeholders in his classic work, which also includes prioritising stakeholders. The prosperity and longevity of the organisation depends on the key stakeholders, whilst the other parties are secondary stakeholders.

2.13 Stakeholder relationship management

Previous studies on project management have identified the importance of stakeholder management in construction projects (Mok et al., 2015). However, there has not been not much information regarding project stakeholder management (Loosemore, 2006). This is assumed to be due to the complexity and uncertainty of infrastructure projects. Many problems related to

stakeholder management in infrastructure development projects, identified by previous scholars, include, but are not limited to, inadequate stakeholder engagement; unclear stakeholder management objectives; managers who are unclear or unable to identify the project's invisible stakeholders; and a lack of a proper communication plan with stakeholders (Bourne & Walker, 2008; Eyiah-Botwe et al., 2016). It is suggested by other scholars that, in order to deal with these problems, it is important that project leaders and project managers know the essentials of stakeholder management and are able to apply systems approaches to project management (Elias, Cavana, & Jackson, 2000; Swikael, 2012).

In any project, the government is always a key stakeholder, and it is always important to have and maintain a good working relationship with different government authorities for the project to be considered legitimate (Eskerod & Huemann, 2015). The manager should review the governmental standards and regulations in order to find out about the different stakeholders for the project. Conducting some brainstorming sessions is another good approach to information gathering for any given subject. The project team can benefit from such sessions in order to identify the relevant stakeholders for any project (Chih & Swikael, 2015). Brainstorming sessions can be held by the project team, and some questions whose answers should lead to stakeholder identification should be asked during these sessions.

This process should not end while the project is still on-going. In infrastructure projects, like water infrastructure projects, the project might extend over more than one municipal ward, or even across another municipality (Derakhshan et al., 2019). This means that different groups and individuals will be affected by the project, as each municipal ward has its own interests and expectations, as well as its own social dynamics. Hence, there will be different groups of stakeholders in such cases (Davis, 2014).

2.13.1 Local contractors or workers.

According to Roovers and van Buuren (2016), these will be involved in raising awareness of clients' needs and rights. They will be kept informed about the progress of sub-project implementation and the water and sanitation promotion programme. Roovers and van Buuren (2016) state that they will be interested in raising awareness of clients' needs and rights. Local officials, as well as local contractors, will be kept up-to-date on the status of sub-project execution

and the water and sanitation promotion programme. They take part in the sub-project monitoring groups, as well as promoting dialogue among stakeholders, and implementation. Kossova and Sheluntcova (2016) added that local contractors undergo capacity-building training in areas such as the evolving position of service providers; appreciation for clients and consumers; listening to concerns; providing key messaging to clients about system management; and water conservation. Finally, the local contractors compile a directory of local service providers that are available to provide supplies and do small maintenance on a local basis.

2.13.2 Stakeholder conflict management

According to Ewurum, Aniagolu and Igwe (2020), conflicts are typically an unavoidable aspect of human contact. Conflict in stakeholder networks further emphasises the significance of conflict management within the stakeholder management discourse. According to Golar (2019), disputes between external stakeholders may be the most challenging to settle, due to their diversity and the absence of defined protocols for handling them. Therefore, assessing stakeholder disputes and alliances is a crucial stage in stakeholder management (Freeman et al., 2007). This is accomplished by settling disputes through institutionalised regulations and governing practices for handling conflicts whenever they arise (Neudert, Theesfeld, Didebulidze, Allahverdiyeva & Beckmann, 2020).

If disagreements are to be avoided, it is important that stakeholder conflict management be used primarily as a deliberate activity rather than a reactive one. Stakeholder conflict management is the application of stimulation and resolution approaches to attain the ideal degree of tranquility throughout a project's life cycle (Oetzel & Getz, 2022). These approaches to conflict resolution and stimulation were described as co-operative issue solving; avoiding conflict; smoothing things over; and reaching a compromise (Barrett et al., 2016). This shows that specialists in alternative dispute resolution and public relations are key participants in managing stakeholder conflicts and ought to be involved in the execution of public projects. Conflicts arise in the form of arguments, brawls, clashes, and muttering, but "mediation, negotiation, and reconciliation" are the primary dispute-resolution strategies used in public initiatives (Neudert et al., 2020:541). According to Ewurum et al. (2020), conflicts significantly harm initiatives. Therefore, during project initiation, design, and execution, project managers should pay attention to stakeholder interactions.

2.14 Project performance

Numerous performance indicators, such as those relating to time; cost; quality; customer satisfaction; client changes; organisational performance; health and safety; and other dimensions (groups), can be used to measure and evaluate project performance (Pedrini & Ferri, 2018; Lu et al., 2015). However, the 'iron triangle', or the three most important performance evaluation factors in the construction sector, are time, cost and quality. Hargrove and Heyman (2020) claim that it is assumed that a project is successful if it is finished on schedule, within the specified budget, and with the desired quality, or what is known as the 'golden/iron triangle'. According to Kujala et al. (2020), measuring a project's success entails more than just making sure it is finished. KPIs may also be referred to as key success indicators. Success is typically defined as the extent to which project objectives and expectations are realised (Pollack et al., 2018; Anwar & Razali, 2016). These should be considered from several points of view, including those of individuals and their objectives in relation to a range of factors, such as technical; financial; educational; social; and professional concerns. Project success is intangible and difficult to define, making it a challenging undertaking to measure. There are several parties engaged in the building sector, such as the client, the architect, the contractors, and various surveyors and engineers. As a result, the phenomenon also occurs there. The definition of success will vary, depending on the project participants.

2.14.1 The Iron triangle

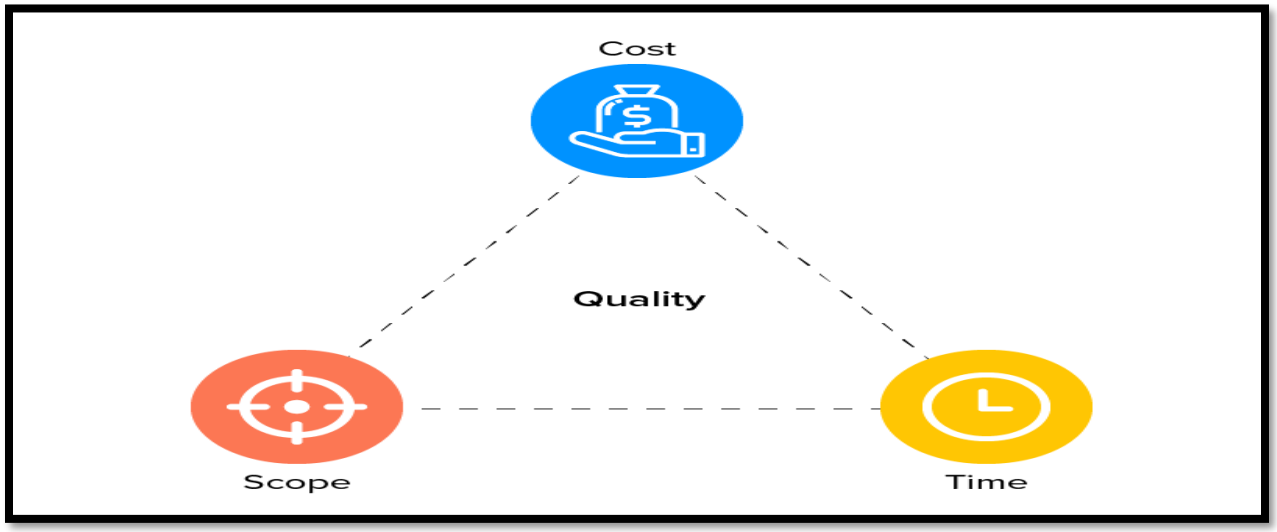

Figure 2.6: The iron triangle (Source: Bronte-Stewart, 2015: 19)

The responses to three questions have frequently been used to judge if a project is successful or unsuccessful shortly after it has ended. “Was it on schedule, on budget, and did the product meet specifications when it was delivered?” (Bronte-Stewart, 2015:21) Traditionally, the entire project may be labeled as a failure if the answer to any one of these questions is ‘no’ (even though it has met the other two requirements). The three components (Figure 2.6) are so tightly woven together that they have been dubbed “the Iron Triangle of project management” (Pollack et al., 2018; Anwar & Razali, 2016). Although the three requirements are important for some aspects of project management success, it is not obvious how they interact (Nguyen & Mohamed, 2021). For instance, the relationship between output and the other two dimensions is inverse: less production may be bad, while less time or cost may be advantageous. While time and cost are expected to grow along with scope, there may be indirect relationships between the two. A project’s cost and scope may both rise if its timeframe is reduced. Even a small budget reduction can have a significant impact on the scope and timeline of a project. It is improbable that tripling a project's expenditure will cut down on time by half.

Despite these drawbacks, the model does offer a means of examining and resolving priorities, disputes, and compromises in projects. This set of standards for evaluating many elements of project performance has received support from many software engineers (Pollack et al., 2018; Anwar & Razali, 2016; Bronte-Stewart, 2015). This might be one of the factors contributing to the high number of IT project failure rates. Handa and Adas (1996) questioned whether this could be the reason some project management is characterised as having failed, when measured against the criteria employed as a measure of success. When evaluating a project’s performance, using time, money, and scope as the sole factors or considerations is likely to skew what may otherwise be a more thorough and comprehensive review process (Li, Han, Luo & Shang, 2019; Manley & Chen, 2017). The project management team being evaluated on their ability to deliver according to these criteria may have a limited view as a result of the emphasis on time, money, and scope; which is another possible issue with the Iron Triangle (Bronte-Stewart, 2015). Several writers have outlined the distinction between managing a project effectively (measured against the three Iron Triangle restrictions) and achieving project product success (measured against the realised benefits of the project) (Li et al., 2019; Pollack et al., 2018; Bronte-Stewart, 2015). One examines deliverables, while the other focuses on procedure. For instance, the first Ford Taurus generation was a

commercial success and was the best-selling automobile in America in the late 1980s, but the project manager was fired because the project was completed three months late. Despite meeting all three requirements of the Iron Triangle, the second-generation Ford Taurus was a commercial disaster (Khan et al., 2021).

Uribe et al. (2021) claimed that the capacity to produce the project's output on schedule, within budget, and with high quality, is the main focus of project management. Cost, scope, time, and quality clearly create a set of restrictions for the project manager, who is tasked with overseeing a number of interconnected components with very different purposes, in a setting where there is typically a limit on the amount of latitude that can be exercised. The project manager is tasked with defining, establishing, and maintaining a trade-off between linked, but distinct, restrictions (Bronte-Stewart, 2015). The Iron Triangle, as a common metaphor, captures the integrative role of the project manager rather effectively (Hargrove & Heyman, 2020).

Directives like ‘be yourself, pay attention to team members as individuals, be emphatic, and communicate well’ are all good advice and reasonable suggestions when considering ‘soft skills’ as equally important qualities that the project manager is expected to employ in the primary task of finding a trade-off among the Iron Triangle’s components (Pollack et al., 2018:26). The underlying presumption that it just involves possessing the appropriate ‘soft skills,’ or be planning to acquire them, could turn out to be untrue. This sounds overly simple. For instance, ‘soft skills’ allow the project manager to enhance communication among team members; yet it is overlooked all too frequently that the project was initiated by a performing company, which may have an impact on it through its culture, procedures, and rules.

A project manager who wants to foster open and easy communication among team members may find it challenging if the culture of the performing company is heavily geared toward organised and hierarchical communication channels (Dal Maso et al., 2018). For instance, soft skills allow the project manager to inspire people in accordance with their requirements. However, a project manager who wants to convince high performers that the project is a suitable fit for their aspirations for growth may feel constrained if the project is familiar or being carried out with a captive customer (Nguyen & Mohamed, 2021). Numerous additional instances highlight the point that

project management works with soft variables that exist in constrained environments, just as hard factors (such as scope, time, cost, and quality) do. Due to the restricted number of available places, the soft factors provide an additional set of limitations for the project manager.

2.14.2 Project management and performance

Project governance is a structured approach to project management that enables key stakeholders to understand and influence choices made throughout the project life cycle (Li et al., 2019). Hargrove and Heyman (2020) claimed that managing stakeholders more effectively in public projects is made possible by project governance. Through a number of processes, project governance affects project performance. Implementing a project management methodology may be affected by the organisational governance structure, which would therefore moderate the methodology's impact on project performance (Joslin & Müller, 2015). Earlier studies identified a tendency to indicate a favorable correlation between project governance and performance across a wider variety of initiatives, although with a modest preference for projects in the public sector (Pedrini & Ferri, 2018).

Lu et al. (2015) claimed that building project performance is tied to contractual and relational dimensions of governance. Project governance is also an argument in favour of benefit realisation, and for the necessity of stronger project governance in the public sector (Li et al., 2019). On the other hand, a number of initiatives have failed due to inadequate governance procedures. According to Sirisomboonsuk et al. (2018), merging the project governance and information technology (IT) governance modalities is a crucial operational technique for co-ordinating organisational goals and ensuring project success. In their research study, the writers also accepted the triple restrictions (i.e., scope, time, and money) as project performance criteria.

Similarly, project governance offers a systematic structure to recognise and address risks as they materialise throughout project execution (Guo et al., 2014). Khan et al. (2021) claim that effective companies employ the right governance methods for various situations. A new model of governance, called project governance, enhances the effectiveness of projects (Kujala et al., 2020). The project owner and project board are crucial in aiding in problem resolution within an appropriate project governance structure, by providing the required resources and senior

management assistance. Therefore, a productive project governance process aims to co-ordinate project priorities with the objectives and business plans (Biesenthal & Wilden, 2014). Uribe, Ortis-Marcos, and Uruburu (2018) have also proposed adaptable and general governance frameworks to direct and solve a variety of likely scenarios. Project governance may help businesses avoid the common reasons for project failure, and may also help projects to perform better.

2.14.3 Stakeholder management's moderating function

According to Khan et al. (2021), stakeholders are the organisations or people who have an impact on how well a company performs and may also be impacted by how well the company does its business. Nguyen and Mohamed (2021) claim that a deficiency in stakeholder management throughout the project life cycle is the primary cause of project failures. Patanakul et al. (2016) advocate for a managerial emphasis on stakeholder management in order to improve the project performance of a public sector initiative. Due to the drawn-out process and the dynamic character of construction projects, stakeholders act differently at different phases of the project to pursue their interests in it. As a result, appropriate techniques must be used, depending on the circumstances, to deal with stakeholders. The management of stakeholders will determine how well the project deliverables are delivered (Uribe et al., 2018).

Stakeholder management is described by academics as a procedure that aids a project team in achieving its goals (Bahadorestani et al., 2020). Prior research has not placed a lot of emphasis on how stakeholder management affects the link between project performance and project governance. Stakeholder integration with the main project governing body is necessary in order to meet project objectives and ensure smooth operations (Rajablu et al., 2017). Additionally, stakeholder management is suggested by Dal Maso et al. (2018) to be a managerial activity and to function as an external moderator. Poor project management practices are a significant concern for many countries, especially developing ones, in the study's target area of public sector projects (Kossova & Sheluntcova, 2016).

Projects in the public sector are typically marked by impulsivity and frustration. Projects in the public sector generally use fragmented, informal stakeholder management procedures that frequently fail to address the intricate chains of events (Uribe et al., 2018). Thus, thorough,

rigorous, and formal stakeholder management processes are also required for public sector project governance methods to have favorable results (Bahadorestani et al., 2020).

2.15 Water service regulations and compliance

In 2003, the Strategic Framework for Water Services (SFWS) was promulgated as a broad policy document for the provision of access to basic water services and other services (Elbanna, 2018). It specifies the duties of water services providers (WSPs) and water services authorities (WSAs), and grants the WSAs the authority to build infrastructure, promote cleanliness and health, and bear financial responsibility for the cost of running and maintaining water systems. According to Watermeyer and Lewis (2018), the Bill of Rights (Constitutional Assembly, 1996), which is a part of the South African constitution, aims to gradually guarantee that residents may exercise their rights to receive water and other fundamental services. The EWS, in this regard, has a responsibility to provide water services for the citizens of eThekwini Municipality, which is a mandate provided in the legislation.

The Municipal Systems Act of 2000 allowed local government entities (municipalities) to assume control of the water service authority previously held by the national Department of Water and Sanitation in order to offer water and sanitation services to the areas under their control. As part of that new system, municipalities began receiving cash from the national government through equitable shares (Booysen, 2017b). The then-Department of Water Affairs' ambition, which had been outlined in the White Paper of 1994, was realised with the promulgation of the Water Services Act in November 1997 (Act 108 of 1997). In order to improve the quality of people's lives, it was envisioned that municipalities would offer water services to communities in accordance with the Redistribution and Development Programme (RDP) criteria, and that these services would subsequently be updated (Beck, Rodina, Luker & Harris, 2016). In support of the legislation discussed above, the National Development Plan for South Africa provides that, by 2030, considering the trade-offs in the usage of water, all South Africans should have access to clean, drinkable water that is sufficient for business and agriculture. This actions the Constitution with regards to access to clean, portable water for South African citizens (NDP, 2013).

2.15.1 Water services infrastructure challenges

Globally, water service institutions have a critical responsibility to address these challenges immediately (Burt, 2015). However, the cost of repairing the infrastructure is another challenge. Insufficient water provision and sanitation service delivery is a concern in many countries, including South Africa (Edokpayi, Odiyo & Durowoju, 2017; Liemberger & Wyatt, 2019). UNICEF/WHO (2014) noted that, at the time of their research in 2012, around 2.5 billion people lacked access to proper sanitation, and over 780 million lacked access to clean, safe drinking water. Aging infrastructure has been identified as one of the main causes of water supply challenges and inadequate sanitation supply (Palmer, Hamer, O'Keeffe & Weaver, 2017). In addition to the aged infrastructure, it is also argued that, in addition to infrastructure being old, the design of the old infrastructure did not cater for population growth and development, especially in rural and semi-urban areas. In developed countries, such as the United States of America, the authorities are facing a huge challenge to solve the water supply issue and replace the water and sanitation infrastructure, characterised daily by pipe bursts, which are due to aging infrastructure coupled with population growth (Burt, 2015).

This growing problem is causing huge water main bursts across the country and is a hindrance to addressing the backlog and developing new infrastructure for the growing population (Palmer et al., 2017). However, the bigger question is, what are the plans to resolve this problem? The South African National Development Plan (NDP) emphasises the optimisation of improved institutional arrangements, which will lead to improved governance and the realisation of key sector objectives (Department of Affairs & Forestry, 2018). These institutions include regional utilities and national infrastructure agencies, as well as the involvement of the private sector (WRC, 2013). The WSA municipalities, as the custodians of the water services mandate, have the responsibility to resolve the challenge of water supply and interruptions thereof. To accomplish this, WSAs should implement infrastructure development projects as a solution to water supply interruptions and need to develop new infrastructure projects to increase water supply to communities.

2.15.2 Water and sanitation rights - A global concern

It is impossible to overstate how important water is to all humans as a source of life. Sanitation and access to clean water are essential for maintaining human dignity, health, and nourishment

(UNDESA, 2019). Around the world, "768 to 884 million people do not have access to improved drinking water sources, and between 2.5 to 2.6 billion do not have access to improved sanitation facilities" (UNICEF, 2014:1). According to SIDA (2018), about 1,000 children die globally every day from illnesses connected to water and sanitation. SIDA (2018), asserted that over two billion people do not have access to clean sanitation at home, while at least four and half billion do not have access to safely managed sanitation. Given the background of the aforementioned global setting, rights-based approaches serve as the foundation for advancing the rights of disadvantaged and vulnerable groups by improving access to water and sanitation. Particularly among inhabitants of informal settlements who often reside on the outskirts of urban towns, a human rights injunction is necessary for the inclusion of the marginalised in the provision of basic services.

2.15.3 Water and sanitation rights in an urban setting

Universal access to clean water and sanitary facilities is both a legal requirement and a fundamental human right (UN, 2019). The bearers of this legal responsibility include municipal, state, and federal governments, as well as any other entities tasked with ensuring the welfare of individuals. However, because they reside in settlements where the provision of water and sanitation services is rarely prioritised, despite the urgent need for such services, the urban poor are frequently denied access to these necessities. The UNOHCHR (2016:14) stated that "the distribution of water and sanitation is neither rights-driven, nor is it rights-informed", and that principles of openness and public engagement are disregarded, preventing urban settlers from having access to water and sanitation. Due to inadequate community engagement and acceptability, sanitation programmes that target the marginalised have had little success worldwide (Barnes, 2018).

Since water is primarily used for business purposes, and is paid for at a much lower rate per kilolitre than it is for poor households, water delivery in South Africa is frequently implemented with financial motives "because water is seen as an economic good or a commodity by government departments" (UNOHCHR, 2016:14). Water provision for economic gain ignores the responsibility to uphold the poor's right to water and sanitation. Rapid urbanisation in underdeveloped countries, where water and sanitation regulations have not kept pace with rising urban populations, contributes to the perception that distributing water is expensive. In South Africa, local government's mobilisation of resources has not kept up with the need for water and

sanitation. The UNICEF (2015) lists further challenges to delivering water and sanitation to everyone, particularly the urban poor, as governance concerns, a lack of demand monitoring, and inadequate and old infrastructure.

2.15.4 Urban environments and access to water and sanitation

The right to water and sanitation lies at the heart of the 2030 UN Agenda, SDG number 6: "guarantee availability and sustainable management of water and sanitation for everyone" (United Nations, 2019:12). The targets of SDG 6 are directed to ensuring that everyone has equal access to water and sanitation services, with a focus on the urban poor, the marginalised, and those who are most difficult to reach (UNICEF, 2019: 14). The Target of SDG 6 is based on human rights concepts of fairness and nondiscrimination, and it covers water and sanitation. For example, Objective 6.1 states that: "By 2030, achieve universal and equitable access to clean and affordable drinking water for everyone" (UN, 2019:12). With a focus on the needs of women, girls, and people in vulnerable situations, Target 6.2 aims to "provide access to adequate and equitable sanitation and hygiene for everyone and eradicate open defecation" (UN,2019:12). To achieve SGD 6, Targets 6.1 and 6.2 serve as the fundamental deliverables. Therefore, enhancing basic service delivery in South African cities will immediately contribute to upholding the rights of the urban poor to water and sanitation, and will push the nation closer to accomplishing SDG 6. Expanding access to clean water and proper sanitation is vital for assisting the world's urban poor, particularly those in South Africa who have undergone decades of suffering, exclusion, and marginalisation, by reducing the prevalence of waterborne diseases and restoring their dignity.

2.15.5 Urban water and sanitation and inclusive communities

Prior to gaining independence in 1994, South Africa had a fragmented social and economic history. Growing informal settlements and urban poverty as a result of rapid urbanisation was a great challenge. SDG 11 of Agenda 2030, which aims to "Make cities and human settlements, inclusive, safe, resilient and sustainable", is consistent with South Africa's historical growth trajectory as well as the country's present development path (Stats SA, 2019:184). The goal is to eradicate material poverty and close social disparities by providing habitable housing, enhancing informal settlements, and providing critical services to the socially disadvantaged parts of society that reside

in shacks in informal settlements. The first target of the Sustainable Development Goal (SDG) 11 reads, "By 2030, guarantee access for everyone to sufficient, safe, and affordable housing and essential services and upgrade slums" (Stats SA, 2019:184). In order to develop inclusive, sustainable, safe, and resilient cities, SDG 11 aims to guarantee that everyone has access to basic services (UN, 2019).

The IUDF of South Africa recognises the need to empower local communities to actively participate in the social, economic, political and cultural development for their well-being. CoGTA (2016:10) stated: "…cities and towns that are stable, safe, and tolerant, respect and embrace diversity, equality of opportunity, and participation of all people, including the disadvantaged and vulnerable groups". These qualities gradually grant and advance the right to development, and consequently the rights to water and sanitation. In SA's "inclusive socio-economic urban development plan", the human rights values of equality and participation are reaffirmed; and their implementation determines the desired results (CoGTA, 2016:12). SDG 11 and South Africa's development policy, places a strong focus on empowering communities to be active partners in development, are related (CoGTA, 2016:10). Other factors, such as resource mobilisation, the ability of national and local governments, governance, and an acceptance of the link between human rights and SDGs in development, will determine if SDG 11 is achieved in South Africa.

2.15.6 Water responsibilities in South Africa

The inequality gap in South Africa is ongoing and, by some measurements, expanding (Bond, 2019). Both the national and municipal governments are impacted by the conflict between addressing pro-growth and pro-poverty objectives that encourage the antagonism of a rights-based vocabulary and a neo-liberal cost-efficiency language in service provision. Despite ongoing attempts by the post-apartheid state to remedy these imbalances, the apartheid racial segregation system remains visible in most South African cities (eThekwini Municipality, 2012b). The country has a high unemployment rate and a high rate of poverty and, despite small improvements, the level of poverty has remained severe. However, non-monetary well-being has improved since 1994 as part of the social wage, including access to clean water, power, and housing (eThekwini Municipality, 2013).

The delivery of water and sanitation services has advanced significantly in South Africa, a country with some of the most advanced legal and policy frameworks worldwide. Water is seen as a social benefit and is essential to the nation's development and change. According to the nation's Free Basic Water Policy (2001), which is based on South Africa's 1996 Constitution, everyone has a right to enough water within the parameters of available resources. However, free basic water and sanitation services are not offered to every part of South Africa equally or evenly (eThekwini Municipality, 2013). The neo-liberal cost-based approach to service delivery dampens the provision of water and sanitation services, which is based on rights. Because services are now commodities, not every person will manage to pay for their entitled access to basic water and sanitation (eThekwini Municipality, 2013). This prompts questions about whether social and environmental justice, or cost recovery, are the primary goals of service delivery. According to the Municipal Structures Act (Act 117, 1997), water services authorities (WSAs), which are often municipalities, are in charge of providing services. Each WSA must create a strategy to gradually ensure that the supply of water and sanitation services is effective, reasonably priced, and sustainable (Budhathoki, 2019).

Although service delivery is within the purview of local governments, the control of water resources is the purview of the national government. Akinyemi, Mushunje and Fashogbon (2018:14) state that this has "helped to sustain the integrity of rivers as management units by building an institutional balancing between local government as water consumers and central government and its regional agencies as stewards of the resource". The national government's function has been altered from supplier to regulator and arbitrator in an effort to address the regulatory gap in the country because water systems and water distribution were not being adequately monitored and managed (Duarte, Neto, Marques, Adams & Caçador, 2017).

Municipalities are under pressure to be financially independent and to collect service-related costs from all regions as a result of the delegation of water services supply to the local level, without sufficient financial backing from the national government, which results in the commodification of water (Hordijk, Sara & Sutherland, 2014). The Municipal Infrastructure Grant (MIG) is a government programme that subsidises the provision of essential utilities like water and sanitation. WSAs must make up the difference because this subsidy is insufficient (Leibbrandt, Finn, Argent

& Woolard, 2010). Municipalities must strike a balance between providing water that is both socially and ecologically acceptable and financially sustainable. Given the rigorous ways in which water restrictions and disconnections are implemented in some South African municipalities, these moral and ethical issues also need to be carefully considered (Lewis, 2013).

The eThekwini Municipality had started to research creative options for delivering water to over 500,000 individuals who did not have access to water by the year 2000, by developing a pricing structure that reflected the political, social, and economic obstacles of obtaining payment for water (eThekwini Municipality, 2013). The first step in reducing demand was the installation of yard tanks and small bore pipelines, which restricted access to water for low-income homes. Free basic water of 6,000 litres per family per month was given to all users of this system with restricted access (Loftus, 2006). Through this change in water service, Durban, according to Loftus, had demonstrated "apparent contempt for the rhetoric of water commercialisation at both the world level and the national level in South Africa" (McCarthy, 1995:2). The courageous choice to offer free basic water to all families in the municipality went against the neo-liberal cost-recovery strategy. Some members of civil society contend that this choice was focused more on cost-recovery than social justice because the municipality saved money by integrating the underprivileged into the official water system (Robina-Ramrez, Saudo-Fontaneda & McCallum, 2020). Even though it resulted in financial advantages for the municipality, Durban demonstrated that it was possible to cross-subsidise water supplies and make it "financially feasible to offer a basic supply of water, free of charge" (Bond, 2019:280).

The South African government decided to implement a programme in 2001 to distribute 6,000 litres of free water per family each month to low-income residents, following the lead of eThekwini Municipality (Murray, 2007). This was a component of the national government's plan to implement a 'social wage' or social security system as part of its redistribution agenda, as well as the government's attempt to combat poverty. In December 2000, a cholera epidemic in KwaZulu-Natal prompted officials to decide to offer clean, free water (Roma, Philp, Buckley, Scott & Xulu, 2013). Murray (2007:21) claimed that the free water policy sparked controversy since it "went against the dominant thinking at the time, which was that water, as an economic good, should be paid for". Furthermore, it signified a significant departure from the initial African National

Congress (ANC) party policy, which mirrored this global consensus (Abrams, Carden, Teta & Wgsaether, 2021). Civil society has also attacked the programme and its execution for "failing to reach all the poor, including too many non-poor customers, for delivering inadequate water, and for charging too much for water given above the free amount" (Howard, 2021:440).

The larger water policy aims in South Africa included efforts to guarantee the effective and ecologically responsible use of water in addition to social distribution and welfare purposes (de Jongh, Mncayi & Mdluli, 2019). Water was viewed as a social and economic benefit in South Africa due to the acute water shortage and the understanding of the need for adaptable policies and practices due to the increased risks connected with climate change. Water is a crucial natural resource that must be used carefully and efficiently.

2.15.7 Water as an economic good and human right

The two discourses of 'water as a human right' and 'water as an economic good' arose in South Africa post-democracy and are now deeply entrenched in eThekwini Municipality's policy and practice. The municipality receives its bulk water supply from Umgeni Water, a company founded by the apartheid government in the 1970s to offer bulk water supplies within a commercialised framework. Umgeni Water's main customer is eThekwini Municipality; hence, the two organisations are dependent on one another (Sim, Sutherland & Scott, 2016). Rhodes and McKenzie (2018) claim that, because bulk water has been commoditised and integrated into the capitalist system as a means of capital accumulation for Umgeni Water, this relationship puts pressure on the discussion of human rights for the provision of water. According to EWS policy, "access to water services must be regulated in an equitable manner, taking into account financial, technological, socioeconomic, and conservation factors; customers must pay reasonable charges; and the water services authority has the right to limit or discontinue the provision of water services if there is a failure to comply with reasonable conditions set for the provision of such services" (Sutherland, Hordijk, Lewis, Meyer & Buthelezi, 2014:475).

EWS also introduces average people to the terminology of capitalism by depicting citizens as clients (Barnes, 2018). In order to address historical disparities in service provision and to meet the demands of a rapidly growing city, while remaining sustainable and financially responsible,

state officials must take into account the two well-established discourses of water as a human right and water as an economic good. These discourses guide water governance in the municipality (Chitonge, Mokoena & Kongo, 2020). EWS has proven its dedication to the human rights discourse by significantly lowering post-1994 water delivery backlogs; taking the effort to provide free basic water; and encouraging participatory ways to administer water in the city (Barnes, 2018).

In the municipality's water administration, there is a constant struggle between the necessity for cost recovery and the need for free basic services. A third discourse, referred to as the geographical diversification of service provision, has, however, come into existence. It is a consequence of the juxtaposition and tangling of the discourses on water as a social good and water as an economic good.

2.16 Chapter summary

This chapter provided a discussion on the evolution of the concept of stakeholders; various classifications of stakeholders; the importance of stakeholder management; and project stakeholder analysis. The literature review clearly pointed out that stakeholders cannot be ignored in a public project since their contributions are critical for the success of such projects. Excellent stakeholder interactions are ensured through proper disclosure and reporting, which is essential for any project's successful execution. Therefore, managing information and communication requirements may be a motivating element in the decision-making process, bringing all genuine stakeholders on board and aligning them to have a beneficial influence on project performance. Project stakeholders include the project team; the project sponsor; project managers; consultants; contractors; civil communities; political decision-makers; and beneficiaries. The next chapter focuses on the systems thinking approach.

CHAPTER THREE: A SYSTEMS THINKING APPROACH

3.1 Introduction

The preceding chapter covered the evolution of the concept of stakeholders, different stakeholder categories, the significance of stakeholder management, and project stakeholder analysis. This chapter reviews the literature on the systems thinking approach in order to understand how it might be used for stakeholder engagement. The literature review attempts to explain how the project core may systematically identify stakeholders and communicate with them directly from the start of the project, to have the biggest effect on the project; and also to understand the inability to collect all the stakeholder opinions. Additionally, according to several academics, system thinking facilitates better stakeholder management, preventing project failure and misconceptions (Aaltonen, 2011; Wuni & Shen, 2020; Ndaguba & Hanyane, 2019). With regard to substance and comparative dynamics, the literature review attempts to comprehend the whole rather than the individual parts.

The chapter continues with the definition of a system; an overview of the concept of systems thinking; a discussion of multidisciplinary systems theories; various systems approaches; SSM learning cycle and finally, a look at systems as a management theory.

3.2 Overview of systems thinking

In simple terms, a system is a complicated whole whose operation is dependent on the interactions between its elements (Jackson, 2019). Reductionism refers to the conventional scientific approach to understanding such systems. Reductionism prioritises the components, attempts to comprehend the parts, and builds an understanding of the whole up from a comprehension of the parts (Yearworth, 2020). The interactions between the components, which have an impact on one another through intricate networks of links, give rise to the whole (Haley, Paucar-Caceres & Schlindwein, 2021). Once the system has evolved, the pieces and their interactions seem to have significance because of the whole. Jackson (2016) asserted that the concept of holism offers an alternative to reductionism in the study of systems. According to the theory of holism, a system is more than the sum of its components. A river system, a philosophical system, an automobile, or a quality system, are just a few examples of systems whose parts are connected by a network of

relationships. However, holism is largely focused on how the constituent pieces create and sustain the total as a new creature.

3.3 Systems thinking as a theoretical framework

Many academics have characterised systems thinking. Arnold and Wade (2015) began by describing the system and then offered the fundamental ideas of the system as something greater than the sum of its components. According to some research, systems thinking is the process of delivering information to the appropriate individuals at the appropriate time for a beneficial purpose in the proper plan and for the proper purpose (Emes & Cole, 2019). It was deemed necessary to begin by defining and explaining what systems thinking is, and how it pertains to management, before the investigation of systems thinking methodologies. As a result, systems thinking involves taking into account the integration of all factors from a broad perspective. As a result, systems thinking is a comprehensive way of thinking that takes into account both the observation of the whole and the contemplation of interrelated factors (Monat & Gannon, 2018). The emphasis on integrating the system's components comes from systems thinking techniques, which are founded on Aristotle's maxim that 'the whole is greater than the sum of its parts'. Therefore, it is crucial that both management and leadership place more emphasis on comprehending the system as a whole, and the connections between its many components, than on each component separately. Because it aims to simplify complicated circumstances, systems thinking differs from analytical thinking in this respect (Jackson, 2016).

Understanding challenging circumstances holistically is crucial to effective organisational management and leadership. According to Haines (1998), a person's behaviours are influenced by their thoughts. The author continued, that improving the quality of thinking is one method to increase the quality of the outputs of an activity. In other words, reflective thinking needs to be included within the organisation for it to accomplish its goal (Taylor et al., 2020). Therefore, before beginning a decision-making process concerning the company's future, the systems thinking approach mimics how the organisation gathers and processes information, creates solutions to problems, and formulates concepts (Adams, Hester, Bradley, Meyers & Keating, 2014).

Systems thinking is “the conceptual patterns of how humans think systematically” (Emes & Cole, 2019:21). According to Chikere and Nwoka (2015), open and closed systems are two essential components of the system. Moreover, Heylighen (1992), cited in Chikere and Nwoka (2015), argued that an organisation should function like a living system, which necessitates that it be an open system rather than a closed system. This is similar to the municipality, which is an open system that must engage with its surroundings. The company must alter the way it conceptualises project management if it is to change its way of thinking, and subsequently its management and interaction with project stakeholders. By offering a comprehensive model to engage with project stakeholders, the systems thinking approach, used as a theoretical framework in this study, aims to provide a balance between the entire project management process and project stakeholder relationships, which is an element in the project management system.

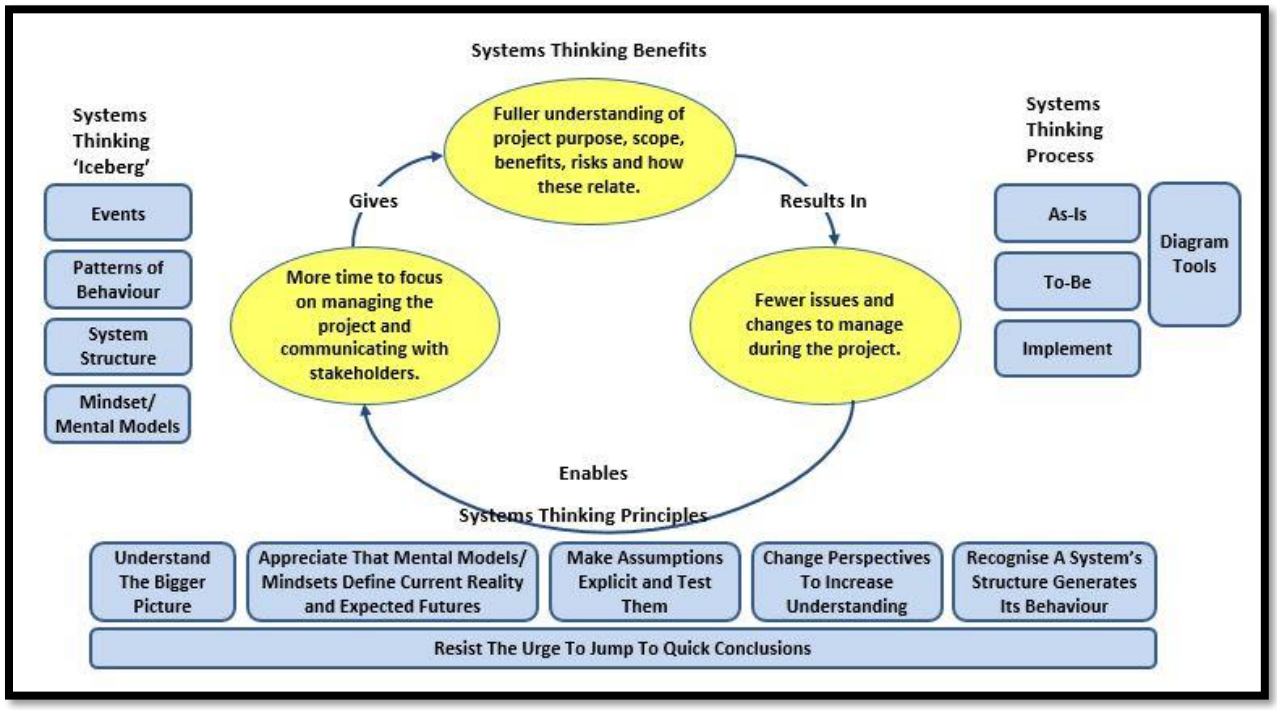

Figure 3:1: The theoretical framework for systems thinking (Source: Emes and Cole, 2019:321)

3.3.1 Systems thinking mind-set and principles

Systems thinking provides a framework for comprehending the problem and is driven by context, understanding problems, and defining solutions from the outside-in, to first identify the limits of the issue and then identify leverage points. Applications often use iterative processes. Emes and Cole (2019) asserted that systems thinking is made up of three main parts: (i) the sorts of thinking to be employed, and the principles to guide considerations; (ii) a framework (the 'Iceberg') that gives the various ways of thinking a framework and settings; and (iii) taking the time to fully comprehend the problem before deciding to use this approach.

According to systems theory, systems have limits, which allows them to function in, affect, and interact with their dynamic environment. According to Jegstad and Sinnes (2015:660), "Systems thinking is also dependent on the contextual patterns of the organisation rather than on specific content", which is evident in favour of their claim. As a result, when the company's decision-makers begin to make any decisions or plans for action, they must take into account the interdependences and interactions between stakeholders, as well as interactions between the organisation and the area in which the project is located. Matook and Brown (2017) contended that it is incorrect to think of project stakeholder management as a technocratic, mechanical, sequential process. Such a way of thinking ignores the holistic picture of stakeholder management procedures and reduces them to linear operations, which ultimately causes chaos. Verhoeff et al. (2018:40) stated that "a mechanical planning approach is incapable of fostering opportunities for learning, innovation, and change inside an organisation". This is backed by the fact that project stakeholder management is a complicated system with connected components, procedures, and methods. As a result, a comprehensive, dynamic theoretical framework is required for the study of project stakeholder management (Forrester, 2016).

3.3.2 The systems thinking 'iceberg'

Emes and Cole (2019) suggested that the systems thinking 'Iceberg', brings together systems thinking principles and tools, as explained below:

Events: These are the degree to which humans see the outside environment and the signs that something is wrong. While some issues can be resolved immediately, not all issues can be resolved by addressing the symptom (s). Greater analysis is required (Emes & Cole, 2019).

Patterns of behaviour: Looking below the events level identifies patterns of behaviour and enables events to be forecast, and hypotheses for their causes developed and tested.

System structure: Consideration of system structure (including elements of the environment within which the system operates) identifies the causes of the patterns of behaviour, previously identified.

Mental models/mindset: The presumptions, convictions, and expectations that underlie the operation of structures and serve as the basis for issue analysis and solution formulation are known as mental models, which are frequently sub-conscious (York & Orgill, 2020).

According to Arnold and Wade (2015), incorporating systems thinking into project management improves comprehension of the issues that the project must solve. Better solutions and more suitable project management are made possible by this improved understanding. Emes and Cole (2019) argued that better solutions and more effective project management lead to more successful projects.

3.3.3 System thinking benefits

According to Emes and Cole (2019), systems thinking is most useful in situations when top-down deconstruction cannot be used, since it is unclear where the top is or how to break the issue down. These are often "complex' situations, where the problem and/or what must be understood to identify its solution are ambiguous; where the solution cannot be separated from the problem or from the context in which it exists; or where the project environment evolves over time. Sweeney (2017) asserted that when considered collectively, these provide a more thorough understanding of the problem, its resolution, the project's scope and technique, and the relationships. The management of issues, 'surprises,' or modifications during the project is reduced when they are combined. According to Ninan et al. (2019), any necessary changes are easier to analyse if the project's purpose and scope are more clearly defined. According to them, this leads to more

effective project management, since the project manager can concentrate on core project management practices rather than issues and modifications.

3.3.4 Systems thinking process

Iterative applications are typical. According to Emes and Cole (2019), systems thinking consists of three main components: a process to understand the situation before considering a solution and putting that solution into action; principles to guide considerations and the types of thinking to be used; and the "Iceberg" structure to provide a structure and context for those types of thinking. Monat and Gannon (2018) argued that, taken collectively, these give a more comprehensive picture of the issue, its resolution, the project's scope and methodology, and its interactions. These lead to fewer problems, "surprises", or modifications that need to be managed throughout the project. As the project's objective and scope are better defined, any necessary adjustments are easy to analyse. Additionally, according to Emes and Cole (2019), this enables the project manager to focus on fundamental project management procedures rather than problems and adjustments, which results in more successful project management.

3.4 Systems theory

Duboz et al. (2018) asserted that systems theory has a lengthy history and the term 'theory' can be deceptive at times, because it is more of a paradigm than a proposition that can be refuted. In general systems theory, York and Orgill (2020) examined emergence; open and closed systems; feedback loops, management and guidelines; system component connections; and the trend of wholeness in sciences (holism). Systems theory and cybernetics share a common ancestor (Timofte & Popus, 2019). Forrester (1971) was the first to launch the current perspective of the field of system dynamics. The researcher was a pioneer in the use of simulations and systems engineering to analyse social systems and predict their behaviour. Systems theory has since grown and expanded in a variety of industries, including business, management, and ecology. Systems theory offers a common vocabulary to interact with reality, which is required for partners in multidisciplinary research to communicate with one another. York and Orgill (2020) described systems and predicted their behaviour using mathematics developed from the study of dynamic systems. Today, modeling and simulation in the domains of epidemiology, biology, and ecology

receive a lot of help from the subject of dynamic systems, which draws on a long history of mathematics and physics to explain its techniques and ideas.

By using a skill set called ‘systems thinking’, one may better grasp these complex behaviours’ underlying causes in order to predict them and, eventually, change their consequences. According to Arnold and Wade (2015), systems thinkers are increasingly required to address these challenging issues due to the exponential rise of systems in society. This demand, which in fact affects every part of life, goes well beyond the fields of science and engineering. To prepare for a future that is more complicated, globalised, and characterised by a system of interconnected systems, where everything has an international impact, systems thinkers are more important than ever (Taylor, Calvo-Amodio & Well, 2020). People must learn to work in new ways as interdependence grows. Simply being more knowledgeable about their individual ‘bit of the rock’ is not sufficient. Mosyjowski, Espinoza, Lattuca and Daly (2020) argued that, in order to exchange expertise, talent, and knowledge with ‘local specialists’ from other parts of the web, people need a common language and structure. They will not be able to behave appropriately until then. In essence, interdependence necessitates systems. Without it, the evolutionary path they have taken since emerging from the primordial soup will become less and less feasible (Monat & Gannon, 2018).

Many scholars and systems science professionals concur with Richmond’s assertions regarding the critical role that systems thinking will play in addressing the complexity of the twenty-first century (Taylor et al., 2020; Plate & Monroe, 2014; Senge, 1990). It has been noted, since the 1950s, that students’ comprehension of complex systems needs to be improved (Hill, 2021). Many scholars have argued that systems thinking provides a solution to this problem, and that it is now more important than ever for the general public to be able to comprehend systems and complexity (Mosyjowski et al., 2020). This, and other such claims, may be found all over the literature. If these experts and researchers in the area are to be believed, systems thinking will be crucial in the future.

3.5 A Brief review on multidisciplinary systems theories

3.5.1 Systems thinking

Systems thinking has many meanings, and in the literature, academics describe it from a variety of perspectives. This section describes the various systems thinking viewpoints before adopting a definition that is appropriate for this investigation. As a method for tackling practical problems, 'systems thinking' has emerged in the operational research community (Monat & Gannon, 2018). Senge proposed the concept in the fields of organisational theory and management (Senge, 1990; Duboz et al., 2018). He recognised the issues caused by incomplete learning and dispersed information in businesses. Systems thinking, according to Ross and Wade (2015), is a collection of abilities that helps people recognise and comprehend systems, anticipate their actions, and make changes that have the intended consequences. The method based on systems theory is called systems thinking. It tackles actual issues when the system's complexity limits comprehension and justification because of assumptions and the constraints of cognitive processing (Mosyjowski, Daly & Lattuca, 2019). Since it was first coined by Barry Richmond in 1993, the phrase has undergone several definitions and redefinitions.

A system is described by Rousseau (2020) as a set of elements that routinely interact or are dependent upon one another to produce a cohesive whole. A fundamental tenet of a system is that it is more than the sum of its components. It is instantly clear from this line of thinking that systems thinking may be understood as a system. Literally, systems thinking is a way of thinking about systems (Lavi, Dori, Wengrowicz & Dori, 2020). These definitions frequently interpret systems thinking using a reductionist methodology, which is typically seen as a non-systems thinking methodology. Reductionist models cannot adequately represent or enable people to comprehend completely novel, complicated and dynamic events (Monat & Gannon, 2018).

Elements, interconnections, and a function or purpose, are the components of systems thinking, as in most systems (Arnold & Wade, 2015). The purpose or function of the system, the part of the system that is least obvious, is frequently the most important factor influencing how the system behaves (Mazzurco & Daniel, 2020). Though not all systems do, systems thinking does have a

clear aim. It is crucially important to express this objective in order to convey its definition, particularly to people who are new to the idea.

Therefore, defining systems thinking as a goal-oriented system should be a prerequisite for a comprehensive explanation of the concept. To achieve this, Arnold and Wade (2015) recommended that the definition must contain elements from each of the three aforementioned categories: elements, interconnections, and a goal or function.

3.5.2 The system test

The system test was created as a technique for determining the systemic accuracy of a systems thinking notion. The following three elements will be checked in each definition to see if they are present:

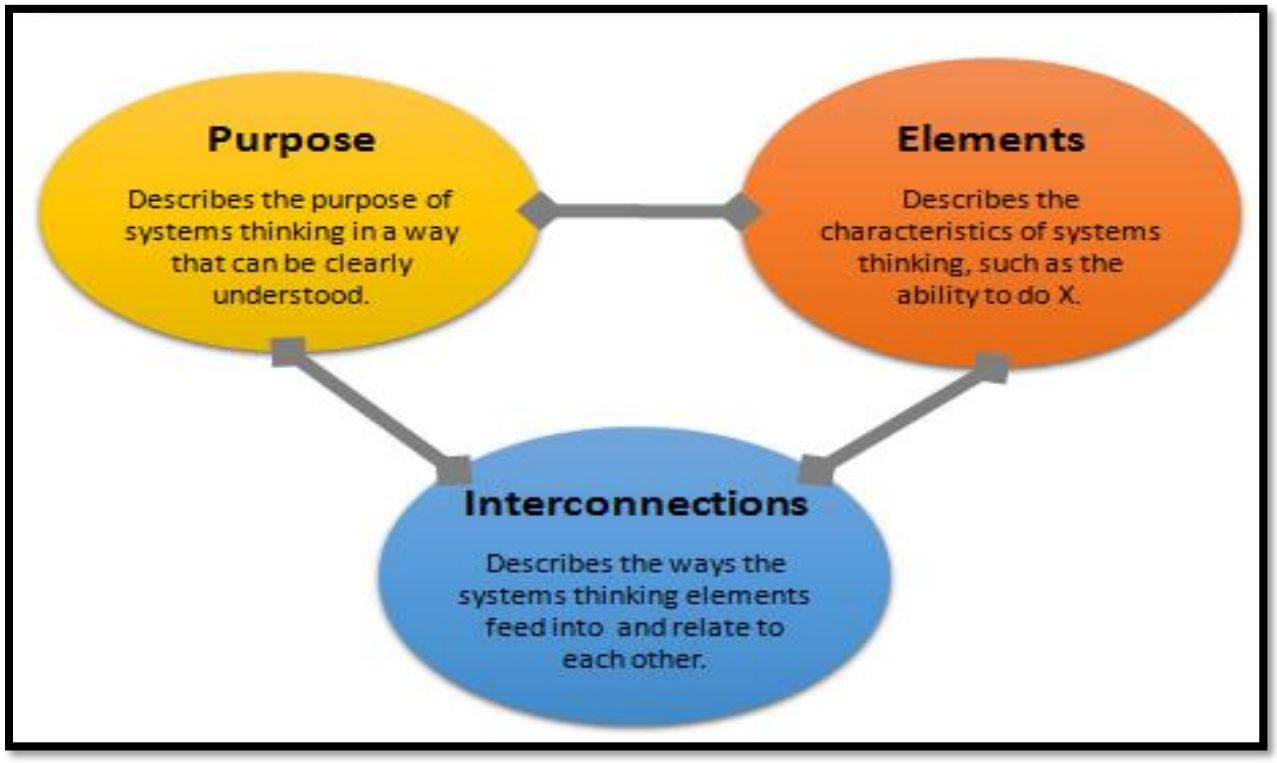

Figure 3.2: The system test (Source: Arnold & Wade, 2015: 672)

Arnold and Wade (2015) suggested that the system test be applied to the notion of systems thinking:

i) Function, purpose, or objective: The purpose of systems thinking should be effectively stated in a manner that is applicable to daily life.
ii) Elements should be the hallmarks of systems thinking.
iii) Interconnections, the interactions and synergies between the elements or qualities, are demonstrated.

In fact, a definition does not automatically qualify as a legitimate definition just because it refers to systems thinking as a system. The inventor of the term 'systems thinking,' Barry Richmond, described it as the science and art of inferring reliable behaviour from an increasing comprehension of underlying structure (Richmond, 1994; Jackson, 2019). Broks (2016) suggested that people who use systems thinking should stand in a way that allows them to view both 'the forest and the trees', while maintaining one eye on each. Despite Gilissen, Knippels, and van Joolingen's (2020) assertion that this definition is sound and useful, particularly the notion of seeing both the forest and the trees, it falls short on the third system test component because it does not adequately describe how the various systems thinking components are interconnected.

Arnold and Wade (2015:675) claimed that "systems thinking is a collection of synergistic analytic abilities used to increase the capability of detecting and comprehending systems, anticipating their behaviours, and proposing alterations to them in order to create desired consequences". These abilities function as a system. This definition's practicality and simplicity make it elegant. By giving some context on the nature of a system, this definition could be presented to a group of individuals who have no prior knowledge of systems science in an approachable way (Mambrey, Timm, Landskron & Schmiemann, 2020). When developing systems thinking in the EWS unit, this study will make use of this term. Put succinctly, the art of systems thinking entails having the capacity to express and evaluate dynamic complexity.

3.5.3 Systems thinking as a system

Driscoll, Parnell, and Henderson (2022) define systems thinking as a system and describe its goal as well as the connections between its pieces. Many systems that relate to people, such as those that purify water, heat homes, produce power, and transport people, adhere to the pervasive idea of naming systems after their intended purposes (Lavi, Dori & Dori, 2021).The simplicity and

usefulness of Arnold and Wade's definition are what make it elegant. This definition might be communicated to a group of people without any prior knowledge of systems science, in an accessible manner, by providing some background information on the nature of a system.

According to Mambrey et al. (2020), the definition's substance will be enhanced (elements and interconnections). Some of the definitions in this text have been combined using ideas from other writers (Forrester, 1994; Richmond, 1994; Arnold & Wade, 2015; Lavi et al., 2021). The systemigram for the material is displayed in Figure 3.3, below.

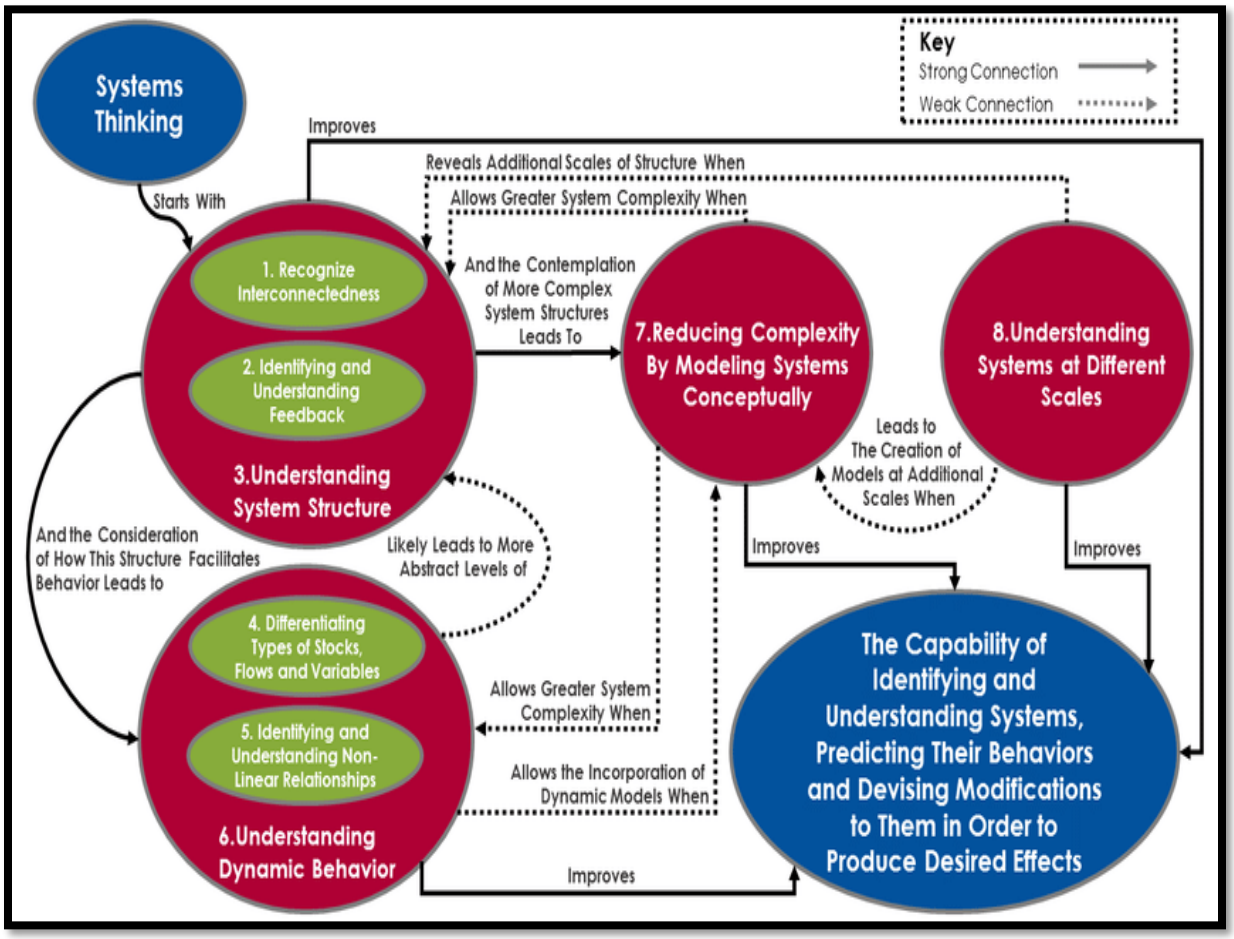

Figure 3.3: Systems thinking systemigram (Arnold & Wade, 2015:677)

Thick lines in the above 'systemigram' indicate strong linkages, whereas thin dotted lines indicate weaker, but still significant connections (Arnold & Wade, 2015; Kordova & Frank, 2018). It is crucial to keep in mind that the systems thinking framework, as shown in this 'systemigram'

functions as a series of ongoing feedback loops. In other words, the system keeps working after the last node. Systems thinking itself constantly develops as each of the components, as well as related components, develop (Arnold & Wade, 2015).

The systemigram components are drawn from definitions in the literature, especially from Plate and Monroe (2014), and Hopper and Stave (2008). The two components that differ most between these two definitions are as follows: reducing complexity by modeling systems conceptually; or identifying and understanding non-linear relationships. Descriptions of each component follow:

3.5.3.1 Recognising interconnections

Systems thinking begins at this level (Arnold & Wade, 2015). Finding important linkages between system components is a necessary skill. Adults with even advanced degrees who have not been trained in systems thinking frequently lack this skill (Plate & Monroe, 2014).

3.5.3.2 Recognising and appreciating feedback

Certain connections come together to create cause-and-effect feedback loops (Hu & Shealy, 2018). Finding those feedback loops and comprehending how they affect system behaviour is necessary for systems thinking (Plate & Monroe, 2014).

3.5.3.3 System structure knowledge

The structure of the system is made up of many components and connections between those components. To practise systems thinking, one must comprehend its structure and how it promotes system behaviour (Arnold & Wade, 2015; Richmond, 1994). Understanding feedback and linkages is essential for comprehending system structure. Arnold and Wade (2015) and Richmond (1994) do not expressly address this aspect, although it could be suggested as a mixture of the two previously stated components and is discussed in other significant works.

3.5.3.4 Differentiating stock, flow, and variables

A stock is the collective amount of a resource in any system (Arnold & Wade, 2015). This might be qualitative – for instance, the level of trust between friends – or quantitative, such as the amount

of paint in a bucket. Changes in these levels are known as flows. The system's movable components, or variables, that have an impact on flows and stocks, such as a flow rate or a stock's maximum amount, can be changed (Arnold & Wade, 2015; Duboz et al., 2018). Being able to differentiate between various stocks, flows, and other components, and being able to understand how they operate, is essential in systems thinking.

3.5.3.5. Understanding and recognising non-linear relationships

Both Plate's (2014) and Hopper and Stave's (2008) taxonomies are out of step with this aspect. This component includes stocks and flows that are not linear. This element falls under the conceptual heading of 'differentiating stocks, flows, and variables'. However, the latter appears to show a straight flow. This division of non-linear flows is done to avoid misunderstandings (Arnold & Wade, 2015).

3.5.3.6 Understanding dynamic behaviour

According to Arnold and Wade (2015), linkages, how they combine to produce feedback loops, and the consequences of these feedback loops, are made up of stocks, flows, and variables, which all contribute to the dynamic behaviour that a system displays. Without systems training, it is challenging to comprehend or explain this behaviour (Hu & Shealy, 2018). One illustration of dynamic behaviour is emergent behaviour, a term for unexpected system activity. Different types of stocks, flows, and variables must be distinguished in order to fully appreciate dynamic behaviour. Non-linear interactions must also be recognised and understood (Dugan, Mosyjowski, Daly & Lattuca, 2021).

3.5.3.7 Conceptually, reducing complexity through system modeling

Both the taxonomies provided by Plate (2014) and Hopper and Stave (2008) are different from this element. This component is different from Hopper and Stave's (2008) use of conceptual models, despite seeming similar. According to Arnold and Wade (2015), this component is the capacity to mentally model various system components and examine a system from many angles. By using diverse techniques, including reduction, transformation, abstraction, and homogenisation, executing this task enters the intuitive simplicity realm, which is outside the scope of established

system models (Duboz et al., 2018). According to the research, perceptual wholes might make their pieces less open to access (Dugan et al., 2021). Potentially, since the mind can retain fewer details about individual parts, interpretations of higher complexity are theoretically possible. This ability might, alternatively, be seen as the capacity to analyse a system in many ways that eliminate waste and simplify it.

3.5.3.8 Understanding systems at various scales

This ability is similar to Richmond's usage of 'forest thinking' (Duboz et al., 2018). Recognising various sizes and systems of systems is a necessity.

3.6 Systems thinking skills and competencies

Examining the particular abilities and talents displayed by a systems thinker can help to further understand what systems thinking is (Orgill, York & Mackellar, 2019). There are a number of lists of capabilities for systems thinking in the literature; but there is no agreement on the competencies in systems thinking that municipalities should acquire. Furthermore, there is not currently a list of system-thinking abilities that are explicitly geared toward project stakeholder management (Arnold & Wade, 2015). One viewpoint on systems thinking skills will be discussed in this section. This perspective adds to the knowledge of systems thinking and may help to construct a list of stakeholder management abilities and competencies in systems thinking in the future.

3.6.1 The seven systems thinking skills of Richmond

Barry Richmond, a pioneering systems scientist, and one of the top authorities on the subject, was the first to list the key competencies required for systems thinking (Richmond, 1993; Richmond, 1994). Richmond (1994) noted that, while comparable strategies may be used to address interrelated global problems, like ozone depletion, hunger, and poverty, they were initially applied to complicated business and management systems. Richmond's seven abilities are frequently mentioned in studies on the use of systems thinking in management and educational contexts. Thus, it is crucial to think about how they may be used in a stakeholder management situation.

3.6.1.1 Dynamic thinking

A reductionist strategy frequently concentrates on events that take place at a specific time. As opposed to this, dynamic thinking entails examining how behaviour evolves through time in order to comprehend the elements that have impacted conduct in the past, so that suitable modifications may be made to change how people behave in the future (Richmond, 1994; Forrester, 2016).

3.6.1.2 System-as-cause thinking

System-as-cause thinking is the notion that it is useful to view the structure of a system as the cause of the problem behaviours it is experiencing rather than seeing these behaviours as being foisted upon the system by outside agents (Richmond, 1994). System-as-cause thinking helps management shift from the perspective of 'blame the behaviour on some outside, uncontrolled source' to 'I can affect the behaviour by altering a variable within my system', which enables management to understand their ability to bring about a change in the system (Forrester, 2016:197).

3.6.1.3 Forest thinking

The concept of 'forest thinking' encourages people to look at a system's behaviour as a whole, rather than just its individual components (a 'tree-by-tree' thinking paradigm).

3.6.1.4 Operational thinking

According to Ninan et al. (2019), operational thinking focuses on the elements, rather than the connections that influence a system's behaviour. Operational thinking also highlights the relationship between factors and a certain behaviour.

3.6.1.5 Closed-loop thinking

Most of the rationale used today in scientific teaching, and to some degree, science study, may be categorised as 'straight line thinking,' which looks at the direct relationship between one variable and another (Richmond, 1994). Closed-loop reasoning, for instance, considers the possibility that, although variable 1 may have an impact on variable 2, variable 2 may also have an impact on

variable 1. Metabolic feedback loops are a well-known example of closed-loop thinking in a biochemistry setting.

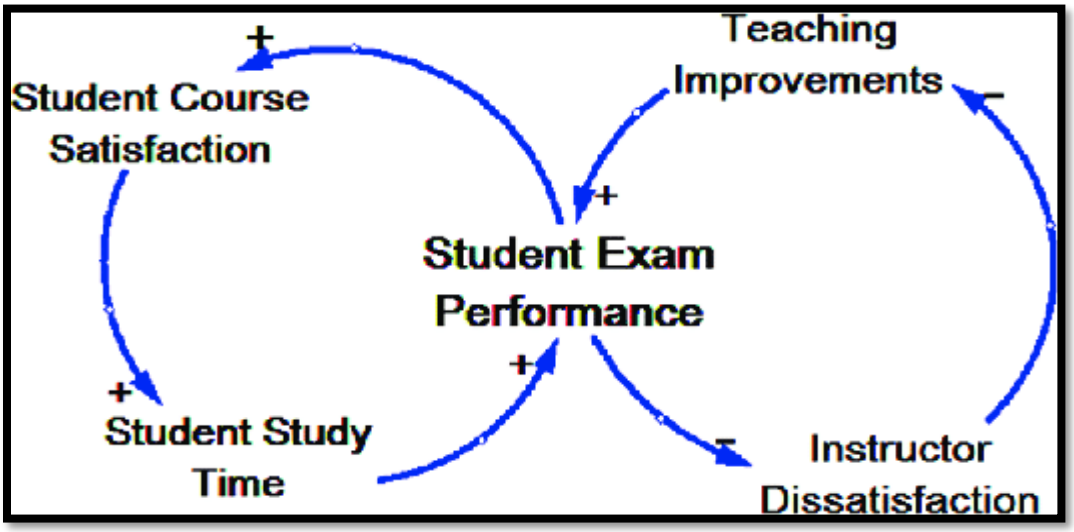

Figure 3.4: Closed-loop thinking (Source: Orgill, York, & MacKellar, 2019:17)

Figure 3.4 shows a causal loop diagram that illustrates the possible impacts of various variables on student test performance, as well as how those variables are influenced by student exam performance. This example pertains to the learning environment, but it may also be used in the project management environment where the management group and stakeholders have an impact on the project's result. The arrows on the diagram should be followed when reading it. Student exam results, for instance, have an impact on how satisfied they are with their courses, which has an impact on how much time they spend studying. The cause-and-effect relationship's 'polarity' is represented by the plus and minus signs in the figure. A plus symbol (+) indicates that improving the first variable will also improve the second variable. The negative (-) symbol indicates that if the first variable improves, the second variable will worsen (Orgill et al., 2019).

3.6.1.6 Quantitative thinking

Despite the fact that all variables can be quantified by giving them values on a relative scale, not all can be measured (Richmond, 1994). According to the example given by Richmond (1993) in Orgill et al. (2019), total dedication to a project may be indicated by the number 100; whereas total lack of dedication might be indicated by the number 'zero'. Systems thinkers quantify these links

and their discernible contributions to system behaviour, in addition to identifying how the components of a system interact.

3.6.1.7 Scientific thinking

According to Phillips and Kenley (2019), systems thinkers create models to explain the interactions between system components and how those components affect a certain systemic behaviour. Then, based on such models, they formulate hypotheses. Virtual or physical testing of produced models and assumptions, or actual experiments, are key components of scientific thought (Verhoeff et al., 2018). It is crucial to keep in mind that a genuine systems thinking approach requires including stakeholders in a variety of these diverse ways of thinking, across various settings and ideas.

3.6.2 Systems thinking hierarchical model

Richmond's list was among the earliest to include systems thinking. However, when one evaluates whether systems thinking abilities would be suitable in the context of project success, it has certain limits. Firstly, Richmond's systems thinking abilities were not intended to be applied in a stakeholder management setting. Secondly, the abilities were not derived empirically. Both of these issues are addressed by Orgill et al.'s (2019) systems thinking hierarchical model.

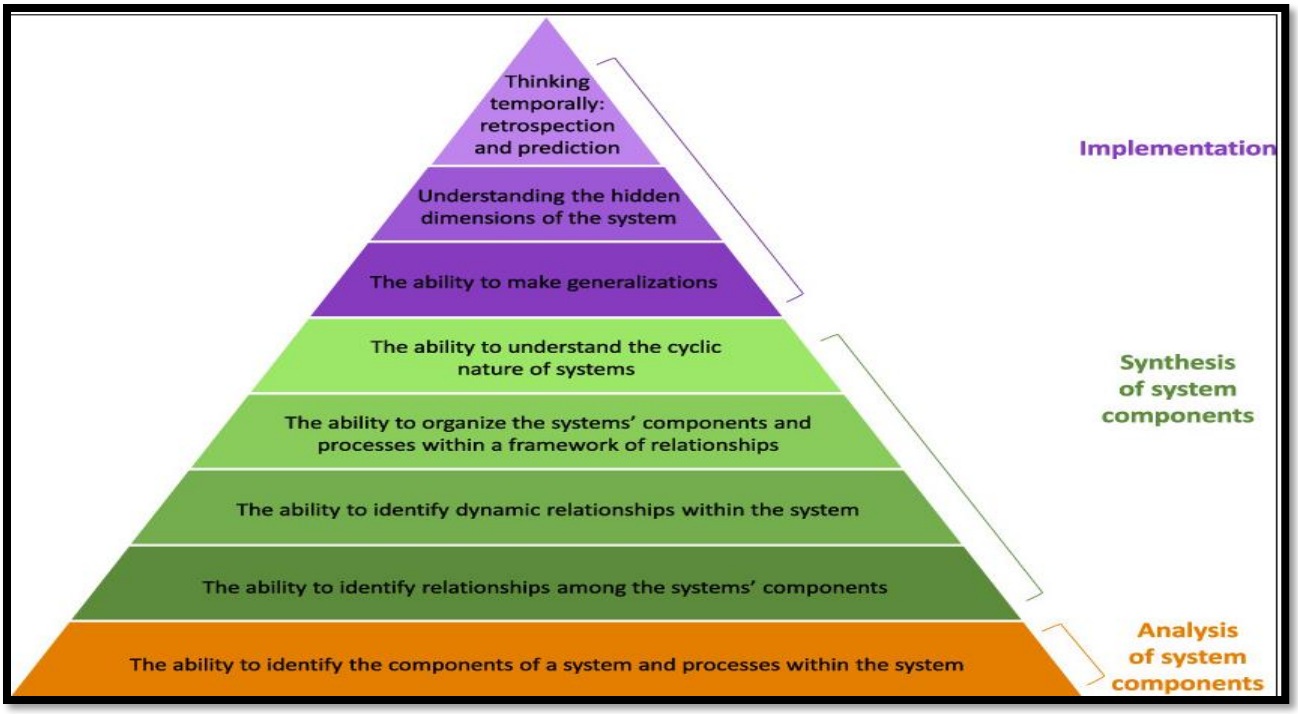

Figure 3.5: Systems thinking hierarchical model pyramid (Source: Orgill, York, & MacKellar, 2019:19)

Figure 3.5 is a graphic representation of their model. The eight systems thinking abilities in the STH Model are classified into three levels: (i) analysis of system components; (ii) synthesis of system components; and (iii) implementation" (Orgill et al., 2019:19). The initial level of the model, analysis of system components, only comprises the first capability of systems thinking: the capacity to recognise the parts of a system and its activities. According to Orgill et al. (2019), the second level, or synthesis of system components, includes systems thinking skills two-to-five. These are the capacity to recognise connections between the system's parts; to recognise dynamic interconnections within the system; to arrange the parts and processes of the system into a framework of connections; and to comprehend the cyclical nature of systems. The third level, implementation, sits atop the pyramid and incorporates the final three systems thinking abilities: generalisation, comprehension of the system's hidden aspects, and temporal thinking (reflection and prediction).

3.7 Systems approaches

Today, various viewpoints on the system are available. Service systems; smart systems; viable systems; reticular systems; institutional systems (from law); living systems; technical systems (cybernetics); ecosystems; and conceptual systems, are some of these systems (Jackson, 2019). A strong research stream with multidisciplinary contributions has grown from this diversity. It is feasible to depict the progression of these ideas, with newer hypotheses attempting to go beyond the limitations of the earlier ones (Camelia, Ferris & Cropley, 2018). However, people should take into account that other hypotheses are still in use today. Researchers should be aware that certain systems theories may contain opposing concepts and should be considered from several aspects when applying them (Benninghaus, Muhling, Kremer & Sprenger, 2019b). Additionally, the researcher should be aware of the method's epistemological position prior to choosing to utilise a certain systems approach.

3.7.1 Approaches to systems thinking and their characteristics

According to Hammond (2017), a variety of methods are used in systems thinking strategies and cognitive frameworks to enhance the understanding of intricate actions and occurrences inside and across systems, both artificial and natural, from a wide angle. Orgill et al. (2019) concurred with Hammond (2017), that systems thinking allows one to see higher-level behaviours and occurrences which one would not anticipate from the mere sum of a system's component elements. Systems can be observed at several scales, such as microscopic, mesoscopic, and macroscopic; and each system's boundary conditions are determined by the observer. Each system includes at least three essential features: components or pieces; connections among the components; and a goal or purpose (Arnold & Wade, 2015). Bendoly (2014:1359) uncovered the following 'defining' system characteristics: "(i) all parts must be present for a system to carry out its purpose optimally; (ii) the order in which the parts are arranged affects the performance of a system; (iii) systems attempt to maintain stability through feedback; (iv) visualise the interconnections and relationships between the parts in the system; (v) examine behaviour that changes over time; and (vi) examine how systems-level phenomena emerge from interactions between the system's parts".

3.7.2 Key systems approaches

A variety of system perspectives are available. This section explores differences in approaches which are regarded as key by various scholars:

3.7.2.1 General systems theory

According to von Bertalaffy (1971), cited in Camelia et al. (2018), a system is a collection of interconnected components. In order to identify universal principles applicable to all systems, von Bertalanffy encourages systems thinking across all academic fields. In contrast to the analytical, mechanical paradigm that characterises traditional science, 'system' is introduced as a new scientific paradigm.

The emphasis on interactions in generic systems theory is a basic idea. A single autonomous element behaves differently to how it behaves when it interacts with additional autonomous elements, according to relationships that support its claim (Arnold & Wade, 2015). The contrast between open, closed, and isolated systems is another fundamental principle. Open systems exchange energy, people, materials, and information with the outside world (Rahmawati, Suryani & Riski, 2021). Only energy can be exchanged in closed systems; neither information nor substance can be. Elements do not exchange in isolated systems (Ninan et al., 2019). Using general systems theory as a foundation, several tactics were developed. Camelia et al. (2018), highlighted the viable system approach, open system theory, and viable system model among others.

3.7.2.2 Open system theory

Open system theory investigates the interactions between organisations and the environments in which they operate (Jackson, 2016). This emphasis reveals how well organisations can shift to new environmental conditions, whether or not information processing is required (Allender et al., 2019). According to this hypothesis, organisms that can digest information relevant to their own environments are better equipped to adapt to changes in their environment. Two adaptive levels were defined by Whelan et al. (2018), both of which were related to the informative deviation. First-level counteraction (processing environmental information) is connected to the capacity to direct behaviour through personal goals; second-level amplification is tied to practising self-

organisation. Arnold and Wade's (2015) application of the open system idea to the organisation was cited by Katz and Kahn (1978). The company is described as an energetic input-output system, with energy from the output reactivating the system. Organisations are discussed as socio-technical systems by Haley et al. (2021), who emphasise the two key parts of the company as a system: a social component (people) and a technological component (technology and machines).

3.7.2.3 Viable system model

On the other hand, VSM defines a system as an entity that is flexible in order to survive in its changing environment (Jackson, 2016). The viable system is a cybernetic abstraction that may be used to describe autonomous groups (Beer, 1972; Yearworth, 2020). Because cybernetics is a multidisciplinary investigation of the organisation of regulatory systems, it examines how a system's operations cause changes in the environment, which the system perceives as feedback and uses to adapt to new situations. In other words, the system has the ability to modify its actions. Because the system cannot comprehend the environment's complexity levels, there exist differences between the system and environment's levels of complexity in cybernetics (York & Orgill, 2020). The viable system model, as used in companies, focuses on conceptual skills for comprehending system structures and redesigning them through: (i) change management; (ii) an understanding of the company as a whole; and (iii) an evaluation of the critical functions of implementation, control, co-ordination, policy and intelligence (Leveson, 2016; Yearworth, 2020).

3.7.3.4 Viable system approach

Sub-systems and supra-systems, according to VSA, offer a fresh perspective on consolidated strategic organisational and management frameworks (Jackson, 2016). While supra-systems concentrate on the links between businesses and other influencing systemic entities in their setting, sub-systems analyse interactions among the internal components of business entities (Barile, 2010; York & Orgill, 2020).

3.7.3.5 Cybernetics

Systems theory was given a substantial boost by Beer's work in 1972. According to the viable systems concept, a system is defined as something that can change to survive in a changing

environment. According to Timofte and Popus (2019), the viable system is an abstract cybernetic concept that can be used to define autonomous groupings. Cybernetics is an interdisciplinary study of regulatory system design that investigates how a system's activities produce in environmental changes that are understood by the system in terms of feedback, enabling the system to adapt to new circumstances. Therefore, the system has the ability to alter its behaviour. In cybernetics, the levels of complexity between the system and the environment are different because the environment possesses complexity levels that the system cannot perceive (Taylor et al., 2020).

3.7.3.6 Organisation

Katz and Kahn (1978) applied the open system principle to the company. The business or institution is viewed as a dynamic input-output system, with the energy from the output revitalising the system. (Mosyjowski et al., 2020). Due to the material interactions that social organisations have with the environment, they are thus open systems. Instead of addressing organisations as socio-technical systems, Emery and Trist (1965), cited in Jackson (2019), emphasised the two major components of the organisation as a system: the social element (people or society) and the technological element (technology and machineries).

3.7.4 System dynamics and smart systems

Based on the ideas of self-regulation and self-organisation, Stermann (1994; 2000) emphasised learning as a feedback process, focusing on people's learning experiences in, and regarding, complicated dynamic systems. Learning is a feedback process in which activities alter the environment around people. Furthermore, people learn how their efforts are doing and adjust the decisions they make, as well as the mental models that inform them. Sadly, in the field of social change, there are a number of obstacles that slow down or prevent the functioning of these learning feedbacks, allowing harmful and incorrect behaviours and beliefs to persist. "The dynamic complexity of the systems themselves is one of the learning obstacles" (Stermann, 1994:291). Smart systems are entities that can handle resources intelligently, interactively, and objectively, and are capable of self-reconfiguration in order to carry out consistent conduct capable of eventually pleasing all related participants. The principle of learning is fundamental to smart or intelligent systems. (Hu & Shealy, 2018).

While the backstage should be built on models and techniques that enable operational modifications and time efficiency, the input that systems must monitor in order to uncover essential elements for self-adjustment and reconfiguration is at front stage. Both stages are impacted by these 'smart' system properties. Systems are intelligent because they respond via technology and aim to make clever and intelligent use of the resources that are involved (Jackson, 2019). According to VSA suggestions, the pursuit of reactive, dynamic, and intelligent IT-based service systems by smart systems may very well be regarded as a workable behaviour that may enhance the system's long-term performance and competitiveness (Rousseau, 2020). Intelligent systems employ self-increasing knowledge to 'hear' their own contextual patterns, while continually learning and acquiring experience from outside occurrences. Intelligent systems are crucial to organism adaptability.

Systems thinking has become more popular across a variety of fields, including engineering, economics, social science, and information technology. The primary benefit of employing systems techniques is the availability of tools to create complicated scenarios to promote examination of the complete spectrum of complex interacting elements and interests, enabling exchanges to take place between them (Mahboob & Zio, 2018). Studies across the board support the observation that the systems thinking perspective embeds an interdisciplinary approach. Most studies include an overview of the broad context for understanding systems thinking – a nuanced concept (Zexian & Xuhui, 2010; Thoroman, Goode & Salmon, 2018). Reynolds (2021) complied five systems-based management techniques that can be helpful in managing complicated circumstances. Many scholars contend that the best methods for handling naturally complicated problems are systems approaches (Sharma, 2021).

3.8 Impact of system thinking on stakeholder engagement

By including their expertise and values in the decision-making process, stakeholders are engaged in order to solve their various issues (Ninan & Mahalingam, 2017). It becomes possible to prevent an uneven distribution of interests and power by promoting participation and offering a fair and equal platform. Stakeholder involvement offers a forum for social negotiation and dispute resolution, as well as a chance for co-operation and collaboration that can benefit the project (Vuorinen & Martinsuo, 2019). An advantage of good stakeholder involvement is increased

project acceptance. Additionally, engaging in a consultative discourse to solve issues and concerns of the community fosters a sense of ownership (Kumar et al., 2016). As a result, many academics advocate for more stakeholder involvement in megaprojects (Winch, 2017; Ninan, Mahalingam & Clegg, 2019). Stakeholder involvement should balance the project's economic, environmental, and social consequences on the stakeholders, as in de Fátima Teles and de Sousa's (2014) recommendation for stakeholder consensus building. In the samer vein, Henisz (2016) urges megaprojects to design an 'organisational fit' in their challenging and dynamic social and political environments.

Because of their limited cognitive capacity, the project team cannot fully understand all the stakeholders in the megaproject (Mok et al., 2015). As more stakeholders join the project and the organisation develops, the number of stakeholders will continue to rise (Lundrigan, Gil & Puranam, 2015). The project core should systematically identify stakeholders and interact with them directly from the start of the project to have the most impact; while also acknowledging the impossibility of capturing all stakeholder viewpoints. In order to comprehend the technical components of the project, the engagement approach should involve technical specialists, such as engineers, planners, and architects, in the project core. To comprehend the possible repercussions of the project, they should also include stakeholders, such as recipients and affected parties (Vuorinen & Martinsuo, 2019). The project core interacts with these stakeholders using direct strategies like avoidance, adaptation, flexibility or persuasion, as changing reactions to dynamic settings; as well as indirect strategies, like informing the stakeholders of the project's advantages, or building the project's reputation to win their support.

Ninan and Mahalingam (2017) suggested that, frequently, only the opinions of the bigger and more influential stakeholders are heard. Vuorinen and Martinsuo (2019) emphasised the significance of taking into account the objectives and requirements of external stakeholders. The project's core cannot take into account and plan for all of these stakeholder concerns because many of them may not be valid and are instead merely the clamour of many people (Ninan, Clegg & Mahalingam, 2019). When managing massive projects, patience and discipline are more important than speed (Sharma, 2021). Therefore, it is necessary to implement a methodical, rational decision-making procedure for teams to enable stakeholders in understanding the tensions between their authority

and interests and effectively handle disagreement (Leung et al., 2013). Ideally, such a strategy would provide each stakeholder with an equal voice and would act as a forum for communication. Additionally, it should go beyond compromise and trade-offs, which are frequently influenced negatively by prevailing power structures, and should instead focus on developing creative win-win solutions that benefit all parties involved.

Future managers must also be taught soft skills, often known as micro-social skills, in order to respond to social difficulties in infrastructure megaprojects. Winch (2017) highlighted the inability of project managers to complete the duties necessary for stakeholder participation in a project. Construction project managers must have the ability to plan, negotiate, manage conflicts, etc., because their work exists in a social environment. It is crucial to take into account how these soft skills may be cultivated in the classroom in order to properly educate future managers who will be ready for real-world challenges. Systematic, analytical, and creative thinking will be encouraged by this.

3.8.1 Systems thinking for enhancement of project(s)

The feedback technique in systems thinking allows for a comprehensive perspective of the intricate organisational structure (von Kutzschenbach et al., 2018). The systems dynamics technique gave rise to the feedback system approach, which was conceptualised by Jay W. Forester in the 1950s (von Kutzschenbach et al., 2018).

By allowing systematic management, control, and assessment, the systems thinking approach is the foundation for enabling successful and efficient customer or stakeholder relationship management (Trkman et al., 2015). Business process initiatives fail because a holistic approach has not been used, since they only focus on one department or one area of a certain operational process inside an organisation. To avoid becoming isolated or fixated on a particular feature, it is crucial to apply a holistic approach or idea in the scope description (von Kutzschenbach et al., 2018).

Jackson (2016) added that being systematic entails understanding issues from several angles and being able to address them by integrating systematic techniques and a diversity of viewpoints.

Systems thinking outperforms conventional thinking when it comes to tackling complicated, persistent, and societal issues, since the latter tends to provide conventional solutions that occasionally fall short of the mark (Stroh, 2015). Systems thinking, according to Jackson (2003) and Checkland (1999), includes both hard system and soft system methods. The justification for offering a short overview emphasises how pertinent systems thinking is to the investigation and demonstrates how similar it is to public initiatives. According to Checkland and Poulter (2006), systems thinking takes a holistic approach, which Jackson (2003) refers to as creative holism. By using systems thinking, one may better comprehend how systems develop through time, as well as the connections that exist in each situation and the effects of actions (Murray, 2016). When dealing with complicated and difficult issues, this is helpful. The administration of public projects is essential to a municipality's mission and continued existence.

To be able to handle the complexity the world faces, a variety of disciplines should apply the systems thinking approach (Arnold & Wade 2015). Professionally trained people are taught to handle issues linearly, which has constraints, such as unexpected repercussions that were not recognised since difficulties were obscured by the conventional temporary solution (Sharma, 2021). Systems thinking offers a perspective that makes sense in process philosophy (Keto, Palomäki & Jaakkola, 2018). According to Armson (2011), holistic thinking promotes an awareness of a thing as a whole, including its links or interactions. An entity in this context might be a person, an organisation, or a concept. The antithesis of reductionism, which is scientific and focuses on understanding an entity's underlying structures by breaking them down into their component pieces rather than considering the whole, is holistic thinking. Organisations nowadays are intricate. Understanding the connections between parts is essential (Jackson, 2019).

Technology is always developing, and it is essential to progress. As a result, previously existing interdependencies in their systems have increased (Arnold & Wade, 2015). According to Jafarzadeh-Kenarsari et al. (2019), the introduction of technology as a tool has caused a significant transformation in the organisations. The majority of business process transformation initiatives fail because the anticipated results are not produced, which results in financial loss, a loss of competitive advantage, and other issues (Cockburn et al., 2020).

When used in complicated projects, systems thinking provides a number of advantages (Emes & Cole, 2019).

These are:

- It provides answers to complicated issues that could not be handled by conventional methods which used deconstruction as a first step.
- It significantly cuts down on any project delays.
- It improves organisational learning about ongoing and upcoming initiatives.
- It improves the project's final results.
- It assists the organisation in choosing the best project to solve the problems, and provides the tools necessary for the organisation to carry out the project successfully.

According to Cockburn et al. (2020), the reasons why business process initiatives fail are dynamics; a lack of complicated internal interaction within the project; a lack of understanding of complexity; and the manner the project is begun and carried out. According to published statistics, 60 to 80% of business process transformation initiatives fall short of the organisation's envisioned objectives (Cockburn et al., 2020; Trkman et al., 2015). Cockburn et al. (2020) asserted that current research shows that business process change projects only take into account the technical aspects of things, such as IT automation, and fail to take into account other, more complex factors that are highlighted in scholarly work. These factors include management, interdepartmental co-operation, communication, and user involvement, all of which are essential for project success. According to Cognini et al. (2018), organisations must manage the constantly changing environment and complications that occur in order to achieve their aims and objectives. In order for stakeholder management to be successful in the complex and extremely diversified system, systems leaders are crucial in project management that is diverse, adaptable and learning (Khanyile, 2019).

3.8.2 Systems thinking tools to be infused in project management

Marnewick, Erasmus and Joseph (2018) asserted that systems thinkers apply systems ideas and employ tools to analyse particular circumstances. Because systems thinking is included into the project's standard management techniques and metrics, projects are successful (Kasser, 2019). Arnold and Wade (2015) asserted that, economic feedback loops occur as a result of global commerce or open borders with other nations for economic progress. There is thus usually a knock-

on impact for other goods. Contrarily, systems thinking can only be used in complicated initiatives, as basic projects lack interconnection (Emes & Cole, 2019). If systems thinking is solely applied to complicated initiatives, there is benefit for organisations.

According to Sharma, (2021:1), "some see systems thinking as providing a powerful language to communicate and investigate complex issues, while others are confused by the sizable and amorphous body of theories, methods and tools involved". According to Chiloane-Nwabueze, Tanyimboh & Glendinning, (2022), project management may be extremely beneficial and very successful if it takes into account how different organisational factors, such as strategy, people, and flexibility, are connected to one another. It also has to be led by competent individuals. Nowadays, a systematic influence that can be seen right away over time has caused many modern, sophisticated initiatives to fail (Emes & Cole, 2019).

Singh and Bhushan (2017) asserts that systems thinkers contribute significantly to the resolution of complexity by using approaches like systems dynamics (feedback loops). Singh & Bhushan (2017) added that understanding other components or parts that enable sustained improvement of complicated difficulties is made possible by systems dynamics, which also helps to enhance and comprehend cross-functional business processes and obstacles. Marnewick et al. (2018) claims that systems thinking evaluates circumstances as a system for improved comprehension and analysis. Applying the reductionist approach results in a worse understanding and resolution of the problems. According to Emes and Cole (2019), a studies conducted earlier found that using systems thinking tools and concepts across the project life cycle was a key component in project success.

Ojiako, Chipulu, Marshall, Ashleigh and Williams (2015) claims that systems dynamics was created in the 1970s. It has been shown to be quite helpful in figuring out how another system behaves. Soft system technique is particularly successful for project management (Nevstad, Borve, Karlsen, & Aarseth, 2018). There are very few companies that use project management in a more comprehensive manner since this method makes it possible to perform projects successfully (Chiloane-Nwabueze et al., 2022). Even though project managers may benefit from applying systems thinking to complicated projects, just a small percentage of project managers actually do

so (Emes & Cole, 2019). System dynamics is a technique that enables the comprehension of feedback loops incorporating delays and non-linear interactions. Systems dynamics will eventually enable effective corporate procedures and policies (Singh & Bhushan, 2017).

Pirani, de Pinho, Arana, Bhaskar, Hale and Murrman (2022) goes on to state that the methodology's problems, which are unsustainable, are thought to be the reason why around 70% of public initiatives failed. Mays (2017) asserts that given the complexity of today's problems, it is essential for organisations to approach problem resolution holistically. Because the system is open and dynamically interacts, solving problems in silos or in isolation is not a viable solution. A causal loop is used to depict the dynamics as feedback, stocks, time delays, and flows; systems dynamics is a technique for understanding the dynamic behaviour of complex systems (Moldavska & Welo 2015).

According to Marnewick et al. (2015), it is crucial to comprehend the following while beginning and carrying out public initiatives. Processes are performed in their current state in conjunction with their associated sub-processes. Dennehy and Conboy (2018:114), argued that "documenting the sequence of activities thus recognised, in both the causal and temporal sense, including identifying i) causal relationships of process activities; ii) temporal relationships of inputs and outputs in processes; and iii) logical links" is critical. Systems dynamics is a very helpful technique for aiding with organisational decision-making (Moldavska & Welo, 2015). It enables understanding the behaviour of the organisation. Mitra and Mishra (2016) asserted that the systems dynamics technique is a splinter from the theory of constraint.

Further emphasising this point, Fowler et al. (2019:2809) stated that "managers need to develop and cultivate a capacity to perceive and analyse relationships between their organisations and the business environment as a complex, adaptive, dynamic system containing nonlinearities, inertia, delays, and networked feedback loops. Within this environment, principles of and connections between systems and control theory, complexity notions, business process orientation, and simulation are examined through discourse". Moldavska and Welo (2015) went on to claim that systems dynamics concentrates on the causalities that set off long-term patterns of change in a highly complex system.

Dennehy and Conboy (2018) claimed that, when management in organisations tried to utilise rigid systems or conventional methods to address organisational issues, it was discovered that management was unable to even effectively articulate the issues that needed to be addressed, which led to the failure of initiatives. However, Marnewick et al. (2015) argued that one of the reasons why it could be difficult to define problems is that stakeholders do not have divergent opinions about what the system and the system problems are. Marnewick et al. (2018:2) added that systems thinkers may "paint the overall picture, collect and codify divergent views, uncover the underlying patterns, and disclose the natural and relevant structure" using tools that are available.

According to Marnewick et al. (2018), Checkland and Wilson created the soft systems technique through action research; as a result, it is more than just a way for dealing with problems. CATWOE, Conceptual Model, Rich Picture, and Formal Systems Model are the tools that were created. Burge (2019) went on to argue that systems thinking is necessary in circumstances that are extremely confusing, so that all viewpoints, including those of stakeholders, may be better understood. CATWOE is the instrument used for determining the root cause and is defined in accordance with a variety of viewpoints. According to Jackson (2003:187), "A root decision should be well formulated to capture the essence of the relevant system and, to ensure that it is, should pay attention to the factors brought to mind by CATWOE (Customers, Actors, Transformation process, Worldview, Owners and Environmental constraints)".

A soft system thinking methodology tool, known as CATWOE, is used to demonstrate needs from many areas by comprehending the problem's perspective (Mayouf et al., 2015). Jackson (2019) added that the CATWOE analyses each system to determine the fundamental cause. Hagiwara and Saito (2016) claimed that CATWOE is employed to analyse stakeholders, goals, and problems. It helps to create a full image. In order to guarantee that the issue is clearly understood and to investigate alternative hypotheses on the nature of the shift, CATWOE uses six criteria to determine the root cause (Jackson, 2003:193).

The following definitions apply to the six CATWOE components:
"C 'customers': the beneficiaries or victims of the transformation process;

A ‘actors’: those who would undertake the transformation process;
T ‘transformation’: the conversion of input to output;
W ‘worldview’: the worldview that makes this transformation, meaningful;
O ‘owners’: those who could stop the transformation; and
E ‘environmental constraints’: elements outside the system that are taken as given.”

A systemic approach and holistic thinking are crucial for improving service delivery to all stakeholders (von Kutzschenbach et al., 2018). When analysing and resolving problems, the holistic viewpoint is extremely important. As a result, project management and methodical process optimisation are crucial to lowering the risk of implementation failures and delivering long-lasting solutions (Lin et al., 2018). Furthermore, Bibri (2018) agreed that, as organisational problems become more complex, systems thinking is crucial when trying to solve them. This includes taking into account factors like the interconnection of the whole system and its subsystems, as well as new, creative ways to solve problems. Marnewick et al. (2018) made more claims on the effectiveness of systems thinking in managing organisational risks, issues, and complexity in the modern world.

3.9 Soft Systems Methodology

The previous section described the variety of systems thinking paradigms that make up this study’s theoretical framework. An extensive overview of SSM, which was recognised as one of the systems thinking techniques, is presented in this portion of the research. SSM is an approach that belongs to the systems thinking family. The section also discusses the theoretical foundations of SSM, including its main ideas, guiding principles, advantages, and organisational structures. SSM is an interactive method for conducting systems development and general academic study (Nikakhtar, Hosseini, Wong & Zavichi, 2015).

Checkland created SSM at the University of Lancaster in the UK in the late 1960s (Jackson, 2008). Due to the methodology’s value as a modeling tool which was later turned into a learning and development tool, it has become more well-known in recent years. Its power and usefulness come from comparing the real world to hypothetical world models. This comparison offers some suggestions for development and offers a better undersdtanding of the world (Bibri, 2018).

Although Checkland (2000), the creator of SSM, could disagree slightly with the terminology used, since he disapproved of the phrases ‘solution’ and ‘issue’ when working with SSM, there is a logical relationship between SSM and action research (Senge, 1990). Human activity-related situations are inherently complicated, and organisations need interventions rather than fixes (Nikakhtar et al., 2015).

When employing the SSM as an approach, the problem to be solved becomes the participants’ classroom, and the conceptual models are thus more applicable to the scenario (Jackson, 2019). This is due to the fact that SSM employs a number of models to examine the issue from many angles. All SSM models include ‘human activity systems’ (HAS), which Checkland (2000) considered to be one of the key elements in the growth of SSM. The purpose of the system is determined by people, because they are the ones who created the issue, and the remedies also depend on how they perceive the system.

3.9.1 SSM Processes

Four of the original seven phases in the SSM process have become more important in the present context. Figure 3.6, below, shows the seven-step SSM procedure in more detail.

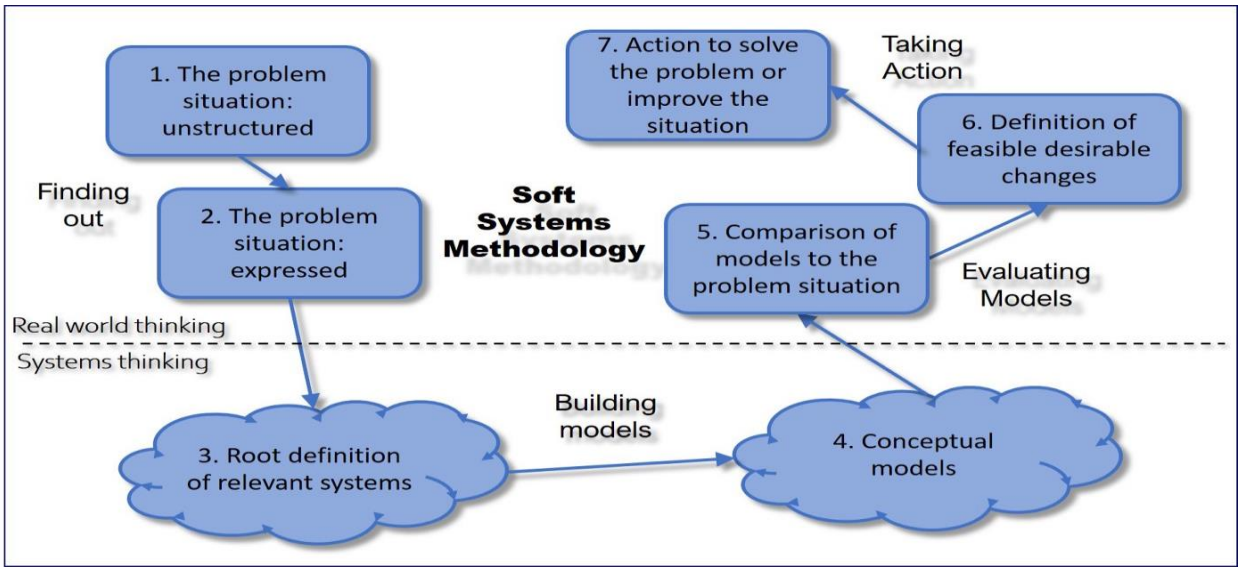

Figure 3.6: The learning cycle of SSM (Source: Checkland & Scholes, 1990:27)

The seven-stage SSM approach was initially employed to examine issue scenarios involving the human activity system. In order for the practitioner to be able to take action to improve the situation, the process begins with an analysis of the problem scenario, which identifies the issues of concern in the situation.

3.9.1.1 Phase 1

At this point, the researcher or practitioner enters the issue scenario with the intention of monitoring it. The practitioner's purpose is to identify the owners of the difficult situation's values and aims, which are typically not clearly expressed at first (Jackson, 2019). There are typically several issues, and most of them are connected. Therefore, analysis is a necessary part of the investigative process. The practitioner tries to divide the challenging circumstance into smaller segments, with the participants looking at the characteristics of each element. Because SSM is an intervention approach for complicated, messy situations, soft system methodology practitioners do this (Verhoeff et al., 2018). Additionally, the situation's stakeholders can transcend their disparate perspectives to develop a more comprehensive knowledge of the situation's complexity.

3.9.1.2 Phase 2

This is the investigative procedure, which often includes speaking with interest groups in interviews. In this stage, the practitioner might use the discussions with the interest group to create a detailed picture (Aubrecht et al., 2019). Here, the practitioner can record the attitudes and values of the important system players, as well as their interactions with one another. In other words, although in the first stage the practitioner is simply observing the issues, in this step the practitioner is researching the problem situation. According to Jegstad and Sinnes (2015), the practitioner will first appraise the situation and explore his or her own perceptual models. It is critical that the practitioner establish their own goals inside the system's framework. The 'rich picture' as a means of representing the issue scenario is one of various inquiry procedures that may be employed at this point; but this research only examines the one that will be used in this study. Rich visualising is an effective method in social settings for illustrating complicated events. Real-world activities and a participatory approach are the two phases that have been previously outlined.

3.9.1.3 Phase 3

Without the stakeholders present, the practitioner sits alone and makes an effort to make sense of the data at hand. In other words, the practitioner leaves the actual world. The practitioner creates a root definition of the system, using the facts at hand as a technique to represent the issue (Jackson, 2019). Simply put, the root definition is a description of the process through which the situation will change. Various viewpoints on the system's purpose are often used to establish the fundamental definitions.

Understanding the idea of several viewpoints that may be used to create a rich image is the first step in root definition. They are referred to as holons by Checkland and Scholes (1990), and each holum offers a distinct value foundation upon which to judge the circumstances. According to Omarova et al. (2018), the root definition is a description of the system that will produce the intended result. He views root definition as the conversion procedure that will turn a defined input into an output.

The recommendation of soft systems theorists is that the transformation process should start with an undesirable, existing condition and go from there to a vision for the ideal situation. Through this approach, one moves from the current circumstance to the ideal situation. The issue-based definition and the primary task definitions are the two categories that make up the root definition (Verhoeff et al., 2018). Definitions that are based on concerns speak to problems that occur inside the organisation. Typically, these result in structures that are unlikely to become institutionalised in the actual world. In this stage of the intervention, it is crucial to come up with a number of root definitions, one of which has to be issue-based. Testing of root definitions is necessary. Checkland (2000) suggested using the mnemonic CATWOE to test the root definitions.

3.9.1.4 Phase 4

In order to create an account of the activities and the links between them that are required to enhance the system, the practitioner creates models at this point. The practitioner here should develop a conceptual model of the system using the many root definitions offered. This is the bare minimum required for the system to function. Thinking about, and outlining, the actions that are

essential to carry out the transformation, as specified in the root definitions, will result in the conceptual model (Jackson, 2016).

Checkland recommended that the actions must be stated using verbs that are essential in the root description for the practitioner to build a sound conceptual model (Checkland, 1999). The root definitions must be logically deduced to produce the models. The practitioner is modeling the system during this stage. As a result, the linkages between the actions are crucial and must be indicated by arrows.

3.9.1.5 Phase 5

The practitioner meets the stakeholders once more during this phase with a model that has been built using the data collected during the earlier meetings. The practitioner sparks conversation on the ongoing activities. In order to decide how to remedy the problematic condition, the model is utilised to advance discussion about it (Checkland & Scholes, 1990). The primary goal of this stage is to spark conversation about current operations, while avoiding forcing a model design onto an organisation.

3.9.1.6 Phases 6 and 7

The relevant parties debate potential improvements to the situation throughout these last phases. Structure, process, and attitude changes are the three types of change that might occur during this period (Verhoeff et al., 2018). It is suggested, nevertheless, that the practitioner makes sure that the alterations are performed in accordance with certain standards. They ought to be societally favoured, culturally practicable, and morally tenable. The next step is to put the improvement plan into action.

The Stakeholder Relationship Management Communication Model is flawed because it fails to describe the issues that stakeholders' relationship management systems encounter; how stakeholders' relationship management systems are used; or how stakeholders' relationship management system models can be created to improve the delivery of water and sanitation services (Blackburn et al., 2012). The seven-stage model supplements the stakeholder relationship management communication paradigm.

A problem-solving, facilitating, and structural learning strategy built on interpretative epistemology is known as SSM (Boardman & Sauser, 2008). The strategy is created to make it easier for the participants to understand the challenging scenario. This method's main tenet is that systems are subjective creations made by an observer of challenging real-world circumstances (Jackson, 2016). The practitioner serves as a facilitator in the SSM enquiry process, allowing the many participants to define and assist in implementing the system they feel would solve the problematic situation. SSM is applicable in creating explanatory systems, making it a participatory technique where the practitioner helps others think about, and view, the issue scenario in new ways, so they may more easily come up with potential change-related solutions.

According to Jackson (2016), SSM is a methodology that sets forth guidelines for the application of techniques that permit involvement in poorly organised issue situations. The methodology originated in systems engineering techniques, which is a hard systems approach that deals with simple issue scenarios. It offered a better strategy for identifying some systems important to resolving the issue, each of which expressed a worldview. Consequently, the use of SSM results in the creation of several models (Nikakhtar et al., 2015). These simulations accurately reflect human behaviour and are compared to actual circumstances.

According to Ninan et al. (2019), SSM is a method for actively managing people who are involved in chaotic, complicated circumstances. They also describe it as a mechanism for learning. SSM tries to address socially problematic regions by encouraging participants to engage in an ideal never-ending cycle of learning. "Learning occurs through the iterative process of utilising systems ideas to reflect on and discuss views of the actual world, and then to reflect on the events using systems concepts again" (Checkland & Scholes, 1990:910).

It is encouraging to see how SSM forces practitioners to think in ways that encourage thinking expansion. The problem is investigated in an unstructured manner, allowing for the development of numerous situational models. The strength of SSM is that it can be used to untangle issue situations within a programme and attack them via numerous aims and multiple scenarios (Monat & Gannon, 2018; Williams, 2005). This is made feasible by developing distinct viewpoints on the

programme, carefully designing models based on these perspectives, and comparing them to real life.

3.9.2 SSM and its application in project stakeholder engagement

The soft systems technique and its usefulness in stakeholder participation in the project were explored in this section. Action research activities have been used to address unstructured, complicated, and ambiguous issue situations because of how common they are and the difficulties they present (Flyvbjerg, 2014). These kinds of issues have been seen to entail a number of parties, views, uncertainties, competing interests, and important intangibles (Pitsis et al., 2018). Problem structuring methods (PSM) and concepts were subsequently created to motivate corporations to use systemic strategies for solving problems. These PSMs provide "a manner of describing the situation that enables participants to define their predicaments, congregate around a potentially actionable shared problem or issue inside it, and agree on the commitments that partially address it" (Lundrigan et al., 2015: 527).

It is necessary, however, to categorise these issues appropriately. Problem settings were divided into four categories by Jackson and Keys (1984), cited in Ninan et al. (2019), and each category was given appropriate approaches for tackling the problem. This is a systemic concern since it is open, has functional components, can only be observed partially, and cannot be grasped using reductionist means. Using the goals to be achieved as a guide, Jackson and Keys (1984), cited in Ninan et al. (2019), categorised a problem situation as pluralist. A pluralist problem context arises when the group of decision-makers cannot agree on predetermined goals and, as a result, everyone makes a choice with a different aim.

SSM is one of these PSMs that is particularly noteworthy. The original articulation of SSM by Checkland (2007), as cited in Ninan et al. (2019), was motivated by urgent issues that existed inside numerous organisations, but were not explicitly expressed. The method is a gentler, more adaptive response to the systems engineering approach's failure to effectively address a wide range of management issues (Allender et al., 2019). SSM handles 'soft' problems by first constructing the 'richest possible image' illustrative of the extent of the issue. The technique then investigates conceptual models, which are systems of human activity that each have a worldview. These

hypothetical systems might be given names in 'root definitions,' and they are then contrasted with reality (Rahmawati, Suryani & Riski, 2021).

The generally-used seven-stage cyclic learning procedure for SSM was presented by Checkland (1981), cited in Ninan et al. (2019). Orgill, York and MacKellar (2019) used an experiential learning approach to communicate the ideas and techniques of SSM in an effort to offer it as a universal strategy for dealing with complicated problems. The SSM system's seven stages begin before it is depicted, as a rich visual, with the identification of a problem situation that assists in the creative comprehension and distribution of the 'as-is' problem. The systems thinking step then creates the fundamental definitions of relevant, meaningful activity systems. According to Forrester (2016:197), systems thinking is the stage at which attention is paid to the "essence of the relevant system", which is made feasible by 'CATWOE'. The worldview represents the many ways in which the issue scenario is seen by these basic concepts. The conceptual models of the suitable systems are then named in the root definitions before being compared to the real-world scenario. Finally, while acting to ameliorate the issue situation, systemically desired and culturally viable modifications are examined.

Because of the limited description of the pioneering seven-stage procedure and a lack of systemic understanding of the process, a better portrayal of the methodology as a "two-strand model" was devised (Hammond, 2017). This new paradigm introduced a more sophisticated style of cultural examination, most notably Analysis 1, 2, and 3. Analysis 1 focuses on the client, the problem-solver, and problem-owner responsibilities in connection to the intervention. Analysis 2 uses social system analysis to assess roles, values and norms. Analysis 3 dives into the issue scenario's politics and how power is gained and utilised. The two-strand model enhances the "seven-stage SSM model" by emphasising continual reflection on the socio-cultural underpinnings of the problem scenario during all phases of the earlier model.

Several attempts have been made in the literature to apply pertinent PSMs to the resolution of systemic-pluralist issue situations. SSM and MCDA were used to structure multi-objective issues involving many stakeholders and environmental decision-making for a public transportation firm (Mok, Shen & Yang, 2015). By separating the substance of the issue scenario and activity

planning, Winter additionally creatively applied the SSM technique at the beginning of a branch specific range (BSR) project for Tesco in the UK. This distinction served as the inspiration for the Tesco intervention, which not only addressed the actual content of BSR, but also utilised SSM to assist in organising the educational workshop (SSMp) (SSMc).

SSM, however, has several shortcomings, particularly when it comes to managing issues involving competing interests. In addition, Aubrecht et al. (2019) contended that SSM is not obviously the best technique for dealing with difficulties, including substantial coercion or conflict, that need a complex system organisational design; it offers only a limited understanding of the reasons why issues arise, in the eyes of hard system thinkers; and it does not take cybernetic laws into serious consideration when structuring large systems. As a result, SSM can be used as a component of the Systems of System Methodologies (SOSM) that Jackson (2000) proposed, and which Verhoeff et al. (2018) cited, in order to address systemic-pluralist problems that are complex and include numerous views, such as stakeholder participation in megaprojects. Biesenthal et al. (2018) highlighted the relevance of issue structuring, utilising SSM in the early stages of projects. The authors recognised the usage of various soft systems techniques, like causal mapping, and strategic options development and analysis (SODA).

A challenge that contains "many players, numerous viewpoints, incommensurable and/or competing interests, critical intangibles, and key uncertainties" should be examined using SSM, as a technique for organising problems (Mok et al., 2015:451). Hanafizadeh and Mehrabioun's (2018) survey provides credence to the use of SSM as a problem-structuring technique. A problem-solving approach that permits the creation of an idea for a solution to the recognised problem must be used in conjunction with SSM. Given the aforementioned SSM constraints, as well as interest in systemic-pluralist scenarios with multiple worldviews and competing aims, Ninan et al. (2019:5) used a supplementary solution concept-generating technique that: "(a) is capable of handling and resolving conflicts; (b) answers the question of why problems occur, revealing contradictions inherent in the problems; (c) goes beyond simply using coercion and/or compromise for resolving conflicts, to finding innovative solutions that create value for each stakeholder with respect to their worldview, thus keeping with the spirit of the SSM of respecting plurality; and (d) applies cybernetic/systemic principles in finding these innovative solutions".

In this study, SSM was used to improve the relationships between the project stakeholders in the EWS unit, which often come with conflicting interests and expectations. Some elements of the critical systems heuristic approach (CSH) are also adopted in the study because of its attention to boundary critique. In the CSH approach, users focus on working constructively with tensions between opposing perspectives in problematic situations. Infrastructure projects are multi-stakeholder projects; hence, tension and conflicting perspectives are usually experienced.

Action research activities have been used to address unstructured, complicated, and ambiguous issue situations because of how common they are and the difficulties they present (Ninan, Phillips, Sankaran & Natarajan, 2019). Various parties; multiple viewpoints; a wide range of uncertainty; competing interests; and considerable intangibles, are all present in these kinds of challenges. However, it is necessary to appropriately categorise these issues. Ninan et al. (2019) divided problem situations into four categories and offered appropriate approaches for each the resolution of each category. This issue is open in the sense that it is systemic, has functional components, can only be partially observed, and cannot be grasped using reductionist means. Jaradat et al. (2019) classified a problem scenario as pluralist based on the desired outcomes. There is a pluralist problem environment when the group of decision-makers is unable to agree on predetermined goals and, as a result, each makes their own decisions with different aims.

SSM is one of these PSMs that is particularly noteworthy. The original articulation of SSM by Checkland (2007), as cited in Ninan et al. (2019), resulted from urgent issues that existed inside numerous organisations, but were not explicitly expressed. The approach is a softer, more adaptable response to the systems engineering approach's failure to effectively address a wide range of management issues (Allender et al., 2019). SSM handles 'soft' problems by first constructing the 'richest possible image' illustrative of the extent of the issue. The technique then investigates conceptual models, which are systems of human activity that each have a worldview. These hypothetical systems might be given names in 'root definitions,' and they are then contrasted with reality (Rahmawati, Suryani & Riski, 2021).

The frequently used seven-stage cyclic learning approach for SSM was presented by Checkland (2007), cited in Ninan et al. (2019). Checkland and Poulter (2006) used an experiential learning

approach to disseminate SSM's concepts and methodologies in an effort to portray it as a universal strategy for handling complicated problems. The 'seven-stage SSM approach' begins before it is depicted as a rich visual, with the identification of a problem situation, which helps with a creative comprehension and description of the problem 'as-is.' The system thinking step follows by creating the fundamental concepts of pertinent, useful activity systems. The worldview is a reflection of the various ways that the problem scenario is seen in these basic concepts. Before being compared to actual situations, conceptual models of the pertinent systems are first named in the root definitions. In order to ameliorate the problematic situation, systematically desired and culturally practical modifications are taken into account.

There have been several attempts in the literature to apply pertinent PSMs to the resolution of systemic-pluralist issue situations. For the purpose of organising multi-objective issues, including environmental decision-making involving several stakeholders for the benefit of the public transportation corporation, SSM was utilised in conjunction with multi-criteria decision analysis (MCDA) (de Fátima Teles & de Sousa, 2014). By separating the substance of the issue scenario and activity planning, the SSM technique was also creatively applied at the start of a branch specific range (BSR) project for Tesco in the UK. SSM, however, has certain shortcomings, particularly in how it handles issues involving competing interests.

Whelan, Love, Millar, Allender and Bell (2018:843) contended that SSM is "(a) is 'much less obviously' the most suitable approach in dealing with problems requiring the organisational design of complex systems with significant conflict or coercion; (b) provides a little perspective on why problems occur according to hard system thinkers; and (c) does not take the idea of obeying cybernetic laws seriously when organising complex systems". As a result, SSM may be employed as a component of the Systems of System Methodologies (SOSM) that have been proposed to address systemic-pluralist problems when the problem is complicated and is viewed from various perspectives, as is the situation when including stakeholders in megaprojects. Whelan et al. (2018) highlighted the relevance of issue structuring utilising SSM in the early stages of projects. The authors recognised the use of various soft systems techniques, like causal mapping, and strategic options development and analysis (SODA).

According to Ninan et al. (2019:4), SSM is a method for organising problems that may be used to examine problems with "many players, numerous viewpoints, incommensurable and/or competing interests, major intangibles, and key uncertainties". According to Rahmawati et al. (2021), SSM can be useful for solving structural problems. A problem-solving approach that permits the creation of the idea for a solution to the recognised problem must be used in conjunction with SSM. Given the interest in systemic-pluralist scenarios with many worldviews and competing aims, as well as the aforementioned SSM restrictions, the authors would want to use an additional technique for generating solution concepts that: "(a) is capable of handling and resolving conflicts; (b) answers the question of why problems occur, revealing contradictions inherent in the problems; (c) goes beyond simply using coercion and/or compromise for resolving conflicts, to finding innovative solutions that create value for each stakeholder with respect to their worldview, thus keeping with the spirit of the SSM of respecting plurality; and (d) applies cybernetic/systemic principles in finding these innovative solutions" (Rahmawati et al., 2021:22).

3.10 Applications of systems theory in management

This section provides example of how systems thinking and systems theory may be used in the disciplines of management and marketing, and the idea of managing stakeholders. The emphasis is on adaptation; knowledge; complexity; value relationships; the environment; and quality.

3.10.1 Knowledge

According to Rousseau (2019), the firm is regarded as a learning system with a set of abilities that allow it to develop its own knowledge. In this instance, the corporation is a cognitive system that exists, generates data, and stimulates skills in order to create information through ongoing learning processes (Meilinda et al., 2018). In an autopoietic process of resource creation, knowledge is at the centre, generating cycles of resource-behaviour-resource that enable the system as a whole to operate. According to Mazzurco and Daniel (2020), the systems approach to thinking helps businesses to develop into organisations that are learning. They consider systems thinking, mental models, personal mastery, producing shared vision, and team learning to be the foundation for building three important learning abilities: promoting ambition, nurturing reflective dialogue, and addressing complexity in value creation.

3.10.2 Value

The firm is seen as a full system with a high degree of integration between the elements that impact the value generating process using this strategy (Lavi et al., 2020). The value of a company is defined as the "potentiality of existence, development, and evolution" (Lattuca et al., 2017:82). Business value creation is connected to the supra-system (via co-operative logics and asset enhancement in terms of technological, perceptive, interpersonal and adaptive elements), as well as to the sub-system (through research and development activities; quality management; feedback; daily study; and internal audits) (Lavi et al., 2021). The systemic method, for example, enables one to progress from a single organisation to the full supply chain or network, which includes various system participants such as firms; individuals; districts; countries; consumers, and markets.

3.10.3 Quality

When discussing quality concerns, it is critical to emphasise the link between total quality management (TQM) and systems thinking (Plack et al., 2018; Kim & Burchill, 1992). The emphasis on the significance of the links between the parts and the desired outcome in TQM strengthens the systemic perspective of the company. TQM is a learning system, and through TQM every size of unit, from individual to team to company to region and nation, can learn how to learn. "TQM can be thought of as a system for learning new skill for the benefit of society, as a system for developing individual, team, company and national skill" (Pambreni, Khatibi, Azam & Tham, 2019:1403).

3.10.4 Environment

If the organisation is the macro level system, the environment is the micro level system. According to Monat and Gannon (2018), the decision-maker in the systems approach employs amplifying and attenuating actions of the type necessary for survival, modifying the system's, and particularly the supra-system's borders, by analysing the structure of his own system and the structure of supra-systems (viability). In addition, Rousseau (2020), emphasised two environmental conceptualisations: the enacted environment and the objective environment. In the first case, "the construct 'environment' corresponds to some freestanding material entity that is independent of the observer, concrete, external and tangible" (Rousseau, 2020:184). The environment is viewed

as a mental image incorporated into a cognitive framework that is performed in hindsight and fashioned out of the discrete experiences of managers by researchers who take the second approach, who deny the idea of an external objective reality. From this perspective, organisations and the environment are viewed as labels for activity patterns that are produced by human behaviour and the attempts that go along with it to explain this behaviour (Meilinda et al., 2018).

According to scholars who hold this perspective, it is feasible for several firms operating in the 'same' environment to interpret the same set of facts regarding specific market situations and circumstances in different ways. This second body of literature makes the case that the organisation is entangled in a variety of stakeholder connections, some of which are stronger than others (Derakhshan et al., 2019). The networks method, which contends that businesses are 'linked' and function within a 'texture of interdependencies', adopts this viewpoint in marketing (Gazder & Khan, 2018).

3.10.5 Relationships

According to the viable system model, the ability to comprehend and manage linkages and functions is fundamentally tied to competitive organizational behaviour (York & Orgill, 2020). As a result, communication channels are established, information flow is organised, and a firm's development is rationalised and harmonised with all external relationships. Then, by changing inert structural connections into active interactions with other viable systems, the administration of viable organizations must address and direct the system toward a final objective. A critical component of functional systems, the ability to organize relationships, distinguishes the efficiency of governmental action by promoting system equilibrium on the one hand and meeting supra-system expectations on the other (Kujala, et al., 2020). Companies must focus on systemic actor compatibility (consonance) and improve how they interact harmonically (resonance). Consonance pertains to a static picture and denotes the potential harmonic relationship; it is connected to the idea of relationships (Nguyen et al., 2019). On the other hand, resonance is related to the dynamic way in which living things interact.

3.10.6 Adaptation

The viable systems concept states that every organisation's viability and stability must be maintained by building its own internal environment capable of responding at all levels, and responding efficiently to environmental stimuli (viability) (Mazzurco & Daniel, 2020). Organisations are referred to as viable systems if they can exist in a given setting as a result of ongoing dynamic processes and various types of internal changes (adaptation).

3.10.7 Complexity

Variety (the variation that a phenomenon may exhibit to the observer), variability (variation noticed over time), and indeterminacy (the capacity to completely grasp a phenomenon) are three factors that may be used to define networked systems (Lavi et al., 2020; Golinelli, 2010). Starting from these characteristics, the idea of complexity can be addressed, which may be extremely beneficial in analysing service systems, since these are sophisticated adaptive systems (Jackson, 2019). They are complicated because they are diverse and comprised of numerous interconnected network parts, and they are adaptive because they can alter and learn from experience.

3.11 Reductionism vs Holism

Ainscough, Wilson and Kenter (2018) contended that the environment is a complex system that must be seen holistically in order to take into account interactions between systems. However, reductionism is frequently utilised to comprehend the parts separately rather than together. Freddi and Salmon (2019) defined reductionism as the idea of breaking down an issue into its component elements. Reductionism is mostly utilised in technical science to deconstruct things into their component parts; whereas holism asserts that things are interconnected or interdependent and cannot exist separately from one another, or as a whole (Freddi & Salmon, 2019). In a similar vein, Singh and Bhushan (2017) contended that, in order to address complex problems, corporate processes or systems must be considered holistically and in a nonlinear manner. Complex systems cannot be comprehended by examining their constituent parts separately. The interactions between the many components and the resulting overall behaviour are what make a system what it is. The "system must be examined in its entirety" (Pezza & Pinto, 2019:75).

The reductionist approach, as a scientific process, examines the system by dissecting it into individual parts or components (Fardet & Rock, 2018; Correll et al., 2014). “Holism as a philosophy is a belief that the whole is greater than the sum of its parts” (Correll, et al., 2014:2). It is represented in assessment by the notion that ‘visualisations are best appraised as full’. The holistic perspective aims to grasp the situation and an issue in a worldview, while taking into account that there is always interaction between different aspects and surroundings. It does not just focus on the structure or a specific behaviour to solve problems (Yun, Choi, Oliveira, Mulva & Kang, 2016).

Subsystems, innovation, and business processes are only a few of the non-linear aspects that are taken into account in the comprehensive perspective (Singh & Bhushan, 2017). Jackson (2003) asserted that the butterfly effect, which is a concept used to describe how changes in any complex system affect the system’s long-term behaviour, exists across the whole system. To provide the organisation with a long-lasting solution, systems thinking may be employed as an alternative to reductionist techniques (Moldavska & Welo, 2015).

Armson (2011) claimed that western society and the educational system, where students are encouraged to grasp an issue by breaking it down into smaller pieces, favours reductionist thinking. The holistic method makes it possible to comprehend the context. Jackson (2003) agreed that reductionism is the conventional scientific approach that first identifies and comprehends the components before comprehending the whole. Reductionism, however, is unable to handle complicated issues. In contrast to linear thinking, which is analytical and isolated, systems thinking is comprehensive and integrative (Monat & Gannon, 2018).

3.12 Systems approach methodology critics

Like all other methods and approaches, SSM has its critics. These critics have noted that that the methodology is unable to provide adequate guidance regarding the application of the different stages of SSM. It is also criticised for not having worldwide applicability in stakeholder engagement processes. The overall appropriateness of the methodology has been queried. Critics have argued that SSM can only reveal what needs to be done, but fails to provide guidance on how the problem situation can be improved (Hermans, 2019; Lawrence, 2018).

3.13 Chapter summary

This chapter has provided the outline of the systems thinking approaches as the theoretical framework that supports this research. Systems approaches have been discussed, and special attention has been paid to SSM. SSM has been discussed as it has been used in conjunction with qualitative methods; hence, the study took a multi-methodological approach. Since the whole idea of action research is to contribute to the solution of problems in real world situations, the connection between action research and SSM should be normal. The next chapter focuses on the research design and methodology.

CHAPTER FOUR: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

The previous chapter has provided the outline of the systems thinking approaches as the theoretical framework that supports this research. This chapter provides as an overview of all the components and features of the research employed in this study. It discusses research methods; research philosophies; research tools; sample strategies; data gathering; processing; and analytic methods. In order to be aware of the advantages and disadvantages of various research methodologies, and choose the most suitable research technique for this study, the researcher studied the relevant literature on research design and data collection.

According to Phillippi and Lauderdale (2018), research is the methodical collection and impartial assessment of facts with the purpose of achieving a certain goal; and many approaches are utilised to analyse an issue or subject. 'Conclusive of research methodology' approaches relate to the techniques used to gather and analyse data (Sekaran & Bougie, 2019). These data collection and analysis techniques were created to ensure the reliability and quality of knowledge acquisition. A research strategy is deliberate and rigorous, with the objective of obtaining information about a certain subject (Haugstvedt, 2020). Fundamental philosophical ideas and objectives regarding the nature of reality, and the quest for knowledge in science, are included in research paradigms (Park, Konge & Artino, 2020). The two most prevalent schools of thought are positivist and phenomenological. This necessitated matching the research methodologies with the research objectives and research questions. As a result, the research questions and objectives are restated in this chapter:

4.2 Research design

A research design is a plan for conducting an investigation that brings together a philosophy, inquiry tactics, and particular methodologies (Creswell, 2014). In this case, the research design outlines how the study is carried out, including how, when, and from whom the data is collected (Opie, 2019). Dannels (2018) asserted that the study design and the chosen research methodology are determined by the issue or subject that the researcher is looking at. Research design is the overarching process for tying theoretical research issues to pertinent and useful empirical research,

and it provides specific guidelines for research activity (Sileyew, 2019). To successfully fulfil the objectives of the study, a researcher must follow this step-by-step protocol before beginning the data gathering and analysis phases.

In order to get the most cost-effective, precise answers to research questions, it is necessary to transform a problem into data that can be analysed. A research design may be defined as "a plan, structure, and strategy of study that is established with the purpose of uncovering answers to research questions with optimal control of variables" (Asenahabi, 2019: 78). The research strategy is always used to identify the sort of analysis that must be carried out in order to achieve the required outcomes. It explains the information that is required, how it is collected and analysed, and how it is answers the research questions. In light of this, Andrade (2019) noted that weak and unconvincing findings are likely to be reached if a researcher gathers data without taking into consideration the elements impacting the study design and the data required to answer the research objectives. Ultimately, this can make it impossible to accomplish the research goal.

If the research is to produce sufficient results and recommendations, the plan must include a method for interpreting the studied data. The researcher is then able to offer recommendations or implications based on the study. There are three different types of research designs: quantitative, qualitative, and mixed. The researcher must select the design that is most suited to the research topic. Bloomfield and Fisher (2019) identified mixed method research as the blending of quantitative and qualitative research methods from the distinctive positivism and interpretivism research viewpoints. A mixed method approach, which combines quantitative and qualitative methodologies, is comprehensive and yields more knowledge (McKinney & Cook, 2018).

4.2.1 Qualitative research design

The main goal of qualitative research is to identify and understand the significance that a person or group of people attaches to a social or human event (Creswell, 2014). History has demonstrated that the foundations of qualitative research are found in anthropology, sociology, the humanities, and evaluation. Data that cannot be quantified are produced through the open-ended research questions employed in qualitative studies. This method allows the researcher to understand problems by looking at their unique contexts and the meanings that others attribute to them

(Rutberg & Bouikidis, 2018:209). Its main objective is to give meaning or purpose to participants' ideas and experiences of reality.

The key underpinnings of qualitative research are that reality is a social construction; that components are intricately interwoven and difficult to quantify; that the subject matter is essential and that the data is acquired from an insider's perspective (Collins & Stockton, 2018). Even if it is subjective in nature, this type of study respects diversity, culture, and social justice; as a consequence, it delivers a variety of information that is up-to-date. Participation, interviews and observations are the principal data collection methods employed in this strategy.

The social component of science is the focus of qualitative research. The researcher uses semi-structured interviews and open-ended questions to collect data using qualitative techniques. Interviews are typically conducted at a subject's home or in another calm location, such a conference room (Collins & Stockton, 2018). Qualitative research is typically used when a subject is poorly understood and there is a natural desire to fully understand the situation. Participant interviews in qualitative research typically produce a rich narrative that is then evaluated to answer the research question. Several inquiries are made in order to thoroughly understand the issue and find a solution (Rutberg & Bouikidis, 2018).

To understand an issue more deeply, qualitative research methodology may use a variety of data gathering techniques, such as observations and interviews (Rutberg & Bouikidis, 2018). Qualitative research is flexible and evolves as new data is acquired, providing a holistic picture of the topic and allowing the researchers to fully immerse themselves in the inquiry. The researcher acts as the research instrument, and the study's starting point is determined by ongoing data analysis. The decision to utilise a qualitative technique calls for thorough preparation, which includes taking into account the appropriate research design for the study, the amount of time required to finish the study, a strategy for collecting data, and the resources available to gather data.

Finally, it is important to examine any prejudices or presumptions one may have about the topic design (Collins & Stockton, 2018). The first stage in selecting a sample group for qualitative research is evaluating who is qualified to participate, in light of the study subject. The participant must have had direct experience with, or exposure to, the research topic. A thorough interview will

reveal details about the participant's interactions with the research subject or occurrence. There will be a few general questions for all participants, as well as additional ones based on their experiences and replies. Because of this, sample sizes are typically small, but there is a lot of narrative material to examine and assess in order to identify important trends (Norris, 2020). As shown by Rutberg and Bouikidis (2018), this enables the researcher to venture beyond statistical findings. The researcher adopted this research design in this study as it allowed the researcher to understand problems by looking at their unique context.

4.3 Research philosophies

This relates to various worldviews or assumptions about a particular inquiry, which shape how it is designed, carried out, and how it is approached in order to learn more about the subject under investigation (Saunders & Townsend, 2018). In the event of a natural or scientific inquiry, the object is used, while in the case of a management or social sciences study, a construct or phenomenon is used (Ryan, 2019).

4.3.1 Positivism

The positivist technique, which follows the example of natural scientists, is commonly referred to as an unbiased research strategy. Positivist researchers are those who have this viewpoint. From an epistemological standpoint, positivists claim that generalising about things that are observable and measurable as real knowledge is possible. They come to the conclusion that the 'thing' being studied and the meaning associated with it exist independently from the researcher (Horne, 2021). This is seen in the majority of natural science, or pure scientific, study, when the actors are not involved in the object's reality. According to objectivism, from an ontological standpoint, social phenomena, and the perception thereof, have a reality separate from that of the researchers or players (Ahlskog, 2020). One such social phenomenon is a corporate organisation and its culture, which has a unique identity and reality, apart from that of the social players. It also has the characteristics of an object, beliefs, and values, in addition to real-world goals.

In contrast to this, constructivism, from an ontological standpoint, asserts that social constructions are the result of the viewpoints of social actors and the actions of researchers (Kirongo & Odoyo, 2020). This shows that, rather than being seen as something outside of social actors, social

constructs are formed on the foundation of a thorough grasp of reality and interactions among social players. Zukauskas, Vveinhardt and Andriukaiti (2018) claimed that the constructivists are interested in co-operating to produce social processes. Since the researcher is disassociated from the subject under inquiry, and instead regards it as an object, the positivists' axiological beliefs show, once more, that the scientific research process is value-free. This contrasts sharply with management research, where interpretation of findings is frequently influenced by the attitudes and perspectives of the researchers (phenomenologists). Because positivism is objective, positivist researchers frequently use a quantitative research methodology.

4.3.2 Realism

The two main characteristics of positivism that realism highlights are a direction that is entirely distinct from the subject of the study, and the presumption that all scientific and social science research must utilise a standard technique for data collection (Abu-Alhaija, 2019). This gave rise to empirical and critical realism, two distinct varieties of realism. Empirical/direct realism emphasises that using the right methods help us learn more about a given phenomenon (Dougherty et al., 2019). According to Saunders et al. (2015), direct realism involves social actors' awareness of the world through their senses in order to give a truthful representation of it. Due to its impartiality, this may not be entirely appropriate in commercial research, but it is appropriate in the natural sciences.

The second realism, critical realism, was born out of this debate. Critical realism, as the name suggests, challenges how accurately social actors' views reflect reality. It lists situations where social actors have been duped by human senses, resulting in a false perception of reality. Social actors have diverse perspectives based on the scenario or conditions at hand. In order for individuals to have a similar view of reality, critical realism contends that actors must engage in the educational process (Bloomfield & Fisher, 2019). Otherwise, critical realism cannot be expected to hold true. Based on the assumption that what people see is what they receive, direct realism can hold that the world is largely stable. Due to shifting and inaccurate views of what appears to be the true reality, what you see in a particular situation might not correspond to what you receive. This explains why certain business academics tend to be subjective, especially when studying marketing (the behaviour of customers) and organisational behaviour.

4.3.3 Interpretivism

Phenomenology and symbolic interactionism were the two logical foundations from which interpretivism emerged (Obloberdievna & Nematjonovna, 2022). The way that social actors see the environment around them is explained by phenomenology (Dougherty, Slevc & Grand, 2019; Holt & Goulding, 2017). On the other hand, symbolic interaction explains how people continue to perceive and comprehend the reality they live in (Dougherty et al., 2019). Additionally, it clarifies how actors discuss and understand the world, through their deeds and interactions with others, which frequently form or mould their beliefs and behaviours. In terms of natural scientific research, interpretivism is an alternative to positivism. According to interpretivism, there should be less separation between the subject of the research, who is also a social actor, and the researcher (Saunders & Townsend, 2018). This shows a deep connection between the researcher and the subject matter of the investigation. This mostly applies to social and management science scholars. In order to fully comprehend the social phenomena being studied, an interpretivist viewpoint must be adopted. This is necessary to prevent a scenario in which the researcher's point of view prevails, or has an impact on how the results of a study are interpreted and discussed. Despite the advantages of interpretivism, Bauer (2017) lists validity, reliability, and generalisation as difficulties.

4.3.4 Pragmatism

In contrast to other research philosophies, pragmatism is a branch of philosophy that bases its arguments on events, circumstances, and outcomes (Creswell & Poth, 2016). It uses a variety of techniques to address research issues and concerns rather than concentrating on knowledge about truth and reality. It places a strong focus on using a variety of ways to get better results. The researcher is free to choose the best approach or methods, depending on the need to use a practical research problem or questions to create better outcomes (Lewis, 2015). Pragmatists believe that the universe is incredibly varied, which necessitates the use of many methods to address its problems (Creswell & Poth, 2016; Ryan, 2019). This implies that numerous strategies for data collection and analysis are required in order to offset the drawbacks of using a single method. It does not necessary follow that researchers who use a combination of approaches, or more than one method, need not strongly support their decisions. Above all, the pragmatic worldview provides a

chance for many perspectives, methods, and presumptions, which enhances data gathering, analysis, and interpretation to provide excellent research findings (Creswell, 2014).

Saunders et al. (2015) suggested that the choice of axiology, ontology, and epistemology is influenced by the research challenge or questions. In order to adequately address the issue at hand or offer a response, they went on to say that one philosophy may be more appropriate than another, or that the three viewpoints may be combined. As a result, mixed method approaches to resolving societal issues began to emerge.

4.3.5 Research philosophy suitable for the study

After reviewing the research philosophies, the researcher concluded that interpretivism was the best choice to frame this study because it clarifies how actors understand the world through their actions and interactions and with others. The EWS unit's stakeholder management has to be improved through effective exploration and development of a comprehensive approach (Ryan, 2019). This has provided the rationale for this study's use of many qualitative research methodologies for data collection and analysis.

Because multi-method qualitative methods might favour interpretivism when examining challenging research problems, the study takes an interpretivist approach. The interpretivism method was chosen because it clarifies how different research philosophies may be successfully combined to provide the best prospects for answering research problems. As it is not dedicated to any one school of philosophy and reality, and does not see the universe as an absolute unity, interpretivism also provides a conceptual underpinning for a qualitative study (Horne, 2021).

Ahlskog (2020) made the argument that interpretivism is less likely to adhere to conventional procedures and preconceived notions about philosophy and approaches. As a result, pragmatism is more focused on the useful outcomes and findings of a study. Not prior conditions, but actions, circumstances, and outcomes are what give rise to interpretivism as a worldview (Creswell & Poth, 2016). Under the interpretivism paradigm, the scientific method is insufficient on its own; instead, the appropriate strategy is chosen, based on the objectives of the study and the surrounding

circumstances (Bauer, 2017). Interpretivism, therefore, provides the theoretical framework for carrying out this qualitative method study.

According to Creswell & Poth (2016), the interpretivism worldview provides the chance to take into account many viewpoints, methods, and presumptions, which enhances data collection, analysis, and interpretation to generate excellent study outputs. According to Kirongo and Odoyo (2020), one of the greatest ways to defend the use of non-numerical techniques of inquiry in research in the management or social sciences is to embrace interpretivist strategies as a philosophical viewpoint. According to Abu-Alhaija (2019), a study's non-numerical data gathering and analysis methods pave the way for paradigm changes that produce credible results, which are more realistic from an interpretivist philosophical perspective.

Zukauskas et al. (2018) provided justification for the use of a conceptual framework during the use of qualitative methodologies in a social science investigation. The conceptual criteria must be flexible enough to allow for the selection of qualitative research methodologies. As a result, the model used in this work supports the methods used to gather and analyse non-numerical data.

The EWS unit uses a stakeholder management paradigm, which is the subject of this research. The choice of interpretivism as a philosophical perspective was made to guarantee trustworthy and superior study results.

4.4 Research approaches

Deduction, induction, and abduction are three different research approaches. A research strategy is a course of deliberate scientific reasoning (Opie, 2019). Following the research's reasoning is thus necessary while analysing a research technique. A paradigm for the research process was previously developed by Kova'cs and Spens (2005), cited in Hall, Gaved, and Sargent (2021), to distinguish between the three research methodologies of deduction, induction, and abduction. They especially looked at the development of an approach's argument – that is, its reasoning through time. This research framework identifies whether a line of inquiry, such as theory or empirical study, occurred first. One factor that separates scientific inquiry from other types of study is its

unique addition to knowledge (Leavy, 2017). Therefore, although taking different paths, all research methodologies attempt to further knowledge.

4.4.1 Deductive approaches

Deductive positivism is frequently cited as the standard research methodology in both general and logistics research (Farghaly, 2018). The hypothetico-deductive model's line of reasoning moves from a general law to a particular situation. Deductive inquiry, especially, begins by scanning theory. Then, logical deductions from this theory are offered as *ex ante* hypotheses or propositions, which represent universal rules. Thereafter, these claims or hypotheses are tested empirically. Deductive reasoning is, therefore, described as a theory testing procedure that starts with a generalisation or known theory and checks to determine whether it holds true in a given situation (Prayag, Hassibi, & Nunkoo, 2019). On the basis of the empirical tests that corroborate or refute the hypotheses or propositions, general conclusions are offered (Booth, Colomb & Williams, 2018). Developing hypotheses or ideas prior to testing them and generalising the findings is known as deductive research. The new knowledge is comprised of these generalisations and how they are discussed in light of previous information.

When a deductive method is employed in a research endeavour, the author creates a series of hypotheses that must be examined before each hypothesis is put to the test using the proper procedure (Ishtiaq, 2019). It is crucial to comprehend the different characteristics of deductive reasoning. If the premises are true, then the conclusions of deductive reasoning must be accepted. Deductive reasoning entails articulating the conclusions' contents, and the premises, in an implicit manner, making the argument non-implicit (Obloberdievna & Nematjonovna, 2022). The conclusion must still follow if the argument's additional premises are introduced. There is no intermediate level of validity for a deductive argument; it is either true or false. Applying such an argument does not require making any decisions, and no judgment is required to arrive at the outcome and conclusion.

According to Mfinanga, Mrosso and Bishibura (2019), the deductive research technique examines a certain hypothesis and conducts tests to determine whether or not it holds true in the intended context. The deductive method follows a logical progression, perfectly. A new assumption is

reached through argument, after starting with a hypothesis. This hypothesis is examined through comparison with the observations, after which it is either accepted or rejected (Recchiuto & Sgorbissa, 2018). Deductive reasoning is sometimes referred to as a general to specific (top-down) reasoning process (Fischer, Stanszus, Geiger, Grossman & Schrader, 2017). The inductive method, however, is just the opposite contrary. In other words, inductive investigations do not involve making any assumptions, but the deductive technique involves generating assumptions and evaluating them during the research process.

4.4.2 Inductive approaches

According to Palaci, Salcedo and Topa (2019), the deductive research process can be thought of as the antithesis of the inductive research process. Argument in this process follows the pattern of case - outcome - rule, moving from a single empirical case or a set of observations to generic law; or from facts to theory. Knowledge of a general framework, or body of literature, is not always required as a starting point (Rahman, 2020). Developing (post hoc) hypotheses or statements about the world are the result of actual observations, and their generalisation occurs through logical argument within a theoretical framework. In other words, inductive investigation begins with actual observations (facts) (Andrade, 2019). Induction also attempts to construct theory, rather than test it. Hypotheses or propositions are generated after this research procedure, based on the empirical examination (Abutabenjeh & Jaradat, 2018); rather than prior to observations.

The inductive method starts with individual observations, before making broad generalisations. After choosing an appropriate number of observations, through the inductive technique, one can generalise the conclusion to all groups of related conditions and circumstances (Rahman, 2020). It is necessary to test these generalisations, some of which may be confirmed and others rejected. Therefore, every principle that is formed through inductive reasoning is theoretically testable. The researchers should record what they see during the induction process honestly, without any prejudice or bias, and with an open mind. Following that, these findings provide a basis for the formulation of the theories and guidelines that constitute scientific knowledge (Palaci et al., 2019). Additionally, inductive researchers believe that one may rationally extend the findings into all-encompassing principles, if the scientific presumptions are confirmed (Fischer et al., 2017).

No assumptions are made in the early phases of research, because there is still work to be done, and the researcher is unsure of the type and quality of findings. With inductive reasoning, the researcher builds an abstract, or provides a description of the events under study using the observations (Farghaly, 2018). The main advantage of using an inductive method is that there is no need for a pre-made framework or model. Obviously, although being generalised, principles should be checked through a logical process (deductive approach). Because of various issues, the inductive method has received criticism. The primary problem with the inductive approach is that the researchers may be swayed by their incomplete understanding of the relationships and study results (Daley, Martin & Roessger, 2018).

Some contend that the fact that induction is reliant on human observations makes it a concept that can be refuted. The German philosopher, Kant, developed a new school of thought that challenged the correspondence theory of truth and addressed ontological questions for the first time (Ishtiaq, 2019). Truth is the congruence between an objective notion and reality, which no scientist or philosopher before Kant had disputed (external subject). However, observation is a form of interpretation, meaning that people interpret their experiences and observations of the world according to their cultural and personal perspectives. Therefore, while a portion of the universe, as it is represented by science, has its origins in realities outside of existence; the rest has its origins in how it is classified the world.

4.4.3 Abductive research process

A ‘puzzling’ observation or anomaly that cannot be explained by a known theory may serve as the starting point for abductive research (Divan, Ludwig, Matthews, Motley & Tomljenovic-Berube, 2017); alternatively, theories may also be purposefully used to explain a phenomenon (Pill, Harvey & Hyndman, 2017). In both instances, an actual phenomena and an observation serve as the starting point for the abductive research process. However, even in the event of a ‘puzzling’ observation, theoretical background information is crucial, even if it cannot fully explain the phenomena (Creswell & Creswell, 2017). In order to establish a potentially matching framework, or to expand the theory employed before this observation, the researcher starts a creative iterative process of theory matching or systematic combining (Phakiti, & Paltridge, 2015).

When researchers purposely choose the abductive method, they are applying a fresh theory or conceptualisation to a pre-existing reality. This method is used, for instance, when using theories from different disciplines in logistics (Leavy, 2017). It is crucial to note that the processes of collecting empirical data and developing theories in abductive research overlap in a learning loop (Ishtiaq, 2019). The abductive process seeks to propose novel ideas in the form of fresh hypotheses or claims (Booth et al., 2018). Abduction generalises hypotheses or propositions to new information, only after applying these hypotheses or propositions in additional empirical investigations, or after their verification in a theory-testing phase. Inductive reasoning generalises them to new knowledge after this step. Thus, an abduction argument follows the steps of rule, case, and result (Tharenou, 2015).

4.4.4 Combination of inductive and deductive methods

The merging of the two techniques in social/management research was prompted by the necessity to resolve the discrepancy between subjective and objective processes in the creation of new information, or the re-examination of existing knowledge in order to give thorough explanations of the essential factors. It is not hard to combine deductive and inductive methods. Based on their own experience, Saunders and Townsend (2018) noted that certain combinations have major benefits. In a single study, depending on the topic or research objectives, a mixed method refers to the employment of deductive or quantitative, and inductive or qualitative, methodologies (Ishtiaq, 2019). The unusual character of business operations, which incorporate objects and constructions, as well as social actors, makes it logical to blend inductive and deductive methodologies in a management sciences study.

4.4.5 The approach used for the study

After weighing the advantages and disadvantages of the inductive and deductive approaches, the researcher decided that an inductive approach was best suited to investigate and explore a holistic model to enhance stakeholder management in the EWS unit (Creswell & Clark, 2011; Lewis, 2015). This is because the approach facilitates a sophisticated exploratory investigation of cause and effect in the interactions between two or more variables (Zuber-Skerritt, 2017). This is also consistent with the assumptions of interpretivism, which served as the study's chosen philosophical perspective. The researcher was able to fill in the gaps in the relationship between

stakeholder management and project management by using an inductive technique to create the framework for this study.

This was accomplished through an exploratory analysis of how and why organisational stakeholder management affects project performance (Creswell & Poth, 2016). Non-numerical data collection and analysis techniques were used, and the results of the study were trustworthy (Bauer, 2017). Due to its ability to provide high-quality results in management and social sciences, particularly with regard to the relationship between management and other factors, many academics have backed the use of an inductive framework (Recchiuto & Sgorbissa, 2018).

4.5 Research strategies

Research procedures, also known as research strategies, are the techniques a researcher uses to gather information in order to make plausible inferences (Creswell & Creswell, 2017). Different sorts of research designs or strategies are used to implement the study technique. By converting research methodology into techniques, equipment and tools, the researcher is able to examine the reasons for a specific problem through the use of study design (Abutabenjeh & Jaradat, 2018). As stated below, the three main categories of research investigations are further separated into several types of research design.

4.5.1 Experimental research

In a study using experimental research, one or more dependent variables are changed to see what effect it has on the variables. According to Baldwin (2018), a cause-and-effect link on a specific issue is the cornerstone of experimental research. In order to determine the nature of the link between the variables being researched, two groups are used: an experimental group and a control group, where the experimental group receives treatment and the control group is left unmodified. Asenahabi (2019) contends that experiments are performed in circumstances when the researcher has to exercise direct, accurate, and systematic control over the behaviour of the phenomenon being examined. This method is essential when examining the ideas or hypotheses at the core of the inquiry (Creswell, 2014).

Experimental designs can take many different forms. A 'pre-experimental design' involves studying just one group and implementing an intervention during the trial. There is no control group in this instance, for comparison with the experimental group. In simulated studies, the subjects are not randomly assigned to treatment groups; but rather the researcher uses control and experimental groups. 'Single-subject design, [which] involves monitoring a single person's or a small group's behaviours throughout time' (Creswell, 2014:33).

One way to regulate the results of an experiment is to use variables: choosing homogenous samples; using pretest scores as moderating factors and statistically controlling for their impacts; or classifying the participants into subgroups or categories and examining the influence of each subgroup on the result (Gaus, 2017).

4.5.2 Case study

In the design of an investigation known as a case study, the researcher conducts a thorough analysis of a case that involves a technique; person; animal; house; group; culture; organisation; industry; or nationality. This is in line with Collins and Stockton's (2018) description that it entails an in-depth examination of a person, group, organisation, or phenomena within its real environment, particularly when there is minimal distinction between the phenomenon and setting. 'Depth' in this context refers to going over every peculiarity of a situation. While a case study is an in-depth analysis of a subject, the knowledge it offers is subjective rather than objective. It gives comprehensive information on the phenomenon, but is unable to draw conclusions from that information (Asenahabi, 2019). According to Asenahabi, a case study is a comprehensive analysis of the particular unit. It has limits in terms of time and experience. Creswell (2014) defined a case study as an inquiry with the goal of describing; comprehending; anticipating; and/or governing the unit under study.

Through highlighting the process by which a causal link emerges, a case study offers a thorough knowledge of how and why certain events occur (Collins & Stockton, 2018). To gather comprehensive data, the researchers employ a range of technologies and data gathering techniques over an extended period of time. To determine the underlying factors, and how they connect to the behaviour under investigation, a case study is essentially conducted. It offers comprehensive

information on the module being studied. The case study approach covers all facets of a single entity while doing qualitative analysis of the problem (Silverman, 2020). Conclusions are based on a much more extensive and wide-ranging collection of facts, since this necessitates a lot of information (Creswell, 2014).

This approach has drawn criticism since it relies too heavily on the researcher's interpretation, which invariably results in different readings of the same information. Additionally, researcher bias might affect the process of gathering data and evaluating it (Gaus, 2017). They just describe what happened without going into detail about why it occurred, like other non-experimental approaches. Due to the small sample size used in this study, it is unlikely that the results would be applicable to others facing similar difficulties or issues (Asenahabi, 2019).

4.5.3 Narrative research

In the humanities, narrative research is a form of inquiry that entails asking people to relate stories about their lives, which the researcher is studying (Asenahabi, 2019). The material is then sorted into a chronological narrative by the researcher. By fusing the researcher's and the participants' points of view, the narrative typically culminates in the creation of a shared tale (Gaus, 2017). The researcher uses narrative; location; activities; climax; and denouement as structural aspects to recount the participants' stories.

4.5.4 Phenomenological research

In phenomenological research, which has philosophical and psychological foundations, the researcher provides the participants' firsthand recollections of a phenomenon. Creswell and Plano-Clark (2018) claimed that, in qualitative research, the researcher isolates the essential ideas of participants' explanations of a phenomenon as they apply to their own unique human experiences. The substance of the experiences of the various people who have all encountered the phenomenon is contained in this summary. It uses units of meaning, analysis of significant utterances, and the development of essence descriptions (Chiwawa, 2019). This design frequently involves conducting interviews and is conceptually sound.

According to phenomenologists, the universe is socially formed; science is driven by human interests, and the researcher, as a subjective being, is an essential part of the observed reality (Silverman, 2020). One benefit of this qualitative, interpretative technique is that the results are typically more legitimate and less contrived, since witnessing happenings in actual, real-world situations generally permits researchers to gain a more accurate understanding of those phenomena. On numerous occasions, qualitative research has demonstrated a depth of understanding and a plethora of facts (Kalu & Bwalya, 2017). However, phenomenological research can also be undermined by the subjectivity of the researcher and the unreliability of the results, raising the likelihood that two researchers could reach divergent conclusions based on their concurrent views of the identical occurrences (Kalu & Bwalya, 2017). The research philosophy known as interpretivism guided this study's methodology.

4.5.5 Grounded theory

Using a sociological method known as 'rounded theory', which is based on the opinions of participants, the researcher creates a general, abstract theory of a process, activity, or interaction. This method includes processes for data collection, category refinement, and interrelationship analysis (Chiwawa, 2019). The systematic grounded theory approach includes the following steps: categorising data (open coding); choosing a category; including it in a theoretical model (axial coding); and ultimately explicating a story from the relationships between these categories (selective coding). Using this investigative strategy, the researcher may construct theoretical accounts based on concepts, classifications, and propositions. It is employed to provide a theoretical framework for understanding organisational difficulties associated with the adoption and exploitation of information technology breakthroughs and applications (Asenahabi, 2019). Asenahabi continued by pointing out that the main disadvantage of this approach is that it is susceptible to the rigour and data-interpretation skills of the researchers, which makes it unattractive for novice researchers.

4.5.6 Ethnography

The use of ethnography, a method of study with origins in anthropology and sociology, allows for the prolonged examination of the common patterns of behaviour, language, and activities of an entire cultural group. Observations and interviews are frequently utilised in data collection

(Creswell, 2014). In ethnographic research, people or the setting are carefully documented before data are examined for themes or issues (Asenahabi, 2019).

Its goal is to examine a group of persons in order to understand how they perceive their social interactions. For example, communities may establish a practice culture and communication techniques to use technology breakthroughs together. Information technology researchers can utilise ethnography as a design to investigate the organisational, social, and human aspects of technological advancements (Collins & Stockton, 2018:17). Gaus (2017) stated that it is a successful assessment of the needs of technology users and facilitates consumers' perception of information technology advancements and applications.

In an ethnographic study, the researcher spends a lot of time engaging with participants in their daily life through interaction, conversation, and engagement. Since much of it is done through observation over time, it has a longitudinal perspective (Akhtar, 2016).

4.5.7 Archival research

The administrative records of both public and private organisations are reviewed as the main sources of data in archival research (Saunders & Townsend, 2018). Archival research uses secondary sources that assist academics in responding to questions regarding the past and how a phenomenon has changed through time. It is crucial to consider the availability of the data and whether or not the commercial or governmental entity would enable access, before putting this research strategy into practice.

Researchers using archived data are advised to think about four important considerations before beginning their research (Silverman, 2020): Is paying for access to the data necessary? Has the relevant data been processed, or are they still in their unprocessed state? Does the database's concentration lie with the organisation or the phenomenon? How good is the data's accuracy? What sets apart an excellent researcher or archival worker is their ability to overcome these four challenges. This does not suggest that archive research and other study techniques that rely on secondary sources of data are flawless.

4.5.8 Descriptive study

Descriptive research is frequently carried out to learn more about a subject and to describe the aspects involved. This is a spontaneously occurring arrangement that frequently includes a list of stated theories or inquiries (Vaismoradi, Jones, Turunen & Snelgrove, 2016:78). Additionally, descriptive studies ensure that variables are properly and accurately recorded (Creswell & Creswell, 2017). Descriptive studies utilise a variety of data gathering strategies in an effort to accurately characterise occurrences (Creswell & Poth, 2016:78).

To guarantee an acceptable description of the characteristics of variables or groups, descriptive research is conducted (Sekaran & Bougie, 2019). These studies offer further details on the characteristics of certain variables, social groupings, or occurrences. The focus of a descriptive study is a thorough examination of the topic under research, as the name suggests. As a result, previous exploratory investigations can be thoroughly discussed (Collins & Stockton, 2018). Descriptive studies build upon the groundwork laid down by exploratory research in order to settle in-depth disputes or arguments.

4.5.9 Explanatory studies

The use of hypothesis testing to identify or clarify the nature of the relationship or difference between two or more research variables is a crucial aspect of most explanatory investigations (Sekaran & Bougie, 2019). The majority of explanatory investigations need hypothesis testing in order to explain changes in dependent variables or, occasionally, to forecast organisational consequences. Depending on the nature of the research topics, data collection and analysis for an explanatory study can be done using quantitative, qualitative, or mixed methodologies (Creswell & Plano-Clark, 2018; Sekaran & Bougie, 2019).

4.5.10 Exploratory as an adopted research design

A research technique or examination used to deepen the understanding of a particular subject is called an exploratory research project (Rahman, 2020). When there has been little or no investigation into the problem at hand, exploratory research is carried out. Exploratory research necessitates, firstly, familiarisation with the topic in order to gather further understanding about

the causes and effects of the issue (Sekaran & Bougie, 2019). An exploratory research strategy is indicated in qualitative studies that largely depend on observations and interviews as data sources to cast fresh light onto a phenomenon. The study should employ an exploratory strategy when information about a phenomenon is limited and proper comprehension is required (Alberts & Durrheim, 2018).

Saunders et al. (2015) suggested that conducting exploratory investigations should involve three main steps: reviewing the literature; interviewing key informants in the field of specialisation; and conducting focus group interviews. They noticed that, while conducting exploratory investigations, researchers first think about the phenomenon from a broad perspective, and as the study goes on, the phenomenon is seen from a narrower perspective. This is one of the fundamental conditions for making a legitimate addition to the corpus of knowledge through exploratory investigations (Sekaran & Bougie, 2019).

An exploratory research design is used when there are few or no previous studies to serve as a reference for predicting a result; while a descriptive research design is used when there are few or no prior studies to use as a reference for predicting an outcome. Additionally, exploratory inquiries are required when the researcher has to have a thorough understanding of the issue to introduce theories and important conceptual frameworks to produce a framework of new knowledge (Creswell & Creswell, 2017:33).

This study employs multi-qualitative techniques for data collecting, and analysis processes based on the pragmatism-based assumptions, to achieve a thorough examination of the stakeholder management model functioning in the EWS unit (Alberts & Durrheim, 2018; Saunders & Townsend, 2018). Considering the gap in the literature that was discovered, research questions were created, and a theoretical framework was created to fill in the blanks. An exploratory design was used to investigate how stakeholder management and outcomes relate to project management and performance.

This investigation was deemed to be exploratory in nature. Exploratory research is frequently employed to conduct early analysis into mostly unexplored areas of a research issue (Alberts & Durrheim, 2018). New insights into the phenomenon of stakeholder management and project

management were revealed through exploratory study. This study utilised an exploratory research design, which was appropriate because it allows for the identification of the environmental conditions that the issues, opportunities, or situations of interest exist in, as well as the identification of important factors or variables that may be found to be pertinent to the study (Asenahabi, 2019).

Additionally, conducting exploratory research aids in the discovery of novel concepts connected to the research subject in question, in addition to being utilised to clarify and characterise the problem under examination (Dawadi, Shrestha & Giri, 2021). In conclusion, it should be remembered that the purpose of exploratory research is to uncover important concerns and key variables that may be utilised to answer the major research questions pertaining to the subject being studied.

4.6 Research choices

The numerous methods for data collecting and processing are research options. These consist of "the mono method, numerous techniques, and mixed methodologies" (Saunders & Townsend, 2018:13). These writers claimed that the mono approach entails using a strategy for gathering data and a conforming method for analysing that data. Multiple approaches make use of more than one data gathering method and associated data processing (Saunders et al., 2015). This may be done by utilising many methods for data gathering and analysis; either quantitative (multi-method) or qualitative (multi-method) methods. On the other hand, mixed techniques integrate quantitative and qualitative data collection and analysis procedures in a study, either simultaneously or sequentially. Below is a discussion of these options.

4.6.1 Mono method

A single data gathering approach and one data analysis process are referred to as a mono method (Rahman, 2020). Data can be obtained and analysed qualitatively or quantitatively (numerically), and then the results can be summarised numerically using complex statistical analysis (Saunders & Townsend, 2018). This method's primary flaw is the absence of data triangulation, and it is possible that the instrument's validity and dependability are in doubt. Due to the potential need for several, or mixed, approaches to enable data and methodological triangulation, it might not be the

best way to address complicated or dynamic research topics (Creswell & Poth, 2016). In light of this, the researcher did not consider the mono method to be appropriate for investigating the creation of a comprehensive model to enhance stakeholder management in the EWS unit, utilising systems thinking techniques. Rahman's (2020) work served as a guidance for this choice.

4.6.2 Multiple methods

In research, multiple approaches to data gathering and the associated data processing can be employed. Lewis (2015) divided various techniques into the four broad groups: multiple-methods quantitative research; multi-methods qualitative studies; mixed methods research; and mixed model research. This research used the multi-methods qualitative study approach, since it enabled the researcher to fuse several data collecting approaches. This method focuses on the depth of the information obtained up until the point of data saturation, rather than a large sample.

4.7. Target population

The definition of a target population is "those units for whom the survey findings are meant to be generalised" (Pennay, Neiger, Lavrakas & Borg, 2018:9). Blanche, Diaz, Barretto and Cermak (2015:23) asserted that the "population is the larger pool from which the sample is formed and on the basis of which generalisations of the findings are sought, and it thus encompasses all the components that compose the planned unit of analysis". The target population was 373 people who work for the eThekwini Municipality's Department of Water and Sanitation, and others with positions of authority in areas under the jurisdiction of the eThekwini Municipality. These included the heads of different portfolios in the EWS; councillors; trading clusters; the business support unit; the environment unit; rate payers associations; the project monitoring committee; the project steering committee; military veterans; women in business and traditional leaders. The people from these various units are internal or external stakeholders in water and sanitation projects (Mashali et al., 2020).

4.8. Sampling

A sample is a portion of the complete population from which a researcher gathers data (Levac, Ronis, Cowper-Smith & Vaccarino, 2019). The sample included heads of different portfolios in

the EWS; councillors; trading clusters; the business support unit; the environment unit; rate payers associations; the project monitoring committee; the project steering committee; the water services portfolio committee; the Planning and Design Department at eThekwini Municipality; military veterans; women in business and traditional leaders. All levels of the workplace were represented by participants, allowing the researcher to assess a range of viewpoints, ideas, and situations without limiting the possibility for rich data by concentrating on a single level, rather than all of them.

4.8.1. Sampling strategy

According to Sharma et al. (2019), sampling is a method that researchers employ to purposefully select a smaller sample of representative items or persons from a pre-defined population to function as subjects for observation or investigation. Researchers generally employ sampling because it is difficult to evaluate every member of a community. Despite being a subset, it nevertheless serves as a good indicator of the population and is simple, inexpensive, and quick to analyse (Sekaran & Bougie, 2019). However, every researcher must keep in mind that the greatest way to get reliable, valid, and accurate data is to test every participant. Only when evaluating every person is impractical does one turn to sampling (Etikan & Bala, 2017).

A sample is a representation of the entire population, from which data is collected by a researcher (Sekaran & Bougie, 2019). Sampling is the methodical selection of a smaller subset from a larger set with the intention of examining particular patterns and/or behaviours in that representation in order to draw a conclusion (Alvi, 2016). As far as sampling goes, probability and non-probability are two of the most common types. Participants in this research were picked using a non-probability selection method due to the qualitative nature of the study. This approach means that not all of the researcher's sampling units are selected to be part of the sample size (Sekaran & Bougie, 2019).

4.8.2. Probability sampling

A method of choosing units called probability sampling gives each one an equal chance of being picked (Collins & Stockton, 2018). Four further categories of probability sampling are cluster;

multistage; stratified; and basic random sampling, which are all examples of systematic random sampling (Rahi, 2017).

4.8.2.1 Simple random sampling

In this approach, each person in the population has an equal chance of being chosen (Collins & Stockton, 2018). Throughout the sampling process, each subject is selected independently from the other population members in a single phase. There is an equal chance that every object in the universe is found in the sample using this sampling strategy (Etikan & Bala, 2017). Simple random sampling refers to the ease of the sampling procedure. It is considered a fair way to choose a sample from a certain community, since each participant has an equal chance of getting picked (Sharma et al., 2019). Chance is the sole element that might possibly reduce its representativeness. When the sample is not representative of the population, a random fluctuation is referred to as sampling error. The results of a study must be inferred using a representative sample and objective random selection. Because a sample obtained by simple random sampling is typical of the population, it is possible to extrapolate sample results back to the population. Sharma et al. (2019) said that one of the most obvious shortcomings of the fundamental random sampling technique is the need for an exhaustive list of every person in the population.

4.8.2.2 Systematic sampling

Collins and Stockton (2018) asserted that only the initial unit of a systematic sample is selected at random, with subsequent units being selected over a predefined period of time. Strictly speaking, it cannot be compared to a random sample. Due to its more equal distribution over the whole population, systematic sampling is more likely to out-perform ordinary random sampling. The method's application is practical, affordable, and simple to carry out when applied to a larger population (Sharma et al., 2019).

4.8.2.3 Stratified sampling

According to Sharma et al. (2019), stratified sampling is the division of a population into discrete groups known as strata. In a stratified random selection, individuals are divided into groups according to traits or qualities they share. The number of randomly selected samples obtained from

each stratum is related to the size of the population (Collins & Stockton, 2018). A random sample is then created by combining the strata's subsets. A stratified random sample is required to minimise the possibility of human bias in the decision-making process when choosing the instances to be included in the sample (Etikan & Bala, 2017). The stratified random sample provides a sample that is fairly typical of the population under study, provided there are not too many missing data points. When it is impossible to adequately divide the population into distinct subgroups, stratified sampling is not practical (Collins & Stockton, 2018).

4.8.2.4 Cluster sampling or multi-stage sampling

In cluster sampling, samples are selected from the naturally existing clusters. Cluster sampling differs from all other probabilistic sampling methods in that it does not need gathering frames from each sample unit (Sharma et al., 2019). After being selected, the clusters are put together into frames. After conducting a variety of probability analyses and observations on these frames, conclusions must now be reached.

4.8.2.5 Multi-stage sampling

Another variety of cluster sampling is multi-stage sampling (Sharma et al., 2019). A multi-stage sampling approach is usually suitable for use over an entire country or a large geographic area. The most effective and economical approach to combine several probability sampling techniques is through multistage sampling.

4.8.3. Non-probability sampling

When there is no known or present chance that a member of the population is chosen as a sample subject, the sampling strategy is known as non-probability sampling (Etikan & Bala, 2017). There are several non-probability sampling strategies, such as convenience; quota; purposive; snowball; anomalous case; sequential; theoretical; and adaptive sampling. A non-probability sampling approach was utilised due to the qualitative nature of this study. Convenience sampling is used when randomisation is not practical. This is a biased approach that includes convenience; purposeful; snowball; modal; expert; diversity; and proportional techniques (Bryman, 2016).

4.8.3.1 Quota sampling

When strata (groups) are being researched, such as the ratio of male to female students, a sample from proportional quota sampling should be representative of the population under investigation. According to Sharma et al. (2019), quota sampling is especially helpful when it is not feasible to gather a probability sample, but one still needs to construct a sample that is as representative of the population being researched as is feasible. Any potential sampling error cannot be calculated, since quota sampling does not employ random selection (Etikan & Bala, 2017). It is quite possible that units are selected for the sample, based on difficulties with cost and accessibility, which might result in biased sampling.

4.8.3.2 Self-selection sampling

Self-selection sampling is acceptable when the researcher wishes to allow units (or instances), such as people or organisations, choose whether to participate in the study on their own. The primary determinant is whether study participants choose to engage willingly, rather than in response to contact with a researcher. According to Sharma et al. (2019), this might cut down on the time needed to find relevant units (or instances), that is, persons or organisations that fulfil the criteria for the sample. Potential participants are more likely to be dedicated to the study, which can help with attendance and boost their desire to provide more information about the topic being studied (Collins & Stockton, 2018). However, some self-selection bias is undoubtedly present.

4.8.3.3 Snowball sampling

In non-probability sampling techniques like snowball sampling, chain sampling, or chain-referral sampling, existing study participants recruit new study participants from their social networks (Collins & Stockton, 2018). The sample group appears to be growing like a snowball as a result. As the sample gets larger, enough information is gathered to be useful for research. In secret groups, which are challenging for researchers to enter, this approach is frequently utilised (Sharma et al., 2019). Finding units to include in the sample may be difficult, partly because the relevant population is not clearly listed. It is challenging to calculate the possible sampling error and extrapolate statistical results from the sample to the population.

4.8.3.4 Purposive sampling as a technique

A class of sampling techniques known as ‘purposive sampling’ depends on the researcher’s judgment when selecting the study’s units, such as participants, cases or organizations, events, or data points. The terms ‘judgemental sampling’, ‘selective sampling’, and ‘subjective sampling’ are also used to describe it (Etikan & Bala, 2017). Critical case sampling, for instance, might be used to decide whether a phenomenon warrants additional examination before utilising an expert sample approach to further analyse particular problems. According to Sharma et al. (2019), bias on the part of the researcher might seriously affect any kind of deliberate sampling.

In this study, a purposive sampling strategy was used to conduct interviews with the four deputy heads of different portfolios in the EWS, with the aim of focusing on the first objectives of this study. The objectives were: (i) to identify the stakeholder management challenges in the EWS projects; and (ii) to determine the stakeholder management systems that are being used in EWS projects. During the data collection procedure, participants presented the main themes. Using this approach, the researcher was able to gather qualitative data, which produced more accurate findings and deeper insights. The results are pertinent to the study, since the researcher used the most competent sources to collect data. A researcher can target certain demographics to gather specialised data for a study. In purposive sampling, the margin of error in data is reduced, since the data sources closely mirror the study environment (Saunder, Lewis & Thornhill, 2015).

The practice of ‘judgmental sampling’ involves deliberately choosing particular locations, individuals, or events, in order to gather essential data that cannot be obtained from other sources. Purposive sampling was used in this study to ensure that the respondents could be easily reached and that the research objectives would be achieved. Interviews were used to get responses from the respondents.

The sample was chosen from among senior employees, government officials, interested community groups, and residents or rate payers. Participants were chosen from all the stakeholders, both internal and external, so that the researcher could understand various points of view, ideas and situations, without limiting the possibility for rich data by focusing on only one level.

4.9 Sample size

The sample size is the bare minimum required to ensure that the sample is representative of the research population (Gruijters & Peters, 2020). Thirty-four (34) research participants from the eThekwini Municipality Water and Sanitation Unit's internal and external stakeholders were involved in both interviews and SSM workshop discussions. For participants to be included in the sample, they needed to be directly employed on the water and sanitation projects; or be a stakeholder directly involved with the water and sanitation projects. All employees and external stakeholders who were not directly working with the Department of Water and Sanitation were excluded from the sample. The researcher divided the target population for the study into two groups, one for the interviews and the other for the SSM workshop discussion. The sample size for the interviews is shown in Table 4.2.

Table 4.1: Interviews sample size

Designation	**Sample**
Project manager	4
Councillors	4
Business Support Unit manager	1
Communication Unit manager	1
Social facilitators	2
Planning and design department	2
Total	**14**

Source: (Researcher's compilation, 2022)

From May to August 2019, 14 participants listed above were all chosen for the semi-structured face-to-face interviews because of their relevance to the study's major topic of stakeholder management on water and sanitation infrastructure projects in the eThekwini Municipality were interviewed. The interviewees' workplace, in particular, was a handy location for the interviews. Prior to participating in the SSM workshop discussions, the researcher chose to analyse the in-person interviews.

4.9.1 Inclusion and exclusion criteria for interviews

The researcher interviewed the four project managers; four councillors; one business support unit manager; one communication unit manager; two social facilitators; and two planning and design officers at the EWS unit. A total of fourteen (14) participants were interviewed. According to Ness, Pfeffer, Stark, Guest, Combs and Nathan (2016), the initial few interviews provide the researcher with a wealth of information, and further interviews serve to confirm what the researcher has previously discovered. Knowledge is said to have reached saturation at this point.

The project that was used as a case in this study was the construction and installation of a long water pipeline which cut through five municipal wards. Of 222 municipal ward councillors, only the councillors whose wards were directly impacted with the construction of the project were invited to participate. Four of the five affected ward councillors were interviewed; the fifth one was not available to participate, and the area affected in his ward too small to have a proper impact. Out of ten project managers, only four were available and willing to participate. Two of them were working directly on the Phase Five Northern Aqueduct Augmentation project, and two were interested and affected because they were working on another similar kind of infrastructure. Others were excluded because they were not found to be relevant to the study. The unit has about twenty social facilitation staff, all are doing the same work in different projects. The two that were chosen to participate were chosen based on the fact that one was working on the case project and the other was the outsourced staff member on the same project. Participants from other support units like Communication and Business Support provide additional support to EWS; others were excluded because they were not directly involved with EWS operations.

Table 4.2: SSM Workshop sample size

Designation	Sample
Project manager (Planning and Design Department)	2
Social facilitator	4
Rate payers association	2
Military veterans	2
Project contractors and project engineer	4
Women in business	2

Traditional leaders	2
Community liaison officer (project based	2
Total	**20**

Source: (Researcher's compilation, 2022)

The SSM workshop discussions were held on 9 October6 2020, at the ESW unit headquarters in Durban, South Africa. The discussions were done with four groups comprising five participants each. As the attendees spoke and pondered, the session lasted over six hours.

4.9.2 Inclusion and exclusion criteria for SSM workshop

The targeted participants for the SSM workshop were made up of project managers from the EWS Planning and Design Department; social facilitators; rate payer representatives; military veterans; contractors; women in business; and traditional leaders. A sample of twenty (20) participants was purposely selected to participate in the SSM workshop. The selection criteria were based on the condition that they were working under, or with, the EWS. Councillors and traditional leaders were excluded from the SSM workshop because they had participated in the face-to-face interviews. Those among the target population who were not directly involved in the water and sanitation projects were also excluded from the sample. The project managers and social facilitators that were selected for the SSM workshop were not the same as those who participated in the interviews. These were project-based project managers who were employed by either the project engineer or the project contractor. From the five project-based CLOs, only two were willing to participate in the workshop.

4.10. Data collection procedures

The term 'data collection procedure' refers to the act of obtaining data in order to measure or provide answers to the variables included in the problem statement, research questions, and hypotheses (Saunders & Townsend, 2018). The researcher's data collection techniques were in accordance with the study's research objectives. The data collection was through interviews and SSM therefore primary data was utilised in this investigation. A semi-structured interview was one of the main sources of data gathering. This was essential to effectively measure how SSM can assist to create an enabling environment for effective stakeholder management.

The data collection procedure utilised in this study required the researcher to approach the head of department for permission to administer the instruments. The researcher then made appointments with participants to conduct in-depth interviews. Due to their high information output, semi-structured interviews were employed to gather data (Whitehead & Whitehead, 2016). They are also suited to examining people's real-life experiences, which is an important component of the study. Understanding participants' worldviews and the significance they ascribe to their experiences is the aim of qualitative research (Whitehead & Whitehead, 2016). Interviews offer a chance to probe more profound consequences. In this case, the interview was useful since it allowed the researcher to examine the attitudes, assumptions, and beliefs that inform people's behaviour. Interviews were recorded in order to guarantee accuracy of the verbatim transcript.

After analysing the interviews data, the researcher then set a date for the SSM discussion in the form of an SSM workshop. This study adopted a multiple-method qualitative research design in which semi-structured in-depth interviews and an SSM workshop were employed for data collection. As usual with qualitative research, the researcher in this study was fully involved in collecting data in a natural setting (Groenland & Dana, 2020). The researcher conducted the SSM discussion in which different stakeholders participated while the researcher was a facilitator. This agrees with the principles of qualitative research which require that participants are studied in a natural setting and not in a laboratory. Also, participants were not requested to respond to any questionnaires (Loomis & Paterson, 2018) The section below details the steps taken to collect the three categories of data in this study.

4.10.1 Interviews

In-depth semi-structured interviews were used to collect data in this qualitative research and this involved conducting intensive individual interviews with 14 participants to explore their perspectives on stakeholder management on the EWS infrastructure projects. As noted by Taherdoost (2021), this technique offers the opportunity to capture rich, descriptive data about people's behaviours, attitudes, and perceptions, and to unfold complex processes. In agreement, Fritz and Vandermause (2018) said that in-depth semi-structured interviews increase the validity of information gathered because participants tend to share their opinions, values, attitudes, and

beliefs in relation to the context of the research problem. Specifically, in this study, data was collected using semi-structured in-depth interviews and an SSM workshop discussion that had a less-structured format with some level of flexibility in the SSM approach.

Semi-structured interviews were conducted with the individuals in EWS who were purposively selected. The 14 participants were made of municipal officials in the EWS unit; officials from other support units; local leadership; community members; councillors; and project-based officials.

The semi-structured face-to-face interviews were conducted with 14 participants, all selected because of their relevance to the main focus of the study, which was stakeholder management on the water and sanitation infrastructure projects in the eThekwini Municipality from May 2019 to August 2019. The researcher decided to analyse the face-to-face interviews before proceeding to the SSM workshop discussions.

Face-to-face interviews were conducted with each participant for between 45 minutes and an hour, depending on the personality of the participants and their capacity to explain, since the questions were open-ended. All the questions were conducted within the eThekwini Municipality, with a particular focus on the Water and Sanitation Unit. The researcher called the selected participants telephonically to arrange for a suitable time; and the venue was chosen by the participants. The researcher explained the requirement of the venue to the participants as one with minimal distractions to assist the participants to focus on the interview (Barrett & Twycross, 2018). Interviews with political leaders and councillors were held in the offices of a particular councillor (participant) at the time chosen by the participants. The researcher, after seeking the approval from the participants, recorded the interviews and they were transcribed to capture all responses accurately. This practice was in line with McGrath, Palmgren & Liljedahl, (2019). Capturing and transcribing was further used in data analysis.

The interview questions were designed in a way that made it easy for the researcher to build on the collected data from the different interviews and SSM workshops, which eventually led to a point of understanding of the issues pertaining to stakeholder engagement and management, and the recommendations from the participants for the improvement of the situation. This agreed with the nature of action research as it related to the SSM through its collaborative and participatory

nature. This collaboration changes the researcher from the position of an expert to the position of a process facilitator (Moser, & Korstjens, 2018). The reason why the researcher used semi-structured and open-ended questions was to allow the emergence of rich descriptions and stakeholder perspectives to prevail (Groenland & Dana, 2020). Question were open-ended, so there were no questions which required a yes or no answer. A probing technique was also used by the researcher in cases where the participants were providing vague responses. Probing is one of the advantages of using interviews since the researcher can ask participants to elaborate on some of the responses. The researcher is also allowed to ask follow-up questions, and natural conversation is allowed (Loomis & Paterson, 2018). The same probing techniques were used by the researcher during the SSM workshop since the researcher played a facilitator role during these workshops. Although the researcher played a facilitator role, notes were taken during the SSM workshops, and group presentations were recorded in the same manner as face-to-face interviews were.

Since the researcher was familiar with the terminology in the water and sanitation sector, as well as the municipality setup, it was easy for the researcher to understand and make sense of some issues of convergence and divergence during interviews and workshop (Taherdoost, 2021). It was also noticed and observed that some participants who participated in both interviews and the SSM workshop were more confident in participating in face-to-face interviews than in the SSM workshop. This might be because participants enjoyed anonymity and confidentiality after being assured that their identities were not going to be disclosed. Participants were a little bit reluctant to participate in the SSM workshop discussions since they might have been afraid that their views could be taken as a direct insult because of their different roles in working relationships.

Although the interviewing technique is highly recommended by qualitative researchers, some challenges that were encountered by the researcher during the study cannot be ignored. These involved skepticism by stakeholders, especially the municipal officials, to participate in the research. The researcher also faced a difficulty when trying to engage in ‘soft issues’ with the project managers, all of whom were engineers and technical officials; and soft issues are regarded as something beyond their scope of work.

4.10.1.1 Justification for using interviews

Creswell (2014) argued that interviews are valuable tools for collecting data in qualitative research. A one-on-one interview allows the researcher to interact with the participants and to observe non-verbal cues during the interview process. In this study, a semi-structured interview was used to allow for an open-ended discussion of the research topic. Ghauri et al. (2020) noted that semi-structured interviews allow the researcher to understand the complexity of the situation without imposing any prior categorization.

Through choosing interviews as a method of data collection, the researcher hoped to gain a deeper understanding of the participants' perspectives through dialogue and through the language they used in constructing the different discourses. This interview method allows the researcher to seek clarity and probe for deeper understanding. As a result, the reporting and analysis of data is reflective of the views of the participants. The researcher is able to build trust and rapport with the participants and the trust in the interaction or relationship makes it easier for the participants to share their own experiences without fear of being judged (Creswell, 2014). The interviews were mainly focusing on the first two research objectives:

- to identify the stakeholder management challenges in the EWS projects; and
- to determine the stakeholder management systems that are being used in EWS projects.

4.10.2 SSM Workshop

Four groups, of five participants each, participated in the SSM workshop discussion which took place on 09 October 2020, which was also used for data collection. Findings from the semi-structured interviews were then used to determine the extent of the problematic situation of the research study. Themes that emerged from the semi-structured interviews were then used as the first of the seven steps of the SSM (finding out).

SSM is an excellent instrument to explain chaotic multifaceted situations with the intention to understand the background. The first step of the SSM data collection method, interviews, was discussed in the preceding section. The second step after the semi-structured interviews involved defining the problematic situation by developing the rich pictures (Annexure D) which were describing the processes; the stakeholders; their emotions; their attitudes towards each other and towards the project management team; and interrelationships between the processes. In the third step of the SSM, the researcher encouraged the participants to identify the critical and relevant

perceptions from the situation themes from which the root definition was developed. CATWOE and conceptual models for the main issues were also developed, following the principles of SSM as outlined in Chapter Three.

The six-hour SSM workshop was conducted with twenty participants divided into groups of four participants in each. The workshop comprised representatives of all interested and affected groups, and individuals in the EWS infrastructure projects who were purposively selected. The selection criteria for the workshop was based on the interest that the member of the group had in the outcome of any infrastructure project that is implemented by the EWS. The participants at the workshop were conversant with the research problem and were able to provide responses to research questions. Participants were made up of EWS project managers; project social facilitators; members of the local business forums; members of the MKVA; members of project steering committees; and non-affiliating members of the community in which the project was being implemented.

The participants in the workshop could respond to questions in the best way they deemed appropriate. By so doing, they were able to provide responses, drawing a rich picture to provide detailed explanations of concepts. Each group developed a rich picture (Annexure D) and presented the discussion of the picture to the larger group.

After the presentations by the groups, each group was guided by the researcher to reconvene to their respective groups and come up with the root definition from the issues that were identified as important by the group. The groups were then guided to plot the concepts of their root definition into a CATWOE model. Because of the time, and the restrictions from the COVID 19 pandemic, the researcher could not hold the groups any longer. After the workshop, the researcher developed the conceptual models from the work of the groups, and by analysing the notes that were taken during the group presentations. The presentations were also recorded, and that gave the researcher time to go back to the details of each group presentation. Details of this analysis are provided in the next chapter, the results chapter.

The SSM workshop was also not without challenges. The COVID 19 pandemic restrictions had a negative impact on the study by delaying data collection. This also led to the data collection from the SSM workshop being costly in respect of time and resources (Fritz & Vandermause, 2018). The researcher hired a bigger venue to accommodate the regulated social distancing. The SSM

workshop took the whole day, so the researcher had to provide the refreshments for the groups. Impartiality was paramount during the interviews and the SSM workshop, and that was a serious challenge for the researcher who was also part of the system that needed improvement. This challenge surfaced during the workshop when the technical officials and the social official had to express their strong views about relationships during the project implementation, which was the situation needing to be improved.

4.10.3 Secondary sources of data collection

The researcher also embarked on collecting secondary data. Secondary data included a documents review of reports; the municipal Integrated Development Plan (IDP); project plans and project progress reports; as well as newspaper articles about the EWS and the eThekwini Municipality at large. It also included stakeholders meeting minutes from the Northern Aqueduct water project. Other internal project management documents, like the municipal supply chain policy, were reviewed to establish the issues of work allocation to emerging contractors during the implementation of the EWS infrastructure projects. The benefit of the secondary data was that the researcher learned other aspects of the problem situation and discovered other areas that required further attention.

4.10.4 Primary sources of data collection

The primary research instruments utilised in this study to get first-hand information from the participants were the interviews and SSM workshop. They were used to gather the views of stakeholder management challenges, and to determine the stakeholder management systems that are being used in EWS projects. The researcher used semi-structured, open-ended questions to get relevant data on the challenges of stakeholder management on projects.

The gap identified in the review of related literature and the study's objectives were carefully aligned in the design of the interviews. Shortcomings were identified in previous studies on the relationship between culture and performance, in which interviews were conducted with the management staff of the organizations. This was not the best way to collect data because management staff was not inclined to provide sensitive information to researchers based on the

agreements signed with their organizations. Hence, it is better to gather information from core employees who experience the culture, abide by the rules and regulations, and, above all, contribute to the goals and objectives of the organisation through their opinions (Ghauri et al., 2020). The SSM workshop was conducted with both internal and external stakeholders of the ESW.

4.11. Data quality control

The detection of potentially missing necessary information, checking for data transfer issues, and deleting duplicates and remaining outliers, all served to provide data quality control. By choosing the appropriate participants for this study and making sure that the information provided by them was accurate, data quality control was also ensured.

Qualitative research has been criticised for lacking the rigour and credibility of traditional quantitative research (Moser & Korstjens, 2018). With quantitative research, the emphasis is on the accuracy of data and the extent to which data can be generalized. According to Cohen and Larrea (2018), quantitative research concerns itself with the extent to which results are consistent over time (reliability) and whether the research truly measures what it was intended to measure (validity).

Qualitative research disputes the idea of the generalizability of results and argues that meaning is historically situated and therefore no two people can experience the same 'problem' in the same way. With qualitative research there is a multiplicity of information and results can thus not be generalized across different contexts (Sharma, 2019). In qualitative research, reference is made to various techniques that can be used to evaluate and validate qualitative research. For example, Moser and Korstjens (2018) highlighted the hallmarks of qualitative research that can be used to ensure the validity of qualitative research. The researcher acknowledges that her framework and context had an influence on the conception of the research. Therefore, by referring to her personal journey with regards to the study, the researcher provided the context and foundation upon which the research was grounded.

4.11.1 Credibility

This variable ensures that the research accurately assesses or evaluates the hypotheses for which it was designed. Several of the concerns raised evaluate how well the outcomes correspond to reality (Serret et al., 2019). The emphasis is consequently on making sure that the research methods used retain the quality of the data and that it accurately represents the subject being studied. Regarding credibility, the semi-structured, in-depth interviews and SSM workshop discussions were used to collect valuable first-hand information from the context of participants' experiences about the challenges encountered by stakeholders at the eThekwini Municipality Water and Sanitation Unit. The SSM workshop was conducted in a flexible manner which allowed the participants to share their experiences and their opinions freely, and the researcher was able to observe the participants' reactions during discussions.

Audio recordings were used for the in-depth interviews and SSM workshop discussions sessions to ensure that the findings that emerged from the interviews were not biased, but were a true reflection of the views of the participants. The researcher used pre-determined, semi-structured interviews and SSM workshop discussion questions to provide consistency between the in-depth interviews and SSM workshop discussions, which is critical in understanding a research problem.

4.11.2 Dependability

Similar outcomes are attained if equivalent techniques are applied in the same situation and under the same conditions (Alaoui & Gahi, 2019). The methods should be sufficiently comprehensive for other researchers to repeat them in related studies, and the researcher must be able to describe the several phases required to prove the study's, and the methods', dependability. Dependability was ensured by clearly documenting the research process and ensuring that the process was logical and traceable (Taherdoost, 2021). As suggested by Creswell (2014), the research questions for the in-depth interviews were designed in a manner that should allow future studies to produce similar results. The use of CATWOE models, from which the researcher developed the conceptual model of the situation makes the research dependable.

4.11.3 Transferability

The study's findings' applicability to other, relevant research is determined by this variable. Since the results of a qualitative inquiry are context-specific, demonstrating their applicability to other

contexts may be challenging. Transferability has been noted as a challenge in qualitative research (Alaoui, & Gahi, 2019). Issues of transferability were considered important by the researcher; therefore the researcher made sure that the study was guided by the research objectives. The researcher used the theoretical framework as a guide to construct the interview guide (Annexure B) to develop the research questions that would, in turn, inform the research objectives underpinning the study (Barrett & Twycross, 2018). Transferability of the study's findings and data to other municipalities is crucial for achieving the research's objectives. Therefore, the researcher ensured that all participants were legally recognised by the laws that govern municipalities in South Africa.

4.12 Data analysis

The assessment of a transcript's contextual implications is the main goal of content analysis (McKinney & Cook, 2018). It is a non-numerical technique for data analysis that is frequently employed by academics to look at narrative data (Braun & Clarke, 2016) by examining the substance of the transcripts in the investigation's context (Dhakal, 2022). By applying codes to the many themes and patterns found in the transcript, this study employed qualitative content analysis to analyse the transcript's content. The analysis and interpretation of non-numerical data benefited greatly by the grouping of the information into themes, subthemes, or patterns. The qualitative data were analysed using content analysis, which looked for recurring themes that directly addressed the research questions. This made it possible for the researcher to investigate the phenomenon using the textual interpretation of the transcripts, providing logical arguments from several angles.

This study employed qualitative research where semi-structured interviews and the SSM were employed for data collection and analysis. Data collected in interviews was analysed using thematic analysis which was assisted by NVIVO. An SSM workshop was conducted, and rich pictures (Annexure D) were developed by the participants. SSM was chosen because of its flexible, but systematic, process that is useful in bringing about the improvement in a problematic situation. In depth semi-structured interviews and an SSM workshop were conducted with participants from different stakeholder groups. The researcher illustrated the importance of SSM in project stakeholder engagement by putting together different stakeholders to identify and discuss their opinions on stakeholder management.

In order to more effectively find themes that spoke more closely to the study objectives, the huge volume of transcribed material was reduced and rearranged with the intention of discovering acceptable themes and sub-themes. However, because all of the replies relevant to the study questions were equally reflected in the data analysis, reducing the data did not mean that important topics were removed. The transcript's mention of each dataset was mirrored in the order in which they were organized and presented in the condensed datasets. Finally, logical inferences were derived from the themes that had been found by carefully examining how each topic aimed to answer the stated research question (McKinney & Cook, 2018)

4.12.1 A six-phase approach to thematic analysis

Phase 1: Familiarising with the gathered data

In order to complete this phase, the researcher must thoroughly and actively engage with the data by first transcribing the interactions, reading and re-reading the transcripts, and/or listening to the recordings (Braun & Clarke, 2016). The researcher must be fully conversant with all facets of the data and must possess a clear grasp of the interaction's core concepts. The groundwork for further analysis is laid in this phase. It is vital to use analytic software that enables the researcher to code both transcripts and audio recordings (Zamawe, 2015). Software NVivo (version 12) was chosen because it complied with these specifications.

Phase 2: Generating initial codes

In NVivo, the imported audio-file takes the form of an audio wave, which can be listened to and divided up into audio excerpts. The author followed the NVivo audio coding process described by Wainwright and Russell (2010). After becoming familiar with the data, the researcher started looking for preliminary codes, which are aspects of the data that seem interesting and pertinent. These codes are more frequent and specific than themes, yet they nevertheless act as a context indicator for the discourse. To begin the analysis, two source folders were created in NVivo: one for audio recordings and the other for transcripts. The word-formatted transcript was easily imported into the NVivo program. Following the transfer of all required files, the next step was coding, which involved grouping extracts from the various documents that were related to one

another into nodes. The transcripts and audio files were reviewed and listened to in detail, and any noteworthy sections were coded to free nodes (Zamawe, 2015).

Phase 3: Searching for themes

The process then moved on to the next step, which was to start interpreting the gathered codes. Broad themes are created by mixing or dividing pertinent data extracts. The relationship between codes, sub-themes, and themes should be acknowledged in the researcher's argument (Braun & Clarke, 2016). Audio files were listened to, and relevant audio excerpts were coded to new and/or existing nodes. The content of the nodes was constantly reviewed by simply double clicking them. Coding stripes were also turned on to help manage the coding process by providing some insights; for example, where the densest parts or coding were, and so on. When this was done, nodes associated with each source were created with the relevant details (Dhakal, 2022). Apart from coding to nodes, the researcher was also able to connect ideas emerging from two or more sources using 'see also links'.

Phase 4: Theme review

The themes were next examined in further detail, after which the researcher chose whether to integrate, enhance, separate, or reject the initial ideas. According to Dhakal (2022), the information contained in the themes should make sense, but there should be clear distinctions between them. Typically, this is completed in two stages: the first phase involves validating the themes in relation to the coded extracts, and the second phase involves validating the full data set. During this stage, a themed map is produced.

Phase 5: Theme definition and naming

The themes and potential sub-themes of the data must be 'refined and defined' at this step. The prominent topics must be strengthened by more research (Phillips & Lu, 2018). The researcher must provide topic headings and pithy working summaries that clearly and simply communicate the essence of each subject. At this point, the concepts must coalesce into a cohesive story about the facts. Annotations were created for both audio files and transcripts but they were particularly important when coding audio files because they were also acting as a reminder or clarification of audio excerpts.

Phase 6: Report production

Braun and Clarke (2016) asserted that the researchers must then add precise examples that are fascinating and vivid and link to the research topic and material in order to turn their analysis into a piece of writing that is intelligible. The report's conclusions must convince the reader of the report's value and veracity. It must include an evaluation based on actual facts and should explicitly address the research issue, going beyond a simple explanation of the ideas. When the analysis process reaches an advanced stage, a broader picture and/or a visual representation of the data and progress of the work becomes a necessary prerequisite for the development and testing of the theory (Dhakal, 2022). At this level, reports, queries, charts and models were created.

4.13. Elimination of bias

The planning, collecting, analysing and publishing stages of research can all be tainted by bias (Farghaly, 2018). The authors also stressed the need to understand study bias so that studies may critically and objectively assess the findings and avoid solutions that can be hazardous, or of poor quality. The researcher focused on making sure that bias was eliminated, and that objectivity persisted throughout the inquiry.

- **Non-use of gender aligned words**

A kind of linguistic prescriptivism, known as gender-neutral language, tries to exclude (or neutralise) references to gender in sentences that describe persons (Hall et al., 2021). The study continued to exclude anything that would reveal the gender of research participants, including gender-specific job titles. Moreover, to refute the idea that language subtly perpetuates gender and gender stereotypes, gender-neutral pronouns were used for people who were either male or female.

- **Avoiding categorising people based on their race or ethnicity**

According to Robertson, Morgan, Bird, Catchpole and McCulloch (2014), the more significant an identity is to a person's sense of self, the more driven they should be to maintain and develop it. In fact, according to the social identity theory, people are just as driven by their own sense of self-

worth to maintain and enhance the self-esteem of the group, as they are by their own. Popular social identities are significant sources of self-esteem for people (Opie, 2019). Vocabulary identifying persons of this origin was avoided throughout this investigation to prevent the inferiority or superiority of ethnicity and race.

• Avoiding language that implies judgment or feeds stereotypes

Bias and its related phenomena have been subjected to a more thorough and rigorous investigation as a result of the nature of prejudice. Robertson et al. (2014) asserted that industries, including business and health as well as related disciplines like sociology and political science, are now interested in prejudice, stereotyping, and discrimination. In an attempt to address this issue, the study avoided using wording that implies judgment or supports biases.

• Refusing to generalise regarding different age groupings

Age-related assumptions may influence information that is relevant for reliable research. The survey instrument was elevated beyond the minimum legal age of work (18 years) and as far as the pensionable age of 60 years to avoid the assumptions of different age groups.

4.14. Ethical considerations

- **Obtaining informed permission from participants:**

The term ‘informed consent’ refers to the importance of properly informing participants about the purpose and scope of the study. Only when study participants are fully informed of the study’s goals, and the extent to which they are being asked to participate in the research project, can they provide their informed permission. To achieve this goal, the researcher provided participants with information about the type of activity and the intended study subjects (Annexure A). Additionally, the participant’s right to withdraw from the study at any time without repercussions was disclosed by the researcher.

- **Making sure there is no harm to participants:**

To ensure that study participants are not harmed, researchers must implement safety procedures. Formal authorisation from the relevant warehouse was requested and granted in order to ensure that no participant was held responsible for his or her comments.

- **Ensuring anonymity and confidentiality:**

The researcher was in charge of ensuring that no participant's name was disclosed. The researcher restricted access to raw data in order to preserve participant anonymity by securely storing all data, presenting results in a way that made it hard to identify particular people, and obtaining consent before utilising the data in the future. In addition to collating the study's findings to reflect the opinions of all participants as a whole, acronyms were employed to safeguard individual identities.

- **Ensuring that consent is obtained:**

When requesting authorisation to do research, it is crucial to follow the right steps. The study's ability to reach participants determines how successful it is. The UKZN Research Committee's ethical approval was requested (Annexure E), and the EWS management at head office was informed of the problem (Annexure F).

4.15. Chapter summary

This chapter detailed and defended the technique and research design that were employed in the investigation. Before choosing interpretivism as the philosophical perspective best suited for this study, this chapter provided a thorough analysis of the various research philosophies, highlighting their benefits and drawbacks, as well as the subject areas where they are most effective. The correlational technique, with an advanced explanatory design, was used in a non-experimental, ex post facto research design. This was supported by concomitant transformative mixing approaches and a pro-data advocacy emphasis. The study's sample size was determined by considering the competence, accessibility, and willingness of the respondents to participate; the study's population

was also taken into account in respect to various sampling techniques. This explains why purposive sampling was used to choose individuals.

In this chapter, the data collection procedure, and a six-phase approach to thematic analysis was also discussed. The combination of semi-structured interviews and SSM was justified in the chapter. The ethical considerations of the study were also presented in this chapter. Issues of reliability, validity, trustworthiness, reliability, validity, and trustworthiness, as well as ethical considerations, have likewise been discussed in detail. The next chapter presents the results of the study from the data gathered from the face-to-face interviews.

CHAPTER FIVE: FINDINGS AND DISCUSSION FROM INTERVIEWS

5.1 Introduction

The previous chapter gave a detailed description of the research methodology utilised for this study, as well as details on the population, sample, and procedures used for data collecting and analysis. The study's qualitative findings are presented in this chapter, based on the information generated by the conducted interviews. As part of this research study, several interviews were conducted with EWS stakeholders. The primary aim of the interviews was to explore the use of systems thinking approaches in the development of a holistic model to improve stakeholder management in the EWS unit. This chapter presents and discusses the first two objectives of the study, as the other remaining objectives will be covered in the following chapter which discusses the SSM workshop. The interviews were mainly focusing on the following two research objectives:

i) to identify the stakeholder management challenges in the EWS projects; and

ii) to determine the stakeholder management systems that are being used in EWS projects.

To accomplish this, the interview schedule was divided into four main sections that were in line with the study's research objectives:

- value, contributions and impact
- authority and influence
- input and feedback
- stakeholder relationships
- challenges, conflicts and resolution

Each focal area was covered by a number of questions, and the interviewer guided the conversation by asking pointed questions that sparked candid discussions. Each interview lasted from thirty minutes to an hour, depending on the interviewee's availability. Every interviewee responded to every question. The results that are presented in this chapter were generated using NVivo. The advantage of NVivo is its compatibility with thematic analysis by enabling the development of nodes. The nodes additionally offer 'a simple-to-work-with structure' for developing scripts and identifying themes.

5.2 Themes of the study

Guided by the word cloud and tree map, the main themes identified are presented in Figure 5.5, below:

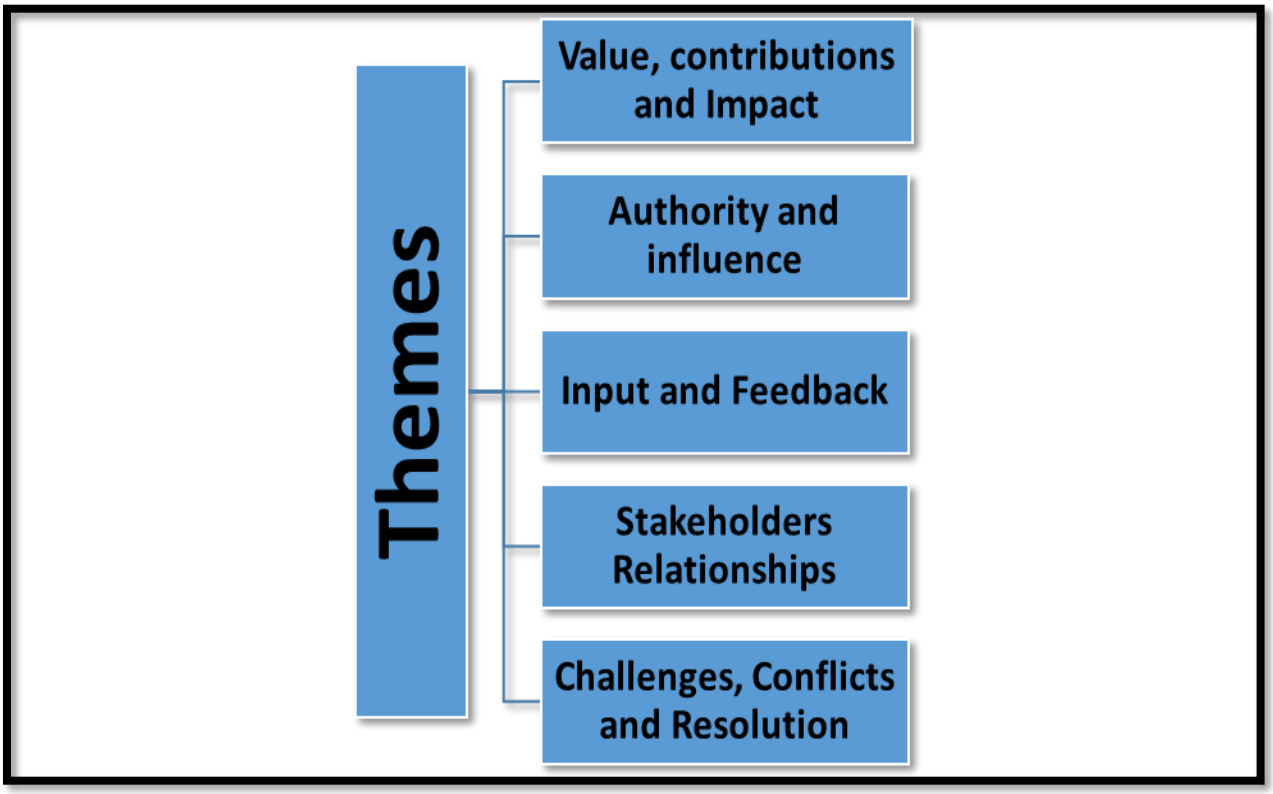

Figure 5.5: Identified main themes (source: field work, 2022)

For ease of reference, as per Figure 5.5 above, the analysis was aligned to the five key themes discussed, as follows.

5.2.1 Value, contributions and impact

This primary theme examined the values, contributions and impact made by relevant stakeholders within the Water and Sanitation Unit's infrastructure projects at eThekwini Municipality. It was informed by various subthemes summarised in the diagram below;

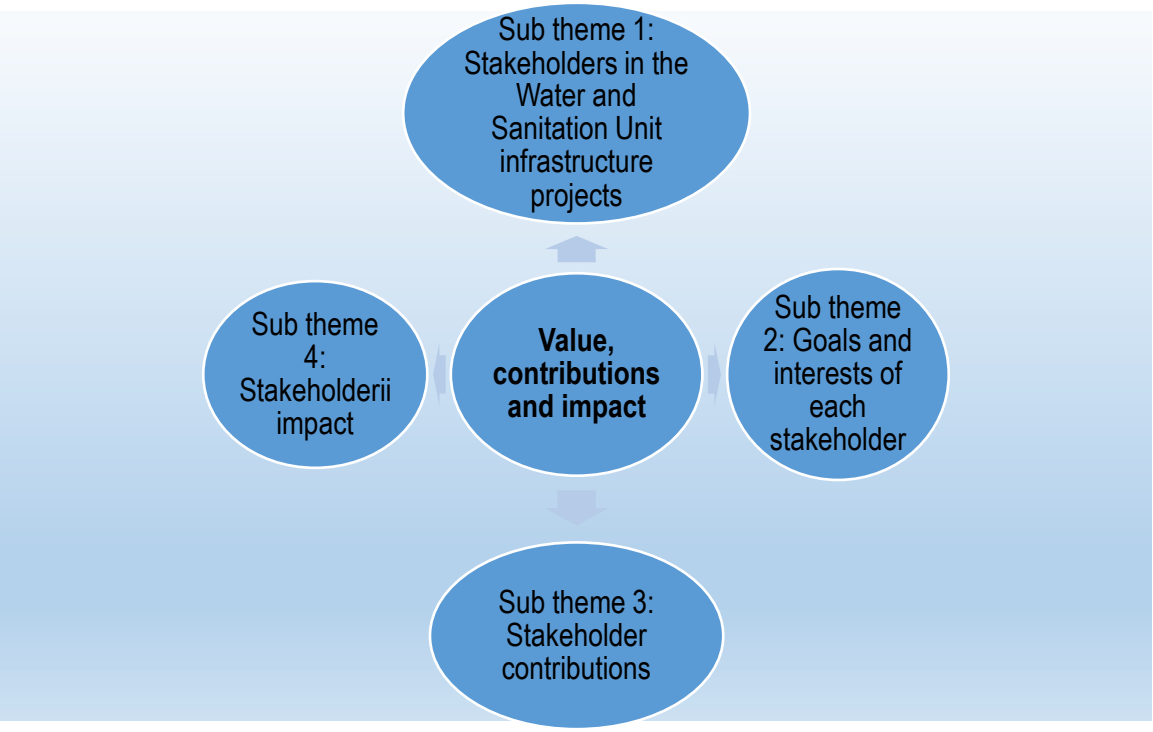

Figure 5.6: Sub-themes for main theme 1

5.2.1.1: Stakeholders in the water and sanitation unit infrastructure projects

There are many stakeholders involved when it comes to water and Sanitation Unit infrastructure projects at eThekwini Municipality. They are classified under internal, external and most valuable stakeholders.

Under the internal stakeholders, five groups of stakeholders were noted. These groups were The Department of Water and Sanitation; community participation departments; the institutional Social Development Unit; the Business Support Unit and Area Based Management. The biggest internal stakeholder was the Department of Water and Sanitation itself. This was a logical finding as the Department of Water and Sanitation was the driver of the projects from a governmental perspective. The key stakeholders within the department itself included the engineers; project managers; finance and procurement; supply chain management; and planning.

Participants highlighted that the type and area of the project is critical in determining stakeholders, but in most cases the municipality is the main stakeholder, as most infrastructure belongs to the

municipality. Therefore, they identified the relevant departments within municipality, such as Finance; Supply Chain Management; Procurement; Community Liaison Officer (CLO); and Planning as key stakeholders. This is confirmed by the following participant, who conveyed the same position, supported by the following comment:

> *eThekwini Water Services need to establish projects and provide water in terms of the constitution, giving access to water and the Bill of Rights. Therefore, the municipality has to look at forward planning to design big water schemes because I see them as the main stakeholder. After that I do not think you can put them in a ranking order. The engineering team will also appoint specialist as to when they will be needed; for example, if they are doing a sewer project, we need to check with the Environmental Department, so another stakeholder will be the Water and Sanitation specialist to do that study (Interviewee 4, project manager, 2022).*

This outcome concurred with the findings of Mashali et al. (2020), who found that stakeholders are of two types: internal and external project shareholders. The study concluded that internal project stakeholders typically comprise the project team, the sponsor, internal clients, and project support workers. Similarly, PMBOK (2018) advised that senior management, additional project managers, and functional managers, be considered internal stakeholders.

External stakeholders were also a key factor in projects. These stakeholders included the community; business forums; councillors; local leaders; taxi associations; contractors; transformation forums; non-governmental organisations; and not-for-profit organisations. Participants felt that external stakeholders are made up of the communities where the project is going to be implemented. They identified primary external stakeholders as those communities involved, and business forums as secondary external stakeholders. This is confirmed by the following participant, who conveyed the same opinion, as confirmed by the following statement:

> *Stakeholder management process will be put in place and that would be for all interested parties within the community, whatever construction*

> *activity or infrastructure is to be constructed, whether it be principals of schools, business forums, churches, they all stakeholders. Local leadership structures in rural areas includes then local chiefs and their councils. 'Amakhosi' being the traditional leaders, because the area that we are concentrating on has an office. It is mainly the rural areas, therefore they become main stakeholders (Interviewee 2, councillor).*

This outcome strongly concurs with the observation of Kossova and Sheluntcova (2016), who concluded that projects benefit the communities in two ways: through the outcome of the project, which usually improves the health and hygiene in a given community; and also, through the economic development in the community, which usually depends on the number of jobs created during the implementation of the project. The results regarding the categorisation of external stakeholders concurred with those of Mashali et al. (2020), who discovered that external project stakeholders include customers, suppliers, competitors, and other external bodies that may be involved in, or influenced by, the project, such as government officials and concerned citizens.

The study further identified six stakeholders as most valuable. These were all stakeholders; communities; project managers; environmental impact assessors; business forums; and councillors. However, participants highlighted that all stakeholders should be seen as equal. This is confirmed by the following participant who stated:

> *I do not think there is one stakeholder more important than the other is because they have different roles and responsibilities. Now, if we begin to classify the other one as the most valuable, I don't think there is one, because they are all the same, because they play a vital role, but in a different approach (Interviewee 11, communications unit).*

This outcome concurred with the findings of Nguyen et al. (2018), who concluded that it is crucial to strike a balance between empowering internal and external stakeholders, as both are equally important. However, this outcome disagreed with the findings of Begg (2018), who suggested that

project managers are the most crucial, as they must be adept at balancing the interests of several stakeholders in order to properly manage a project.

5.2.1.2 Goals and interests of each stakeholder

The goals and interests of each stakeholder were different. The participants identified that the community has four main goals and interests in the operations of the eThekwini Municipality. These included the community goals and project interests, service delivery, community development and jobs, as well as skills. The most highly ranked was the community interests and goals. This was followed by service deliver, community development, and jobs.

The participants stressed that the main concern revolved around community interests and that of the project to support community interests. The relevant community stakeholders, therefore, should serve the community needs by ensuring that the project outcomes are aligned accordingly. This is confirmed by the following participant:

> *They are stakeholders within the communities. They are those stakeholders who are having interest within the project. Those stakeholders want to be involved and benefit. The municipality's main role is to provide services, the right level of services at the right price and within a short space of time, and also communities get the service / have the access to the services promised. Also complying with environmental legislation that they deliver the scope of work (Interviewee 6, social facilitator).*

This result supported the UNOHCHR's (2016) assertion that the distribution of water and sanitation is neither rights-driven, nor is it rights-informed, and that the values of openness and public involvement should not be ignored when denying urban settlers access to water and sanitation.

Finally, the provision of jobs for the local community, as well as skills development in line with the project, could serve community needs and interests. Participants also highlighted that, whilst

business forums do play an important role in community development, they seem to have more of a business interest at heart, rather than the interests of the community. They see the projects more as a business opportunity for their business. This is confirmed by the following participant who conveyed the same opinion, as confirmed by the following comment:

> *We have business people who have registered companies, but when it comes to experience and skills they lack both. When the contracts come we expect them to assist through providing mentorships to these small businesses by giving them small work and provide supervision. We generally have an idea when we are engaging the business forum. Their interest is on the business element. That is how they can benefit and we might have the taxi association that gets affected by the project interacting or maybe having an element of interrupting their business. So, we need to make sure that we have identified all these elements so that if there is an element to engage in, the process where mitigations process might start (Interviewee 10, Business Support Unit).*

This outcome concurred with the finding of Barnes (2018), who found that, due to inadequate community engagement and acceptability, sanitation programmes that target the marginalised have had little success worldwide.

5.2.1.3 Stakeholders contributions

This sub-theme examined the contribution of stakeholders to the necessary projects. The stakeholders were examined according to the three classifications of external stakeholders, internal stakeholders and general contributions. It was identified that the external stakeholder makes substantial contributions, which include resolving problems; support; enabling; labour; and project protection. The traditional leaders, ward committees and councillors serve to facilitate the project and also to resolve problems related to projects. They also serve as a key point of communication to the community about all the details of the project.

Participants underscored that external stakeholders make considerable contributions on these projects. This is confirmed by the following participant who noted:

> *Firstly, we speak about traditional leaderships. Their existence protects the project once it has the support of the traditional leaders, as everyone submits to the leadership. On its own it is protected to the big contribution in terms of the community. Ward committees and councillor resolve project problems. It depends on which stakeholder is involved and it depends with the officials who are with the project from start to completion. In this project, the Water and Sanitation Department, ward councillors are there working together trying to facilitate the project to move forward. Sometimes if you look at the water project, it affects a number of people and then in most cases infrastructure then it normally goes on the ground, therefore you will have people that own land. In some instances, that will help to allow a possibility for that particular pipeline or reconnection line happening in that particular area (Interviewee 6, social facilitator).*

This result does not support the findings of Watermeyer and Lewis (2018), who found that accurate stakeholder identification is the most important stage for some stakeholders. The incorrect stakeholders may be included in the project if the exercise is not done effectively, which would have a detrimental effect on the project by lowering the value of the stakeholders' involvement.

Moreover, the contractor also has a role to play in the contribution to the community by employing people from the community on the project. Participants highlighted that contractors make a bigger contribution to the community, since they create employment for the community and assist in other community problems. This is confirmed by the following participant who conveyed the same opinion:

> *Yes, in terms of after the projects have been completed and in terms of skills and expertise within the community. But we do receive reports that*

the people will not be experienced enough. This causes some delay in projects and some contractors will be willing to go the extra mile to learn and produce the required effort, thus contributing their labour, energy, skills to the local (Interviewee 7, project manager).

This outcome concurred with the finding of Khan et al. (2021), who concluded that external stakeholders support organisational success through participatory decision-making, which entails a review of the organisation's legitimacy and the provision of resources to the organisation.

Internal stakeholders were also identified, as they provide support and technical services, such as analysis of the project, and ask the appropriate questions pertaining to project scope, resources, labour, and outcomes. Participants felt that internal departments are critical in the implementation of such projects. This is confirmed by the following participant:

We need to make sure that the finance and supply chain management departments are involved from the start to the end of the project. Depending on their mandate and the areas of specialisation. For example, the interior team for design will give the design parameters (Interviewee 8, project manager).

This result was consistent with the findings of Nguyen et al. (2019), who found that internal stakeholders, such as the project manager, consultants, the project team, and contractors, are deliberately involved in projects in the public sector under the project governance framework.

Finally, participants underscored that all stakeholders serve to conceptualise and plan the project. This is important so that everyone can be on the same page and all aspects of the project can be agreed on. This is confirmed by the following participant:

Once we have the concept, we circulate it for comments from stakeholders to make an input and that usually directs and shapes the project in a manner that is going to be much more agreed upon. Each stakeholder

begins to find room for how they can package the project. So yes, stakeholders are given the opportunity to make inputs during the planning stage (Interviewee 10, Business Support Unit, 2022).

This result was in line with that of Nguyen et al. (2018), who noted that, as project planning and decision-making can be affected during the course of the project, it is critical to empower internal and external stakeholders and to strike a balance between them.

5.2.1.4 Stakeholder impact

This key sub-theme examined the impact of stakeholder involvement in projects. The majority saw it as a positive impact. However, some saw it impacting negatively. There was mainly a positive attitude to stakeholder impact. Participants felts that stakeholder involvement promoted cohesion in different ways, such as unity, understanding, social facilitation and protection. When stakeholders worked together, it promoted better understanding of the project and this minimised conflict between internal and external stakeholders. This is confirmed by the following participant:

Yes, as EWS officials, we have a job of ensuring that all stakeholders do understand the importance of the project. The first and most important thing is to ensure that there is a clear understanding of the project, unless the stakeholders do not care about their community. But if they do care about the community and we make them understand the importance of that project, I do not think the project will not take place. Unity within the stakeholders makes the delivery quicker, so if teams work together it speeds up process that means clear communication channels will enhance the relationship (Interviewee 5, social facilitator).

This result was consistent with the results of Kossova and Sheluntcova (2016), who discovered that representatives would participate in municipal oversight committees and the community of stakeholders would be informed of the status of the sub-execution, thereby fostering co-operation among the parties.

Moreover, stakeholder involvement could positively impact on the progress of the projects. Participants highlighted that stakeholders could come together to resolve issues amicably, thereby allowing progress on the project. They could also ensure the implementation of the project, as people would be able to see, and be informed, how the project should be implemented. This is confirmed by the following participant:

> *I believe that one does need a stakeholder management team in structure. I believe there is merits, they add value and they are able to resolve issues within their level and area of expertise. Positively, they might be able to allow a project to be implemented in a certain area in a certain way. Therefore, it will be positive. And also they may support the implementation of a project in the sense that you might find that, in some instances, they will be able to mobilise community to have a buy in the project (Interviewee 1, councillor).*

In addition, stakeholder involvement can promote participation in the project. When stakeholders participate in the project, it can lead to better understanding and transparency, thereby making the project implementation easier. Participants felt that participation involves ongoing communication; and hence communication is key to ensure that everyone is aware of what is expected of them. This is confirmed by the following participant who conveyed the same opinion:

> *I think communication is the key, because if people are not aware, obviously there will have concern, there will have issues. Communications as an external stakeholder have a vital role to play in terms of your infrastructural projects because by that people will know what is expected and what is not expected from them (Interviewee 11, councillor).*

This result was consistent with the findings of Derakhshan et al. (2019), who came to the conclusion that effective stakeholder management requires stakeholder participation in decision-making, as well as involvement in project activities during the project development. Likewise, Rose (2013) discovered that involvement may take many forms, including attending meetings;

giving one's time; sharing knowledge that might help with project planning and minimise unneeded risks and delays; and taking responsibility for the project's success.

However, there were a few participants who viewed stakeholder impact as having negative implications. Some participants felt that the Business Forums can negatively impact the project because they have the power to disrupt the project if a particular business was not selected to carry out the project. They seem to be concerned with profits, rather than community needs. This is confirmed by the following participant:

> *Business Forums' intention is to become professional businesspeople, but they just come and disrupt the project. To them businesspersons are definitely sure to make a profit. They do not know that sometimes you can be a businessperson, but failing to make profit. We have had a bad experience with them and they are negative; but, slowly and gradually, surely we are certain that they are becoming to put them to an end. In the first instances, when they try to introduce themselves to the project, there was resistance as to who are these people who had to go and tender. Within the projects, they will come, stop the project, and demand to be in the project, which was negative then. Yet the municipality wanted the projects to continue hence (Interviewee 7, project manager)*

This outcome disagreed with the findings of Srinivasan and Dhivya (2020), who concluded that the majority of these groups frequently have some type of formal agreement with the organisation as owners, workers, consumers, or suppliers. This implies that each stakeholder represents their own interest; but representing one's own interest is not necessarily opposing the project.

5.2.2 Authority and influence

This primary theme examined the aspect of the authority and influence of stakeholders.
It was informed by three primary sub-themes, as unpacked below:

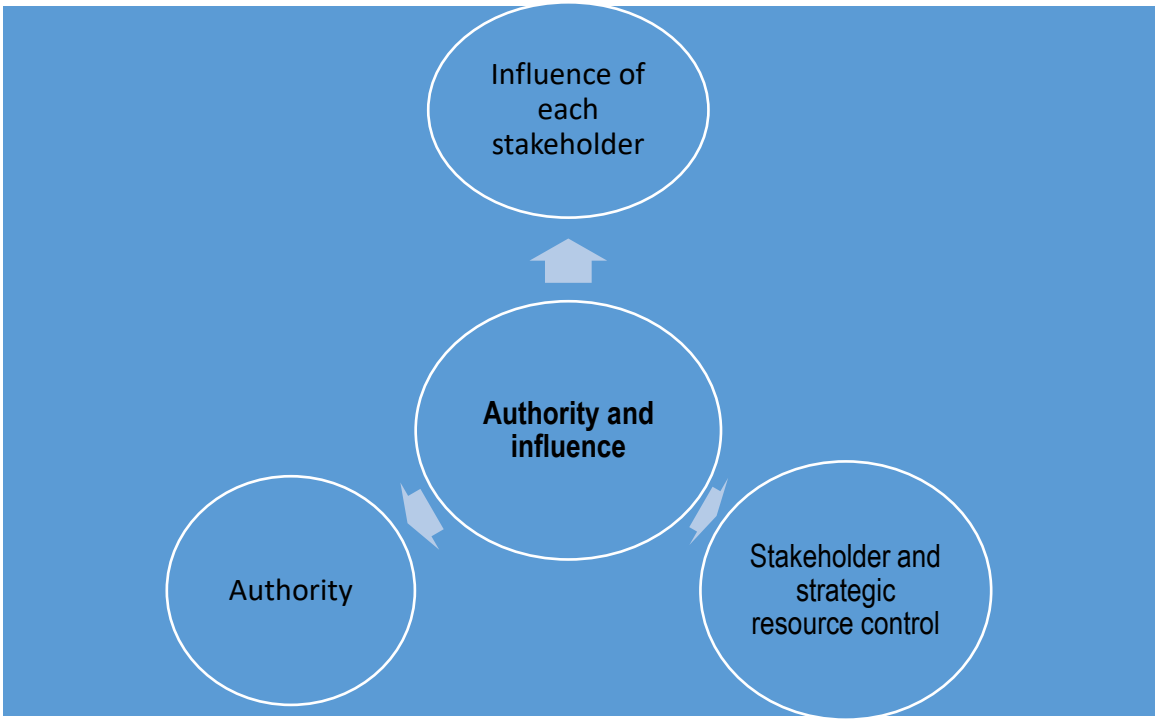

Figure 5.7: Sub-themes for main theme 2

5.2.2.1 Authority

This sub-theme examined the level of authority of stakeholders when it comes to projects. This entailed the leadership roles, as well as legitimacy of authority. The stakeholders were seen to have leadership authority which varied, depending on their roles in the implementations of projects and their position in their constituency. The project manager seemed to have the most authority, based on participants' responses. This is because the project manager would have the necessary information about the objectives and aims of the project. The project manager would possess the knowledge of how the project should be implemented and which stakeholders should be included. Their expertise also rested won the project manager's shoulders. Also, some leaders become representative of their sector. The relevant associations and forums elect their own chairpersons.

Participants felt that leadership authority varies, depending on the role of the stakeholder in the implementation of the projects. This is confirmed by the following participant:

The leader for all groups should be the ward councillors. The project starts with the ward councillor, smaller or bigger the size of the project, but he becomes the centre. It starts with the ward councillor. But the councillor must always work and foster relationship with all the stakeholders. However, we also have traditional leadership in rural areas. They also possess legislated authority. Each group has its own leader. The taxi association has its own chairperson, the business forum has their chairperson, but when it comes to the project, that's when it comes to the formalities. Ward community has different representative. There is one who is responsible for infrastructure projects, and he serves as the leader for the project and report to the councillor (Interviewee 6, social facilitator).

This outcome concurred with the findings of Begg (2018), who suggested that project managers are the most crucial, as they must be adept at balancing the interests of several stakeholders in order to properly manage a project.

5.2.2.2 Influence of each stakeholder

This primary sub-theme examined the influence of each stakeholder on the projects, along with who had the most influence. In addition, the negotiating power of stakeholders over others was explored. Stakeholders are very influential, depending on their proximity to the project, and on whether they are the beneficiaries of the project. The participants highlighted that the community has the influence to support or query the project. This is confirmed by the following participant who conveyed the same opinion:

The project will only go smoothly if EWS engage with the community and make them understand the purpose of the projects for the first time, before it even comes to the implementation. Some do have great expectation as getting jobs, i.e. the community. It happens sometimes, there might come as group, sometimes the job seekers - looking for jobs themselves. The group that has more influence in this appointed time is the business forums

because of work stoppage threats, which is not being acceptable, and this is costing the council more money to put on the project that is not budgeted for, as the business forums comes forcefully with threats that sometimes becomes reality to stop the project (Interviewee 5, social facilitator).

This view agreed with that of Marks and Breen (2021), who discovered that municipal stakeholders had the authority to affect the scope, regulatory adjustments, resource allocation, and communication hierarchy.

This sub-theme examined those who had most influence. Participants indicated that the end-users and communication personnel are the most important stakeholders. As mentioned in the preceding theme, they are the recipients of the project and their influence on the direction and community needs are pivotal. This is confirmed by the following participant:

From what I have assessed, it is because people don't have information. There is obviously an exaggeration of what sort of power one possesses. For example, if the project is affecting a community in terms of a road, you have the taxi association as a stakeholder. However, they are not the only people who use the road. There are other motorists. There are other road users that are affected in that area. So if you are going to use their influence you get delayed. The end-users, which is usually the communities of the project, it depends on their power of influence or level of influence, because you might find that some communities, for example, might want water taps only. And others want to benefit in other ways: you would find that others want to benefit financially, depending with their power and position in the community, as they are able to influence with their positions within the community. Others seem to not have those powers (Interviewee 10, Business Support Unit).

This outcome agreed with the findings of Rajablu et al. (2017), who found that stakeholder influence, behaviour, and decision-making that endanger the project and its deliverables are the

subject of stakeholder risk management. The possibility and effect of hazards must be evaluated, which is a crucial stage.

5.2.2.3 Stakeholders and strategic resources control

This sub-theme outlines the role of stakeholders and their influence on resource control.
The project managers seemed to mainly be in control of strategic resources, as they were the overall heads of the projects. They had to make sure that all necessary resources were available and readily utilised for the project. The project managers were also responsible for obtaining contractors for the job, and their payment.

Participants felt that project managers are responsible for the controlling of resources and implementation of the projects. This is confirmed by the following participant:

> *They do have project managers who deal with projects and site agents who visit sites to ensure that everything is on site and that the equipment is available for all the work to be executed. The project manager and the head, because if the project is there in that financial year there need to implement it. The municipality controls the resources (Interviewee 2, councillor).*

This outcome concurs with Derakhshan et al. (2019), who found that a project manager's ability to achieve strategic goals over a major investment period will also increase as assessments of projects extend to encompass governance and stakeholder management over time.

However, some participants argued that there was a lack of control of strategic resources. Due to many stakeholders being involved, there was a lack of overall structure to control resources. This is confirmed by the following participant:

> *It depends, when asked who controls strategic resources. It depends on that particular stage of the project. For example, at the designing stage, it will be the professionals that will do designs. The question that controls*

it will be the company who has been appointed. The only control the municipality has is to give instruction with the desired outcome. It depends on the stage and different stakeholders (Interviewee 8, project manager).

This outcome disagrees with the findings of Nguyen et al. (2019), who found that, to manage stakeholders who have certain characteristics, project managers must employ the right stakeholder management techniques.

5. 2.3 Input and Feedback

This key theme established the processes of stakeholder input and feedback. This was important in stakeholder management. Input and feedback were informed by the following sub-themes: methods of consultation for input; feedback mechanisms; decision making with stakeholder involvement; communication channels used to enhance stakeholder relationships; and information access and disclosure.

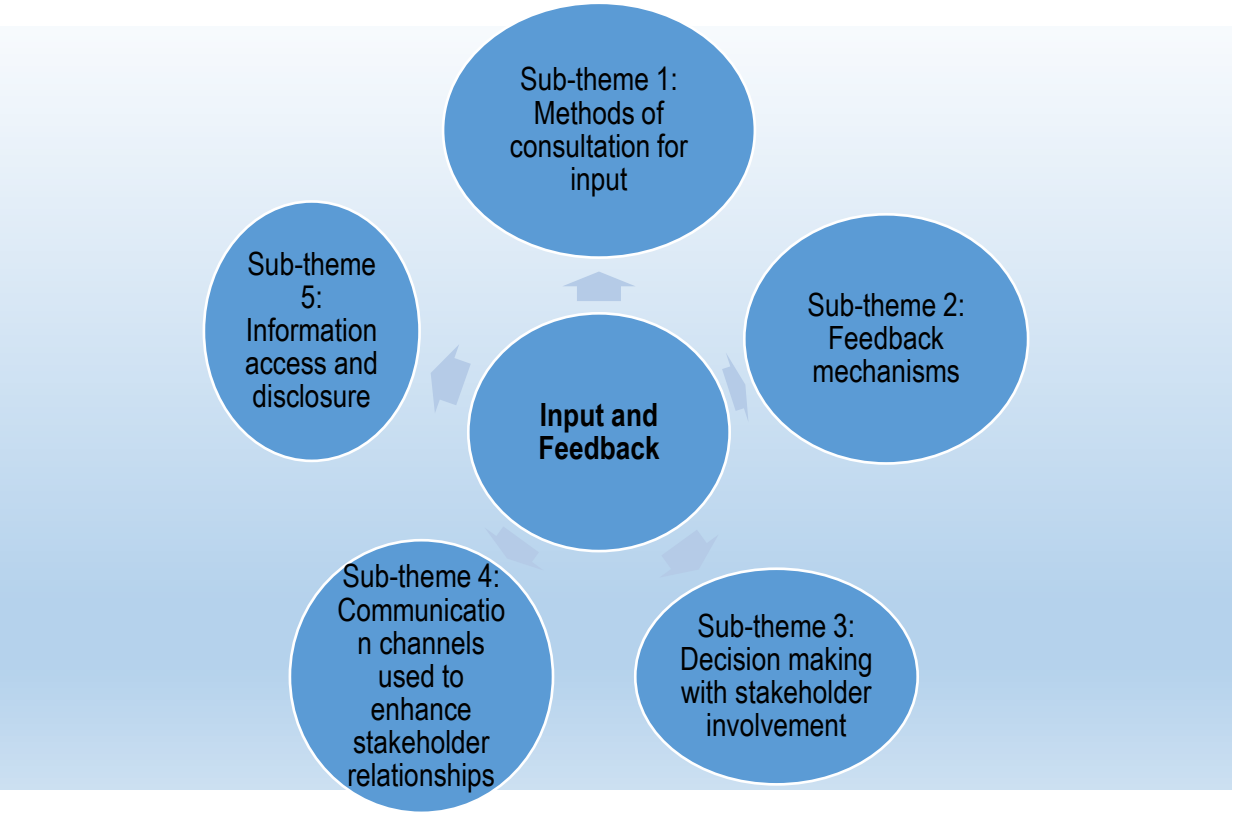

Figure 5.8: Sub-themes for main theme 3

5.2.3.1 Methods of consultation for input

Various methods of consultation to access input from the stakeholders were being used. Among these methods were meetings, leadership, public notices, newspapers, war rooms and websites. Meetings were the most commonly used platforms, followed by leadership, public notices, newspapers, war rooms and websites. Such meetings happened periodically. At these meeting all stakeholder groups could come together and give input on pertinent matters.

The participants highlighted that the urgency and relevance of the matter determined the method to be used to engage stakeholders. This is confirmed by the following participant:

> *There are quarterly meetings, which the councillors in their wards hold. If the councillors invites the officials to come and explain about the progress of the project, we do attend those meetings. The Project Management Committee is made up of people from the business forums, representatives of the wards, affected stakeholders. All the stakeholders will be represented in this committee so they do have access, as during the meeting all will be laid out. If it is the community, there is a leadership that has to be consulted through posters, and we allow them to provide their inputs via the public notices and via internal newspaper that comes out every two weeks, which is circulated amongst the wards (Interviewee 6, social facilitator).*

This outcome concurred with the findings of Rose (2013), who discovered that participation in consultations can take a variety of forms, including attending meetings and public hearings; volunteering time; supplying information that can help with project planning and minimising unneeded risks and delays; and taking ownership of the project's success. Some project stakeholders can help with project management by, for example, volunteering their time to serve on project steering committees (PSC).

However, some participants felt that there was lack of input from stakeholders and more needed to be done. Sometimes input only occurred after planning was done, rather than before. The following participant, who expressed the same opinion, attests to this:

> *No input from stakeholders. They are told about the project after the planning has been done. Generally, 'No', but it is something that needs to be explored (Interviewee 12, councillor).*

This result conflicts with that of Kerzner (2018), who discovered that transparency, involvement, and communication help to minimise potential issues in the latter project phases.

5.2.3.2 Feedback mechanisms

The feedback mechanism was equally important. The participants highlighted that meetings; councillors; CLOs; and one-on-one methods were used as feedback mechanisms. This is confirmed by the following participant:

> *When there is a meeting during the project steering committee meeting, there are consultants, engineers, councillor and municipality officials present. Everyone is present for most of the issues. If there are issues that can be provided on site or provided via communication, we allow each stakeholder to have communication with the project manager. Since the various stakeholders and the project management team and other representatives do meetings they do have the information that they need and given to them accordingly (Interviewee 6, social facilitator).*

This outcome concurred with the findings of Stermann's (2000) studies, based on the ideas of self-regulation and self-organisation. It was emphasised that feedback is part of the learning process. Therefore, it is quite pertinent to constantly provide such feedback.

There is an appeals process reserved for certain aspects. For example, if contractors wish to claim for more money. This was confirmed by the following participant:

It depends on the nature of the concerns. Let's say the contractor want to claim more money. There is an appeal process that needs to be followed (Interviewee 8, project manager)

This outcome is in disagreement with the findings of Kerzner (2018), who found that openness, participation, and communication help to reduce possible problems in the later project phases.

5.2.3.3 Decision making with stakeholder involvement

This sub-theme refers to the involvement of stakeholders in the decision-making processes. Most participants agreed that stakeholders were brought in from the onset, which included the planning phase, and this continued until implementation. At that point, mostly officials are involved, inclusive of councillors and service providers. This is confirmed by the following participant who conveyed the same opinion:

Stakeholders are involved in the planning stage, obviously monitoring implementation. I think they are involved at a stage where the project starts and the project team would introduce them to the project, the contractor, and we cannot shy away as people are interested in jobs. Obviously that element, there would have interest in that project when it starts. Actually, before the project starts EWS officials go to the councillors and the planning engineers to discuss the projects; then after that the procedure will follow. Yes, they are because the municipality will decide that we need to do a service and a service provider will be appointed and looks at the scope of work and decide what is going to work. Then it is taken back to the municipality, then it goes to the community. There is always decision making within the processes (Interviewee 10, Business Support Unit).

This outcome concurred with the finding of Pedrini and Ferri (2018), who found that the success of a project is critically dependent on stakeholder participation; and the early involvement of external and internal stakeholders is very important.

5.2.3.4 Communication channels used to enhance stakeholder relationship management

It was identified that interacting communication and electronic channels were currently in use to promote stakeholder relationship management and to communicate with stakeholders.

The participants indicated that face-to-face communication channels were used. These channels included meetings; individual one-on-one conversations; forums; reports and notices. Meetings were the most highly ranked communication platform. Meetings also occurred at different stages of the project so that stakeholders could be informed and the project status conveyed. Sometimes, emergency ad-hoc meetings would also be called if a matter was urgent. Minutes and records were also kept as a point of reference for what was discussed. This is confirmed by the following participant:

> *They also have monthly meetings, talking towards the project's progress, which is fine, but I am saying it must also be cascaded to the project steering committee. There are many meetings with stakeholders and main contractors for the discussion of the programme and the progress. In addition, there is a PSC that sits monthly. We have monthly meetings that is where we update the issue of reports; what the state progress or how far we are; which stakeholders/businesses have benefited; how many local labour was employed. Most projects appoint an administrative person who becomes site agent or principal agent communicating on behalf of stakeholders. Contractors and the client and the community, but for me there is that additional element where the project manager must also take a drive. For communities, some need a written notice or verbal communication, but it all depends on the stakeholders (Interviewee 9, project manager).*

This finding was supported by York and Orgill's (2020) study on the viable system model, which discovered that competitive organisational behaviour is inextricably linked to the ability to understand and manage functions and relationships. As a result, communication channels are established, information flow is organised, and a firm's development is rationalised and harmonised with all external relationships.

Participants also indicated that some electronic media channels were used to communicate. These media were also seen as effective communication channels. They included radio and television, newspapers, emails and telephones. Local radio stations and TV stations were used to communicate to particular areas. This is confirmed by the following participant:

> *Within council there are a number of communication channels; for instances there is the radio to communicate to a particular area and let them know if they want to participate and also the posters in different communities, as not everyone listens to the radio. Not everyone is on social media. Bill-boards, through emails and printing media (newspapers). The channels used mostly are Gagasi radio, telephone and emails (Interviewee 6, social facilitator).*

5.2.3.5 Information access and disclosure

This key sub-theme examined the concept of information access and disclosure, which is important in stakeholder management.

This sub-theme explored the current opportunities for accessing information. Participants highlighted that meetings; forums; notices; programmes; and structures were used to access information. This is confirmed by the following participant who conveyed the same opinion:

> *We have the war rooms, or Operation Sukuma Sakhe Programmes, which is one of the platform that we have and look at improving the service delivery. The community access information via political structures like the wards. African National Congress (ANC) leads most of the wards.*

> *Every Wednesday there are reporting to BEC. It is their job to ensure that the message is translated to the community. Like regional forums that can be communicated as well, so there is constant communication, but the frequency of it depends on the needs of the stakeholder. I don't think so that's where we are lacking in terms of public participation. Sometimes there would be a notice to say we are calling the public to comment: they must comment on such a date, but we don't receive those comments. Local structures can be monthly meetings. Sometimes we use the platform that exists at ward committees' meetings. They can be updated (Interviewee 5, social facilitator).*

This result was consistent with the findings of Dal Maso et al. (2018), who discovered that, in order to transmit information fast and properly, the project team must set communication norms and make sure they are followed. Information flow for the project must be rapidly disseminated through formal channels of communication, especially in the case of significant changes or issues.

This sub-theme addressed the attitude of management towards information disclosure. Participants highlighted that, in most cases, information was not being disclosed effectively. This is confirmed by the following participant:

> *If we are disclosing that information to the business forums, that is very hard to ask as EWS officials. It is very hard to disclose information. It depends on the approach that you take. Some people are more patriotic, where you find that the attitude is more of all-inclusiveness in terms of how they engage with stakeholders (Interviewee 5, social facilitator).*

This outcome disagrees with the findings of Khan et al. (2021), who found that project governance disclosure and reporting give correct information, timely reports for decision-making processes, and access to key project reports for important stakeholders.

However, one participant felt that inconsistent information was disseminated. Information was only given when required and not by default. Hence, standardisation was needed in terms of consolidated information. This is confirmed by the following statement:

> *Another grey area, you will get information when it is required. It is not something you get; you get information through the Project Steering Committee. On a technical meeting, you cannot say I need information for Enterprise Development if that information is accessible to me. Not even ourselves when we sit with various department. We have to go through project manager. They need to ask for that report by the time you consolidate it (Interviewee 10, Business Support Unit).*

This outcome is not in support of the findings of Gabriel (2015), who concluded that performance information is acquired, examined, and disseminated in quarterly reports throughout the monitoring and controlling process. Therefore, stakeholders should get information through formal channels, such as reports.

5.2.4 Stakeholders relationships

This primary theme examined the key aspect of stakeholder relationships. It was informed by the following:

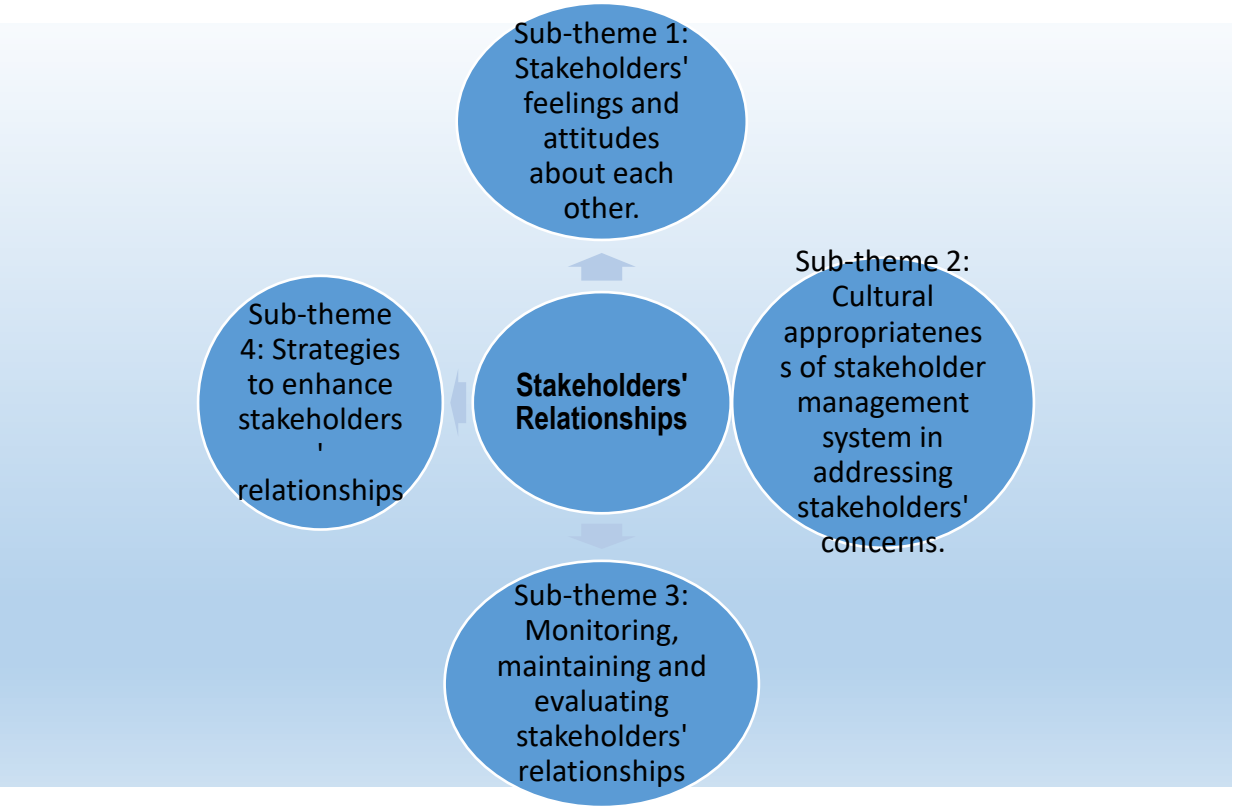

Figure 5.9: Sub-themes for main theme 4

5.2.4.1 Stakeholders' feelings and attitudes about each other

It was important to establish how stakeholders felt about each other. Stakeholder cohesion is important. However, the results implied a more negative feeling and attitude towards each other. Traditional leaders are historically significant leaders of the community and occupy their positions based on traditional conditions and roles. The councillors, however, are employed based on 'political' influence. In addition, the business forums have more of a business interest and they are leaders from that perspective. They can also stop projects for their own business-related reasons. This means that there will be inevitable conflict between the three leadership roles, as each has different interests.

Participants felt that the relationship between stakeholders is, at times, not good. This is confirmed by the following participant:

The relationship of these stakeholders should be a working relationship. However, but when you speak of a ward councillor, bearing in mind that they are elected and they are members of certain political parties, they become leaders in the society. There is a perception that when they execute their duties they will be more biased on their political parties. Then the traditional leadership will become the watch dog in the village, saying: "You coming to divide my people because you taking certain groups and leaving out others in my village." So as a political party, there is going to be tension because sometimes you even hear of traditional leaders summoning councillors. In my personal opinion, I think there is a lot of competition and that other stakeholder feel better than the others. The members in the business forum are consisting of youth, women structures and community structures like ward committees. In other words, this body will address the other ones because there are affiliated to each other. When a tender is advertised they do not say only forums can apply for this one. Everybody within the community can apply as long as the company is in order (Interviewee 12, councillor).

This result agreed with those of Vuorinen and Martinsuo (2019), who found that including stakeholders provides an opportunity for social negotiation and conflict resolution, as well as a possibility for co-operation and collaboration that may be advantageous to the project. A benefit of effective stakeholder engagement is greater project acceptance.

However, very few participants perceived positive feelings and attitudes towards each other. Relationships were mutual, with the project service providers providing the project, which would be well received by the beneficiaries – a mutualistic relationship. This is confirmed by the following participant:

Once all stakeholders appear to have an input on the table, the issue of cross-referencing becomes here and there; but the most important thing to all stakeholders is their contribution. They need to say: "I have been

given a chance as much as I have other stakeholders". It could be an opposing stakeholder, but they want to say how their matters are going to be handled. All the stakeholders in the community find themselves happy about the other stakeholders around them as they listen to their concerns, except the business forums (Interviewee 10, Business Support Unit)

This outcome disagrees with the findings of Cognini et al. (2018), who found that factors, including management, interdepartmental co-operation, communication, and user involvement are essential for project success.

5.2.4.2 Cultural appropriateness of stakeholder management system in addressing stakeholders' concern

Currently, the cultural appropriateness may need improvement in terms of addressing stakeholders' concerns. More sensitisation is needed, due to the region having different cultural communities. Participants felt that the stakeholders need to be capacitated in terms of cultural appropriateness. This is confirmed by the following participant:

As eThekwini has different cultural communities, I think they do cope. It is just that they are not capacitated in terms of stakeholder management in such a way that they are able to advise accordingly. We need to talk about it and put it out there and not keep going back on olden-day issues. Certainly, you find here in Durban where the project managers cannot articulate the language spoken by the other groups and you know that Durban, in terms of demographics, has more black population; there is an element wherein the community there is a barrier of communication. And some of these things will be issues of information that would have been engaged in the language they are used to (Interviewee 10, Business Support Unit).

This result agreed with Park et al. (2017), who found that, in order to complete a successful project and satisfy all stakeholders, the approach to guarantee a well-defined project should incorporate full involvement from all relevant stakeholders, regardless of cultural difference.

5.2.4.3 Monitoring, maintaining and evaluating stakeholder relationships

This was an important sub-theme which sought to determine how the monitoring and evaluation of stakeholder relationships was done. The participants believed that there was a lack of monitoring, primarily because the relationships tended to end once the project was over. Relationships were only for the time of the project. This is confirmed by the following participant:

> *There is no monitoring of the relationship. Once the project is complete, the project team leave the site. We just rely on to keep the project going. I do not think there is any big or formal monitoring programme (Interviewee 4, project manager).*

This outcome is in disagreement with the findings of Cascetta et al. (2015), who found that stakeholder engagement includes talking to and involving stakeholders, fostering better relationships with stakeholders, and promoting stakeholder involvement in decision-making at all project phases.

Some participants mentioned that ongoing communication was key to monitoring and maintaining relationships. Ongoing meetings need to be held, and personnel such as CLOs should be used to facilitate communications. Reporting mechanisms also need to be in place. This is confirmed by the following participant who conveyed the same opinion:

> *There is a way for continuous engagement. Once the project has been introduced, and even after completion, you must be able to protect that project. If the relationship is healthy, stakeholders will protect the project. They will be able to report water leaks. If we don't report, we will be exposed to a lot of costs, so maintaining relationship is that continuous engagement to be able to assist where possible. Actually, they are*

monitored and evaluated through weekly meetings and extended to fortnightly, and it should be an item on the agenda where they are invited to come and discuss regarding the specific project (Interviewee 7, project manager).

This concurred with the findings of Cascetta et al. (2015), who found that stakeholder engagement encouraged stakeholder involvement in decision-making at all project phases. Similarly, Hargrove and Heyman (2020) came to the conclusion that the capacity to consistently deliver the right information to the right person at the right time is essential for project success and stakeholder engagement.

5.2.4.4 Strategies to enhance stakeholder relationships

The following were seen as strategies to enhance stakeholder relations. Communication and feedback are very important for transparency. Hence, there is a need for more meeting platforms for communication and feedback. There also needs to be formalised communication channels, whereby people can direct their communication and receive adequate feedback. Participants felt that communication skills were necessary to avoid conflict/anger related problems when communicating. This is confirmed by the following participant:

The wards have the stakeholder meetings at least once a quarterly, where all stakeholders meet so that the flow of information and being able to understand what is happening in the water department, and their frustrations, they are able to report them and engage with the water department (Interviewee 2, councillor).

This result was consistent with the findings of Mashali et al. (2020), who discovered that successful project management depends on the capacity to communicate with, and manage, relationships with the many project stakeholders. Therefore, a lot of information, including expectations, goals, and demands, must be continually communicated to all important stakeholders in order to ensure the project's success.

Additionally, in relation to communication, is the pertinent aspect of information dissemination. It is crucial that the right, accurate information is being passed to all stakeholders. Participants felt that good information dissemination may promote understanding and transparency among stakeholders. The absence of this may lead to conflict and people will begin to ask questions. Hence, having an information dissemination strategy will serve to benefit the stakeholders. This is confirmed by the following:

> *Stakeholders meet so that the flow of information and being able to understand what is happening in the water department, and their frustrations they are able to report them, and engage with the water department. That there need accurate information, 'cause if we give them daily, then something changes, they will start questioning, why was it changed, only after a certain milestone has been reached. Yes, they are working as stakeholders because they go on project meetings with the councillors, even if it is on a weekend, so that they can address the community. They are the centrepiece of the entire puzzle. All information needs to go via through them (Interviewee 7, project manager)*

5.2.5 Challenges, Conflicts and Resolution

This primary sub-theme was crucial. It examined the potential challenges and problems in stakeholder management, as well as potential opportunities and approaches to attain goals and promote stakeholder management.

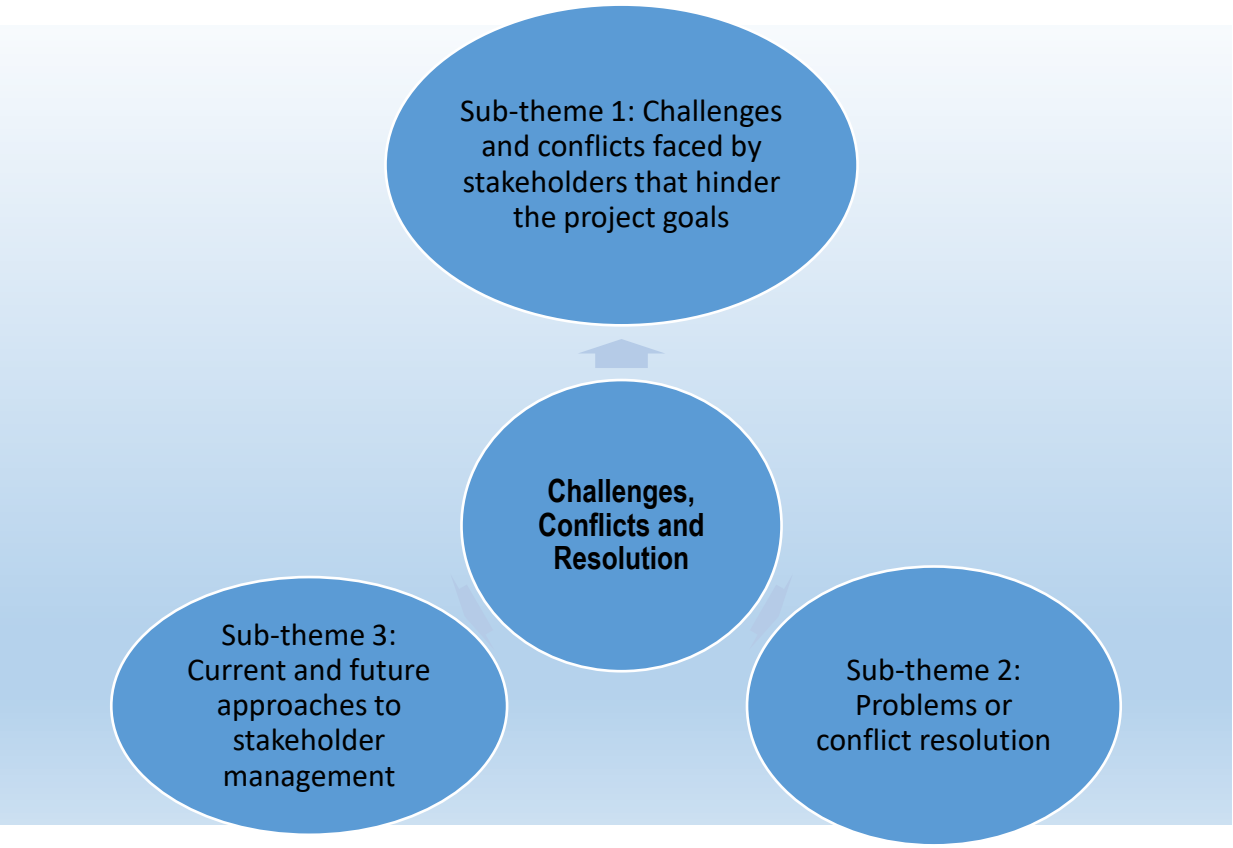

Figure 5:10 Sub-themes for main theme 5

5.2.5.1 Challenges and conflicts faced by stakeholders that hinder the project goals

There was a plethora of challenges experienced by stakeholders which hindered the goals of the project. These challenges include volatility; resources and infrastructure; finances; information and understanding; and conflicts of interest. Participants indicated that volatility is ranked highly as a challenge, and this was informed by several factors. This is confirmed by the following participant:

> *Sometimes when working on a project we used to have a main contractor which is led by 'whites'. Most of them, according to my understanding, there are looking down on the other contractors. For example, EWS wants to use a land of another race there is somewhere you can see that this is unfair to the people. Also these main contractors give better prices or*

offers to the other race. We as 'black' officials of EWS, that is where we are getting a hard way if we are working on the 'black' landowners Those who are main contractors refuse to give better offer to the land owners (Interviewee 5, social facilitator).

This outcome agreed with the findings of Kujala et al. (2020), who concluded that the concerns about how power is allocated and distributed among all external and internal stakeholders are connected to political interests.

Participants highlighted that the issue of resources and infrastructure was another challenge. There was either a lack of resources to carry out the project, or the processes to acquire resources were restrictive, which then led to project delays. This is confirmed by the following participant:

First, it would affect the project by resources to take up a project. Most of our projects that are pertaining to roads, we don't have contractors that have the financial stability to open up credit with. They lack access to facilities to make sure that they buy the material for the project. Now we have a situation where a contractor is appointed by the domestic, no matter how is going to have a problem with financial constraints, and that will impact directly on the project. Remember, if one portion of the project is appointed one contractor that causes a challenge (Interviewee 10, Business Support Unit).

This conclusion was consistent with the findings of Khan et al. (2021), who discovered that the challenges faced by developing countries are caused by the public sector's convoluted processes, a lack of resources and experienced people, and an inefficient bureaucracy. Biesenthal and Wilden (2014) came to a similar conclusion that a successful project governance process strives to align project priorities with the goals and business strategies. The project owner and project board are therefore essential in assisting in the problem's resolution within a suitable project governance framework, by providing the necessary resources and senior management support.

Furthermore, participants highlighted that when project infrastructure cuts across people's land and buildings, then it can become challenging. Some people do not want pipelines to run across their properties. In addition, some want to be heavily compensated when this happens. This causes conflict, delays, and unexpected expenses, as was confirmed by the following participant:

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> *There are challenges that are faced by the stakeholders in all these projects. Remember even the community, when introducing a project, others or community within that land, for example, when articulating a pipeline, they will have expectations. During road construction, maybe they are houses, which will be affected, and need to be moved. The project cannot move, so those are the challenges that are faced by leadership and in other communities, you can dig until you realise it is a grave site, then you call an expert to come and exhume the bodies (Interviewee 2, councillor).*

This outcome also concurred with the findings of Golar (2019), who found that disputes between external stakeholders may be the most challenging to settle, due to their diversity and the absence of defined protocols for handling them.

Participants felt that the issue of labour and budget also pose some challenges. This is confirmed by the following participant:

> *There are always challenges concerning employment, whether it's local labour or any forms of employment. The main one is employment of the emerging local contractors. However, most of the time the big challenge is that we are faced with now on projects is rates. The main contractor,s most of the time, are giving the local contractors low rates when it comes to subcontracting. That is where the conflict usually starts (Interviewee 4, project manager).*

This result conflicts with the findings of Platonova et al. (2018), who came to the conclusion that the fundamental goal of stakeholder management is to complete projects on schedule, within budget, and without sacrificing quality. As a result, the relationship between stakeholder management and project success should not be disregarded. Instead, there could be financial problems, with parties not disclosing budgeting information.

Participants also highlighted that information reporting to stakeholders was a challenge. The information was not being passed on accurately to the stakeholders in the community and this led to misinterpretation and misunderstandings. This, in turn, led to protests and disruption for the project. This is confirmed by the following participant:

> *The challenges are information reporting to all stakeholders; communication to stakeholders are some of the things. As much as you want to see elements of either threatening to stop a project, those are some of the things that have not been done. They will creep up into those elements. So those, for me, are the biggest challenges. How, then, do you make sur? Is you either through procurement before planning or you would have data, you would have announced yourself to, say, to the community that this is what we plan for you in the next two years. This is going to be our implementation plan and those who will participate in the project and then will begin to add it up for stakeholders to participate. So, community in terms of that, do we have the people available and submit their names. We start from planning, implementation up until completion (Interviewee 10, Business Support Unit).*

This outcome concurred with the results of Hargrove and Heyman (2020), who discovered that stakeholder communication is a strategy that encourages information exchange among the parties concerned as well as their engagement and empowerment. The capacity to deliver the right information to the right person at the right time and in a less expensive manner is therefore crucial for project success and stakeholder participation.

Last, but not least, participants felt that conflicts of interest between stakeholders abound. Subcontracting becomes an area of conflict, when subcontractors, forcefully, want to be part of the project without following due procurement processes. Furthermore, they would not account for their part of the project or commit to their role in project implementation. Community leadership in terms of councillors and traditional leaders created tensions. Councillors were elected leaders, whilst traditional leaders felt that it was their historic birth-right to lead the community. This is confirmed by the following participant:

> *There always been a conflict of interest in that one, e.g Madelangokubona (business forums) who stop the projects. In particular, when you have certain individuals who believe they are community leaders and they are continuing harassing and obstructing work and not part of any management team they are just individuals creating trouble. The conflicts amongst each other, such as not seeing eye-to-eye with the subcontractor or with the project manager, these are things that the stakeholder management might pick up from the site (Interviewee 12, councillor)*

This comment is in line with the conclusions of Platonova et al. (2018), who found that public sector infrastructure projects have underperformed, and the primary causes of this are ineffective governance and conflicts of interest among the numerous players, including consultants; contractors; project directors; sponsoring organisations; and various social community groups.

5.2.5.2 Problems/conflict resolution

Participants felt that communication and engagement are the most appropriate methods to resolve the above challenges and conflicts of interest. This is confirmed by the following participant:

> *We normally engage with them by finding out the concerned issues and deal with those issues; as when they come to projects it is difficult to predict what is going to happen in a week or weeks' time. It is some kind of day-to-day conflicting issues, so they are dealt as they come. It is always*

communication that is important to resolve conflicts and also transparency is the key; it helps a lot (Interviewee 6, social facilitator).

This outcome concurred with the findings of Khan et al. (2021), who noted that project stakeholder management is based on constant communication with stakeholders to understand their needs and expectations; solving problems when they arise; handling competing interests; and fostering appropriate stakeholder engagement in project decisions and activities. Furthermore, Ewurum et al. (2019), found that ongoing collaboration with stakeholders was effective in fostering understanding. Similarly, Oetzel and Getz (2022) found that managing stakeholder conflict involves using methods of stimulation and resolution in order to achieve an optimal level of calm over the course of a project. This demonstrates that experts in public relations and alternative dispute resolution are crucial players in handling stakeholder conflicts and should be included in the implementation of public projects.

5.2.5.3 Current and future approaches to stakeholder management

Current and future approaches to more effective stakeholder management can include improved communication, negotiation, capacity development and strategy development. Participants felt that communication with stakeholders needs to be improved for effective stakeholder management. This is confirmed by the following participant:

Communication with stakeholders need to be improved. On that platform, each stakeholder engages on that particular meeting. Then it becomes easy. And including all-inclusive in terms of participation in the project in one room. It appears to be good because we are not negotiating with business forums and we are not negotiating on various platforms. We had one project that has all of these groupings that have been identified. We presented the project to say what it is about from planning and what we have done. Although some stakeholders are there for financial gain, but I think there have to be consulted that each stakeholder knows how their roles will be affected and how they link. Maybe that's how we can resolve it. I think we also have to develop a proper strategy that would be adopted

by the council and various committees. Before council adopts any strategy, it has to go via approved structures, but I think there have to be a proper strategy for stakeholder management that would be developed (Interviewee 11, councillor).

This outcome was in line with the findings of Neudert et al. (2020), who found that, although disagreements often took the form of debates, brawls, confrontations, and grumbling, "mediation, bargaining, and reconciliation" were the main dispute-resolution tactics employed in the public projects.

5.3 Chapter summary

Chapter five discussed the findings reached after applying a number of analytical techniques to qualitative data that was gathered from participants through interviews using an interview schedule. Qualitative analysis was conducted on interview transcripts to explore the use of systems thinking approaches in the development of a holistic model to improve stakeholder management in the EWS unit. The interviews contributed to, and improved, the researcher's understanding of the stakeholder management challenges in EWS projects and the stakeholder management systems that were being used in EWS projects. The chapter concluded by presenting possible approaches fpr more effective stakeholder management. The following chapter presents the findings identified from the SSM workshop in order to address the last two research objectives.

CHAPTER SIX: FINDINGS AND DISCUSSION FROM SSM WORKSHOP

6.1 Introduction

The preceding Chapter presented the findings obtained after employing multiple methods of analysis to the qualitative data collected from participants through interviews. This chapter presents the findings from the analysed qualitative data which was collected during the SSM workshop. The study is qualitative research in nature. The researcher is a staff member in the unit where the study took place, so the study is in line with the theories of action research, as presented through the principles of SSM. The SSM workshop methods were used to point to potential improvements that could be made to project stakeholders in EWS infrastructure projects. The SSM workshop mainly focused on the following two research objectives:

i) how SSM can assist in creating an enabling environment for effective stakeholder management in EWS projects; and
ii) how SSM can assist in creating a holistic model aligned to systems approaches to facilitate stakeholder relationships and management in EWS projects.

The primary purpose of the study was to use systems thinking approaches to develop a holistic model to improve project stakeholder management in the EWS unit.

6.2 Target participants

The targeted participants for the study comprised of project managers; contractors and sub-contractors; local business forums from the communities; women business representatives; councilors; representatives of traditional leaders; and different levels of management at various departments in the municipality. The EWS, as the study area, was selected based on its relationship with the beneficiaries of water and sanitation services. A sample of twenty participants was purposely selected to participate in the SSM workshops. These participants were made up of people who have been involved in one way or another in the implementation of EWS infrastructure projects.

6.3 Findings from the SSM workshop

Analysing qualitative data entails identifying, classifying, and categorising its themes and patterns (Williams & Moser, 2019). The process by which the researcher organises both primary and secondary data obtained during the course of the study is referred to as 'data analysis.' A technique for gathering, combining, coding, segmenting, organizing, and developing patterns from unstructured data is qualitative data analysis (Appelman & Sundar, 2016:79). In qualitative research, the aim of data analysis is to comprehend the viewpoints and experiences of the participants and to offer an answer to the research question. The aims of the study should be achieved regardless of the data analysis method chosen. Typically, data analysis entails summarising data, condensing it to a manageable amount, looking for patterns, and applying statistical techniques (McKinney & Cook, 2018). Data themes and patterns will be found and extracted using thematic data analysis. Most qualitative research initiatives use thematic data analysis, a qualitative research technique (Schoonenboom & Johnson, 2017). The approach splits the data into many groups, based on how relevant the data is to the subject being studied.

6.4 Overview of the SSM workshop

The SSM workshop was held on October 9, 2020. Good participation was achieved, as almost all the project stakeholder groups were represented at the workshop. Invitations were sent out to participants with a full explanation of the purpose of the workshop, as outlined in the informed consent letter. The local business forum was represented by three members from different regions of the municipality; three participants represented the EWS project management group; four came from the EWS project social facilitation group; two were from the outsourced services of Institutional Social Development (ISD); one was a member of MKVA; one was a member of the project steering committee; and one was a member of the community as a municipal ward committee member. Participants were divided into four groups. Some participants were observed to have previous knowledge of stakeholder management and were noticeably dominant in the groups.

The workshop commenced with an introductory section that presented the study and acknowledged the current COVID-19 pandemic. The workshop was set up to conform to the

COVID 19 protocols. Social distancing was made easy by putting four tables per group of four people. Each participant had her or his own stationary pack in which there were pens, flip chart markers, sticky notes, individually wrapped peppermint sweets (refreshments) and some tissues. Each table had a sanitiser spray bottle and 70% alcohol wipes in case they wished to share the station. The COVID 19 protocol announcement was covered in the introduction. Screening at the point of entry/door was carried out by the workshop administrator of the day, prior to entering the workshop venue. A box of disposable surgical masks was provided at the entrance to the workshop.

6.5 Workshop procedure

After explaining the processes and the procedures to be followed during the workshop, the research assistant explained the first group activity. In the first activity, the groups were asked to draw a rich picture (Annexure D) of their understanding of the project stakeholders in the EWS infrastructure project. Guidelines were provided and were projected on an overhead projector. Groups were requested to draw a picture of all stakeholders relevant to the EWS infrastructure project, including people; processes; places; events; emotions; relationships; perceived stakeholder feelings and their power during the implementation of the project. After some discussion among the group members, each of the four groups developed a rich picture (Annexure D) on the provided flip chart and presented it to the larger group at the end of this exercise.

The groups were given about an hour to complete their rich picture (Annexure D) drawing activity and to prepare for presentation to the larger group. This session was used as the pre-analysis of the situation, and was not intended to provide definitive results. The researcher hoped to understand the situation from the ‘summaries’ provided by the stakeholders. The participants were instructed to capture the real situation as they understood it. The rich pictures (Annexure D) from the four groups of participants are represented in Figure 6.1 on page 201.

After the group presentations of their rich pictures (Annexure D), the researcher provided the guidelines for the next exercise. The participants were told to analyse their rich pictures and identify the gaps and those to be included in the presentation. They were asked to present the pictures and report on stakeholder relationships in the water and sanitation infrastructure project. The presentation included talks about what the group had left out of the picture, and the reason for that. Participants were also asked to provide their interpretation of the picture with regards to the

effectiveness of the stakeholder management process. After the group presentations by all four groups, the participants had gained insights from the workshop.

6.6 Findings from SSM workshop

The seven steps of the SSM process were followed as a framework to guide the researcher through the data collection and data analysis. The findings from the face-to-face interviews were used as the first step of the SSM framework (Annexure C) and were used to determine the context and problematic areas of the research study. Themes that emerged from the interview data were used to facilitate the SSM workshop. Table 6,1, below, outlines the seven steps of the SSM framework (Annexure C) that were followed in the study.

Table 6.1: Seven steps of SSM framework

Step 1	Face-to-face interviews and analysis Themes emerged which were used to facilitate the SSM workshop discussion.
Stage 2	Rich pictures were developed from the issues which emerged from the interview data. Key issues and concepts were discussed among the participants. From the issues and points in the groups' rich pictures, the researcher identified the indicators of effective stakeholder management.
Stage 3	The group participants, with the researcher, formulated the root definitions by engaging Checkland's CATWOE model for each theme developed at Stage 2.
Stage 4	From each theme developed, the researcher built a conceptual model. The model identified the key activities that need to be carried out for the improvement to take place (transformation).
Stage 5	This step was also incorporated in the second step where the participants were brainstorming in their groups, expressing what they thought should be implemented to improve the problem situation.
Stage 6	The researcher then evaluated the results that emerged from the group discussion. Group participants discussed the conceptual models and proposed the changes for improvement. Then the intervention framework for the problem situation was developed.
Stage 7	A model for improving the project stakeholder management in EWS was developed using the key recommendations from SSM steps four to six. The key concepts were then placed into an ease-benefit matrix, as shown on Figure 6.3.

6.6.1 SSM Situation analysis

According to Nikakhtar et al. (2015), SSM is a relevant instrument to explain chaotic and messy problems in order to understand the background of the situation. The second step in the SSM process was about analysing the situation by defining the circumstances, through developing rich pictures (Annexure D). Rich pictures were used to illustrate the processes, stakeholders and their concerns and interrelationships (Aubrecht et al., 2019). The third step included identification of critical and relevant perspectives from the themes and the development of important aspects of the SSM, i.e., root definition, CATWOE and a conceptual model for the problem situation.

Each group was asked to draw a rich picture (Annexure D) and evaluate the picture and the situation they were depicting. Participants from all four groups indicated, during their presentations, that there was a lack of a coherent stakeholder engagement approach which manifested as a problem during the implementation phase of all projects. This was a confirmation of one finding from the interviews under the sub-theme of stakeholder impact, where negative cohesion among the stakeholders was identified. It was identified that project managers from EWS were not seeing stakeholders as an important aspect of the project management process. This conclusion ran contrary to the findings of Dal Maso et al. (2018), who concluded that project managers must find suitable ways to address problems caused by certain stakeholders' characteristics. This is because stakeholder power and competing interests present a significant barrier to stakeholder management.

Although participants managed to list what they believed to be the critical stakeholders, they reported that they had difficulty trying to identify the linkages between the stakeholders. Some additional stakeholders were mentioned during the presentation, although they were not included in the pictures. A careful study of the rich pictures (Annexure D) by the researcher, after the completion of the workshop, revealed commonalities in all four group presentations. The researcher constructed one rich picture which is presented as Figure 6.1. The picture is the consolidation of the four group pictures into one picture, from the common opinions and discussions of the participants.

6.6.2 Consolidated group rich picture

Presentations of, and engaging with, the rich pictures organised the problem situation into a well-articulated situation and assisted the researcher in selecting the relevant systems from the themes identified in the problem. The main groups of problematic issues cannot be re-listed from the rich picture. However, it is worth emphasising that the rich picture created the basis on which to articulate the root definitions that followed.

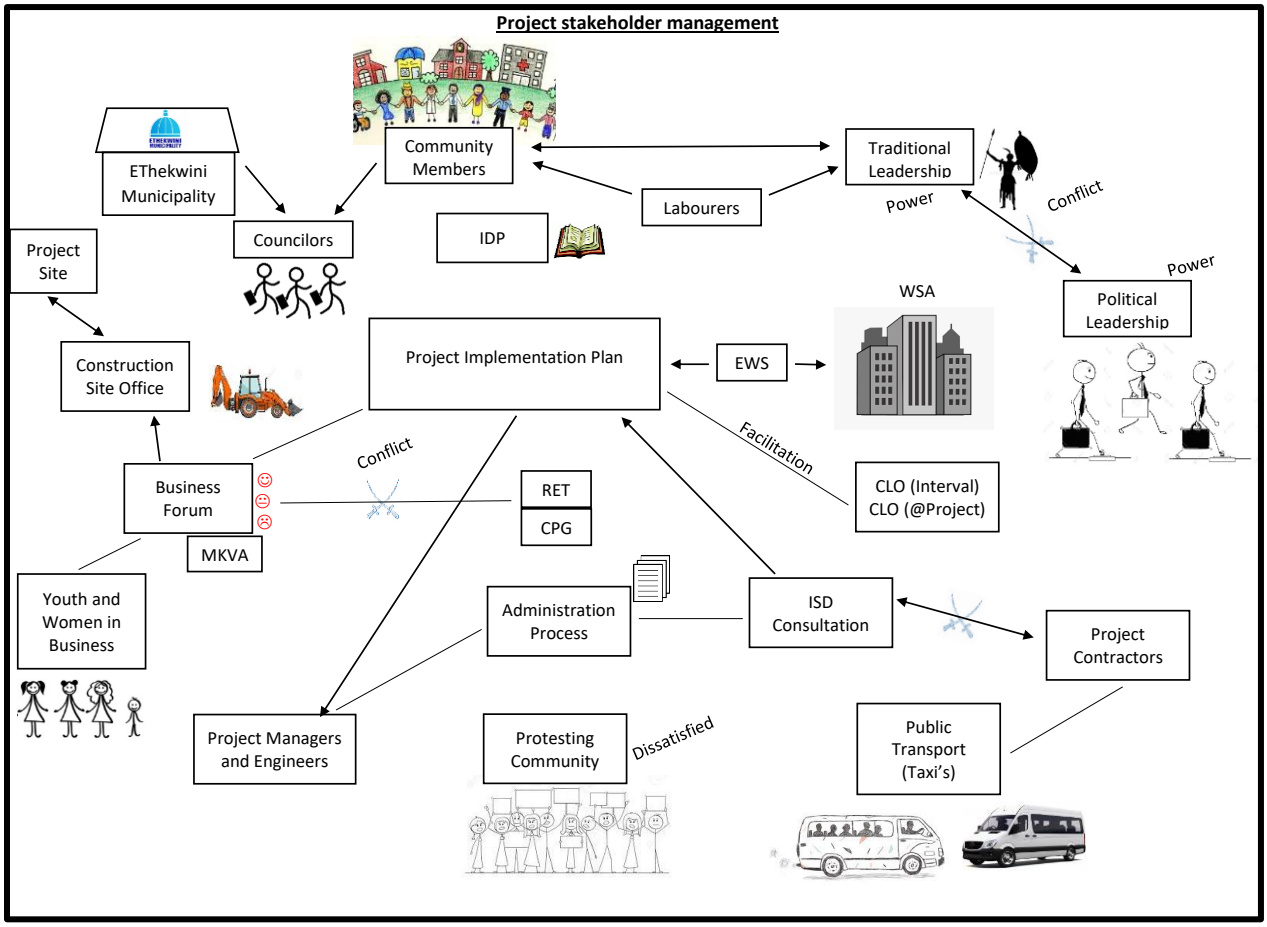

Figure 6.1. Consolidated group rich picture (RP) (Source: own compilation)

The rich picture (RP) in Figure 6.1 illustrates the problem situation from the perspectives of the participants of the study. The EWS headquarters (HQ) was the main stakeholder in the RP and the owner of the infrastructure projects in question. This outcome confirms the interview results where

it was identified that the municipality was the main stakeholder and its respective departments were the internal stakeholders. The interviews indicated that it was the municipality that was responsible for resource management. This outcome agreed with that of Hammer (2019), who noted that municipalities who are water service authorities (WSA) are in charge of supplying and providing water to the communities under their auspices. In the local government system, municipalities are in charge of providing vital water services to communities.

The local business forums come from the communities and were presented by all four groups as a critical stakeholder group. This was because they are well known for standing out from the community and challenging the project implementation processes if they are not satisfied with any decision. This was in agreement with the findings from the interviews, where the business forum was perceived as only focusing on its own business interests and not considering other stakeholders' interests. Project management also stood out as a critical process in the situation because stakeholder management, which is the problem area in the study, is an element of the project management system. Communities were identified as the primary stakeholders in the situation and the main beneficiaries of all projects. This result was in line with the findings of Kossova and Sheluntcova (2016), who came to the conclusion that projects benefit communities in two ways: firstly, through the project's outcome, which typically improves the health and hygiene in a given community; and secondly, through the community's economic development, which is typically measured by the number of jobs created during the project's implementation.

Although all the stakeholders come from the community, a part of the community is just neutral and inactive. Their main interest is to see the project completed so that they benefit from the outcome of the project. Participants agreed that communities are the primary stakeholder. This is the group of stakeholders that quickly protest for service delivery should the projects either not come to the community, or are interrupted by any of the stakeholders with different interests. There are two groups of leadership in the RP, political leadership and traditional leadership, which is more powerful in rural areas. These two sets of leadership have conflicting interests most of the time, indicated by the crossed sword in the RP. Mostly, the conflicts are around issues of power. The political leaders are elected, and they serve a five-year period; whereas the traditional leaders are permanent leaders who are traditionally ordained, and there is no fixed term assigned for their leadership. This result agreed with that of Kujala et al. (2020), who discovered that political

interests are linked to concerns about how power is divided and dispersed among all internal and external stakeholders. Another important component of stakeholders is their interests, which differ from power, in that they have specific objectives for initiatives. In order to engage and manage different, or even opposing interests in initiatives, managers must understand stakeholder interests.

The following themes were identified on the rich picture; some came up in discussions:

- stakeholder's authority
- value, contributions, and impact
- stakeholders' influence
- input and feedback
- communication
- stakeholder relationships
- challenges
- conflict and resolutions

6.6.3 Step 3 – Root definition

The next phase of SSM workshop analysis was the root definition of the problem situation. The group participants, with the researcher, formulated the root definitions by engaging Checkland's CATWOE model for each theme developed during the discussion and presentation of the rich pictures in Stage Two. From the various system issues listed above, stakeholder relationships emerged as the main theme for the improvement of stakeholder management in the EWS. This outcome concurred with the findings from the interviewees who agreed that stakeholder cohesion is very important for the success of the project. Additionally, the results supported the findings of Vuorinen and Martinsuo (2019) who found that stakeholder involvement offers a forum for social negotiation and dispute resolution, as well as a chance for co-operation and collaboration that can benefit the project. An advantage of good stakeholder involvement is increased project acceptance.

Stakeholder involvement is the aspect of the process that should be prioritised. Although stakeholder authority emerged as the second important theme, the researcher followed the process of developing the root definition and conceptual model using the CATWOE analysis. Whilst authority is important in project management, this SSM workshop outcome does not concur with

the interview findings. Interviewees were of the view that the stakeholders had leadership authority which varied, depending on their roles in the implementations of projects, and their positions in their constituencies. The project manager seemed to have the most authority, based on participants' responses. This is similar to the study conducted by Sepehrirad et al. (2017), where tools from an SSM approach; CATWOE analysis; root definition; and a conceptual model were used to describe and develop a structure for the Ministry of Petroleum in Iran to resolve the problem of cancer. The SSM assisted in a process of identifying the main actors and customers, and their interactions through different engagements with affected and interested stakeholders (Sepehrirad et al., 2017). Table 6.2 outlines the CATWOE model based on the rich picture analysis.

Table 6.2: CATWOE model based on the rich picture

Customer or client	Communities of eThekwini Municipality
Actors	-eThekwini Municipality -Local business forums -EWS
Transformation	From despotic decision making to democratic decision making
Worldview/Assumption	-If the ETM and EWS can change and involve the all stakeholders during the planning and allocation of budget-forward projects, there will be fewer protests and work-stoppages. -It is assumed that increased communication and access to information from ward level can increase the level of project ownership and fewer protests will be the result
Owners	-ETM -EWS -Communities
Environment	The municipality is an element in the local government system; hence it exists in the political space.

Key customers, the main actors and owners in the problem situation were identified with use of the CATWOE analysis. This process assisted in outlining the process of transformation, pointing out the output and input elements. Identifying the worldview and explaining the environment in which the problem is situated was critical to identify the impact of the improvement to the problem. Main themes emerged from different stakeholder groups while unpacking the CATWOE analysis. The use of SSM is supported by Kulikov et al. (2019) who used it to describe a complex problem and develop a framework that assisted in identifying the source of the problem and solutions to the

knowledge gap in information technology graduates through a CATWOE analysis. Salavati and Mirijamdotter (2017) also used the SSM and indicated that it not only helps with outlining and configuring complex problems, but it also allows a holistic viewpoint of the problem situation, defining several areas and developing issues.

In this study, the CATWOE for the improved stakeholder relationship in the EWS unit revealed that the **customers** in the CATWOE model are the community members of eThekwini Municipality, and the direct beneficiaries or victims of the service delivery projects in the eThekwini Municipality. However, the stakeholders that were identified as the major **actors** were the stakeholders who have a major role to play in ensuring smooth service delivery. Those were identified as the stakeholders who could stop the project should their interests not be met. The results from the SSM workshop identified those **actors** as including the ETM and its leadership, as well as EWS unit senior management and the local business forum. The municipality, EWS and business forums were identified from the results as the main stakeholders that could leverage change in project implementation.

The process of **transformation** was meant to ensure that there are improved stakeholder relationships, which was identified as the key output element. The **transformation** elements of the model refer to the chains of events or activities that result in the improvement of service delivery to the community (Burge, 2019). The **world view or assumption** refers to the views presented by the study participants at the SSM workshop on how stakeholder management in the EWS can be improved. The EWS was identified as the main **owner** of the transformation, on behalf of the municipality. They were therefore identified as holding the key for game changing initiatives for the transformation of the identified problem situation. It is the EWS, through the project officials, who can improve project stakeholder relationships by improving its governance and communication of project information with all the stakeholders (Von Kutzschenbach et al., 2018).

The EWS project stakeholder management, as the problem situation, is the responsibility of the municipality. The municipality is the part of the local Government system. This means that the situation is occurring within the political **environment.** Political organisations have a different landscape, including socio-political dynamics, local and external businesses, as well as socio-economic situations. The political **environment,** alone, is a complex situation that can impact the

progress of infrastructure projects since the projects are being implemented within the municipal wards. The progress on project implementation can also be hindered by the social aspect, in cases when the locals are not satisfied; and this can lead to protests and work stoppages.

Root definition was then developed by the researcher, based on the results from the CATWOE analysis.

The EWS is a municipal-owned system mandated to provide water and sanitation to communities by planning and implementing infrastructure projects through the involvement of all those who are interested and affected by the outcome of the projects.

Figure 6.2: Root definition for improved stakeholder relationship

The key element of SSM is to facilitate and manage change through a clear understanding of a problem situation and the context among a group of stakeholders. The root-definition, above, was developed, based on the results from the rich pictures and the CATWOE model. The municipality, EWS and business forums were identified from the results as the main stakeholders that can leverage change in the project implementation and improve the stakeholder relationships by improving the governance and communication of project information with all the stakeholders (Kasser, 2019).

The local business forums are the groups of people within the communities and the municipal wards of eThekwini Municipality who are representing the business interests within their wards by ensuring that they engage with the municipalities in matters of projects, with the aim of sustaining the local economy through negotiations with the municipal units that are implementing the projects

Figure 6.3: The root definition for the improved stakeholder relationship

6.6.4 Conceptual model for improved stakeholder relationships in the EWS infrastructure projects

The developed conceptual model, shown in Figure 6.4, for improved stakeholder relationships, indicated that some activities were needed to improve the relationships among the stakeholders during the implementation of infrastructure projects. EWS management needs to improve communication among the stakeholder, especially with the beneficiaries of the project (communities). The technical project staff need to ensure that they collaborate with the staff that is responsible for social facilitation of the project. This should address all the soft issues of the project, and the relationship with the stakeholders will improve. Improved relationships with the stakeholders will curb service delivery protests and there will be no project work stoppages. A study by Hildbrand and Bodhanya (2017) used SSM and a viable system model to determine how these methodologies could help in tackling the complexities involved in the sugarcane supply chain. The results of that study assisted with identification of soft issues that could serve as a foundation for improvement within the sugarcane industry's systems. The diagram below depicts the relationships between the concepts that emerged during the analysis.

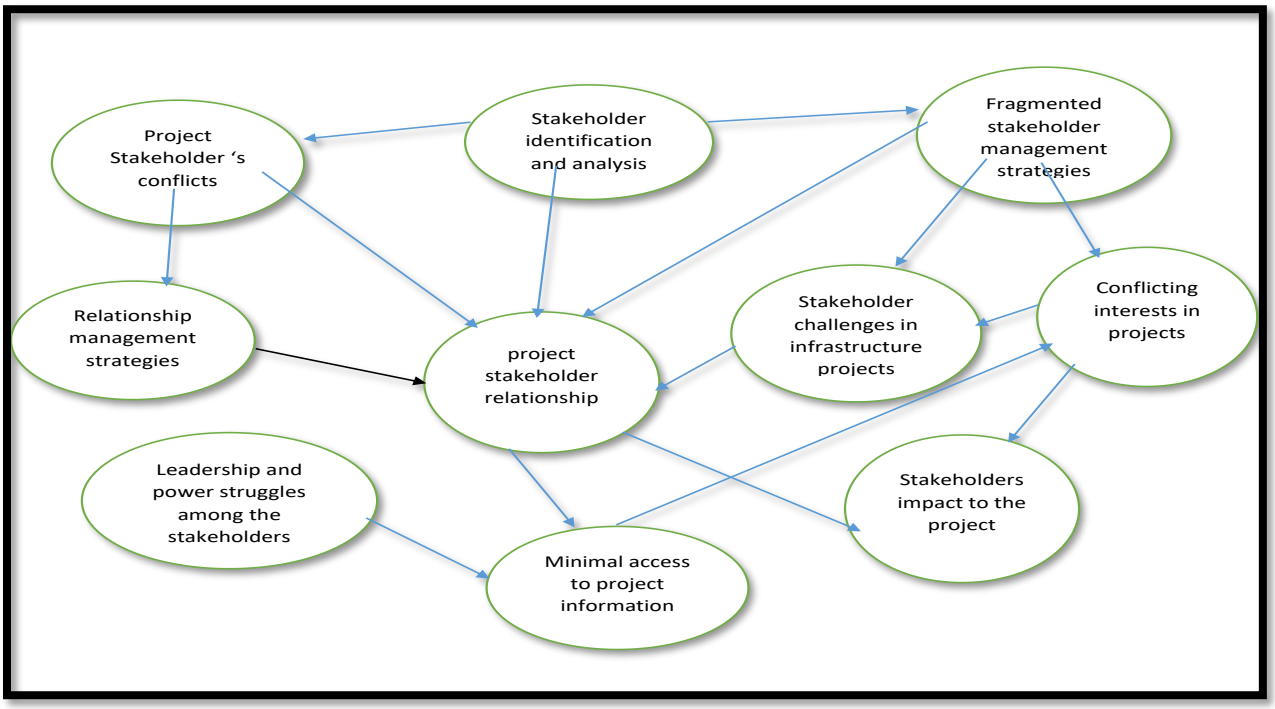

Figure 6.4: Conceptual model for the improvement of stakeholder relationship management

Amidst the complex issues and messy situations encountered at the EWS unit, it is sometimes difficult to identify the real problem that requires changing. Various variables that impact and interrelate with each other are the reason for this problem. The conceptual model was used to determine the relationships among the concepts impacting on achieving the aim of the study. Conceptual models are illustrations that are used to depict the relationships between the main attributes within a system. Conceptual models are thought-drawing in the SSM methodology. The number of arrows coming into the variable means that the concept is critical and must be addressed. The number of outgoing arrows means the concept is a driver or a basic cause.

Theme 1: Challenges

The stakeholder management challenges faced by both stakeholders and management that previously emerged as the theme during the face-to-face interviews also came out strongly during the analysis of the SSM workshop. It was confirmed that, although there are conflicts among the stakeholder groups, another conflict exists between the stakeholder groups and the EWS project management staff during the implementation of the projects. These challenges hinder and delay the achievement of project goals. Conflicts of interest between the political leadership and the traditional leadership were also highlighted as having a negative impact on the achievement of the project goal. This was said to be based on the power struggles that exist in the project environment. As there was no mechanism for conflict resolution during the infrastructure project implementation, an ad-hoc approach was adopted. This result concurred with those of Golar (2019), who found that, because of their diversity and the lack of established standards for resolving them, disagreements involving external stakeholders may be the most difficult to resolve. As a result, a key step in stakeholder management is evaluating stakeholder alliances and conflicts. In support of the same conclusion, Neudert et al. (2020) asserted that this is achieved through resolving conflicts through institutionalised laws and regulating methods for treating conflicts whenever they occur.

Theme 2: Fragmentation

The data from the SSM workshop indicated that there was an element of fragmentation in the existing stakeholder management approaches that EWS is using. As a result, the project managers and project social facilitators are driven by the dynamics of the environment in which the project exists, which is wrong and sometimes impacts negatively on the success of the project. In some instances, the councillors assist in managing conflicts among the stakeholders. This conclusion was consistent with the results of Khan et al. (2021), who discovered that the challenges faced by developing countries are caused by the public sector's convoluted processes, a lack of resources and experienced people, and an inefficient bureaucratic structure. According to Cockburn et al. (2020), the dynamics; a lack of complex internal interaction within the project; a lack of knowledge of complexity; and the way the project is started and completed, are other factors that contribute to business process efforts failing.

Theme 3: Relationship management

There seems to be no relationship between EWS officials and the intended beneficiaries of the project (communities). Although there is a relationship among EWS officials and other internal stakeholders, and with the officials and project leaders, such as outsourced project engineers and the contractors, it was found that communication channels for managing relationships were lacking. This finding concurred with the finding of York and Orgill (2020) who found, using the viable system model, that competitive organizational behaviour is inextricably linked to the ability to understand and manage functions and relationships. As a consequence, lines of communication are created, information flow is structured, and a firm's progress is logically explained and in line with all of its external ties.

Theme 4: Social dynamics

Although there was no image in the rich picture that indicated this, through observations and listening to presentations by each group, it transpired that the projects are operating in a complex environment. Since SSM is an approach that is based on action, and it is known that practical action increases the appetite for situation improvement, those practical actions should be socially

and culturally feasible. Stakeholder management and engagement are regarded as soft approaches to project management. Therefore, it is critical to understand the culture of the individual people working on the projects within the stakeholder groups. It is important that a robust approach to stakeholder management is adopted to conduct stakeholder relationship monitoring. This finding was in line with that of Park et al. (2017), who discovered that, regardless of cultural differences, the strategy to certify a well-defined project scope should include full engagement from all important stakeholders.

Theme 5: Project stakeholder identification

All the participants seemed to understand the concept of project stakeholder management. However, they seemed not to be clear regarding the process of identifying the stakeholders, especially during the implementation of the project. It was observed that there was confusion between the project staff and the project stakeholders. Similarly, during the face-to-face interviews, some of the participants referred to stakeholders as only the local business forums. This was mentioned in all the group presentations, and each rich picture had a picture of the business forum and one of a councilor or a political leader. Some important stakeholders on the project were not mentioned, either in interviews or in the SSM workshop. The business forum's bullying behaviour makes them appear as a powerful and influential stakeholder group. The gap in the system of stakeholder management can be blamed on the absence of a proper stakeholder management framework within the EWS. Project managers are forced to be creative when engaging with stakeholders, which is normal but comes with a lot of problems. The conclusions of Watermeyer and Lewis (2018), who found that correct stakeholder identification is the most crucial stage for some stakeholders, are not supported by this outcome. If the exercise is not done well, the wrong stakeholders may be involved in the project, which would have a negative impact on the project by diminishing the value of the stakeholders' engagement.

Theme 6: Leadership issues

The rich pictures indicated the conflicts between the traditional leaders and the political leaders. Different kinds of communities have different types of leaders. However, all municipal wards are led by their political leaders (councillors). The conflict begins when the project is in rural and

semi-rural areas where there are both forms of leadership in one community. In the interview and also in the rich pictures, it was noted that traditional leaders are sometimes undermined by political leaders. In one municipal ward, the councillor indicated the importance of a good working relationship between the two leadership groups for the wellbeing of the community. This outcome concurred with findings of Begg (2018), who suggested that project managers are crucial and they must be adept at balancing the interests of several stakeholders in order to properly manage a project.

Theme 7: Project benefactor

Communities, as the main benefactors of the project, were highlighted by all the groups and by all the interview participants. Even the participants, who seemed to not understand what the stakeholders are, understood that the community in which the project exists is the primary stakeholder. Communities are the main project benefactors, as they are the ones who stand to be affected either negatively or positively by the outcome of the project. Although all the stakeholders come from the community and assume different roles, based on their interest in, and expectations of, the project, there are community members who are solely interested in the outcome of the project, the water supply, or the provision of proper sanitation services.

This result strongly supports Kossova and Sheluntcova's (2016) observation that projects benefit communities in two ways: firstly, through the project's outcome, which typically improves the health and hygiene in a given community; and secondly, through the community's economic development, which typically depends on the number of jobs created during the project's implementation.

6.7 The proposed holistic model for improving stakeholder management using the systems thinking approach

The primary aim of this research was to explore the use of the systems thinking approach in the development of a holistic model to improve stakeholder management in the EWS unit . The holistic stakeholder management model intends to improve on the existing, often unco-ordinated and poorly conceptualised, stakeholder management approaches. To support this objective and deepen the researcher's own understanding, a thorough literature review was conducted, data was collected

during an SSM workshop, and in-dept interviews were conducted. The findings, integrated by weaving a narrative, and outlined in the above discussion, were gleaned from the initial theoretical research and strengthened by empirical research.

With the initial conceptualisation and best practice gleaned from the theoretical research covered in the literature review, and supported by several influential authors (Green, 2013; Adams et al., 2014; Tsuro & Hardman, 2020; Proches & Bodhanya, 2010; Proches & Bodhanya, 2015), the conceptual approach was derived in direct response to the findings from the research study itself, thereby inherently addressing the concerns and suggestions of interviewees. Thus consolidated, this input guided the design of the conceptual stakeholder management approach model for improving stakeholder management using the systems thinking approach. The formalised conceptual strategic thinking approach framework for the delivery of creative and adaptive organisational strategy is presented in Figure 6.3, below.

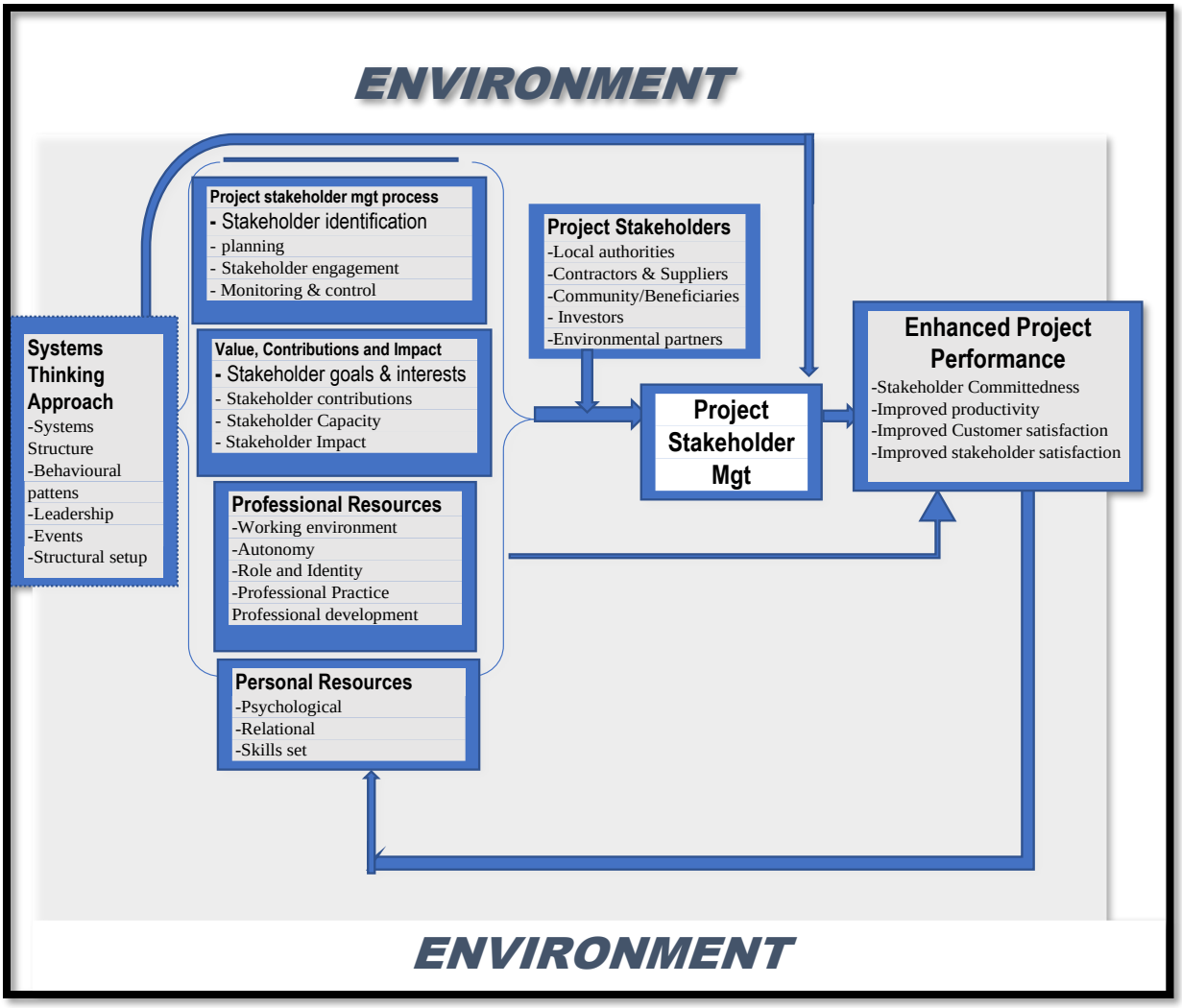

Figure 6.5: Proposed holistic project stakeholder management model (Source: own compilation)

The system thinking approach framework proposes a practical, yet holistic, model to improve stakeholder management in water and sanitation projects in municipalities. The above proposed model (Figure 6.3) shows the supporting enablers, attributes, and key activities that guide this process in the project environment. To support an understanding of each component of the holistic framework approach, each enabler, attribute, and activity is outlined below, with supporting tools. The model first and foremost acknowledged the influence of the operating environment where the projects are taking place. The outer loop of the above framework outlines the co-ordination of critical enablers for enhanced project performance. Each enabler feeds into the project's stakeholder management. Each is described below.

6.7.1 Project environment

Project management environments provide various difficulties for knowledge management. Projects differ greatly from one another, and there are frequently substantial gaps in the flow of employees, materials, and information. During the course of the project, personnel changes frequently take place, involving people from various backgrounds, cultures, and tongues. When a project is completed, its scope is temporarily constrained, and those engaged are frequently scattered. It becomes challenging to establish consistent practices that enhance information flow and capture learning, both inside a project and from one project to the next. Creating, transferring, and exchanging knowledge is a crucial problem in both company and project contexts. The breadth of the concept makes knowledge management even more difficult. The managers must deal with facts (know what), cause and effect linkages (know why), and skills (know how), while thinking about the transfer of information. Both the explicit and tacit dimensions of knowledge must be taken into account by managers; and we know more than we can express. The tacit component of knowledge is made up of intuition; beliefs; values; skills; ideals; and lessons learnt through experience, which all differentiate human thinking. The knowledge acquired through education, on the other hand, is a representation of the explicit dimension and can be simply expressed and transmitted to others.

It is thought that elements at the individual and organisational levels affect knowledge sharing. Trust is one of the key elements influencing the information transmission process at the individual level. Without a sense of trust, most individuals are unwilling to share their wisdom and expertise. People need to be confident that other people will not abuse their expertise and that the information they get is reliable and accurate since it comes from a reliable source. The quantity of information that flows, both between persons and from individuals into the firm's databases, best practices, achievements, and other records, is highly influenced by the degree of trust that exists between the company, its subunits, and its employees.

In a relationship, trust reduces ambiguity and complexity, grows gradually, and builds through time, making it history-dependent. To put it another way, trust is a system of meanings that is part of each team member's worldview. Although it is durable, it may be swiftly shattered when

something bad occurs in a person's situation that damages expectations of the behaviour of the other party. On the other hand, a culture where employees feel secure and comfortable sharing their expertise with their coworkers is necessary to foster trust. The values, ideas, and conventions that individuals hold and employ on a daily basis to direct their work make up culture. Culture also affects how people behave, interact, and interpret how a project will affect their job. Culture affects key behaviours for knowledge generation, sharing and usage, in a variety of ways.

6.7.2 Systems thinking approach

This is the entry point of the model. Systems thinking offers a framework for understanding the issue and is driven by context. It defines challenges from the outside in, establishing the problem's boundaries before identifying potential leverage points. Applications frequently employ iterative techniques. It consists of three main components: (i) the types of thinking to be used and the principles to guide considerations; (ii) a framework (the 'Iceberg') that provides the various ways of thinking with a framework and settings; and (iii) taking the time to fully understand the problem before choosing to use this approach. Jegstad and Sinnes (2015) provided proof for their assertion that systems thinking is based on the contextual patterns of the organisation, rather than on specific content. The company's decision-makers must thus consider stakeholder interdependencies and interactions, as well as interactions between the organisation and the region where the project is located, when they start to make any choices or plans for action.

Ross and Wade (2015) defined systems thinking as a set of skills that enables individuals to recognise and understand systems, foresee their activities, and make adjustments that will have the desired outcomes. Systems thinking is a strategy based on systems theory. When the complexity of the system prevents comprehension and justification due to presumptions and the limitations of cognitive processing, it addresses the actual problems. Burge (2019) made the case that in highly ambiguous situations, system thinking is essential to better understand various points of view, including those of stakeholders. Chan and Choi (1997) claimed that CATWOE is the tool used for identifying the root cause and that it is defined in line with a diversity of opinions.

This is in contradiction to Unlike Ewurum, Aniagolu, and Igwe's (2020) sustainable public housing stakeholder management model. Their model has been applied to the housing sector, but it is difficult to apply it to a number of different city projects and initiatives to get general statistics

on stakeholder goals and stakeholder management. This proposed model utilises systems thinking in its decision-making process and can be applied to every municipal project.

6.7.3 Stakeholder management process

Stakeholder identification and classification are essential elements of stakeholder management that help project managers to comprehend the views and influencing techniques of stakeholders. When creating performance indicators, it should be taken into account since it is an essential part of any stakeholder management process and enables project teams to accurately reflect the stakeholder landscape. Talking to, and involving, stakeholders, establishing stronger connections with stakeholders, and encouraging stakeholder participation in decision-making at all project phases, are all examples of stakeholder engagement. Stakeholder communication is a technique that encourages information exchange, as well as the engagement and empowerment of the parties concerned. The involvement of stakeholders is crucial to a project's success. External and internal stakeholders must be included as soon as possible. With the early involvement of interested parties, the negative effects of a stakeholder are minimised, or at least diminished. Especially in the early phases of projects, transparency, involvement, and communication may assist in reducing potential issues in the later project phases.

Risk is the uncertainty and unanticipated circumstances that arise over the course of a project. It may be a chance or a threat. Stakeholder risk management addresses stakeholder influence, behaviour, and decision-making that puts the project and its deliverables in jeopardy. Project management professionals have employed techniques for risk identification, assessment, planning, communication and monitoring, to control risk.

Unlike de Colle's (2005) ten-step model of stakeholder management for ethical decision making, which was designed for profit making organisations, it gives a lot of recognition to owners or shareholders. Therefore, it cannot fit well into public institutions such as municipalities. De Colle's (2005) model also gave a lot of power to the organisation in the form of agents to control the process of decision making. Since they are primary stakeholders, they also have their interests, which also need to be balanced; hence the management cannot bear 'fiduciary duties', that is, be expected to act in the interests, not only of the firm's owners, but also on behalf of all its

stakeholders. The proposed model eliminated personal interests through the integration of the systems thinking.

6.7.4 Project stakeholders

Project stakeholders are both internal and external stakeholder. The project team, the sponsor, employees within the company, and project support staff are examples of internal project stakeholders. Clients, suppliers, competitors, and other external groups that may be engaged in or impacted by the project, such as government officials and concerned citizens, are just a few of the external project stakeholders. Those who are viewed as the core of the organisation's existence are the key stakeholder groups. As owners, employees, customers, or suppliers, the bulk of these groups often have some sort of formal agreement with the organisation. In order to build the organisation's legitimacy and garner permission for its activities, communities, governments, and rivals are among the group of secondary stakeholders who play an essential role. Stakeholders are commonly categorised based on a variety of factors, such as attitude; interest; impact; power; influence; risk; urgency; and satisfaction. Successful projects demonstrate excellent stakeholder management and may follow the procedure of finding, classifying, analysing, and designing management strategy for stakeholders. The proposed model recognised all stakeholders as equally important and valued their interests, as guided by systems thinking.

This is contrary to Katsela and Palsson's (2019) multi-criteria decision model for stakeholder management sustainable city logistics. Although the model recognised the diversity of all stakeholders, some of the stakeholders may have unrealistic goals. For instance, it might not be possible to reduce the size of the vehicles, as perceived by a stakeholder; or it might not be possible to obtain the economic benefits another stakeholder expects. Such considerations are primarily management issues. Additionally, if it is impossible to find an acceptable solution, it might be possible to exchange stakeholders, such as transport providers, who are exchangeable. Although a holistic approach to the stakeholders' interaction was captured, it would have been interesting to explore such similarities or differences in terms of the service being implemented and the stakeholders being involved in initiatives from different countries. This could demonstrate if there are any particular differences on national level. Such limitations are being addressed with this new proposed systems thinking, holistic stakeholder management model.

6.7.5 Enhanced project performance

The proposed model recognises the stakeholder interests and power that may also be connected to project performance because of how stakeholders use their influence to advance or protect their interests in the project. Project performance is impacted by conflicting interests and stakeholder influence. Additionally, there is a favourable correlation between project governance and performance. Large-scale construction projects may be successfully completed by using governance strategies to enhance overall project management. As a result, it is expected that good governance, through project sponsorship, would lead to enhanced project performance. Project performance may be measured and evaluated using a variety of performance indicators, including those that relate to time; cost; quality; customer happiness; client changes; organisational performance; health and safety; and other dimensions (groups). However, in the construction industry, time, cost, and quality are the three most crucial performance evaluation parameters. Therefore, the contractual and relational aspects of governance are related to how well a building project performs. Benefit realisation and the need for more robust project governance in the public sector are other arguments for project governance. Throughout the course of the project, stakeholder involvement serves to achieve project ideals and potential stakeholder satisfaction.

6.7.6 Value, contribution and impact

There is a growing understanding that timely and extensive stakeholder engagement is essential for project planning, evaluation, and development in general, as well as for effective environmental assessments. The inclusion of stakeholders clarifies issues that were previously unclear, and members' experience and local knowledge support sustainable development. Stakeholders are all those individuals and organisations with an interest in the project's successful conception, execution, and sustainability. This comprises persons who are impacted by the project, both favourably and unfavourably. Stakeholder involvement refers to procedures that allow everyone who has an interest in the result of a project to actively participate in choices about planning and management. They collaborate, exchange information, and contribute to the project in order to further its success and, ultimately, their own interests. The term 'stakeholder involvements' in this work refers to all forms of stakeholder engagement with the decision-making process, including governmental, non-governmental, business/private sector, service providers, and the general

public. The phrase includes both involvement and consultation. This work defines participation as a method by which stakeholders influence choices that have an impact on them; and distinguishes it from consultation by the level to which stakeholders are permitted to influence, share, or control the decision-making process.

People or organisations in the impacted community will be interested in knowing what is proposed, what the potential effects will be, and how their concerns will be addressed and taken into consideration. They will want reassurances that their opinions will be thoroughly heard and taken into account on a case-by-case basis. They will expect advocates to respond to their queries. Additionally, they will have local environmental and social information that may be accessed and included in baseline data. Naturally, supporters will want to rework the idea to improve its chances of passing. Frequently, this entails making an effort to spread fundamental knowledge in order to increase public comprehension and approval of the plan. By incorporating suggestions from the public for alternatives and mitigation measures, and by taking into account local knowledge and values, project designs may be developed more creatively. Impact analysis and mitigation considerations should take into account the policy and regulatory obligations of the participating government bodies.

An efficient public engagement programme may reduce the likelihood that the plan could spark controversy in subsequent stages of the process, which is good news for the responsible authority. NGOs' comments on a plan might offer a relevant policy perspective, for instance, on how the proposal relates to sustainability goals and strategies. Although incorporating locals is difficult, their opinions could be useful as well. However, this surrogate strategy should be viewed as an exception rather than a replacement for direct requests for opinions. Experts in certain domains who may significantly advance the project research are among the other interested organisations. It is usually advisable to seek the guidance and expertise of governmental organisations and the industrial sector that is most immediately affected by the plan. However, in many instances, important details regarding the context and impacts of the environment will come from outside sources.

6.7.7 Project stakeholder management

The management of project stakeholders is a challenging issue in the water services industry, particularly when water services infrastructure projects are involved. The sector of local government that is in charge of delivering essential services to communities via municipalities is the water services sector. It is the duty of municipalities that have WSA to supply water services to the communities within their authority. The success or failure of a project is often related to the expectations and views of the stakeholders regarding the value supplied by the project. The management of project stakeholders is a challenging issue in the water services industry, particularly when water services infrastructure projects are involved.

Stakeholder management, a managerial task, could be thought of as an impartial mediator. In order to implement project stakeholder relationship management, six continual activities, including identifying stakeholders; assessing; engaging; identifying information flows; enforcing stakeholder agreements; and stakeholder debriefing, should be employed. Stakeholder identification and classification; communication; engagement; empowerment; and risk control are the five variables that have to be used to evaluate the efficacy of the stakeholder management process.

6.7.8 Professional resources

Rather than adopt a stance on the old debates over the boundaries of ‘professionalism’ and on whether certain kinds of work are exclusive to a ‘profession,’ one can begin with the assumption that one of the central distinguishing features of a professional’s work (wherever it is found and by whomsoever it is being done) is the expectation of discretionary judgments. Such judgments mark out the very practice of professionals’ work. People may call such discriminatory processes ‘critical’ because they admit to substantial, but astonishingly flexible, evidential justification. Yet they require substantial judgments, made in the flux of practice, and these judgments contribute powerfully to epistemological claims about workplace learning – claims currently generating considerable explicit attention in policymaking and provision in non-school settings, as well as in schools and teaching.

6.7.9 Personal resources

Project team management and organisational procedures are both included in the human resources management of a project. The team members and project partners get together to create the project team. The project team members make up the core group of people who are responsible for the project's development. The participants in the initiative only have temporary responsibilities to complete (sub-team). The project team's duties include involvement in project activities, timely completion of all work assignments in accordance with all deadlines, and attendance at team meetings on a regular basis. Planning for human resources, assigning roles to the staff required to complete the project, and team development – improving communication and co-operation among team members as well as between them and project management, are all included in the human resources management processes that take place within the context of a project; monitoring each person's performance, providing comments, resolving issues and disagreements, and organising modifications to enhance the project's performance. Projects require someone to keep the team on track and focused on the end goal since they include numerous unknowns, risks and decisions. The management of a team project presents the project manager with significant difficulties because of this. Organisational planning is the first phase of the human resources management system. This process entails defining roles within the project, assigning duties, and establishing relationships and dependencies.

The tasks and duties assigned to each person and group of people will be identified as a result of the planning process's methodologies. The project-specific roles (who performs what and how) and responsibilities (who determines what and how) that must be assigned to the decision-making committee will be made clear. The tasks and positions will change over time. The decision-making committee that is really involved in the project's work, the project manager, other members of the management project team, and/or individual participants, will be assigned the most varied duties and responsibilities.

Contextually**,** eThekwini Municipality, as one of the WSAs in South Africa, is no different from other municipalities regarding the challenges faced during the implementation of infrastructure projects. Challenges faced by the eThekwini Municipality in implementing water and sanitation

projects include conflicts of interests among different stakeholder groups who understand water services from different perspectives and have different expectations from the implementation of infrastructure projects (eThekwini Municipality, 2018). The unit has received several complaints and concerns from the public regarding opportunities to participate in the implementation of water and sanitation projects (eThekwini Municipality, 2018). These complaints come from the community members, local business forums such as local contractors, unemployed youth, and other community groups who feel that they need to benefit from the projects.

Further to the key findings discussed above, the EWS has different processes and systems in place that are used to facilitate and engage with the project stakeholders during the implementation of infrastructure projects, as articulated to in Objective Two. The unit has a department that has internal community liaison officers who facilitate the relationship between the stakeholders and the municipality, depending on their level of expertise and training. Internal project managers are also there to offer guidance in processes when it comes to applying technical expertise in the project. However, consistency was found to be a challenge, since there was no formal model, framework or policy to provide guidelines and uniformity in stakeholder management. A number of gaps were identified as factors that contribute to the challenges of project stakeholder management.

The situation in EWS can be improved by the implementation of the developed holistic model and by institutionalising it as formal system. The findings indicated that there is no correlation between the project management processes and the project stakeholder management processes. Figure 7.1, below, shows the ideal situation which integrates project management processes with activities of the project stakeholder manager in an infrastructure project.

The lack of proper communication between the EWS officials and project stakeholders, as well as the fragmentation of social facilitation systems within the unit, was confirmed by the findings from the SSM workshop. Stakeholder management was identified as a crucial soft issue and the lack thereof hinders the progress and sustainability of infrastructure projects. The fragmentation impairs the synergy of systems that are crucial for the smooth running of the projects. Other soft issues that emerged as contributing to fragmentation included:

- power conflicts between the traditional and the political leaders over operational matters, such as employment of unskilled labour to work in the project;
- the relationship between the main contractors and sub-contractors;
- the distribution of the contractor participatory goal (CPG);
- the lack of a systemic conflict management strategy from the unit; and
- the lack of transparency, trust, and communication.

In-depth interviews and SSM workshops enabled the researcher to reach the desired holistic understanding of two different aspects of project management: project stakeholders at the implementation level; and the owners of the project, which include the project management team at EWS.

6.8 Chapter summary

The chapter has provided a detailed report on the findings from the SSM workshop. The SSM results were presented in the form of rich pictures, root definitions, a CATWOE analysis, and the conceptual model. The proposed action was to create an integrated and holistic model based on systems thinking approaches to improve project stakeholder management in EWS infrastructure projects. The next chapter outlines the conclusion and recommendations of the study.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

The previous chapter has provided a detailed report on the findings from the SSM workshop. This chapter draws conclusions and makes recommendations for changes from the findings of the study, which need to be explored in order to ensure that the holistic management of stakeholders is in place. These emerged from the findings presented in Chapters Five and Six, and also from the theory discussed in Chapters Two and Three. The study aimed to use systems approaches to develop a holistic model to improve stakeholder management in water and sanitation infrastructure projects.

The purpose of the study was to address the discrepancy in stakeholder management techniques used in EWS infrastructure projects. The goal of the study is to give the municipality a model for managing and enhancing stakeholder engagement. Additionally, the research sought to aid in bridging the gap between technocrats and the social aspects of water services provision (Amadi et al., 2018). The researcher was challenged by the fact that municipal leaders and infrastructure project managers seem to be making little effort to comprehend water services stakeholder management in local government.

The intention of the research was to provide a solution to the problem of the eThekwini Municipality in delivering water and sanitation projects; and to address conflicting interests among stakeholder groups who have various viewpoints on water services and different expectations of how infrastructure projects should be implemented. The municipality has received several complaints and concerns from the public regarding opportunities to participate in the implementation of water and sanitation projects (eThekwini Municipality, 2018). The eThekwini Municipality also has experienced widespread public protests and project development halts during the past five years. Due to demonstrations over the delivery of services, project interruptions, and wasted time on projects brought on by stakeholder demands, the city has lost a sizable sum of money as a result of project delays (eThekwini Municipality, 2016). The problem

of stakeholder management, highlighted above, may be addressed by using a systems thinking approach to study the research problem in a holistic manner (Fardet & Rock, 2018).

The study is significant in that it contributes methodologically to the body of knowledge concerning the application of soft systems techniques to address difficult circumstances in the water and sanitation sector (Jackson, 2016). Systems thinking approaches, in particular SSM, have hardly been used in local government and water services sector research, and this study is intended to close that gap. While the study's conclusions cannot be generalised, it may be able to demonstrate some inter-relationships between numerous complex factors and values in the local government system. The research will help to improve water services authority governance and boost the prominence of stakeholder relationship management within the municipality.

The existing methods of engagement and effective communication approaches applied to ensure co-operative governance also formed part of the study's objective. The risks associated with fragmented approaches to stakeholder engagement were found to be due to the diversity and complexity of each stakeholder group, which informed the development of a holistic approach to ensure proactive strategies to mitigate the identified risks.

The objectives of the study were:

- to identify stakeholder management challenges in EWS projects;
- to determine the stakeholder management systems that are being used in EWS projects;
- to determine how SSM can assist in creating an enabling environment for effective stakeholder management in EWS; and
- to develop a holistic model aligned to systems approaches to facilitate stakeholder relationships and management in EWS projects.

The literature reviewed for this study focused on the project stakeholders rather than corporate stakeholders, systems that are used by the EWS to engage with project stakeholders, and systems thinking theories and practices regarding the management of stakeholders. Data was gathered from fourteen (14) in-depth interviews with participants who shared their opinions and perceptions of the relationship between the municipality and EWS during the implementation of the projects under study. Thematic data analysis was conducted using NVIVO 12 software system analysis,

which uncovered recurring themes. Those themes formed the basis of the facilitation of the SSM workshop, which was conducted with twenty participants. The findings from the analysed data, therefore, formed the basis of the proposed recommendations.

7.2 Objectives of the study

The aim of the study was to develop a holistic stakeholder management model to improve and contextualise the existing, often unco-ordinated and often poorly conceptualised stakeholder management approaches used within the EWS unit.

7.2.1 Objective One

Identifying stakeholder management challenges in the EWS projects

The theme that emerged on stakeholder management challenges revealed that conflicts of interest among the stakeholders were at the centre of the challenges identified in the study. These conflicts emanate from the fact that stakeholders and the beneficiaries of the project had different interests and often conflicting expectations from the project. In both the face-to-face interviews and the SSM workshops, participants identified the key stakeholders, their roles, and their interests in the project. Participants also agreed that some of the stakeholders exert more power than others. Three key stakeholders were identified as the main stakeholders under this objective. These were community members as the beneficiaries of the project; the municipality as the owner of the mandate to provide access to water; and the business forums, who were identified by all the participants as the stakeholder group with the power to stop the project should their interests not be met. This finding confirmed the importance of stakeholder analysis before the inception of any project.

7.2.2 Objective Two

To determine the stakeholder management systems that are being used in EWS projects

For this objective, the key findings emanated from the management and leadership themes that emerged from the interviews. It was found that there was no formal system to manage the

relationship between the EWS and the project stakeholders at the implementation level. That was identified as a lack of relationship management between the project technical team, the project stakeholders, and officials that are responsible for the project's social facilitation. The unit was found to use different approaches to managing stakeholders and a lack of consistency was found to be problematic because information was not communicated equally among all the project stakeholders.

7.2.3 Objective Three

To determine how SSM can assist in creating an enabling environment for effective stakeholder management in EWS

This objective was tested through both in-depth interviews and the SSM workshop. After the interviews, the SSM workshop was conducted using the data and the themes drawn from the interviews. Participants confirmed that having all stakeholder groups in one workshop provided a positive outcome. It was found that the workshop provided participants with a learning opportunity in two ways: stakeholders learned from, and about, each other's interests in the project; and all participants confirmed that SSM was a good facilitation method for complex situations like stakeholder management. This was confirmed on the evaluation forms that the participants filled out after the workshop. In their evaluation of the workshop, participants agreed that SSM is the approach that can be used to enforce relationships among different areas of project work. The participants recommended the exercise of drawing a rich picture of the problem situation

7.2.4 Objective Four

To develop a holistic model aligned to systems approaches to facilitate stakeholder relationships and management in EWS projects

This primary objective of the study was to explore how systems thinking methodologies could be used to create a comprehensive model that would enhance stakeholder management in the EWS unit. The comprehensive stakeholder management model seeks to advance the currently used, frequently disorganized and inadequately conceptualized, stakeholder management methodologies. A comprehensive assessment of the literature was conducted to support this goal, and data was gathered through the SSM workshop and in-depth interviews. Findings from the

theoretical research were strengthened by empirical research and then integrated via weaving a narrative, as discussed above. The use of systems thinking approaches, in particular the use of SSM, has proved to be an effective approach that can be used to tackle complex situations. This is evident in the holistic model presented in Chapter Six after the discussion of the SSM workshop. This objective was confirmed from the assessment of the above objective, where the participants pointed out that, indeed, SSM can be useful to tackle complex situations. It was also evident from the analysis of the evaluation forms that were filled out by the participants after the SSM workshop.

7.3 Summary of the key findings

Further to the key findings discussed above, the EWS has different processes and systems in place that are used to facilitate and engage with the project stakeholders during the implementation of infrastructure projects, as articulated in Objective Two. The unit has a department that has internal community liaison officers that facilitate the relationships between the stakeholders and the municipality, depending on their level of expertise and training. Internal project managers are also there to implement good processes when it comes to applying technical expertise in the project. However, consistency is a challenge, since there is no formal model, framework, or policy that provides guidelines and uniformity for stakeholder management. The situation in EWS can be improved by the implementation of the developed holistic model and by establishing it as a formal system. This model can be regarded as a guideline to be applied in all infrastructure projects; as well as for assisting in the review of the project after completion. It should include the implementation process, which includes identifying stakeholders prior to project implementation; communicating project boundaries with stakeholders; and ensuring that project stakeholder committees are in place to enforce consistency and improve relationships; as well as ensuring that risk mitigation is prioritised.

The lack of proper communication between the EWS officials and project stakeholders, as well as the fragmentation of social facilitation systems within the unit, were confirmed by the findings from the SSM workshop. Stakeholder management was identified as a crucial soft issue and the lack thereof hinders the progress and sustainability of infrastructure projects. The fragmentation has impaired the synergy of systems that are crucial for the smooth running of the projects. Other soft issues that contributed to fragmentation included:

- power conflicts between the traditional and political leaders over operational matters, such as the employment of unskilled labour to work on the project;
- the relationships between the main contractors and sub-contractors;
- the distribution of the contractor participatory goal (CPG);
- the lack of a systemic conflict management strategy from the unit; and
- the lack of transparency, trust, and communication.

In-depth interviews and an SSM workshop enabled the researcher to reach the desired holistic understanding of two different aspects of project management: project stakeholders at the implementation level; and the owners of the project, which includes the project management team at EWS.

Effective stakeholder participation in this study refers to the involvement of all interested and affected groups or individuals, whether directly or indirectly, in the outcome of the project. The researcher further proposes that the EWS unit appoint a department champion to manage and account for the relationships with the stakeholders and the municipality in all infrastructure projects.

7.4 Contributions to the body of knowledge

In South African water and sanitation projects, empirical research on stakeholder management is scarce. Many scholars have looked at stakeholder management levels in water and sanitation in a number of other industrial settings (Marks & Breen, 2021), but few have looked at stakeholder management in the municipal and developing nation context (Ndaguba, & Hanyane, 2019). In order to promote effective water services management, leadership and governance within the unit and the municipality, it is vital to improve knowledge of stakeholder management strategies or systems thinking paradigms (Sulemana, Musah & Simon, 2018). By providing management with an empirical basis, this knowledge may help them create successful stakeholder management programmes for EWS infrastructure projects. To explore the research subject holistically, the issue of stakeholder management, mentioned above, was examined by utilising one of the systems thinking methodologies, which is SSM (Fardet & Rock, 2018).

Although systems thinking approaches and SSM have been utilised in other disciplines, which are benefiting from systems approaches, these methodologies have not been widely applied in the project management of water and sanitation infrastructure. They have, however, been used to research and address the difficulty of stakeholder management in project management. SSM has only been used to a few studies on water resource management, but not on infrastructure projects for the provision of portable water.

The study was conducted in the eThekwini Municipality's administrative area, with an emphasis on the interactions and co-ordination between project stakeholders in water and sanitation infrastructure projects. Other WSAs and WSPs outside eThekwini Municipality may find value in the holistic systems model that has been developed throughout the study, as well as companies in the water and sanitation industry as a whole. This knowledge may be used to implement projects in all spheres of government that deal with infrastructure and other development initiatives. Municipalities are providing basic services direct to the communities and, hence, their services are dominated by systems of human activity. Therefore, the use of systems thinking approaches presented in this study are invaluable.

This study further posits that, although each project is nominally unique and has different, often competing and conflicting, interests, the use of SSM during the planning and implementation of the project is important for the stakeholders to understand and appreciate each other's interests. Water services institutions are known to be technical, engineering-dominated industries, and they pay more attention to technical matters and hard systems issues in the project, leaving out and paying less attention to the soft issues like stakeholder management. SSM is the methodology that can be valuable in tackling the complexities in water and sanitation infrastructure projects. It can be used to identify those stakeholders that are most powerful and influential in the project. It is beneficial to engage these stakeholders in the early stages of the project to ensure the smooth and efficient operation of the project. SSM processes may assist the municipal project managers to facilitate and create awareness, thus strengthening the relationship between the stakeholders of the project, including the beneficiaries of the project and the owners thereof. The use of SSM tools, like rich pictures, CATWOE models, and conceptual models, can be helpful in outlining the stakeholders' interests and expectations, and hence improve their healthy working relationship

with the project; as well as relationships between the municipality project staff, which is made of technical and social employees.

The study further contributes to the knowledge of using systems approaches to unpack complexities in project management, particularly in the area of project stakeholder management. The study has produced a unique case study and a baseline study for future studies in other WSAs in South Africa. While the findings of the study cannot not be generalised, as they were concerned with specific, complex constructs related to project stakeholder management and engagement, the study has contributed to the body of knowledge on infrastructural project management related matters' It highlighted that:

- Fragmentation of social facilitation systems in the implementation of capital projects exists in the area of project management. Therefore, the use of systems approaches in project management will make a positive contribution to the body of knowledge.
- Soft issues have a critical impact on the sustainability and acceptability of infrastructure projects in the environment where they are implemented, and hence there is a need for them to be taken seriously.
- Stakeholder management is a system that requires the consideration of a holistic approach, which is facilitated by a SSM.

7.5 Study conclusion

Stakeholder management involves stakeholder participation in decision making and involvement in project development activities in order for it to be considered effective stakeholder management. Participation can be in different forms: from attending meetings; contributing time; providing information that can assist in planning for the project and avoid unnecessary delays and risks; to assuming responsibility for the achievement of the project objectives. Some stakeholders can assist in controlling aspects of project work, such as by donating their time by serving on project steering committees (PSC).

This community of stakeholders will be kept up to date on the status of the sub-execution. Representatives will take their place on municipal oversight committees. The partners will be kept up-to-date on the promotion of the water and sanitation programmes', which are aimed at schools

and the larger population. According to the empirical findings of this research, there will be consumer awareness-raising events about the privileges and duties of consumer contacts with service providers, as well as the distribution of contact information for local technicians and plumbers who may perform domestic repairs.

This results from the stakeholder theory's integration of all significant interests in the accomplishment of business goals. It can be argued that stakeholder engagement involves the communication, interaction, and building of relationships with stakeholders Stakeholder analysis is therefore important for effective stakeholder engagement. By implication, management moves beyond providing stakeholders with sporadic updates, towards a culture of stakeholder involvement in decision-making. The company is viewed as more of a learning organisation, according to its response to, and involvement in, models of engagement. A learning company is one that fosters an innovative, adaptable culture through the generation and storage of environmental knowledge. Therefore, by including stakeholders, the organisation is able to get important information from them that may be utilised to change, maintain, or completely overhaul organisational procedures in order to produce a result that satisfies all parties' interests. This is predicated on the idea that everyone who has the power to affect value generation and consumption is accountable for the result. Hence, persistent collaborative interactions with stakeholders are successful in promoting mutual understanding.

This study made a claim that, to mitigate the risk of fragmentation among the systems and to reduce community protests and work stoppages during project implementation, mindset and behavioural changes should start within the municipality among the officials. Systems approaches, especially SSM, should be adopted to deal with the complex soft issues. This will encourage stakeholders to support the projects implemented in their areas, as they will feel like partners and will protect the projects. Mindset and behavioural change would improve the relationship between the owners of the project and the beneficiaries of projects, as well as those who are affected by, and interested in, the outcome of the project. This study also suggested that proper implementation of systems approaches and proper management of any soft issues in infrastructure projects should promote the necessary mindset change and bring projects to a sustainable conclusion. The necessity for a holistic stakeholder management approach, systemic communication, and building partnerships

between the municipality and the stakeholders needs to be promoted in a systemic manner that must bring about behavioural change.

7.6 Recommendations for implementation of the study model

7.6.1 Identification of stakeholders

A stakeholder management approach is recommended to be adopted by the unit in a holistic and integrated manner. Stakeholder identification and analysis (stakeholder mapping) in the infrastructure project should be the first process in the cycle of project management. It is recommended that this happen at an early stage of the project, starting with the internal stakeholder integration during project planning. The stakeholder management team should be working hand-in-hand with the project technical team during the planning process of the project so that the stakeholder management team can have enough lead time to study the project service registration process. All the affected and interested stakeholders need to be identified and should be involved during the feasibility studies of the project to ensure compliance with EWS policies, radical economic transformation, and other procedures. This is an important step of project stakeholder management in order to avoid later delays and compliance risks. The maintenance of regular contact with all stakeholder groups and project beneficiaries is also crucial.

7.6.2 Improve internal stakeholder management in the planning processes

Fragmentation of processes has been identified in the study. It is therefore recommended that the systems be integrated and involve people who will be responsible for the stakeholder management during the project implementation. This should include processes, people who will be involved, and all the resources that will be part of that project. Teamwork between the internal project managers and social facilitators needs to be improved, regarding their roles and responsibilities. Clear lines of support and authority should be spelt out at the beginning of the project. The project team should share an understanding of the project scope and the boundaries of the project. The project team should include the people who will be responsible for stakeholder management during the project implementation.

7.6.3 Development of the holistic and integrated systems approach

The outsourcing of the stakeholder management function to a professional service consultant will enable them to work with the internal project team to co-ordinate, develop, and implement a systems approach to the project. Stakeholder management cannot be a once-off event. A systems approach is recommended to facilitate the inclusion of all people, individuals and groups involved in, and affected by, the outcome of the project. It is important for the success of the project that all the affected stakeholders are identified, analysed and rated according to their interests in the project. Therefore, the personnel working as stakeholder managers should be well trained and competent in these processes, whether directly or indirectly involved in projects, whether they are employed by the municipality or outsourced based on their capabilities, or whether they are customers, consultants, or contractors to the municipality.

7.6.4 Benchmarking and lessons learnt with other municipalities

The EWS is one division in the municipal system, which is also an entity in the local government system. The problem of unsatisfied customers and protesting communities has engulfed all the institutions that are constitutionally charged with the responsibility to provide basic services. It is therefore recommended that EWS should consult with other similar institutions, especially with other municipalities that are involved in the implementation of capital projects, to discuss and learn from their experiences of project stakeholder management during the implementation of project lifecycle processes and other strategies of relationship management.

7.6.5 Mechanism for resolving conflicts among stakeholders in the water and sanitation unit

Another key finding was the absence of a mechanism for resolving conflicts among the stakeholders. The issues of human interaction were found to be central to the inevitable friction. As a measure for conflict resolution, it is therefore recommended that conflict management forms a part of the proposed holistic stakeholder management strategy.

7.7 Limitations of the study

The study is limited to eThekwini Municipality, due to time and resource constraints. The research findings, on the other hand, are assumed to be a fair portrayal of other municipalities in South Africa, and many other emerging economies throughout the world.

The study was also limited by the outbreak of the COVID 19 pandemic, which interfered with the data collection of the study. The national lockdown struck at the time when the researcher was ready for second phase of data collection, which was conducting SSM workshops with focus groups. This impacted negatively on the richness of the data, and caused delays as the researcher could not continue with the study while waiting for the lockdown to ease to conduct workshops. The initial plan was to conduct workshops on different days with different focus groups. However, mixing different stakeholders in one workshop turned out to be advantageous, according to the feedback from the participants after the workshop. This greatly affected the researcher's ability to engage as many participants as possible in order to gather various opinions from many interested individuals and groups. The researcher was guided by the health protocols in engaging the public, hence affecting the number of participants.

Another limitation of this study was the fact that some of the study was conducted using qualitative data and SSM, which means that the research findings cannot be generalised to a larger population. Analysing two sets of data, interviews and SSM workshop data was time consuming and posed some challenges in adhering to timelines.

Furthermore, the nature of the sample of participants chosen from the municipality's stakeholders reduces the generalisability of the results. In addition, the chosen participants represented their own interests, and were not impartial. The study participants should be carefully chosen as persons who have all witnessed the phenomenon at issue, so that the researcher may reach a consensus at the conclusion of the procedure (Baldwin, 2018).

7.8 Recommendations for future research

This study has highlighted the challenges faced by both project stakeholders and the EWS officials, and has made recommendations that can be used to facilitate relationships before, during and after

the implementation of infrastructure projects. However, the focus of the study was narrowed to water and sanitation project stakeholders within the eThekwini Municipality.

Although the experiences of the project stakeholders provided insight into project relationships during the implementation of infrastructure projects, an in-depth inclusion of other water sector stakeholders is recommended for future studies to further understand the role and the importance of stakeholders in project management. The EWS unit is perceived by its stakeholders to be a role model, especially in the wake of the developmental agenda. Hence, a broader study of sectoral stakeholder management is recommended.

The study found that there are power conflicts between traditional leadership and the political leadership. Therefore, more research on that aspect of conflict management at leadership level needs to be conducted. The local business forum was found to be the dominating stakeholder during the implementation of the project. The interests of this stakeholder group are more focused on work allocation to the emerging contractors. It is therefore recommended that research on the distribution of employment opportunities to local communities be undertaken.

It is further recommended that a study be conducted on the relationship between the technocrats and the social experts of project management, focusing on the internal officials of the EWS. SSM is recommended as the method to facilitate this. The issues of corporate stakeholder relationships and the project stakeholders need attention in order to establish social investment within the municipality as an important strategy to facilitate stakeholder support during project implementation.

A study on the impact of the above issues, as they affect the successful execution of infrastructure projects, can be useful as they will influence future decision making and planning of capital projects and other development projects in the municipality. It is further recommended that an investigation be conducted on the merits of SSM in general municipal governance to address the issues of stakeholder management in the bigger arena. This study made a claim that, to mitigate the risk of fragmentation among systems, and to reduce community protests and work stoppages, mindset and behavioural changes should start within the municipality among the officials. Systems approaches, especially SSM, should be adopted to deal with complex soft issues. This will encourage stakeholders to support the projects being implemented in their areas as they will feel like partners and will protect the projects.

Mindset and behavioural change should encourage improvements in the relationship between the owners of the project and the beneficiaries of projects, as well as those who are affected by, and interested in, the outcome of the project. This study further proposed that implementation of systems approaches and proper management of any soft issues in the infrastructure project promotes the needed mindset change and brings sustainability to projects. The holistic stakeholder management approach, systemic communication, and building of partnerships between the municipality and the stakeholders, need to be promoted in a systemic manner to bring about behavioural change.

7.9 Final concluding remarks

The study's findings suggest that project stakeholder management is crucial to the implementation of public projects. Stakeholder management is a challenging issue in the water services sector, particularly when infrastructure projects are being implemented. Water supply and provision to the communities under their authority is the duty of the municipalities that hold water services authority. According to EWS stakeholders, there is strong evidence that the current engineering approach to project management excludes important project stakeholders from the planning, execution, operation, and maintenance of various infrastructure projects. The researcher has also identified the risks that go along with these activities. It was established that only consulting with project stakeholders at a later stage puts any development project at risk and might result in significant losses for the project and the municipality. It was clear that the lack of, or ineffective, participation of project stakeholders had a detrimental effect on service delivery of water and sanitation projects.

The creation of an integrated stakeholder management model can be utilised to reduce risks for the municipality and the department that provides water services, as well as the aforementioned socioeconomic groups. The study's conclusions supported the idea that improperly integrated stakeholder management had detrimental effects. It was established that the first step in stakeholder management is stakeholder identification. If this is not done correctly, the wrong stakeholders may be included in the project, which would have a negative effect on the project by lowering the value of their contributions. The eThekwini Municipality lacks clearly laid out

processes for stakeholder management and involvement; thus the researcher has developed a model to be applied.

The aim of the study was to explore the use of systems thinking approaches in the development of a holistic model to improve stakeholder management in the EWS unit. The all-encompassing stakeholder management model also aims to improve on the already employed, occasionally disorganised, and poorly designed stakeholder management approaches. To achieve this, an interpretivism philosophy guided the research to allow for the integration of different perspectives. The research applied qualitative methods in the research design, to answer the research questions and objectives. The interpretivism philosophy was chosen because it clarifies how different research philosophies may be successfully combined to offer the best prospects for answering research problems. Guided by this research approach, this study investigated and developed a holistic model to improve stakeholder management in the EWS unit. The study found that inadequate and ineffective project stakeholder participation has a detrimental effect on service delivery of water and sanitation projects. Mindset and behavioural changes should begin with the municipality's personnel in order to limit the danger of fragmentation of the systems, and to prevent community protests and work stoppages during project execution. The complicated soft concerns should be handled using systems techniques, notably SSM.

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Appendices

Annexure A: Information Sheet and Consent to Participate in Research

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL

Date:

Greetings,

My name is Gloria Nokuphiwa Zondi (0729632794) from University of KwaZulu Natal, Westville campus. I am from the College of Law & Management Studies under the Graduate School of Business and Leadership.

You are being invited to consider participating in a study that involves research on "The use of the Systems Thinking Approaches to develop a holistic model to improve stakeholder management in the eThekwini Water and Sanitation Unit (EWS)". The duration of your participation if you choose to participate and remain in the study is expected to be 10 – 15 minutes.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee.

In the event of any problems or concerns/questions you may contact the researcher or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus Govan Mbeki Building
Private Bag X 54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any

time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and your responses will not be used for any purposes outside of this study. All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

If you have any questions or concerns about participating in the study, please contact me on Gloria Nokuphiwa Zondi (0729632794).

Sincerely

Gloria Nokuphiwa Zondi (0729632794)

CONSENT TO PARTICIPATE

I……(insert name & surname) hereby agree to participate in the research study on the use of the Systems Thinking Approaches to develop a holistic model to improve stakeholder management in the EWS unit .

I do understand that this is for study purposes and that participation is voluntary. I have been informed that the discussion will be audio recorded for the purpose of data collection and transcription only, codes will be used to identify the respondents and after that the audio record will be destroyed.

I agree to be recorded during the interview.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus Govan Mbeki Building
Private Bag X 54001 Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Signature Date

Annexure B: Interview Guide

UNIVERSITY OF KWAZULU-NATAL

GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

PHD Research Project

Gloria Nokuphiwa Zondi (0729632794)

Supervisors: Prof Cecile Gerwel Proches & Prof Paul Green (0312608318)

Research Office: Ms P Ximba (0312603587)

INTERVIEW

2.1: TO UNDERSTAND HOW STAKEHOLDERS ARE IDENTIFIED IN THE WATER AND SANITATION UNIT INFRASTRUCTURE PROJECTS AT THE ETHEKWINI MUNICIPALITY

- What is your understanding of project Stakeholders?
- Who are the stakeholders in the EWS Unit infrastructure projects at the eThekwini Municipality?
- Who is considered the most valuable stakeholder in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- Who serves as a leader the infrastructure projects at the eThekwini Municipality?
- What are the interests of each stakeholder in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- What is the influence of each stakeholder in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- What are the contributions of stakeholders in the infrastructure projects at the eThekwini Municipality?
- How do stakeholders in EWS infrastructure projects at the eThekwini Municipality feel about each other?

o What are stakeholders' conflicts of interest in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Which stakeholder group has legitimate authority in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Where do stakeholders get their leadership authority (formal or informal) in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Who controls strategic resources in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 How much negotiating power or influence do stakeholders have over others in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Based on your understanding of the stakeholders, how does each stakeholder impact (negatively or positively) the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 If some stakeholders affect the project negatively, how can this situation prevented or corrected?

 If the project is impacted positively, how can this situation make the most of it?

2.2 TO UNDERSTAND HOW STAKEHOLDERS ARE ASSESSED IN THE WATER AND SANITATION UNIT INFRASTRUCTURE PROJECTS AT THE ETHEKWINI MUNICIPALITY

 What is each stakeholder's area of interest in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

o Is there a procedure or a mechanism to assess the interest?

 How are conflicts of interests among the stakeholders managed in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Which stakeholder group have the most influence on the direction, process, or outcome in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

o Is there any stakeholder group that have power to influence other parties to make decisions they would not make otherwise in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Which stakeholder group can take action on an issue that is immediately pressing in the EWS infrastructure projects in the eThekwini Municipality?

2.3 TO UNDERSRTAND THE STAKEHOLDER MANAGEMENT CHALLENGES FACED BY EWS MANAGEMENT

 What are each stakeholder's challenges faced that can hinder the goals of the EWS infrastructure projects at the eThekwini Municipality?

 What are the wide impacts of the problems faced in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 What are the mechanisms used to resolve problems faced in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 Are there any opportunities that need to be seized to advance the goals of the EWS during infrastructure projects implementation?

2.4 TO UNDERSTAND THE RESPONSIBILITIES OF THE WATER AND SANITATION UNIT INFRASTRUCTURE PROJECTS MANAGEMENT TO STAKEHOLDERS AT THE ETHEKWINI MUNICIPALITY

 How are stakeholders involved in decision making in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

 How is the attitude of the EWS management team on the infrastructure projects at the eThekwini Municipality towards information disclosure?

 How is the management in the Water and Sanitation Unit infrastructure projects maintain the long-term relationships that can engender trust?

2.5 TO UNDERSTAND THE RELATIONSHIP MANAGEMENT SYSTEM IN THE WATER AND SANITATION UNIT INFRASTRUCTURE PROJECTS AT THE ETHEKWINI MUNICIPALITY

- What are the strategies put in place to enhance stakeholder relationships in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- How competent are public relations personnel that play an active role in the stakeholder management system in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- How culturally appropriate are the stakeholder's management systems in addressing stakeholders concerns in the infrastructure projects at the eThekwini Municipality.

2.6 TO UNDERSTAND THE COMMUNICATION STRATEGY USED TO FACILITATE STAKEHOLDERS RELATIONSHIP MANAGEMENT IN THE WATER AND SANITATION UNIT INFRASTRUCTURE PROJECTS AT THE ETHEKWINI MUNICIPALITY

- What are the communication channels used to enhance stakeholder relationship management in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- What are the communication messages used to facilitate stakeholder relationship management in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- What is the communication method used to facilitate stakeholder relationship management in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- How frequent is communication with stakeholders in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

2.7 PUBLIC PARTICIPATION IN THE WATER AND SANITATION UNIT INFRASTRUCTURE PROJECTS AT THE ETHEKWINI MUNICIPALITY

- How are stakeholders provided opportunity for access to information in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- How are stakeholders consulted for input in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

- How are stakeholders provided opportunity for dialogue/interaction in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- How are stakeholders provided feedback in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?
- How are stakeholders' relationships monitored and evaluated in the Water and Sanitation Unit infrastructure projects at the eThekwini Municipality?

What is your overall opinion of approaches to project stakeholder management in the municipality?

3. CLOSING REMARKS

Is there anything else or some issues you would like to add that I did not cover in this interview?

Thank you for making the time to participate in this study

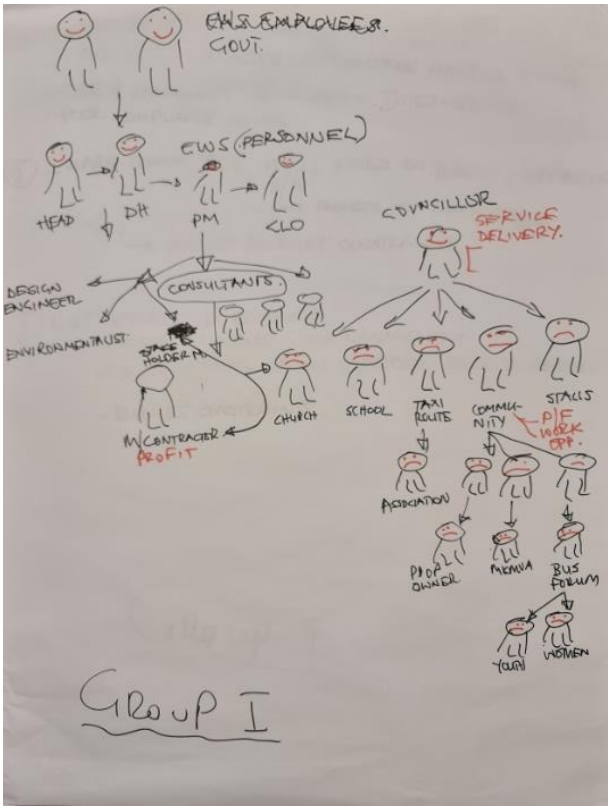
Annexure C: SSM Framework

PLAN FOR DATA COLLECTION ON SSM WORKSHOP

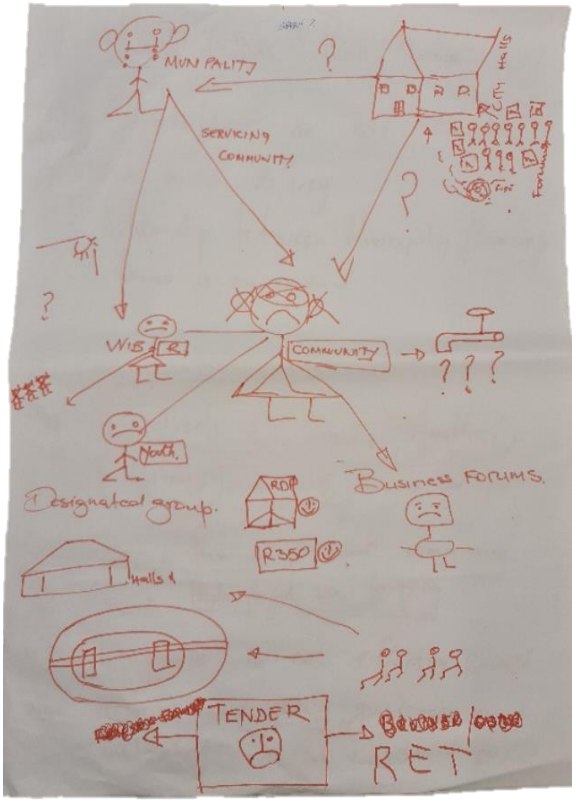
Step 1	One to one meeting with group of project managers
Stage 2	Draw the rich picture from the issues and the elements of water governance and stakeholder management in water and sanitation project. From that key issues and key tasks will be extracted. The researcher will then write a brief story from what the rich picture tells. From the issues and points of the rich picture, the researcher will point out the indicators of effective stakeholder management.
Stage 3	The researcher will formulate the root definition by engaging Checkland's CATWOE model for each theme developed at Stage 2.
Stage 4	For each theme developed, the researcher will build a conceptual model. The model will identify the key activities that need to be carried out for the improvement to take place.
Stage 5	Here there will be a compression between the conceptual model developed in Stage 4 with what is really happening in the Water and sanitation Department. This will be done to establish the differences that will enhance the improvement of the stakeholder management system.
Stage 6	The researcher will then evaluate the results that have emerged in Stage 5. She will again meet with the SSM workshop members and discuss the conceptual model and define the changes. Then the intervention framework for the problem situation will be developed.
Stage 7	The changes that have become apparent as a result of the study will be indicated here.

Annexure D: Rich Pictures from four groups

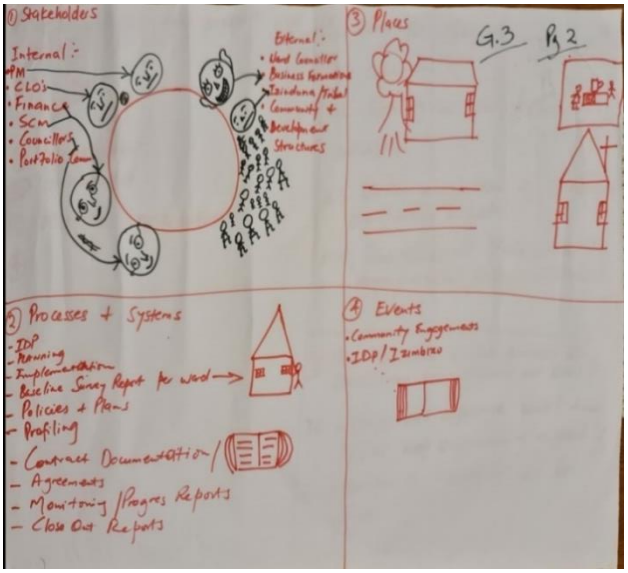
Group 1



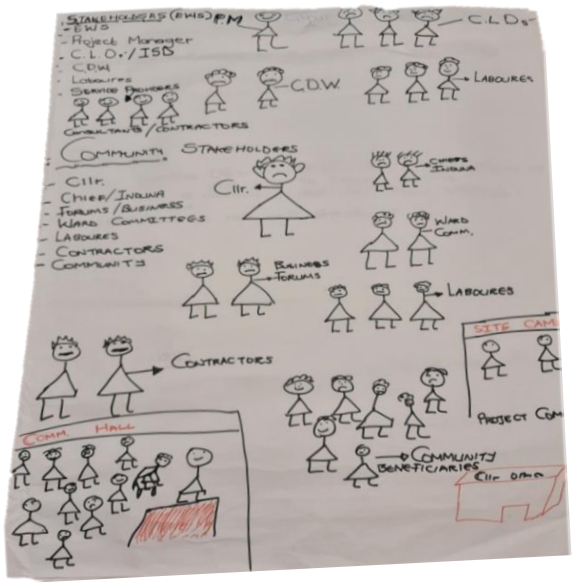
Group 2



Group 3



Group 4



Annexure E: Ethical Clearance

UNIVERSITY OF KWAZULU_NATAL

INYUVESI YAKWAZULU NATALI

23 January 2019

Ms Gloria Nokuphiwa Zondi
961097138

Graduate School of Business and Leadership Westville Campus

Dear Ms Zondi

Protocol reference number: HSS/2177/018D
Project title: The use of the Systems Thinking Approaches to develop a holistic model to improve stakeholder management in the eThekwini Water and Sanitation Unit (EWS)

Full Approval — Expedited Application In response to your application received 5 December 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted FULL APPROVAL.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment [modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully [redacted]

Dr Rosemary Sibanda (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Professor Cecile Gerard
Proches cc Academic Leader Research:
Professor M Hoque cc School
Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics
Committee Dr Rosemary
Sibanda (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag , Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za I snymanm@ukzn.ac.za I
mohunp@ukzn.ac.za Website: www.ukzn.ac.za

Annexure F: Gatekeeper's Letter

TRADING SERVICES CLUSTER
Water & Sanitation Unit
3 Prior Road,
Durban, 4001
PO Box 5588, Durban, 4000
Tel: 031 311 8605, Fax 031 311 88225
www.durban.gov.za

Prof Cecile Gerwel Proches
Graduate School of business & Leadership
University of KwaZulu Natal
Westville

29 November 2018

RE: LETTER OF SUPPORT TO MS. GLORIA NOKUPHIWA ZONDI-GRANTING PERMISSION TO USE ETHEKWINI MUNICIPALITY AS A CASE STUDY

EThekwini's Water and Sanitation Unit and EThekwini Municipality Academy (EMA), have considered a request from Ms. GN Zondi (961097139) to use EThekwini Municipality as a research study entitled "The use of the Systems Thinking Approaches to develop a holistic model to improve stakeholder management in the EThekwini Water and Sanitation Unit (EWS)", has been granted.

We wish to inform you of the acceptance of her request and hereby assure her of our utmost cooperation towards achieving her academic goals, the outcome which we believe will help our municipality improves its services delivery. In return, we stipulate as conditional that he present the results and recommendations of her study to the related unit/s on completion of his research study, as facilitated by the Municipal institute of Learning (MILE).

Wishing Ms. Zondi all the best in his studies.

[redacted]

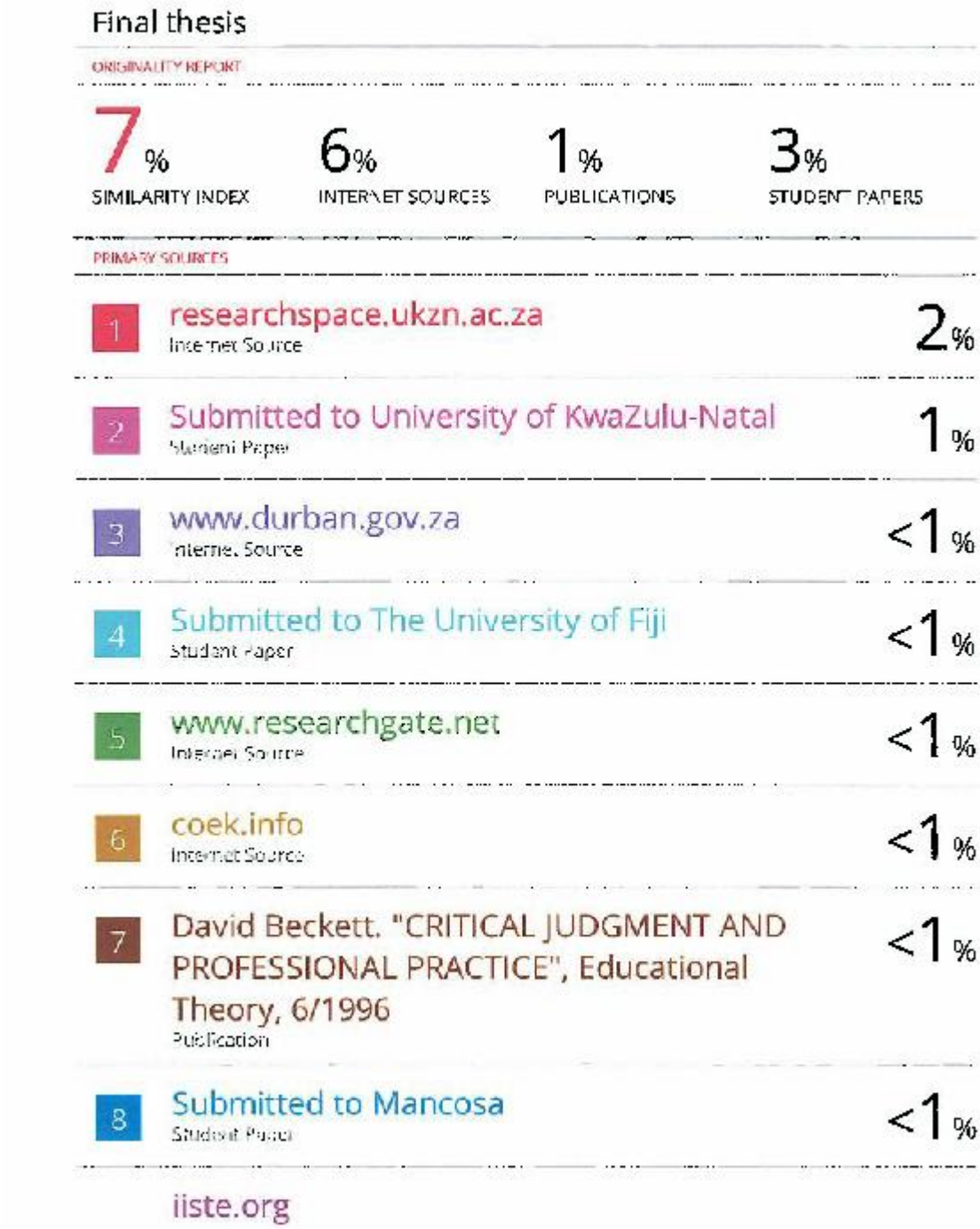
Mr. Ednick Msweli
Head: Water and Sanitation Unit

[redacted]

Dr. M Ngubane
Head: EThekwini Municipal Academy

Page 1 of 1

Annexure G: TII Report



Final thesis

ORIGINALITY REPORT

7%	6%	1%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	researchspace.ukzn.ac.za Internet Source	2%
2	Submitted to University of KwaZulu-Natal Student Paper	1%
3	www.durban.gov.za Internet Source	<1%
4	Submitted to The University of Fiji Student Paper	<1%
5	www.researchgate.net Internet Source	<1%
6	coek.info Internet Source	<1%
7	David Beckett. "CRITICAL JUDGMENT AND PROFESSIONAL PRACTICE", Educational Theory, 6/1996 Publication	<1%
8	Submitted to Mancosa Student Paper	<1%

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Annexure H: Language editor's confirmation letter

ETHEL ROSS

English language editing and proofreading

17 November 2022

To whomever it may concern:

This letter serves to confirm that I worked as the proofreader and language editor on Nokuphiwa Zondi's Ph.D. thesis:

THE USE OF SYSTEMS THINKING APPROACHES TO DEVELOP A HOLISTIC MODEL TO IMPROVE STAKEHOLDER MANAGEMENT IN THE ETHEKWINI WATER AND SANITATION UNIT (EWS)

In no way did I change the content.

Yours faithfully

[redacted]

Ethel Ross (BA Hons; H Dip Ed)

Email: clanross1@icon.co.za Tel: 083 554 5412