

**STRATEGIC KNOWLEDGE MANAGEMENT PRACTICES AND
ORGANIZATIONAL LEARNING IN THE WATER SECTOR IN KENYA**

BY

NAOMI MWIKALI MWEMA

MASTER OF SCIENCE IN KNOWLEDGE MANAGEMENT AND INNOVATION

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for the award of a degree. I also declare that it contains no material written or published by other people, except where due reference is made and authors are duly acknowledged.

Student Name: Naomi M. Mwema

Reg, No:23/08386

Signature... 

Date:9th October 2025

I do hereby confirm that I have examined the master's dissertation of;

Naomi M. Mwema

And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

Sign: 

Date:7th November 2025

Dr. Nyaribo Misuko, PhD, MBA, B.Com

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ABSTRACT

This study examines the impact of strategic knowledge management practices on organizational learning within Kenya's water sector. The following research objectives guided the study; To find out the effect of knowledge creation on organizational learning in the water sector in Kenya. To determine the effect of knowledge storage on organizational learning in the water sector in Kenya. To determine the influence of knowledge application on organizational learning in the water sector in Kenya, and to find out the effect of knowledge transfer on organizational learning in the water sector in Kenya. A descriptive research design was employed, utilizing surveys, interviews, and document analysis to gather insights from employees, managers, and policymakers across Kenya's water sector. The target population consists of 850 employees drawn from the Ministry of Water, Sanitation and Irrigation, the Water Services Regulatory Board (WASREB), the Water Resources Authority (WRA), Water Service Providers (WSPs), as well as other relevant governmental and non-governmental organizations. A sample of 272 respondents was selected through stratified random sampling, guided by Yamane's formula. Primary data was collected via structured questionnaires. Pearson correlation and multiple linear regression were done. Data was analysed using SPSS version 26. Tables and figures were used to present results. To examine the relationship between knowledge management and organizational learning, the findings indicated a positive and significant correlation between knowledge creation and organizational learning ($r = .594^{**}$, $p < 0.000$), knowledge storage and organizational learning ($r = .504^{**}$, $p < 0.000$), knowledge application and organizational learning ($r = .534^{**}$, $p < 0.000$), as well as knowledge transfer and organizational learning ($r = .543^{**}$, $p < 0.000$). The study concluded that knowledge creation, storage, transfer, and application significantly influence organizational learning. It was recommended that the Kenyan water sector enhance its knowledge management practices by improving knowledge creation, storage, transfer, and application through updated training initiatives, supportive policy frameworks, and the strategic use of digital platforms. Additionally, it was suggested that a similar study be conducted in other sectors in Kenya to assess whether the trends observed in the water sector are unique or reflective of broader industry patterns.

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I sincerely thank my family for their unwavering support and encouragement throughout my academic journey. Their belief in me and constant cheering were my greatest source of strength.

This work is also dedicated to all the professionals in Kenya's water sector, whose commitment to knowledge, service, and innovation inspired the focus of this study. May this research meaningfully contribute to the growth and learning of organizations within the sector and beyond.

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DEDICATION

I dedicate this research project to my family, whose unwavering support and encouragement have been my greatest source of strength throughout my academic journey. Thank you for believing in me and cheering me on at every step.

This work is also dedicated to all the professionals in Kenya's water sector, whose commitment to knowledge, service, and innovation inspired the focus of this study. May this research make a meaningful contribution to the growth and learning of organizations in the sector and beyond.

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ABBREVIATIONS

CWSA:	Community Water and Sanitation Agency
EPA:	Environmental Protection Agency
EUP:	European Union
IWRM:	Integrated Water Resources Management
KBV:	Knowledge-Based View
KEWI:	Kenya Water Institute
NACOSTI:	National Commission for Science, Technology and Innovation
NGO:	Non-Governmental Organization
OL:	Organizational Learning
OLT:	Organizational Learning Theory
PSS:	Statistical Package for the Social Sciences
R&D	Research and Development
RWB:	Rwanda's Water Resources Board
SDGs:	Sustainable Development Goals
SECI:	Socialization, Externalization, Combination, and Internalization
SKMP:	Strategic Knowledge Management Practices
U.S:	United States
UKWIR:	United Kingdom Water Industry Research
USGS:	United States Geological Survey
WASREB:	Water Services Regulatory Board
WFD:	Water Framework Directive
WRA:	Water Resources Authority

WRC: Water Research Commission

WSPs: Water Service Providers

OPERATIONAL DEFINITION OF TERMS

Strategic Knowledge Management Practices

Strategic knowledge management practices refer to structured and intentional activities that enable the formation, storage, allocation, and utilization of information to achieve organizational goals (Hislop, Bosua, & Helms, 2021). In this study, these practices are examined through four dimensions: knowledge creation, storage, transfer, and application.

Knowledge Creation

Knowledge creation refers to an establishment's capacity to develop fresh concepts and results by drawing from different aspects of its operations, ranging from management practices and service offerings to product development and technological advancements (Chebii, Lewa & Ngari, 2019).

Knowledge Storage

Knowledge storage involves documenting and preserving knowledge for future reference and organizational continuity. It includes physical documentation, digital repositories, and institutional databases (Rodrigues & Pai, 2021). Effective storage ensures that important knowledge is retained even when employees leave the organization.

Knowledge Transfer

Knowledge transfer is the movement of information from one person, group, or department to another, enabling learning and performance improvement (Grant, 2021). It can be formal (e.g., training, mentoring) or informal (e.g., conversations, collaborative work), and is essential to organizational learning.

Knowledge Application

Knowledge application involves a series of steps through which organizations apply gained knowledge so as to increase learning and competitive advantage in the industry (Chiu & Chen, 2016).

Organizational Learning

Organizational learning is the procedure by which organizations obtain, interpret, and respond to internal and external knowledge to enhance their performance and adapt to change (Argote, 2024). It reflects a continuous improvement culture and is influenced by how well knowledge is managed and utilized.

Water Sector

The water sector in Kenya comprises government agencies, regulatory bodies, and service providers involved in the governance, distribution, and management of water and sanitation services. These include the Ministry of Water, WASREB, WRA, and Water Service Providers (WASREB, 2022).

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Water is essential component of human development, economic progress, and environmental sustainability. It supports vital sectors such as agriculture, energy, health, and industry, making it crucial for achieving the United Nations Sustainable Development Goals (SDGs), especially the goal of ensuring water and sanitation are available and managed sustainably for everyone (Israilova, Voronina & Shatila, 2023). However, the world faces growing water-related challenges. Rapid population growth, urbanization, climate change, pollution, and overuse of water resources are exerting intense pressure on global water systems (Borah, 2025). Addressing these complex issues requires more than technical fixes; it demands institutional innovation, strategic governance, and adaptive capacity built on knowledge.

In this context, organizations across all sectors are increasingly adopting Strategic Knowledge Management Practices (SKMP) and Organizational Learning (OL) to navigate complexity and change (Shaik, Jain, Mendiratta, Alarifi & Arrigo, 2024). When strategically aligned, SKMP and OL become powerful drivers of organizational agility, resilience, and performance (Kaff, Wibisono & Fatima, 2025). Strategic Knowledge Management Practices (SKMP) involve deliberate and systematic processes through which organizations acquire, create, share, store, and apply knowledge to meet their strategic goals. These practices include key elements such as knowledge creation, storage, transfer, and application. Conversely, organizational learning refers to an organization's capacity to learn from experience, adapt behaviors, and promote continuous improvement through reflection, feedback, and innovation.

According to Dai, Huang, Khan, and Labbo (2025), embedding SKMP and OL into water sector institutions offers a pathway to transform how water services are planned, delivered, and governed. Knowledge sharing across departments can improve asset

management, reduce inefficiencies, and accelerate the adoption of best practices (Sun, Shahzad & Razzaq, 2022). Cultivating a culture of learning enhances responsiveness to environmental risks, policy changes, and technological innovations (Ahsan, 2025).

Western countries are increasingly recognizing the importance of viewing knowledge as a strategic asset in tackling complex water-related issues such as climate change, aging infrastructure, urban growth, and water quality management (Khan, Samiullah, Rouf, Sultana, Rahman, Rahman, & Khanum, 2024). In the United States, organizations like the Environmental Protection Agency (EPA) and the United States Geological Survey (USGS) have established robust systems for data collection, knowledge sharing, and stakeholder involvement. These agencies manage extensive databases, water modeling tools, and decision support systems that inform both policy creation and operational decisions (Riato, Leibowitz, Weber & Hill, 2023). Furthermore, utilities and regional water authorities prioritize learning initiatives, scenario planning, and resilience frameworks, such as the U.S. EPA's Water Utility Resilience Program, which integrates lessons from past climate events and emergencies into planning processes (Axtell, 2023).

Sandelin, Hukka, and Katko (2021) state that in the United Kingdom, knowledge management is deeply integrated within a highly regulated and privatized water sector. Organizations such as the Water Services Regulation Authority (Ofwat) and the Environment Agency foster innovation and continuous improvement through regulatory incentives and knowledge-sharing platforms, including initiatives like the Innovation in Water Challenge. Jolly, Velenturf, Salonitis, and Paddea (2022) add that knowledge hubs, such as the UK Water Industry Research (UKWIR) and academic partnerships, facilitate organizational learning and evidence-based planning across utilities.

Asian countries such as Singapore, Japan, South Korea, India, and China have also responded by embedding knowledge and learning into their water governance systems, though

with varying levels of maturity and focus. A key trend across these nations is the integration of technology and data-driven systems to enhance decision-making and institutional memory (Gonugunta & Leo, 2024). In Singapore, the national water agency PUB has pioneered a highly knowledge-centric model, supported by digital tools, in-house R&D, and global collaboration platforms like the Singapore International Water Week. Its well-known NEWater program, which recycles wastewater into drinkable water, demonstrates decades of strategic knowledge application and interactive learning. Similarly, South Korea's K-water has developed integrated knowledge platforms that support real-time monitoring, predictive analytics, and scenario planning, while leveraging partnerships with academia and research institutions to drive innovation (Lim, Goh, Nadzri & Wang, 2025).

In South Africa, Kruger, Pieters, Horn, Van Zijl, and Aneck-Hahn (2022) posit that the Water Research Commission (WRC) has been instrumental in funding research and disseminating knowledge that informs national water policy. Nalumenya, Rubinato, Kennedy, Catterson, and Bakamwesiga (2023) agree that Uganda's Ministry of Water and Environment promotes continuous learning and evidence-based decision-making through annual Joint Sector Reviews supported by a performance measurement framework. Akanbang (2021) indicates that Ghana's Community Water and Sanitation Agency (CWSA) has enhanced data accessibility and asset management through digital knowledge repositories. Nsengimana, Nzibaza, Nzarora, and Mugume (2024) illustrate how Rwanda's Water Resources Board (RWB) has developed a centralized information system aligned with its Integrated Water Resources Management (IWRM) framework to strengthen data-driven planning and resilience.

In Kenya, despite reforms done in the water sector, the adoption of SKMP and OL remains limited. Water resources are unevenly distributed and vulnerable to climatic fluctuations, with only about 59% of the population accessing safely managed drinking water (Mutschinski & Coles, 2021). Institutions like the Water Resources Authority (WRA), the

Kenya Water Institute (KEWI), and various Water Service Providers (WSPs) function within a legal framework focused on sustainable water management. However, institutional knowledge frequently remains fragmented and inadequately documented. Weak inter-agency coordination and underdeveloped knowledge-sharing mechanisms hinder effective decision-making and limit innovation (Obunga, 2023). Moreover, technological platforms exist but are underutilized due to limited capacity and a lack of incentives for knowledge management. The sector's strong emphasis on infrastructure development often overshadows the need to foster a culture of learning and strategic knowledge utilization, which in turn hampers resilience and adaptability.

1.2 Statement of the Problem

Water is a fundamental element for socio-economic progress, human health, and environmental sustainability. Amid global climate change, urban growth, and increasing freshwater demand, effective water governance has become more essential than ever. An increasing number of international studies emphasize the critical role of Strategic Knowledge Management Practices (SKMP) and Organizational Learning (OL) in strengthening institutional capacity, fostering resilience, and improving the overall performance of the water sector. For example, countries like Japan have developed adaptive governance models that incorporate ongoing learning and evidence-based planning into water resource management (Ishiwatari, Nagata & Matsubayashi, 2025). Likewise, in China, digital knowledge management systems have been proven to enhance coordination and stakeholder engagement in irrigation and water infrastructure projects (Chai, Chen, Pa, & Zeng, 2025).

In developed countries such as the Netherlands, knowledge sharing and trust-building mechanisms have been pivotal to effective public engagement in water governance (Voogd, de Vries, & Beunen, 2021). Similarly, Germany's implementation of the EU Water Framework Directive (WFD) highlights the importance of participatory learning processes within

polycentric water systems (Schröder & Watson, 2025). In Canada and the United States, utility-level adoption of knowledge management has contributed to climate-resilient infrastructure planning and long-term adaptation strategies (Smialek, Albrecht & Milman, 2025). These global experiences demonstrate the increasing recognition that the performance of the water sector relies not only on technical and financial investments but also on the strategic use and management of knowledge.

In Kenya, the Kenya Water Institute (KEWI) sector continues to face challenges in institutional knowledge management. Research shows that data fragmentation, weak inter-agency coordination, and a lack of structured learning mechanisms exist (Obunga, 2023). Additionally, high staff turnover, limited documentation practices, and underutilization of digital tools contribute to the erosion of institutional memory, hindering both short-term operational efficiency and long-term strategic planning (Bedelian, Mulwa, Sumari, Rogers, Gravesen, & Funder, 2024). The limited integration of Strategic Knowledge Management Practices (SKMP) and Organizational Learning (OL) hampers the sector's capacity to effectively respond to climate-related disruptions, adapt policies based on previous interventions, and scale successful innovations. In light of these challenges, there is an urgent need to explore how SKMP and OL can be embedded within institutional frameworks, operational systems, and policy implementation in the country's water sector.

This study is therefore both timely and necessary. It aims to fill a critical knowledge gap by examining the current status, challenges, and opportunities for SKMP and OL in Kenya's water governance. By doing so, it will offer evidence-based insights and practical recommendations to enhance institutional resilience, improve knowledge retention, and increase decision-making efficiency. Ultimately, the study seeks to contribute to the development of learning-oriented, knowledge-driven water institutions that are better equipped to address current and future water challenges in Kenya and beyond.

1.3 Objectives of the Study

1.3.1 General Objective

To establish the influence of strategic knowledge management practices on organizational learning in the water sector in Kenya.

1.4 Specific Objectives

- i. To find out the effect of knowledge creation on organizational learning in the water sector in Kenya.
- ii. To determine the effect of knowledge storage on organizational learning in the water sector in Kenya.
- iii. To determine the influence of knowledge application on organizational learning in the water sector in Kenya.
- iv. To find out the effect of knowledge transfer on organizational learning in the water sector in Kenya.

1.4.1 Hypotheses of the Study

H₀: Knowledge creation has no significant effect on organizational learning.

H₀: Knowledge storage does not play a significant role in organizational learning.

H₀: Knowledge transfer has no significant effect on organizational learning.

H₀: Knowledge application does not significantly influence organizational learning.

1.5 Significance of the Study

1.5.1 Policy Makers

The study findings will offer valuable insights to policymakers and regulators, such as the Ministry of Water, the Water Services Regulatory Board (WASREB), and county governments, by underscoring the role of knowledge management in improving decision-

making, resource utilization, and service delivery within the water sector. These findings will guide the formulation of evidence-based policies that foster effective knowledge creation, storage, transfer, and application, ultimately promoting greater sustainability and efficiency in water management.

1.5.2 Organizations

The study is also significant for Water Service Providers (WSPs) and other industry stakeholders, as it will provide practical recommendations on how to enhance knowledge-sharing mechanisms, reduce operational inefficiencies, and promote continuous learning. By integrating strategic knowledge management practices, water organizations can enhance service quality, reduce non-revenue water losses, and improve organizational adaptability to emerging challenges, such as climate change and population growth.

1.5.3. Academia and Researchers

This study will also benefit academia and researchers by adding to the existing body of knowledge on strategic knowledge management and organizational learning. It will offer empirical evidence on the connection between knowledge management and organizational performance within the water sector.

1.5.4 Customers/Community

The study is significant for the general public and consumers of water services as improved knowledge management practices in the sector will result in better service delivery, reduced water shortages, and enhanced access to clean and safe water. By promoting knowledge-based decision-making and innovation, this study will help build a more resilient and sustainable water sector in Kenya.

For the general public and water service consumers, the study is important because improved knowledge management practices are expected to result in better service delivery,

fewer water shortages, and increased access to clean and safe water. Communities will directly benefit from improved efficiency in the water sector through increased reliability of supply, fair pricing, and greater accountability of service providers.

Additionally, the study safeguards community interests by advocating for inclusive knowledge-sharing frameworks that consider the voices of water users in decision-making processes. By encouraging transparency, public participation, and accountability mechanisms, the study ensures that communities remain key stakeholders in water governance. This approach will safeguard community rights to safe, affordable, and sustainable water access while fostering trust between citizens, policymakers, and service providers.

1.6 Scope of the Study

The scope of this study allows for a focused and thorough analysis of the relationship between strategic knowledge management practices and organizational learning within Kenya's water sector. The target population comprised 850 employees, including middle-level managers and senior executives, from various organizations in the sector. Data was collected from 272 respondents between May and September 2025.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter offers a comprehensive review of the existing literature on strategic knowledge management practices and organizational learning within the water sector. It explores key theoretical frameworks, empirical research, and conceptual discussions related to knowledge management practices, organizational learning, and their application in this field.

2.1 Theoretical Review

The theoretical review examines key theories that illuminate the relationship between strategic knowledge management practices and organizational learning in the water sector. These selected theories offer a framework for understanding how organizations generate, store, transfer, and apply knowledge to improve learning, decision-making, and overall performance. This section covers the Knowledge-Based View (KBV) Theory, Organizational Learning Theory, and Nonaka and Takeuchi's Knowledge Creation Theory.

2.1.2 Knowledge-Based View (KBV) Theory

The Knowledge-Based View (KBV) is an extension of the Resource-Based View (RBV) of the firm, emphasizing knowledge as the most vital and strategically important resource an organization can have. KBV theory asserts that knowledge is the key resource and a primary driver of competitive advantage. Unlike traditional resource-based approaches that focus on tangible assets, KBV stresses that firms achieve a competitive edge through the effective management, sharing, and application of knowledge (Grant & Phene, 2022). This theory suggests that organizations that strategically create, store, transfer, and apply knowledge are more likely to improve their performance and achieve sustained long-term success (Curado & Bontis, 2006).

According to KBV, knowledge is regarded as a strategic asset that organizations must continuously develop and integrate to remain competitive. Both tacit knowledge, which is inherent in employees' experiences, and explicit knowledge, which is codified and documented, require effective management to facilitate learning and decision-making (Polanyi, 1996). Furthermore, knowledge transfer within an organization is crucial to ensuring employees can access and utilize relevant knowledge, thereby driving innovation and operational efficiency (Zander & Kogut, 1995).

According to Spender (1996) highlights the Knowledge-Based View (KBV), often lacks clarity in defining what constitutes knowledge within organizations. The theory often treats knowledge as a homogeneous resource, without sufficiently differentiating between types of knowledge such as tacit and explicit or considering how these distinctions impact strategic decision-making. Similarly, Swan, Scarborough, and Preston (1999) argue that KBV assumes knowledge can be easily transferred and shared across an organization. In reality, however, knowledge sharing is influenced by complex factors including power dynamics, individual interests, and organizational politics elements that KBV frequently fails to consider.

Despite some criticisms, the Knowledge-Based View (KBV) remains relevant to this study because it underscores the importance of developing processes and technologies that enable the creation, storage, transfer, and utilization of knowledge within organizations (Alavi & Leidner, 2001). The theory emphasizes managing knowledge across these key areas and offers a strong foundation for understanding the link between strategic knowledge management and organizational learning. By implementing effective knowledge management practices, organizations can improve adaptability, encourage innovation, and sustain a competitive advantage in a constantly changing business environment.

2.1.2 Organizational Learning Theory

Organizational Learning Theory was developed by Argyris and Schön in the late 1970s, focusing on how organizations adapt through feedback mechanisms. They introduced the concepts of single-loop and double-loop learning: single-loop learning addresses errors within existing strategies, while double-loop learning challenges underlying assumptions to promote transformative change (Chiva, Lapiedra Alegre & Miralles, 2018). Organizational Learning Theory (OLT) explains how organizations acquire, interpret, and apply knowledge to improve processes and sustain competitiveness. It suggests that, like individuals, organizations must continuously learn from experience to adapt to changing environments and enhance performance (Easterby-Smith & Lyles, 2019). Learning occurs at multiple levels individual, group, and organizational each playing a role in knowledge retention and fostering innovation within the organization (Tseng, Fan & Pan, 2022).

Organizational learning (OL) theory has significantly contributed to understanding how organizations acquire and use knowledge, however, scholars have highlighted its limitations. Basten and Haamann (2018) argue that OL theory frequently fails to address the connection between organizational structure and learning processes, calling for more research that explores how different organizational designs impact learning outcomes. Similarly, Alvesson (2016) criticizes that organizational learning theory assumes one-size-fits-all approach, the theory ignores important contextual factors like organizational culture and industry specific characteristics.

Despite these concerns, OL theory remains a valuable framework for this study as it supports the development of learning opportunities, promotes communication and teamwork, and facilitates knowledge sharing and collaboration (Goh, Chan & Kuziemy, 2013). Aghdasi and Khakzar (2009) describe creative learning, also referred to as double-loop learning, as a process that thrives in open and supportive environments. It focuses on generating new ideas

both within and outside the organization. Double-loop learning promotes the renewal, increase, and improvement of individual knowledge by questioning existing beliefs and encouraging innovative thinking. This approach provides valuable insight into how organizations can continuously adapt and evolve in dynamic and complex settings through the creation and application of knowledge, thereby aligning with the objectives of the present study.

2.1.3 Nonaka and Takeuchi's Knowledge Creation Theory

Nonaka and Takeuchi's SECI model also includes the processes of Combination and Internalization, which complete the continuous cycle of knowledge creation. Combination (Explicit to Explicit) involves systematizing and integrating different pieces of explicit knowledge, such as through reports, databases, or manuals, to generate new explicit knowledge that can be widely shared within the organization. Combination takes place when organizations consolidate research findings, reports, and best practices into structured strategies (Rodrigues & Pai, 2005). Internalization (Explicit to Tacit) occurs when individuals absorb explicit knowledge and transform it into tacit knowledge through hands-on experience, training, or practice. This process allows employees to internalize documented knowledge, making it part of their skills and expertise. Employees internalize documented procedures by practicing them in real-world scenarios, leading to skill development and knowledge retention (Hislop, Bosua, & Helms 2021). Socialization process (Tacit to Tacit) involves the exchange of tacit knowledge through mutual experiences, observation, imitation, and hands-on practice. It represents the transfer of knowledge directly between individuals, without relying on formal communication channels (Nonaka & Takeuchi, 1995). Externalization (Tacit to Explicit) involves converting tacit knowledge into explicit concepts through discussion, metaphors, or models. This step is crucial for expressing individual insights in a way that others can comprehend (Nonaka & Takeuchi, 1995). Together, these four processes Socialization, Externalization, Combination, and Internalization form a dynamic and continuous cycle that facilitates knowledge creation,

sharing, and application, ultimately driving organizational learning and innovation. (Hislop, Bosua, & Helms 2021).

According to Bratianu (2010), some scholars argue that Nonaka and Takeuchi's model is strongly influenced by Japanese business practices, which puts emphasis on group harmony, long-term employment, and an indirect form of communication. Consequently, implementing the SECI model in Western organizations can be difficult due to differences in structures, which tend to be more hierarchical, and communication that is clear and straightforward. Furthermore, the model has been criticized for its linear structure, which may not adequately reflect the dynamic and complex nature of knowledge creation within organizations. Jorna (2001) also highlights a tendency toward managerial bias in the framework, suggesting it overlooks the significance of informal, emergent knowledge processes that arise organically from within the workforce.

Despite some criticisms, the SECI model remains relevant to this study as it provides a structured framework for facilitating knowledge sharing and the transfer of experience within organizations. It helps identify key knowledge holders and develop strategies to leverage their expertise effectively. For example, experienced employees and senior staff can more easily pass their insights to newer or less experienced colleagues. As older employees retire, their valuable knowledge can be preserved and transferred to the remaining workforce. When tacit knowledge is converted into explicit knowledge a process called externalization, it becomes easier to document and store this knowledge in organizational systems such as databases and knowledge repositories for both immediate and long-term use (Njenga, 2022). Overall, the model illustrates how knowledge can be created, stored, shared, and applied within organizations.

2.2 Empirical Literature

2.2.1 Effect of Knowledge Creation on Organizational Learning

Knowledge creation is the process of generating and producing new knowledge and innovative solutions to address problems and challenges faced by an organization. This is achieved by combining tacit and explicit knowledge within the organization or through external sources such as seminars, training, and workshops (Sousa & Hendricks, 2007). Vikas and Shivraj (2014) describe knowledge creation as the replacement of existing knowledge. It refers to an organization's ability to develop innovative ideas and solutions by leveraging various aspects of its operations, including management practices, service delivery, product development, and technological advancements (Chebii, Lewa, & Ngari, 2019). Zheng and Nguyen (2016) claim that organizations that fail to continue creating knowledge will not be in a position to access and develop new knowledge.

In an organization, knowledge creation involves more than just collecting information; it involves a workplace culture that supports innovation, experimentation, and risk-taking. Employees need to feel confident that they can voice their ideas, insights, and feedback without the fear of negative consequences. Also, to increase knowledge creation, an organization should make sure that people from different departments are in a position to share their roles and expertise with each other. This cross-functional collaboration fosters fresh thinking and helps generate unique solutions. To support this process, organizations should utilize tools and technologies that facilitate communication and knowledge sharing. Platforms such as internal knowledge bases, collaborative tools, and enterprise social networks enable individuals and teams to connect more easily, allowing them to exchange ideas and build upon each other's experiences (Canonico, De Nito, Esposito, Iacono, & Consiglio, 2020).

Stojanović-Aleksić, Nielsen, and Bošković (2019) argued that in an organization, before creating ideas, knowledge should first be created. Therefore, networking and internal

organizational processes play a crucial role in facilitating knowledge creation within organizations (Al-Omoush, Ribeiro-Navarrete, Lassala, & Skare, 2022). Tripathi, Popli, Ghulyani, Desai, and Gaur (2021) argued that factors such as collaborative learning environments, high-performing teams, transformational leadership, and a culture that promotes continuous learning play a significant role in the success of knowledge creation and organizational learning. Grant and Baden-Fuller (2016) add that knowledge creation allows employees and the organization to share new ideas, increase learning, and create a competitive advantage.

Bikash (2018) examined the impact of knowledge creation on organizational performance within service organizations in Bangladesh. Using questionnaires for data collection and regression analysis to explore the relationship, the study revealed that knowledge creation positively affects organizational performance. However, since the study was conducted in India, its findings have limited applicability to Africa. Additionally, the focus was on organizational performance rather than organizational learning. Addressing this gap, the current study will explore the effects of knowledge creation on organizational learning.

Similarly, Rezaei, Allameh, and Ansari (2018) investigated the impact of knowledge creation and organizational learning on organizational innovation through an empirical study with a descriptive research design and a sample of 200 participants. Data was gathered using questionnaires, and the study found that both knowledge creation and organizational learning influence technological innovation. However, it did not specifically examine how knowledge creation affects organizational learning. To fill this gap, the present study will focus on investigating the effects of knowledge creation on organizational learning.

Rehman, Poulouva, Yasmin, Haider, and Jabeen (2021) conducted an empirical study on the impact of knowledge management on organizational learning within higher education institutions. Using stratified random sampling, data was collected from 255 faculty members

across public and private universities in Pakistan. The findings showed that knowledge creation positively influences organizational learning. The study recommended that managers enhance knowledge management by supporting employees, fostering a learning mindset, and valuing their contributions and opinions. However, since the research was limited to universities, its findings may not be generalizable to other sectors. This study will focus on the water sector in Kenya to address this gap.

Mwangi and Mwanzu (2023) explored the effect of knowledge creation on organizational competitive advantage in Kenya's telecommunications industry. Employing a cross-sectional survey design, data were gathered from 100 knowledge management staff using questionnaires. Results indicated that knowledge creation processes, specifically socialization, externalization, and internalization, positively impact competitive advantage. The study also highlighted that organizations generate knowledge through these processes. However, the relationship between knowledge creation and organizational learning was not examined. To fill this gap, the current study will investigate how knowledge creation affects organizational learning.

Bawack (2024) examined the role of technology in knowledge creation and capitalization and its effect on organizational performance. Using a case study approach that combined qualitative and quantitative methods, data was collected through questionnaires and interviews from 60 employees. The study found a lack of sufficient technology to support knowledge creation within the organization and recommended increased investment in technology to enhance knowledge creation, sharing, and storage. Since the study was conducted in Cameroon, its findings may not apply to other regions.

Wanyama (2018) examined the impact of knowledge management on organizational performance within Kenya's public service sector. The study employed a descriptive research design and targeted 2,343 employees, with a sample of 303 selected through stratified random

sampling. Data was collected using structured questionnaires. Findings indicated that knowledge creation positively influences organizational performance. The study also revealed that organizations offering seminars and cross-training encouraged employees to share responsibilities and acquire skills across different tasks. It was recommended that training programs should cover a variety of duties to promote open information sharing among employees. However, since this research focused on the public sector and did not address organizational learning, its applicability to the water sector is limited.

Sisia (2015) investigated the effects of knowledge management on organizational learning within IREX Kenya. Using a descriptive research design, the study included all 25 members of the target population through a census approach. Data was gathered via structured questionnaires directly from respondents. The study found that knowledge creation has a positive effect on organizational learning and recommended adopting technology to enhance knowledge management. Technology was noted as vital for content creation and management, with tools like blogs facilitating knowledge sharing and dissemination of relevant information. Although this study was conducted in Kenya, it focused on a different sector than the water sector.

2.2.2 Effect of Knowledge Storage on Organizational Learning

Wanyama (2018) examined the impact of knowledge management on organizational performance within Kenya's public service sector. The study employed a descriptive research design and targeted 2,343 employees, with a sample of 303 selected through stratified random sampling. Data was collected using structured questionnaires. Findings indicated that knowledge creation positively influences organizational performance. The study also revealed that organizations offering seminars and cross-training encouraged employees to share responsibilities and acquire skills across different tasks. It was recommended that training programs should cover a variety of duties to promote open information sharing among

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Wanyama (2018) examined the impact of knowledge management on organizational performance in Kenya's public service sector using a descriptive research design. The study targeted 2,343 employees, with a stratified random sample of 303 respondents completing structured questionnaires. Results showed that knowledge creation positively affects organizational performance. It was observed that organizations conducting seminars and cross-training encouraged employees to share duties and learn various tasks. The study recommended expanding training programs to cover diverse duties to foster free information sharing among employees. However, since this research focused on the public sector and did not address organizational learning, its findings may not be directly applicable to the water sector.

2.2.3 Effect of Knowledge Transfer on Organizational Learning

Knowledge transfer involves the exchange of both tacit (implicit) and explicit knowledge to generate new knowledge (Van-Den-Hooff & de Ridder, 2004). It encompasses the application, transmission, and absorption of knowledge to enhance learning and organizational capabilities

(Chen, 2010). Effective knowledge transfer improves how individuals learn in the workplace, where learning is defined as acquiring and applying new knowledge, which plays a crucial role in the sharing of ideas and information (Cao, Ali, Pitafi, Khan, & Waqas, 2021). Mariel (2015) highlighted that organizational culture and systems, including rewards and incentives, can significantly boost knowledge transfer and learning. Reward systems not only motivate employees to achieve organizational goals but also encourage and reinforce successful knowledge sharing and learning behaviours.

Tamayo-Torres, Gutiérrez-Gutiérrez, Llorens-Montes, and Martínez-López (2016) argue that organizations fostering a positive learning culture are better at facilitating knowledge transfer among employees. When continuous learning is promoted, individuals are more likely to share, transfer, and apply the knowledge gained from their experiences (Saadat & Saadat, 2016). Such a culture supports not only knowledge transfer but also enhances creativity, confidence, and productivity among employees (Chadwick & Raver, 2015). Consequently, cultivating organizational knowledge demands deliberate learning strategies, with leadership playing a vital role in establishing processes to support this objective. By nurturing a learning-focused culture, organizations foster collaboration, improve knowledge transfer, and boost overall performance (Saadat & Saadat, 2016).

Dimma (2020) studied knowledge transfer strategies and the retention of critical business information using quantitative, qualitative, and mixed methods. The research targeted 25 managers and executives in a credit union in Michigan, with data collected through interviews. Findings revealed that effective knowledge transfer strategies enhance organizational productivity by minimizing the loss of vital business information during employee transitions. The study also noted that organizations promoting employee participation in business meetings and offering job shadowing opportunities enhance learning, as these activities encourage sharing of ideas, asking questions, and receiving feedback, thereby

improving knowledge transfer. However, since the study was conducted in Michigan and did not examine organizational learning in relation to knowledge sharing, its findings cannot be generalized to regions like Africa, highlighting a research gap. This study will be conducted in Kenya, focusing on knowledge sharing and organizational learning.

Rehman *et al.* (2021) conducted an empirical study on the impact of knowledge management on organizational learning within higher education institutions. Using stratified random sampling, data was gathered from 255 faculty members in public and private universities in Pakistan. The study found that knowledge creation positively influences organizational learning, whereas knowledge transfer showed no significant relationship with organizational learning. As the study was limited to higher education institutions, its findings may not apply to other sectors. To fill this gap, the current study will focus on the water sector in Kenya.

Mnasi (2022) examined the effects of knowledge transfer practices on employee performance in local government authorities in Tanzania using a quantitative research design. The study sampled 368 employees, with data collected through questionnaires. Using multiple linear regression analysis, the study found that employee performance was positively influenced by knowledge transfer mechanisms such as mentoring, information and communication technology, and teamwork. It was recommended that organizations review their training policies to better align with the knowledge transfer strategies employed. Since this study was conducted in Tanzania, its findings may not directly apply to other contexts.

Zamfir (2020) conducted a quantitative study examining the impact of knowledge transfer on organizational performance, surveying 100 respondents using questionnaires. The results indicated that knowledge transfer positively influences the company's vision, learning, and overall business performance. The study also highlighted that the organization employs various methods for knowledge transfer, including written documents like organizational

procedures, face-to-face communication, inter-departmental information exchange, and technology. However, the study did not clearly explain how knowledge transfer specifically affects learning.

Mwangi (2019) investigated the effects of knowledge transfer processes on employee performance within Kenyan state corporations, using a cross-sectional survey design. Targeting 187 human resource managers, the study collected data from a sample of 126 respondents through questionnaires. Findings revealed that knowledge transfer positively impacts employee performance. The study further showed that peer-to-peer training and coaching are commonly used to enhance learning and knowledge transfer. It was recommended that organizations increase the use of information technology and develop policies to support training in emerging technologies.

Chineze and Onyeabo (2025) explored the relationship between knowledge transfer and organizational performance in lubricant firms located in Anambra State. Using a survey research design, the study sampled 327 employees from a population of 1,704. Primary data were collected via questionnaires. The findings demonstrated that both tacit and explicit knowledge transfer positively affect organizational performance. The authors suggested pairing experienced employees with less experienced ones through coaching and mentorship programs, alongside offering effective training and job shadowing opportunities to facilitate knowledge transfer and learning. However, the study did not address organizational learning, indicating a gap that requires further investigation.

Asemamaw (2023) examined how organizational factors influence knowledge transfer performance among employees at commercial bank branches in Gondar City, Ethiopia. The study used a cross-sectional survey design, collecting data from 225 employees out of a target population of 733. Results showed that factors such as employee trust, learning and development opportunities, collaboration, management support, and a shared vision

significantly affect knowledge transfer and overall performance. The study concluded that managers can enhance knowledge transfer by providing necessary resources and fostering an environment conducive to learning and knowledge sharing. Since this research was conducted in Ethiopia, its findings may not be directly applicable to Kenya. To extend this knowledge, the present study will explore the impact of knowledge transfer on organizational learning specifically within the Kenyan water sector.

Kinyua (2015) investigated the relationship between knowledge management and the performance of commercial banks in Kenya, employing an explanatory and cross-sectional survey design that included all 43 commercial banks in the country. Both primary data (via semi-structured questionnaires) and secondary data (through document reviews) were collected. The study found a statistically significant relationship between knowledge transfer and the banks' performance. However, the research focused on performance outcomes rather than organizational learning and was conducted outside the water sector. To address this gap, the current study will examine knowledge transfer on organizational learning within Kenya's water sector.

2.2.4 Influence of Knowledge Application on Organizational Learning

Knowledge application refers to the series of processes through which organizations utilize acquired knowledge to enhance learning and gain a competitive edge in their industry (Chiu & Chen, 2016). Zaim (2010) defines knowledge application as the effective use of stored knowledge within an organization to solve problems, boost learning, and motivate employees in fulfilling their roles. Matin and Sabagh (2020) describe knowledge application as the means by which an organization leverages its accumulated knowledge to improve operations and deliver superior products and services.

Lee and Leong (2013) suggest that knowledge application within organizations supports learning, innovation, skill development, and the improvement of products and

processes. Chatterjee, Pereira, and Bates (2018) emphasize that an organization's culture and leadership values significantly impact the success of its learning processes. Organizational culture shapes how knowledge is acquired, shared, and applied; however, negative cultural aspects like coercion and lack of trust can obstruct effective learning, development, and knowledge application.

Noor, Ghorbani, and Soltani (2017) conducted a study on the effect of knowledge management on organizational innovation with organizational learning as a mediator, focusing on the Agricultural Bank in Iran. The research targeted 230 employees, with data collected from 140 respondents via questionnaires. While the study addressed knowledge application, creation, registration, refinement, and dissemination, it did not thoroughly explain how these factors impact organizational learning.

Kordab *et al.* (2020) explored the mediating role of knowledge management in the relationship between organizational learning and sustainable organizational performance. Using a survey, the study sampled 378 CPAs from Lebanon, Syria, and Jordan. Results indicated that organizational learning positively influences knowledge application and performance. Although this study demonstrated the effect of organizational learning on knowledge application, it also examined performance, making it different from the current study, which focuses solely on the relationship between knowledge application and organizational learning.

Alsabbagh and Khalil (2017) investigated the impact of knowledge management on organizational learning within the education sector in Damascus. Adopting a quantitative approach, data was collected through questionnaires from 383 employees of public and private universities. The findings revealed a significant positive relationship between knowledge application and organizational learning. However, since this research was conducted in Damascus and focused on universities, its findings may not fully apply to the Kenyan context.

Mobolade and Ibojo (2023) studied the impact of knowledge application and conversion on organizational performance in six manufacturing companies in Ibadan. Employing a survey design and stratified random sampling, data was gathered from 200 employees using questionnaires. The study found that knowledge application significantly affects organizational performance and recommended that organizations increase technology use, provide incentives, and foster a motivating culture to boost productivity. Since the study focused on organizational performance and was conducted in Ibadan, its applicability is limited, especially given the current study's focus on organizational learning.

Alharbi and Aloud (2024) examined the effects of knowledge management processes on performance in Saudi Arabia's service sector through a survey of employees from public and private organizations. The findings indicated that knowledge application positively affects performance. However, the study's setting in Saudi Arabia, with its distinct regulatory environment, and its focus on performance rather than organizational learning limit the relevance of its results to Kenya.

Kilili (2020) explored the influence of knowledge management on organizational competitiveness at Britam. Using a descriptive research design, the study sampled 138 employees from a population of 1,492, collecting data via questionnaires. Results showed a positive and significant relationship between knowledge application and competitiveness. It was recommended that the organization continue leveraging knowledge application to enhance vision, learning, skills, innovation, and cost reduction. This study, however, focused on competitiveness rather than learning and involved a different sector, thus differing from the current study.

Nzau (2017) researched knowledge management strategies and their effect on the performance of ICT companies in Nairobi County. Using a descriptive design and census method, data was collected from 81 firms via questionnaires. The study found that knowledge

application positively influences performance and suggested implementing incentive programs to motivate employees to share and apply knowledge, thereby improving coordination and reducing task duplication. The focus on performance rather than organizational learning distinguishes this study from the present one.

Kinyua (2015) examined the relationship between knowledge management and the performance of commercial banks in Kenya. Utilizing an explanatory cross-sectional design, the study covered all 43 commercial banks, collecting primary data via semi-structured questionnaires and secondary data through document review. Findings revealed a significant association between knowledge application and bank performance. However, since the study focused on the banking sector, its findings may not be generalizable to other sectors, such as water. This gap underscores the need for the current study, which will focus on knowledge application and organizational learning in Kenya's water sector.

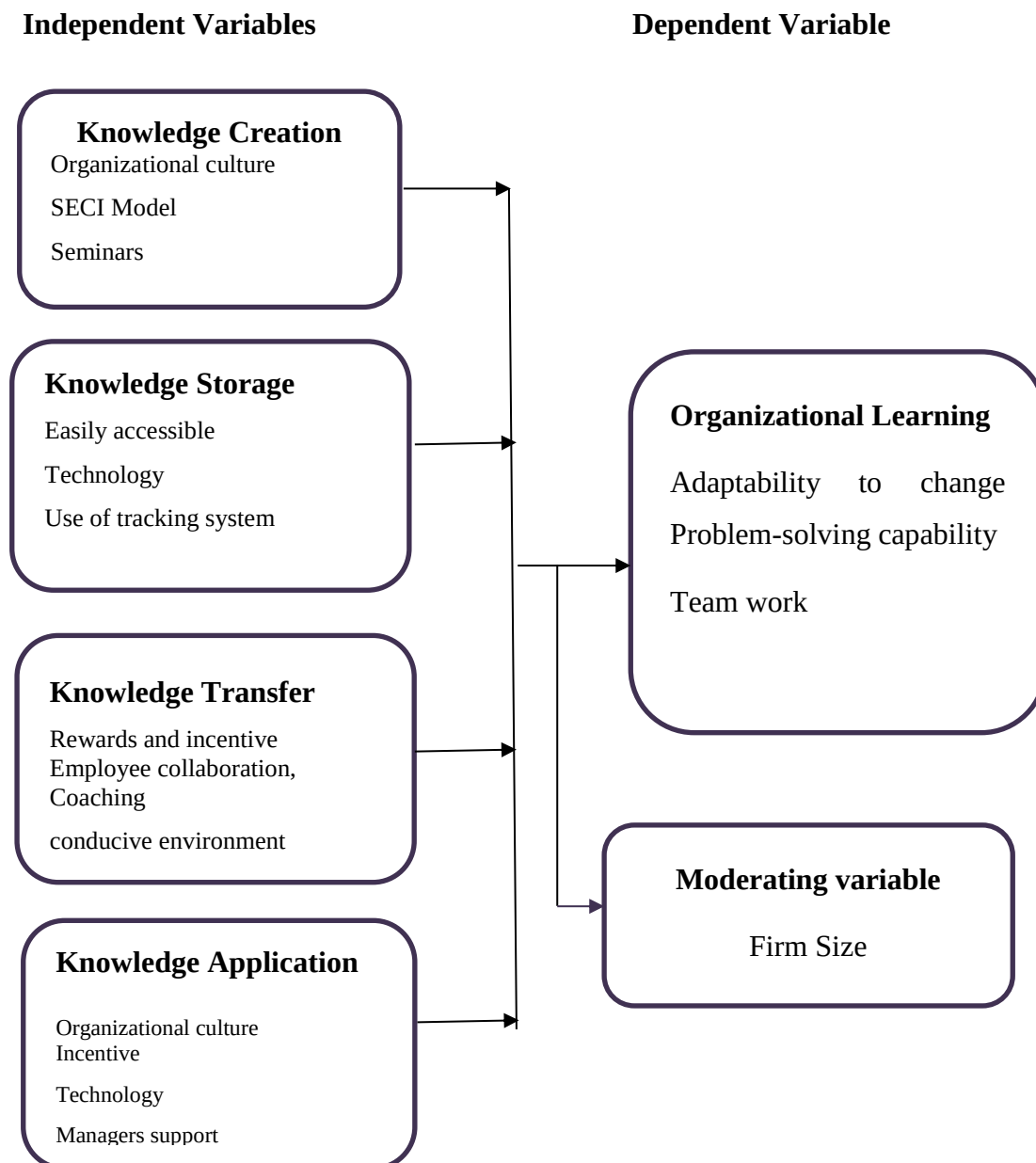
Mtawali (2018) investigated knowledge management practices and their impact on the performance of micro-finance institutions in Kenya, specifically at Uwezo Micro-Finance Bank. Using a descriptive design, data were collected via questionnaires from a sample of 87 employees out of 111. The study concluded that knowledge application positively influences performance and recommended that managers leverage available technology to enhance knowledge application. Despite being conducted in Kenya, the study's focus on micro-finance institutions and organizational performance differentiates it from the current research, which is in line with organizational learning in the water sector.

2.3 Conceptual Framework

A conceptual framework offers a systematic way to comprehend the connection between strategic knowledge management practices and organizational learning within the water sector. It highlights the main independent variables such as knowledge creation, knowledge transfer, and knowledge application and their influence on the dependent variable, organizational

learning. Additionally, the framework clarifies the interactions among these variables, illustrating how effective management of knowledge processes can enhance learning and overall organizational effectiveness.

FIGURE 1 Conceptual Framework



2.4 Operationalization of Variables

Variables	Variable Type	Operational Indicators	Type of scale	Analysis tools
Knowledge Creation	Independent Variable	Organizational culture Technology SECI (Socialization, Externalization, Combination, Internalization) Seminars	Ordinal	Descriptive statistics and Regression Analysis
Knowledge Storage	Independent Variable	Easily accessible Technology Use of tracking system	Ordinal	Descriptive statistics and Regression Analysis
Knowledge Transfer	Independent Variable	Rewards and incentive Employee collaboration, training and coaching	Ordinal	Descriptive statistics, and Regression Analysis
Knowledge Application	Independent Variable	Organizational culture Incentive Technology Managers support	Ordinal	Descriptive statistics, and Regression Analysis
Organizational Learning	Dependent Variable	Adaptability to change Improvement in service efficiency Problem-solving capability	Ordinal	Descriptive statistics, and Regression Analysis

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that will be employed to investigate the relationship between strategic knowledge management practices and organizational learning in Kenya's water sector. It provides a detailed description of the research design, target population, sampling methods, data collection techniques, research instruments, data analysis procedures, and ethical considerations guiding the study.

3.2 Research Design

The study utilized a descriptive research design, which is well-suited for examining the relationship between strategic knowledge management practices and organizational learning within the water sector. This design enabled systematic collection, analysis, and interpretation of data to accurately describe existing knowledge management practices and their effects on organizational learning (Saunders, Lewis, & Thornhill, 2019). Its suitability lies in accommodating both quantitative data collection and analysis. Additionally, a cross-sectional approach was employed, with data collected at a single point in time to assess the current state of knowledge management and learning within organizations. This approach is effective for identifying trends, patterns, and relationships among the key variables (Creswell & Creswell, 2018). The descriptive design provided empirical evidence on how strategic knowledge management practices impact learning and performance in water sector organizations, offering a foundation for informed recommendations and policy enhancements.

3.3 Target Population

This study targets 850 employees, middle-level managers, and senior executives from various organizations in Kenya's water sector. It included personnel from key agencies such as the

Ministry of Water, Sanitation and Irrigation, the Water Services Regulatory Board (WASREB), the Water Resources Authority (WRA), Water Service Providers (WSPs), and other related governmental and non-governmental organizations. These individuals were chosen for their direct involvement in knowledge generation, dissemination, and utilization, making them well-suited to provide insights into the impact of strategic knowledge management on organizational learning.

TABLE 1 Target Population

Institution	Population	Percentage
WASREB	60	7
Ministry of Water	100	12
WRA	80	9
NWSC	200	24
Athi Water Works	80	9
Other WSPs	250	30
NGOs/Partners	80	9
Total	850	100

Source: Ministry of Water, Sanitation and Irrigation (MWSI)

3.4 Sampling Techniques and Sampling Size

This study employed a probability sampling technique, specifically stratified random sampling, to achieve representativeness across the key institutions within Kenya's water sector. Stratified random sampling was chosen because it allows the population to be divided into distinct sub-groups (strata) based on institutional affiliation, including the Ministry of Water, Water Services Regulatory Board (WASREB), Water Resources Authority (WRA), Water Service Providers (WSPs), and development partners. From each stratum, a random sample was drawn,

enhancing statistical efficiency and ensuring proportional representation of each institutional category in the study sample (Kumar, 2019).

Respondents were identified using official organizational records and staff lists obtained from each institution. Within each stratum, the researcher coordinated with HR departments or designated focal persons to access updated lists of employees involved in knowledge management, decision-making, or operational roles. A random selection process was then applied to select respondents from each group proportionally. This approach promoted fairness, minimized researcher bias, and ensured that all eligible staff members had an equal opportunity to be included in the study. Consequently, the sampling process improved the validity and reliability of the study by providing a scientifically sound and representative sample that reflects the structure and diversity of the Kenyan water sector.

The sample size was determined using Yamane's (1967) formula, based on an estimated target population of 850 individuals engaged in knowledge management-related roles. With a 95% confidence level and a 5% margin of error, the calculated sample size was 272 respondents. The sample was then allocated proportionally across the strata, ensuring that it accurately represented the composition of the water sector institutions.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n = Sample size
- N = Target population (850)
- e = Margin of error (commonly 0.05 for 95% confidence)

$$n = \frac{850}{1 + 850(0.05)^2} = \frac{850}{1 + 850(0.0025)} = \frac{850}{3.125} = 272$$

$$n = 272$$

TABLE 2 Sample Size

Institution	Population	Percentage	Sample Size
WASREB	60	7	19
Ministry of Water	100	12	32
WRA	80	9	26
NWSC	200	24	64
Athi Water Works	80	9	25
Other WSPs	250	30	80
NGOs/Partners	80	9	26
Total	850	100	272

3.5 Research Instrument

The primary data collection tool for this study was a structured questionnaire. This questionnaire was specifically designed to gather quantitative data on the four key dimensions of strategic knowledge management practices knowledge creation, knowledge storage, knowledge transfer, and knowledge application and their impact on organizational learning. Structured questionnaires were chosen due to their ability to standardize responses, cost-effectiveness, and ease of data analysis (Mugenda & Mugenda, 2019).

The questionnaire was organized into five sections. The first section collected demographic information about the respondents, while the subsequent four sections focused on the independent variables (the knowledge management dimensions) and the dependent variable (organizational learning). A 5-point Likert scale, ranging from "Strongly Disagree" to

"Strongly Agree," was used to assess respondents' levels of agreement with statements related to knowledge management practices and learning processes within their organizations.

3.6 Pilot Study

A pilot study was conducted to assess the reliability and validity of the research instrument prior to the main data collection. This involved a small group comprising 10% of the total sample size, approximately 27 respondents, selected from water sector institutions similar to those in the main study but excluded from the final sample. The purpose was to identify any ambiguities, inconsistencies, or difficulties in the questionnaire that might compromise the quality and accuracy of the data collected (Saunders *et al.*, 2019).

Feedback from the pilot participants was analyzed to improve the questionnaire's structure, clarity, and wording. Necessary adjustments were made to enhance understanding and ensure the questions aligned with the study's objectives. Additionally, the pilot helped determine the time needed to complete the questionnaire and allowed for assessment of internal consistency using Cronbach's Alpha. A reliability coefficient of 0.7 or higher was considered satisfactory for proceeding with the main study (Tavakol & Dennick, 2011).

3.7 Validity of the Research Instrument

Content validity was established by consulting experts in knowledge management, research methodology, and water sector professionals to evaluate how the questionnaire items adequately capture the dimensions of strategic knowledge management practices and organizational learning. Their feedback helped to refine the instrument, ensuring that all key variables of knowledge creation, storage, transfer, application, and organizational learning are represented clearly and appropriately.

3.8 Reliability of the Research Instrument

The pilot study data was subjected to internal consistency testing using Cronbach's Alpha to assess the instrument's reliability. A coefficient value of 0.7 or higher was considered

acceptable, as recommended by Tavakol and Dennick (2011). Each section of the questionnaire was analysed separately to confirm that the scale items consistently measure the same underlying concept. The reliability scores obtained from the pilot study indicated whether the instrument is reliable for use in the main study.

3.9 Data Collection Procedure

Data for this study was gathered using structured questionnaires administered to selected respondents from key institutions within Kenya's water sector. The researcher first obtained research authorization and ethical clearance from the university ethics committee and the National Commission for Science, Technology and Innovation (NACOSTI). Following approval, formal letters of introduction were sent to participating organizations to facilitate access to respondents.

Questionnaires were distributed both physically and electronically (via Google Forms or email) to improve accessibility and reach a wider pool of participants, especially those in remote or digitally connected institutions. The data collection spanned four weeks, with assistance from trained research assistants as needed. Participants were informed about the voluntary nature of their involvement, and informed consent was obtained prior to data collection. Confidentiality and anonymity of responses were assured, with data used exclusively for academic purposes. To maximize response rates, follow-up reminders were issued, and support from organizational leadership was leveraged to encourage staff participation. Completed questionnaires were checked for completeness before proceeding to data entry and analysis.

3.10 Data Processing and Analysis

After the completion of the data collection process, all responses were subjected to a systematic data cleaning procedure to ensure completeness, accuracy, and consistency. The researcher reviewed the questionnaires for missing responses, duplicates, or inconsistencies, which was

addressed by either eliminating invalid entries or rectifying simple data entry errors. The cleaned data was then coded appropriately and entered into Statistical Package for the Social Sciences (SPSS) version 26, which was used for both descriptive and inferential statistical analysis.

Descriptive statistics was employed to summarize demographic characteristics of the respondents and to provide an overview of the levels and patterns of strategic knowledge management practices and organizational learning across institutions. Measures such as means, standard deviations, frequencies, and percentages was calculated to describe the distribution and central tendencies of the key variables under investigation.

To test the relationships between the independent variables and the dependent variable, organizational learning, the study used inferential statistics, particularly Pearson correlation analysis and multiple linear regression analysis. Correlation analysis was used to determine the strength and direction of the relationships between the variables, while regression analysis was used to assess the combined and individual effects of the strategic knowledge management practices on organizational learning.

The regression model to be used in this study is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

- Y represents Organizational Learning (the dependent variable)
- X_1 is Knowledge Creation
- X_2 is Knowledge Storage
- X_3 is Knowledge Transfer
- X_4 is Knowledge Application
- β_0 is the regression constant (intercept)
- $\beta_1, \beta_2, \beta_3, \beta_4$ are the regression coefficients for each independent variable, and

- ϵ is the error term.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS, AND DISCUSSION

4.0 Introduction

This chapter presents findings based on data that was collected using questionnaires. The findings are discussed based on the following demographic factors; gender, age, level of education, role in the organization, years worked in the water sector in Kenya and organization primarily working for. The results are also presented based on research objectives being investigate.

4.1 Reponses Rate

The study distributed 272 questionnaires only 234 were filled and analysed. This gives a response rate of 86%. This was deemed sufficient for the study because according to Mugenda and Mugenda (2003), a sample size of 30% or more is regarded as sufficient for a study.

TABLE 3 Response Rate

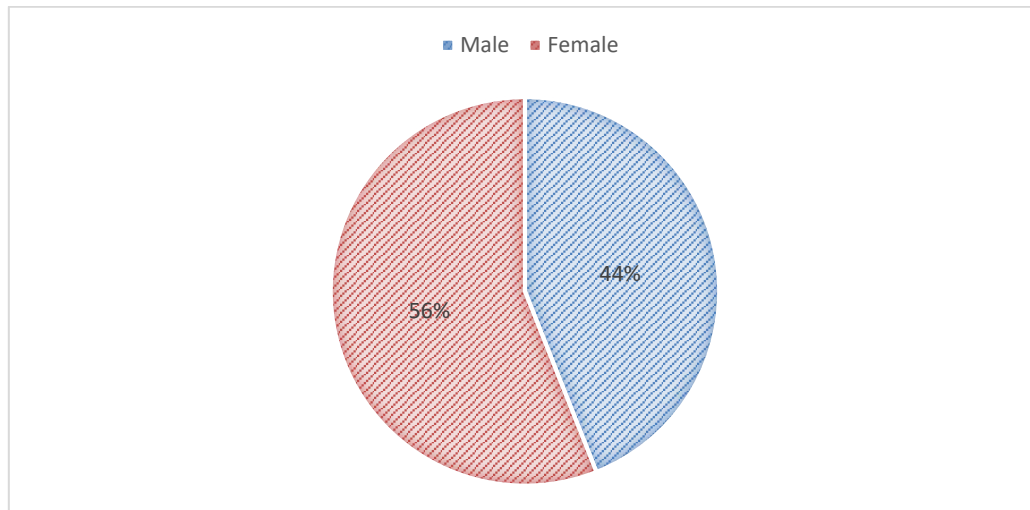
Variable	Frequency	Percentage
Filled and returned	234	86
Non-response	38	14
Total	272	100

4.2 Demographic Factors

4.2.1 Gender

The study sought to determine gender of the respondents. Results are presented in Figure 2.

FIGURE 2 Gender of Respondents



It was revealed that 56% of the respondents were female and 44% were male. This shows that the number of female employees in the water sector in Kenya is slightly higher than male. The study showed that 56% of respondents were female and 44% male, indicating a fairly balanced gender representation. This inclusivity ensures that perspectives from both genders are reflected, which is important for organizational learning, as diverse input enhances knowledge sharing, decision-making, and innovation within the organization.

4.2.2 Age

The findings on age of the respondents are presented in Table 4.

TABLE 4 Age of Respondents

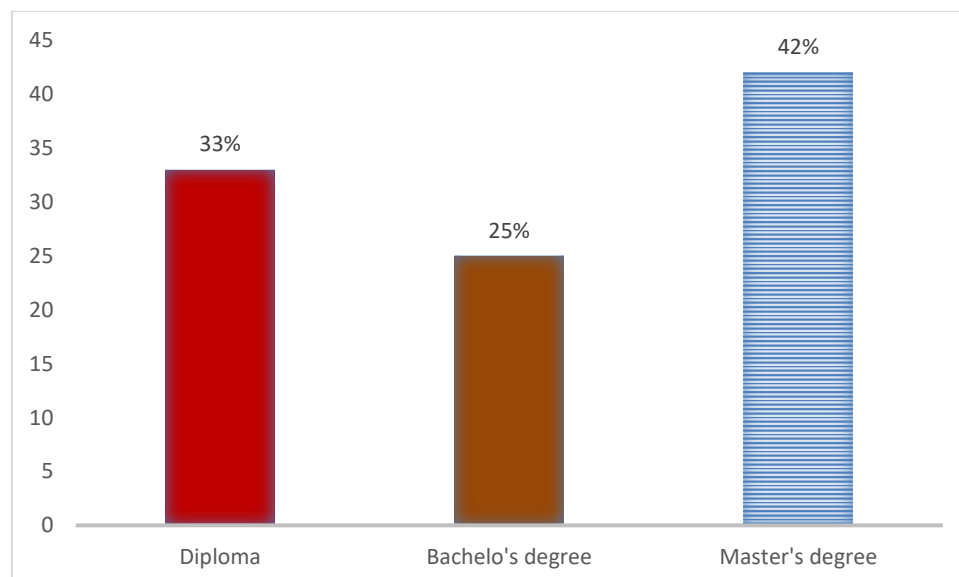
	Frequency	Percentage
26-35 years	47	20
36-45 years	49	21
46-55 years	85	36
56 years and above	53	23
Total	234	100

To determine the age distribution of respondents, it was found that 85 individuals were aged between 46-55 years, representing 36% of the total respondents. Those aged 56 years and above accounted for 53 respondents, making up 23% of the sample. Respondents between 36-45 years numbered 49, constituting 21% of the total, while 47 respondents were aged 26-35 years, representing 20%. From the standpoint of organizational learning, such diversity is valuable because employees at different career stages contribute unique experiences, knowledge, and problem-solving approaches. Older employees often bring institutional knowledge and historical insights, while younger employees may offer innovative ideas and contemporary skills. This mix enhances knowledge creation, transfer, and application, ultimately strengthening the organization's capacity to learn, adapt, and improve performance.

4.2.3 Level of Education

To identify respondents' highest level of education, respondents were asked to specify their education level. Results are presented in Figure 3.

FIGURE 3 Level of Education



The educational background of respondents indicates that 42% hold a master's degree, 33% a diploma, and 25% a bachelor's degree. This high level of education suggests that the participants are well-informed and capable of understanding the concepts of knowledge management and its impact on organizational learning. From an organizational learning perspective, educated employees are more likely to engage in effective knowledge creation, sharing, storage, and application. Their ability to critically analyze, interpret, and apply knowledge enhances the organization's capacity to learn, innovate, and improve performance. Consequently, the data collected from this educated sample provides reliable insights into how knowledge management practices influence organizational learning in the sector.

4.2.4 Role in the Organization

Respondents were asked to state their role in the organization. Results are presented in Table 5.

TABLE 5 Role of Respondents in the Organization

	Frequency	Percent
Entry-level Staff	71	30
Middle-level Management	74	32
Senior Executive	43	18
Policymaker	46	20
Total	234	100

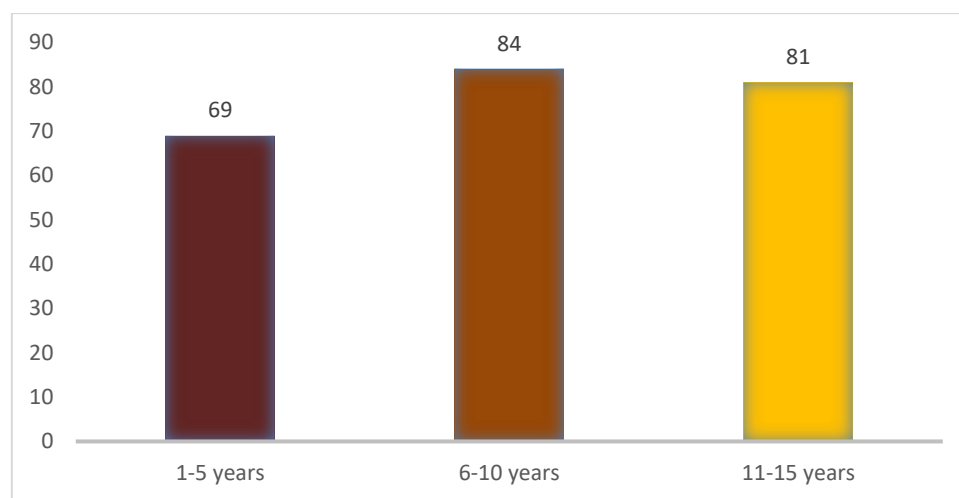
The findings indicate that 74 respondents (32%) held middle-level management positions, while 71 respondents (30%) were entry-level staff. Additionally, 46 respondents (20%) were policymakers, and 43 respondents (18%) occupied senior executive positions. The distribution of respondents by position shows that 32% were middle-level managers, 30% were entry-level staff, 20% were policymakers, and 18% were senior executives. This variety in organizational roles ensures that insights were gathered from employees at different levels of responsibility and decision-making authority.

In terms of organizational learning, such role diversity is crucial. Middle-level managers and senior executives can provide strategic perspectives on knowledge management processes, while entry-level staff offer practical, operational insights. Policymakers contribute to understanding of organizational policies and structures that facilitate or hinder learning. Collectively, the perspectives from this cross-section of positions enrich the understanding of how knowledge is created, shared, applied, and institutionalized, thereby supporting a comprehensive view of organizational learning within the sector.

4.2.5 Years Worked in the Water Sector in Kenya

The study asked respondents to state years they have worked in the water sector in Kenya. Results are presented in Figure 4.

FIGURE 4 Years Worked in the Water Sector in Kenya



It was established that 84 respondents have worked in the water sector in Kenya for 6-10 years, 81 respondents have worked in the water sector in Kenya for 11-15 years and 69 respondents have worked in the water sector in Kenya for 1-5 years. This implies that information was collected from employees who have worked in the organization for a very long time and are

aware on knowledge management practices being used in the organization and how it affects learning.

4.2.6 Type of Organization

The study examined type of organization respondents primarily work for. Results are presented in Table 6.

TABLE 6 Type of Organization

	Frequency	Percent
WASREB	68	29.06
Ministry of Water	66	28.21
WRA	23	9.83
NWSC	25	10.68
Athi Water Works	52	22.22
Total	234	100

The results presented in Table 4.4 indicate that 68 respondents (29%) were from the Water Services Regulatory Board (WASREB), 66 respondents (28%) from the Ministry of Water, 52 respondents (22%) from Athi Water Works, and 48 respondents (21%) from the Water Resources Authority (WRA) and Nairobi Water and Sewerage Company (NWSC). This distribution demonstrates that the researcher successfully obtained data from a wide range of key institutions within the Kenyan water sector. The relatively balanced representation across these organizations suggests that the data collected is relevant, diverse, and reflective of the broader sector, thereby strengthening the reliability and applicability of the study findings.

4.3 Effect of Knowledge Creation on Organizational Learning

The section present results on effect of knowledge creation on organizational learning. The study used a five-point Likert scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

TABLE 7 Descriptive Statistics for Effect of Knowledge Creation on Organizational Learning

	Mean	SD
There are formal processes in place for employees to share their experiences and tacit knowledge (socialization).	3.75	1.052
The organization regularly conduct training programs and workshops to foster new knowledge and skills among employees.	3.70	1.210
My organization offers a workplace culture that supports innovation and risk-taking	3.52	1.202
My organization encourages cross-functional collaboration	3.98	1.054
The use of technology in the organization promote knowledge creation and learning	3.62	1.059
There are platforms and forums within my organization for brainstorming and generating new ideas.	3.88	1.097

The study revealed that respondents exhibited moderate agreement regarding various aspects of knowledge creation within their organizations. For instance, the statement on encouraging cross-functional collaboration received the highest mean score of 3.98 (SD = 1.054), indicating general agreement but also showing some variability in responses. The presence of platforms and forums for brainstorming new ideas followed closely with a mean of 3.88 (SD = 1.097). Similarly, formal processes for sharing tacit knowledge (socialization) and training programs for skill development had means of 3.75 (SD = 1.052) and 3.70 (SD = 1.210), respectively. The lowest rated aspects were the role of technology in promoting knowledge creation (mean = 3.62, SD = 1.059) and a culture supporting innovation and risk-taking (mean = 3.52, SD = 1.202).

The standard deviations (SDs) provide insight into the level of consensus among respondents. A higher SD, such as 1.202 for culture supporting innovation, indicates that

respondents' opinions were more dispersed, reflecting inconsistencies in practice or differences in perception across departments or roles. Conversely, lower SDs, such as 1.052 for formal tacit knowledge-sharing processes, suggest greater agreement and more uniform experiences among employees. These variations highlight potential gaps where organizational practices may not be uniformly implemented or understood, such as fostering an innovative culture or leveraging technology for knowledge creation.

From a theoretical perspective, these findings align with Nonaka and Takeuchi's SECI model (1995), which emphasizes that knowledge creation is driven by the dynamic interaction of tacit and explicit knowledge through socialization, externalization, combination, and internalization. Moderate agreement on cross-functional collaboration and knowledge-sharing platforms suggests that organizations are engaging in socialization and combination processes, but the variability in responses indicates that these processes are not consistently embedded across all units.

Similarly, Knowledge-Based View (KBV) theory posits that the generation of new knowledge is a critical organizational resource that enhances learning and competitive advantage (Grant & Baden-Fuller, 2016; Sousa & Hendricks, 2007). The findings suggest that while mechanisms for knowledge creation exist, such as brainstorming forums, training programs, and cross-functional collaboration, there is room to improve their effectiveness and consistency to fully leverage knowledge as a strategic asset.

The role of organizational culture and technology further supports these theoretical frameworks. SECI highlights that a culture of trust, innovation, and risk-taking is essential for tacit knowledge to be shared and transformed into actionable solutions (Zheng & Nguyen, 2016; Canonico *et al.*, 2020). The relatively low mean and higher SD for culture and technology indicate that employees perceive limitations in both areas, which could hinder knowledge creation and subsequent organizational learning. This aligns with Bawack (2024) and

Wanyama (2018), who emphasize that investment in technological tools and a supportive culture are critical for enabling knowledge creation, knowledge sharing, and organizational learning outcomes.

Empirical studies further reinforce these implications. Rehman et al. (2021) and Sisia (2015) demonstrated that knowledge creation positively affects organizational learning when supported by enabling mechanisms such as training, collaborative environments, and technology. Mwangi and Mwanzu (2023) similarly found that socialization, externalization, and internalization processes significantly influence learning and competitive advantage. Thus, the current findings, while indicating moderate engagement in knowledge creation, highlight areas particularly culture and technology where targeted interventions could strengthen organizational learning outcomes in the water sector.

4.3.1 Normality Test for Knowledge Creation

A normality test was conducted to determine whether the data for the Knowledge Creation construct were normally distributed. Both the Kolmogorov Smirnov and Shapiro Wilk tests were employed for this purpose, as presented in Table 8.

TABLE 8: Normality Test for Knowledge Creation

	Kolmogorov Smirnov ^a			Shapiro Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
B1	.358	234	.000	.756	234	.000
B2	.290	234	.000	.769	234	.000
B3	.297	234	.000	.774	234	.000
B4	.320	234	.000	.751	234	.000
B5	.367	234	.000	.751	234	.000
B6	.321	234	.000	.761	234	.000

a. Lilliefors Significance Correction

The results show that all six items measuring Knowledge Creation (B1–B6) recorded significant values ($p = .000$) under both tests. Since all significance values are less than 0.05, the null hypothesis of normality is rejected. This indicates that the data for Knowledge Creation

deviate significantly from a normal distribution. However, given the relatively large sample size ($n = 234$), such deviations from normality are not uncommon, as normality tests are highly sensitive in large samples. Therefore, although the data are statistically non-normal, the distribution may still be approximately normal in practical terms.

4.4 Effect of Knowledge Storage on Organizational Learning

Results on the effect of knowledge storage on organizational learning are presented in this section. The study used a five-point Likert scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

TABLE 9 Descriptive Statistics for Effect of Knowledge Storage on Organizational Learning

	Mean	SD
The knowledge stored is well-indexed and searchable, allowing for efficient retrieval.	3.97	0.947
My organization's historical data and project reports are effectively stored	3.80	1.086
Our strong knowledge process is done regularly	3.69	1.158
I can easily access relevant information stored in the organization	3.80	1.133
My organization stores and manages knowledge by using technology	3.78	1.151
Our knowledge storage systems help prevent loss of institutional memory due to staff turnover.	3.65	1.047
My organization uses a tracking system to check the accessibility of the knowledge stored	3.83	1.114

The findings indicate that respondents held mixed views regarding the effectiveness of knowledge storage practices in their organizations. The highest-rated statement, “knowledge stored is well-indexed and searchable, allowing for efficient retrieval,” received a mean of 3.97 ($SD = 0.947$), reflecting moderate agreement, though not a strong consensus. Other related

aspects, such as the use of a tracking system to monitor access to stored knowledge (mean = 3.83, SD = 1.114) and the effective storage of historical data and project reports (mean = 3.80, SD = 1.086), also received moderately positive responses. However, the higher standard deviations particularly above 1.0 highlight variability in respondents' perceptions, suggesting inconsistent implementation, uneven access, or differences in departmental practices.

Similarly, ease of accessing stored information (mean = 3.80, SD = 1.133) and the use of technology to manage knowledge (mean = 3.78, SD = 1.151) were viewed somewhat positively but not conclusively. The lowest-rated items included regular knowledge storage processes (mean = 3.69, SD = 1.158) and the use of storage systems to prevent institutional memory loss amid staff turnover (mean = 3.65, SD = 1.047). These lower means indicate potential weaknesses in systematic knowledge preservation, particularly critical for organizations facing high workforce transitions. Overall, the results suggest a moderate presence of knowledge storage practices with significant opportunities to enhance consistency, accessibility, and technological integration.

From a theoretical perspective, these findings align with Nonaka and Takeuchi's knowledge management framework (1995), which emphasizes that knowledge storage is crucial for converting tacit and explicit knowledge into a usable organizational asset. Knowledge must be systematically indexed, accessible, and updated to support continuous learning. The variability in responses highlights gaps in this process, indicating that while some departments may efficiently store and manage knowledge, others may not. This inconsistency can hinder the internalization phase of the SECI model, where stored knowledge is applied to solve problems and improve organizational processes.

The findings also resonate with Wanyama (2018), who demonstrated that knowledge management, including storage practices, positively influences organizational performance when employees can access, share, and learn from stored knowledge. While Wanyama's study

focused on Kenya's public service, it underscores the importance of structured knowledge systems, cross-training, and seminars to facilitate knowledge access and utilization. Sisia (2015) further highlighted that effective knowledge storage supports organizational learning, particularly when complemented by technological tools such as blogs, intranets, and content management systems. These tools enable knowledge dissemination, support decision-making, and preserve institutional memory, which was a key concern raised by respondents in this study.

The implication of the standard deviations is critical. Higher SDs (above 1.0) for several items such as regular knowledge storage processes and accessibility of information suggest that respondents' experiences are not uniform. This variability could reflect departmental disparities, uneven technology adoption, or unclear organizational procedures. From a knowledge-based view perspective, knowledge that is inconsistently stored and difficult to access undermines the organization's ability to leverage knowledge as a strategic resource, limiting learning and innovation potential (Grant & Baden-Fuller, 2016).

The study also points to a need for integrating technological solutions to support storage and retrieval processes, as suggested by Sisia (2015) and Bawack (2024). Implementing centralized knowledge management systems, searchable databases, and automated tracking mechanisms can ensure that knowledge remains accessible, updated, and safeguarded against loss due to staff turnover. Such improvements would directly enhance organizational learning, institutional memory, and performance, aligning practice with both SECI theory and knowledge-based view principles.

4.4.1 Normality Test for Knowledge Storage

A normality test was conducted to examine whether the data for the Knowledge Storage construct were normally distributed. Both the Kolmogorov Smirnov and Shapiro Wilk tests were applied, and the results are presented in Table 10.

TABLE 10 Normality Test for Knowledge Storage

	Kolmogorov Smirnov ^a			Shapiro Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
C1	.359	234	.000	.734	234	.000
C2	.337	234	.000	.764	234	.000
C3	.316	234	.000	.772	234	.000
C4	.317	234	.000	.767	234	.000
C5	.312	234	.000	.769	234	.000
C6	.370	234	.000	.748	234	.000
C7	.322	234	.000	.765	234	.000

a. Lilliefors Significance Correction

The Kolmogorov-Smirnov statistics for the seven items (C1–C7) ranged from .312 to .370, while the corresponding Shapiro-Wilk statistics ranged from .734 to .772. In both tests, all items recorded significance values ($p = .000$), which are below the conventional threshold of 0.05. These results indicate that the data for all seven items significantly deviate from a normal distribution.

Among the items, C6 exhibited the highest Kolmogorov-Smirnov statistic (.370), suggesting the greatest deviation from normality, whereas C5 showed the lowest statistic (.312), indicating relatively smaller deviation. The Shapiro-Wilk statistics support this finding, with all values substantially below 1.0, reinforcing the conclusion that the data are not normally distributed. Although the normality assumption is statistically violated, it is important to note that the sample size ($n = 234$) is relatively large. In large samples, normality tests tend to be highly sensitive, detecting even minor deviations from the normal curve.

4.5 Effect of Knowledge Transfer on Organizational Learning

The section present results on effect of knowledge transfer on organizational learning. The study used a five-point Likert scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

TABLE 11 Descriptive Statistics for Effect of Knowledge Transfer on Organizational Learning

	Mean	SD
My organization offers reward incentives to encourage and reinforce effective knowledge transfer and learning.	3.91	1.027
My organization has formal employee training and mentorship programs.	3.58	1.166
We use digital knowledge-sharing platforms (e.g., intranets, knowledge portals) for information exchange.	3.68	1.049
Cross-functional collaboration and meetings are frequently used to share knowledge between departments.	3.97	0.987
Leadership actively promotes and supports knowledge-sharing initiatives within the organization.	3.63	1.09
My organization uses inter-departmental exchange and face-to-face communication to increase the transfer of knowledge	3.88	0.976
My organization encourages peer-to-peer learning and informal knowledge exchange.	3.82	1.073

The study revealed that respondents had mixed perceptions regarding the effectiveness of knowledge transfer practices within their organizations. The highest-rated practice, cross-functional collaboration and meetings, received a mean score of 3.97 with a standard deviation of 0.987, indicating moderate agreement among respondents. While many employees perceived such collaboration as frequent and valuable, the variation in responses suggests that implementation differs across departments or organizations. Similarly, incentivizing knowledge transfer through rewards received a mean of 3.91 (SD = 1.027), reflecting

recognition by some organizations of the importance of rewarding knowledge sharing, yet the relatively high standard deviation points to inconsistency in how such incentives are applied across the sector.

Other knowledge transfer mechanisms, including inter-departmental exchange, face-to-face communication (mean = 3.88, SD = 0.976), and peer-to-peer learning and informal knowledge exchange (mean = 3.82, SD = 1.073), were viewed positively, but again, the spread of responses indicates variability likely influenced by organizational culture, leadership engagement, and differential access to resources. The use of digital platforms for knowledge sharing received a slightly lower rating (mean = 3.68, SD = 1.049), suggesting that technology is present but not uniformly optimized or adopted across institutions. Lower-rated areas, such as leadership support for knowledge-sharing initiatives (mean = 3.63, SD = 1.09) and the presence of formal training and mentorship programs (mean = 3.58, SD = 1.166), highlight critical gaps in sustaining effective knowledge transfer, especially as these elements are essential for long-term organizational learning.

These findings align with existing literature on knowledge transfer and organizational learning. Van-Den-Hooff and de Ridder (2004) and Chen (2010) emphasize that effective knowledge transfer depends on collaboration and communication across teams, which is partially reflected in the moderately high ratings for cross-functional collaboration in this study. The importance of reward systems in motivating knowledge sharing, noted by Mariel (2015), is supported by the positive mean for incentivization, though the variability in responses suggests inconsistent application, resonating with Tamayo-Torres et al. (2016), who highlighted the role of culture and leadership in fostering knowledge transfer.

The moderate rating for digital platforms is consistent with Mnasi (2022) and Mwangi (2019), who observed that while ICT tools facilitate knowledge sharing, their use is often uneven across organizations. Informal mechanisms such as peer-to-peer learning and face-to-

face exchanges are also in line with findings from Chineze and Onyeabo (2025), who noted the importance of mentorship and coaching in transferring tacit knowledge. Conversely, the lower ratings for leadership support and formal training mirror observations by Asemamaw (2023) and Kinyua (2015), highlighting that without committed leadership and structured programs, knowledge transfer is likely inconsistent and limited in its contribution to organizational learning.

The relatively high standard deviations across several items further underscore the variability in experiences and perceptions among employees, suggesting that knowledge transfer practices are not uniformly institutionalized. This finding is consistent with prior studies indicating that sector, organizational culture, and local practices influence the effectiveness of knowledge transfer (Rehman *et al.*, 2021; Mnasi, 2022). By focusing on the water sector in Kenya, this study addresses a gap in the literature, extending insights from other sectors such as banking, higher education, and local government to a context where knowledge transfer and organizational learning remain underexplored.

Overall, the study indicates that while knowledge transfer practices exist in Kenyan water sector organizations, they are inconsistently applied. Cross-functional collaboration, informal exchanges, and some incentives are in place, but leadership support, formal mentorship, and the use of digital platforms require strengthening. These gaps highlight opportunities for organizations to standardize knowledge transfer processes, cultivate a learning-focused culture, and invest in both human and technological resources to enhance organizational learning and performance.

4.5.1 Normality Test for Knowledge Transfer

To determine whether the data for the Knowledge Transfer construct were normally distributed, both the Kolmogorov Smirnov and Shapiro Wilk tests were conducted. The results are summarized in Table 12.

TABLE 12 Normality Test for Knowledge Transfer

	Kolmogorov Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
D1	.344	234	.000	.752	234	.000
D2	.315	234	.000	.774	234	.000
D3	.366	234	.000	.752	234	.000
D4	.345	234	.000	.744	234	.000
D5	.351	234	.000	.761	234	.000
D6	.368	234	.000	.739	234	.000
D7	.340	234	.000	.761	234	.000

a. Lilliefors Significance Correction

The Kolmogorov-Smirnov statistics for the seven items (D1–D7) ranged from .315 to .368, while the Shapiro-Wilk statistics ranged from .739 to .774. All items produced significant values ($p = .000$), which are below the 0.05 threshold, indicating that the null hypothesis of normality is rejected for each variable. Specifically, item D6 recorded the highest Kolmogorov–Smirnov statistic (.368) and the lowest Shapiro-Wilk statistic (.739), suggesting the greatest deviation from normality, whereas item D2 showed the lowest Kolmogorov–Smirnov statistic (.315) and relatively higher Shapiro–Wilk statistic (.774), indicating a comparatively smaller deviation. These results demonstrate that the data for Knowledge Transfer do not follow a normal distribution. However, given the relatively large sample size ($n = 234$), the normality tests are highly sensitive and may detect even minor departures from normality.

4.6 Effect of Influence of Knowledge Application on Organizational Learning

In this section results on the influence of knowledge application on organizational learning are shown in Table 4.8. The study used a five-point Likert scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

TABLE 13 Descriptive Statistics for Influence of Knowledge Application on Organizational Learning

	Mean	SD
Knowledge gained from past projects and experiences is regularly applied to solve current problems, increase innovation, and promote learning	3.78	1.108
Technology is used in the organization to increase knowledge application and learning	3.9	1.047
My organization has an effective culture in place that supports knowledge application and learning	3.91	1.055
My organization offers training initiatives to increase learning and knowledge application	3.79	1.099
Incentive programs are used to motivate employees to apply and share their knowledge at work with other individuals	3.60	1.139
Knowledge application has increase learning in my organization	3.86	1.014

Knowledge application refers to the processes through which organizations utilize acquired knowledge to enhance learning and gain a competitive advantage (Chiu & Chen, 2016). Zaim (2010) emphasizes that it involves the effective use of stored knowledge to solve problems, boost learning, and motivate employees in fulfilling their roles. Similarly, Matin and Sabagh (2020) describe knowledge application as leveraging accumulated knowledge to improve operations and deliver superior products and services. In organizational contexts, the application of knowledge has been found to support learning, innovation, skill development, and improvement of products and processes (Lee & Leong, 2013).

The current study found that respondents held moderately positive perceptions regarding the extent to which knowledge application is supported and practiced within their organizations. The highest rated item, “the organization has an effective culture in place that supports knowledge application and learning,” received a mean of 3.91 (SD = 1.055), indicating moderate agreement but also variability in perceptions. This aligns with Chatterjee

et al., (2018), who argue that organizational culture and leadership values play a critical role in shaping the success of learning processes. The variability in responses suggests that while some organizations foster supportive cultures, others may still face cultural or structural barriers to knowledge application.

The use of technology to enhance knowledge application and learning was rated closely at a mean of 3.90 (SD = 1.047), reflecting that technological tools exist but may not be fully leveraged across all areas. This finding echoes recommendations from Mobolade and Ibojo (2023) and Mtawali (2018), who emphasized the importance of technological integration to enhance knowledge application and organizational learning.

Respondents also moderately agreed that knowledge application has increased learning within their organizations (mean = 3.86, SD = 1.014), and that training initiatives are offered to support learning and application (mean = 3.79, SD = 1.099). These results support findings by Alsabbagh and Khalil (2017), who demonstrated a significant positive relationship between knowledge application and organizational learning, though in the educational sector.

Application of knowledge from past projects to solve current problems and stimulate innovation was rated slightly lower (mean = 3.78, SD = 1.108), highlighting a gap in institutional learning practices and mechanisms to capture and reuse lessons learned effectively. This observation resonates with Lee and Leong (2013), who noted that organizational learning is contingent on deliberate knowledge application practices that drive innovation and process improvement.

The lowest-rated item, incentive programs are used to motivate employees to apply and share their knowledge, received a mean of 3.60 (SD = 1.139), suggesting that motivational strategies are either weak or inconsistently applied. This mirrors the suggestions by Nzau

(2017) regarding the use of incentives to enhance knowledge sharing and application, which in turn supports coordination and learning outcomes.

In summary, the findings indicate that while knowledge application is recognized and partially supported, it is not yet consistently embedded in organizational practices. Consistent with the literature, enhancing organizational learning requires strong leadership commitment, an enabling culture, structured incentives, and effective use of technology (Chiu & Chen, 2016; Chatterjee *et al.*, 2018; Mobolade & Ibojo, 2023). The current study's focus on Kenya's water sector highlights a critical need for strategic interventions to strengthen knowledge application and institutional learning practices in this context, addressing gaps identified in both prior international and Kenyan studies (Kinyua, 2015; Mtawali, 2018).

4.6.1 Normality Test for Knowledge Application

A normality test was conducted to assess whether the data for the knowledge application construct were normally distributed. Both the Kolmogorov-Smirnov and Shapiro-Wilk tests were applied, and the results are presented in Table 14.

TABLE 14 Normality Test for Knowledge Application

	Kolmogorov Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
E1	.330	234	.000	.767	234	.000
E2	.338	234	.000	.756	234	.000
E3	.333	234	.000	.756	234	.000
E4	.334	234	.000	.766	234	.000
E5	.329	234	.000	.771	234	.000
E6	.357	234	.000	.749	234	.000
a. Lilliefors Significance Correction						

The Kolmogorov-Smirnov statistics for the six items (E1–E6) ranged from .329 to .357, while the Shapiro-Wilk statistics ranged from .749 to .771. All items yielded significance values ($p = .000$), which are below the 0.05 threshold, indicating that the null hypothesis of normality is

rejected for each variable. Specifically, item E6 recorded the highest Kolmogorov-Smirnov statistic (.357) and the lowest Shapiro-Wilk statistic (.749), suggesting the greatest deviation from normality, whereas item E5 had the lowest Kolmogorov-Smirnov statistic (.329) and the highest Shapiro–Wilk statistic (.771), indicating comparatively less deviation.

4.7 Inferential Statistics

4.7.1 Collinearity Diagnosis

Collinearity diagnostics were conducted to assess potential multicollinearity among the independent variables predicting Organizational Learning (OL), namely Knowledge Creation (KC), Knowledge Sharing (KS), Knowledge Acquisition (KA), and Knowledge Transfer (KT). The results are summarized in Table 15.

TABLE 15 Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	kc	ks	ka	kt
1	1	4.977	1.000	.00	.00	.00	.00	.00
	2	.008	24.275	.91	.17	.03	.01	.00
	3	.007	26.954	.08	.55	.00	.21	.15
	4	.004	34.859	.00	.19	.69	.02	.42
	5	.003	38.234	.01	.09	.28	.76	.42

a. Dependent Variable: OL

The analysis indicates that the highest Condition Index is 38.234 (Dimension 5), exceeding the recommended threshold of 30, suggesting potential serious multicollinearity. Examination of the variance proportions reveals that Knowledge Acquisition (KA) and Knowledge Transfer (KT) have high variance loadings of 0.76 and 0.42, respectively, on this dimension. This pattern indicates that these two variables share a substantial amount of variance and may be highly correlated, which could affect the stability of regression coefficients. Other dimensions show moderate Condition Indices (24.275–34.859), but no additional dimensions display overlapping high variance proportions across multiple predictors, suggesting that multicollinearity is primarily associated with KA and KT.

4.7.2 Correlation Analysis

The study conducted a regression analysis to determine the relationship between knowledge creation, knowledge storage, knowledge transfer and influence of knowledge application on organizational learning. Results are presented in Table 16.

TABLE 16 Correlation between of Knowledge Management and Organizational Learning

Correlations			Organization al learning	Knowledg e creation	Knowledg e storage	Knowledg e applicatio n	Knowledg e transfer
Organization al learning	Pearson Correlatio n	1		.594**	.504**	.534**	.543**
	Sig. (2- tailed)			0.000	0.000	0.000	0.000
Knowledge creation	Pearson Correlatio n	.594**	1		.685**	.583**	.593**
	Sig. (2- tailed)	0.000			0.000	0.000	0.000
Knowledge storage	Pearson Correlatio n	.504**	.685**	1		.695**	.660**
	Sig. (2- tailed)	0.000	0.000			0.000	0.000
Knowledge application	Pearson Correlatio n	.534**	.583**	.695**	1		.733**
	Sig. (2- tailed)	0.000	0.000	0.000			0.000
Knowledge transfer	Pearson Correlatio n	.543**	.593**	.660**	.733**	1	
	Sig. (2- tailed)	0.000	0.000	0.000	0.000		
**. Correlation is significant at the 0.01 level (2-tailed).							

Table 16 shows that there is a positive and significant relationship between knowledge creation and organizational learning ($r=.594^{**}$, $p<0.000$), knowledge storage and organizational learning ($r=.504^{**}$, $p<0.000$), knowledge application and organizational learning ($r=.534^{**}$, $p<$

0.000) and knowledge transfer and organizational learning ($r=.543^{**}$, $p<0.000$). This implies that for every improvement on knowledge creation, knowledge storage, knowledge application and knowledge transfer there is an increase in organizational learning.

4.7.3 Hypothesis Testing

The study tested four hypotheses regarding the effect of knowledge management components on organizational learning (OL). The results of the Pearson correlation analysis were used to evaluate these hypotheses.

Hypothesis 1 (H_{01}): Knowledge creation has no significant effect on organizational learning. The correlation analysis revealed a strong positive relationship between knowledge creation and organizational learning ($r = .594$, $p = .000$). Since the p-value is less than 0.01, the null hypothesis is rejected. This indicates that knowledge creation has a significant positive effect on organizational learning.

Hypothesis 2 (H_{02}): knowledge storage does not play a significant role in organizational learning.

knowledge storage was positively correlated with organizational learning ($r = .504$, $p = .000$). The p-value being below 0.01 leads to the rejection of the null hypothesis, suggesting that knowledge storage significantly contributes to organizational learning.

Hypothesis 3 (H_{03}): knowledge transfer has no significant effect on organizational learning. The correlation between knowledge transfer and organizational learning was significant ($r = .543$, $p = .000$). therefore, the null hypothesis is rejected, indicating that knowledge transfer positively influences organizational learning.

Hypothesis 4 (H_{04}): knowledge application does not significantly influence organizational learning.

knowledge application demonstrated a significant positive correlation with organizational learning ($r = .534$, $p = .000$). the null hypothesis is rejected, confirming that knowledge application has a significant impact on organizational learning.

Overall, the hypothesis testing confirms that all four dimensions of knowledge management, creation, storage, transfer, and application all have significant positive relationships with organizational learning. These findings provide empirical support for the theoretical framework that effective knowledge management enhances organizational learning.

4.7.4. Model Summary for Knowledge Management on Organizational Learning

The results for the correlation coefficient R and the adjusted coefficient of determination R^2 are shown in Table 17.

TABLE 17 Model Summary for Knowledge Management on Organizational Learning

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.650 ^a	0.422	0.412	0.38552	0.422	41.779	4	229	.000
a. Predictors: (Constant), knowledge storage, knowledge creation, knowledge transfer, knowledge application									

The results revealed that R^2 was 0.422 which indicates that 42.2% of organizational learning is determined by knowledge storage, knowledge creation, knowledge transfer, knowledge application. This therefor implies that there are other factors that the study did not cover that explains 57.8% change in organizational learning that future studies should focus on.

4.7.5. ANOVA Analysis

The study conducted an ANOVA analysis to determine if there is a variation in knowledge storage, knowledge creation, knowledge transfer, knowledge application that could account for variation in organizational learning.

TABLE 18 ANOVA Analysis

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.838	4	6.209	41.779	.000 ^b
	Residual	34.035	229	0.149		
	Total	58.873	233			

a. Dependent Variable: Organizational learning

b. Predictors: (Constant), knowledge storage, knowledge creation, knowledge transfer, knowledge application

The results in Table 18 shows that at 95% confidence level, the F value=41.779, $p < 0.000$). This implies that there was a significant variation in knowledge storage, knowledge creation, knowledge transfer, knowledge application that could account for variation in organizational learning. Therefore, for every improvement in knowledge storage, knowledge creation, knowledge transfer, knowledge application there is an increase in organizational learning.

4.7.6. Coefficients for Knowledge Management and Organizational Learning

The study conducted a multiple regression analysis to determine the relationship between knowledge storage, knowledge creation, knowledge transfer, knowledge application and organizational learning.

TABLE 19 Coefficients for Knowledge Management and Organizational Learning

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	.706	.248		2.848	.005
Knowledge creation	.404	.075	.383	5.353	.000
Knowledge storage	.448	.094	.007	.080	.036

Knowledge application	.196	.092	.173	2.129	.034
Knowledge transfer	.224	.091	.193	2.445	.015

$$Y = .706 + .383X_1 + .007X_2 + .173X_3 + .193X_4 + \epsilon$$

Where:

- Y represents Organizational Learning (the dependent variable)
- X_1 is Knowledge Creation
- X_2 is Knowledge Storage
- X_3 is Knowledge Transfer
- X_4 is Knowledge Application
- β_0 is the regression constant (intercept)
- $\beta_1, \beta_2, \beta_3, \beta_4$ are the regression coefficients for each independent variable, and
- ϵ is the error term.

The findings revealed that a unit increase in knowledge creation leads to an increase in organizational learning ($\beta=0.383$, $p<0.000$), knowledge storage leads to an increase in organizational learning ($\beta=0.007$, $p<0.036$), knowledge application leads to an increase in organizational learning ($\beta=0.173$, $p<0.034$) and knowledge transfer leads to an increase in organizational learning ($\beta=0.193$, $p<0.015$).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the key findings, discussion, conclusions, and recommendations of the study. It also outlines suggestions for areas that can be explored in future research.

5.2 Summary of Research Findings

The main objective of the study was to examine the impact of strategic knowledge management practices on organizational learning within Kenya's water sector. The study was guided by the following research objectives; To find out the effect of knowledge creation on organizational learning in the water sector in Kenya. To determine the effect of knowledge storage on organizational learning in the water sector in Kenya. To determine the influence of knowledge application on organizational learning in the water sector in Kenya and to find out the effect of knowledge transfer on organizational learning in the water sector in Kenya.

5.3 Discussion on the Summary

5.3.1 Effect of Knowledge Creation on Organizational Learning

The study findings indicate that respondents were generally undecided about whether their organizations encourage cross-functional collaboration. From the perspective of the Knowledge-Based View (KBV), knowledge is the most strategically valuable resource, and its effective use requires that employees across different departments share expertise and insights (Grant & Phene, 2022; Curado & Bontis, 2006). The absence of structured collaboration suggests that tacit knowledge embedded in employees' experiences may remain siloed, reducing the organization's capacity to innovate and adapt. According to KBV, such

underutilization of knowledge can constrain the organization's competitive advantage, as valuable knowledge is neither fully accessed nor effectively applied (Alavi & Leidner, 2001).

This finding also aligns with Nonaka and Takeuchi's SECI model, which highlights that socialization (tacit to tacit) is fundamental for knowledge creation (Nonaka & Takeuchi, 1995). Cross-functional collaboration facilitates socialization by allowing employees to exchange experiences, perspectives, and problem-solving approaches. Without these interactions, tacit knowledge remains isolated, limiting opportunities for innovation and collective learning. Similarly, externalization (tacit to explicit knowledge) is hindered when collaboration is weak, as employees are less likely to articulate and document their insights for organizational use (Hislop *et al.*, 2021).

Respondents also reported uncertainty about the existence of formal platforms and forums for brainstorming and idea generation. Organizational Learning Theory (OLT) emphasizes that organizations must actively support double-loop learning, where underlying assumptions and mental models are questioned to foster transformative change (Argyris & Schön, 1978; Chiva *et al.*, 2018). The lack of structured forums or knowledge-sharing platforms limits employees' ability to externalize and combine knowledge, restricting the integration of tacit and explicit knowledge for innovative outcomes. From a SECI perspective, combination (explicit to explicit knowledge) is facilitated when structured systems, such as databases, knowledge repositories, or collaborative platforms, are in place to consolidate and synthesize knowledge across the organization (Rodrigues & Pai, 2005). Without these, organizations risk inefficiencies and repeated mistakes, as knowledge remains fragmented and inaccessible.

Another critical finding was the perceived lack of formal processes for sharing experiences and tacit knowledge. KBV theory posits that organizations achieve sustained competitive advantage when knowledge is effectively managed, shared, and applied (Polanyi,

1996; Zander & Kogut, 1995). Socialization and externalization are crucial steps in transforming individual knowledge into organizational knowledge that can inform decision-making and innovation. Similarly, OLT suggests that learning occurs at multiple levels individual, group, and organizational but without mechanisms for sharing experiences, knowledge retention is limited, and opportunities for organizational-level learning are reduced (Tseng *et al.*, 2022; Easterby-Smith & Lyles, 2019).

The study also revealed uncertainty regarding training programs and workshops. Both KBV and OLT emphasize that continuous development of employee knowledge and skills is necessary for effective organizational learning and adaptation. KBV highlights that knowledge must be continuously updated and expanded to remain a strategic asset (Grant & Phene, 2022), while OLT underscores that structured learning interventions enhance the internalization of explicit knowledge into tacit knowledge, strengthening employees' capabilities (Wanyama, 2018; Goh *et al.*, 2013). This aligns with SECI's internalization process, where explicit knowledge acquired through training is absorbed and applied, becoming part of employees' expertise (Hislop *et al.*, 2021). The absence of regular and effective training programs may hinder this knowledge conversion process, limiting both individual and organizational learning.

Furthermore, the role of technology in supporting knowledge creation was perceived as inconsistent. KBV theory and the SECI model recognize that knowledge management systems, collaboration software, and digital platforms facilitate knowledge storage, sharing, and application (Alavi & Leidner, 2001; Rezaei *et al.*, 2018). Effective use of technology allows organizations to capture tacit knowledge, codify it as explicit knowledge, and distribute it to relevant stakeholders, thereby enhancing both combination and internalization processes (Bawack, 2024; Canonico *et al.*, 2020). A lack of technological support can therefore limit organizational learning, slow knowledge dissemination, and reduce the organization's ability to innovate.

Finally, respondents were uncertain about whether the organizational culture supports innovation and risk-taking. OLT emphasizes that learning and adaptation are heavily influenced by culture, as environments that encourage openness, experimentation, and critical reflection enable double-loop learning (Argyris & Schön, 1978; Canonico *et al.*, 2020). Likewise, SECI theory underscores that knowledge creation thrives in environments where employees feel safe to share insights and challenge assumptions. From a KBV perspective, an innovation-supportive culture ensures that knowledge flows freely and is strategically applied, reinforcing the organization's competitive advantage (Grant & Phene, 2022). Organizations lacking such a culture risk underutilizing their knowledge assets, resulting in stagnation and reduced learning capacity.

5.3.2 Effect of Knowledge Storage on Organizational Learning

The study revealed that respondents were generally undecided on whether the organization's knowledge is well-indexed and searchable, suggesting potential gaps in knowledge storage systems. From the Knowledge-Based View (KBV) perspective, knowledge is a strategic resource, and its value is maximized when it is systematically organized, stored, and easily retrievable for decision-making and innovation (Grant & Phene, 2022; Curado & Bontis, 2006). Ineffective storage systems can limit access to both tacit and explicit knowledge, constraining learning, problem-solving, and organizational adaptability (Alavi & Leidner, 2001).

Nonaka and Takeuchi (1995) also emphasize knowledge storage as a critical step in the SECI model, which ensures that both tacit and explicit knowledge are preserved for future use. Knowledge storage involves formal methods such as databases, manuals, and project documentation, as well as informal methods such as personal notes and shared experiences, to maintain organizational memory and support knowledge accessibility. The study's findings indicate that such storage mechanisms may be underdeveloped or inconsistently applied, limiting the organization's capacity to retain and leverage valuable knowledge.

Respondents also reported uncertainty regarding whether the organization uses tracking systems to monitor the accessibility of stored knowledge. KBV theory suggests that without mechanisms to track and manage knowledge assets, critical knowledge can become “lost” or underutilized, reducing the organization’s competitive advantage (Polanyi, 1996; Zander & Kogut, 1995). Similarly, OLT highlights that learning is contingent upon the organization’s ability to access, interpret, and apply past knowledge to improve processes and adapt to changing environments (Easterby-Smith & Lyles, 2019; Tseng *et al.*, 2022). Tracking systems help ensure that knowledge is not only stored but also available when needed, facilitating continuous learning. Wanyama (2018) further notes that such systems positively influence organizational performance by making stored knowledge actionable and readily retrievable.

Uncertainty was also observed regarding the storage of historical data and project reports. From an OLT perspective, the systematic storage of historical knowledge supports double-loop learning, as employees and management can revisit previous assumptions, successes, and failures to refine strategies (Argyris & Schön, 1978; Chiva *et al.*, 2018). Without structured storage, institutional memory is weakened, and opportunities for learning from past experiences are lost. Wanderage *et al.*, (2021) emphasize that well-maintained records enhance decision-making, organizational learning, and performance at both individual and collective levels.

The study also revealed ambiguity regarding employees’ ability to access stored knowledge. KBV stresses that knowledge only contributes to competitive advantage when it is effectively shared and applied across the organization (Grant & Phene, 2022). Similarly, Nonaka and Takeuchi’s SECI model underscores that accessibility of explicit knowledge facilitates the internalization process, where employees transform documented information into tacit knowledge that informs their skills and expertise (Hislop *et al.*, 2021). Amayah (2020) adds that accessible knowledge preserves institutional memory, enabling continuous

improvement and sustaining organizational capability. Escorcia and Barros (2020) further argue that knowledge must be regularly updated to remain relevant and useful, ensuring that organizational learning is supported over time.

Respondents were also uncertain about whether technology is used to manage and store knowledge effectively. KBV and SECI theory both highlight that digital tools and knowledge management systems enhance the storage, retrieval, and dissemination of knowledge (Alavi & Leidner, 2001; Rezaei *et al.*, 2018). Technology facilitates combination (explicit to explicit) by allowing integration of diverse data into structured knowledge repositories and supports internalization (explicit to tacit) by enabling employees to apply stored knowledge in practice. Ramakrishnan and Yasin (2018) emphasize that investing in modern technological tools strengthens knowledge management practices and fosters a learning environment, while Kithuka (2020) notes that technology enhances efficiency, collaboration, and knowledge sharing.

Finally, there was no clear agreement on whether knowledge storage systems help preserve institutional memory amid staff turnover. KBV asserts that knowledge is a key strategic resource that must be retained to sustain competitive advantage (Grant & Phene, 2022). SECI theory also highlights that socialization and externalization processes rely on stored knowledge to transfer experience from outgoing employees to remaining staff (Njenga, 2022). Hislop *et al.* (2018) emphasize that systematic documentation and preservation of knowledge ensure continuity, support organizational learning, and maintain institutional memory, which is critical for mitigating the risks associated with employee attrition.

5.3.3 Effect of Knowledge Transfer on Organizational Learning

The study revealed that respondents could not reach consensus on whether cross-functional collaboration and departmental meetings are frequently used to facilitate knowledge sharing.

From the Knowledge-Based View (KBV) perspective, knowledge transfer is critical for leveraging organizational knowledge as a strategic resource; without effective sharing mechanisms, valuable tacit and explicit knowledge remains siloed, limiting the organization's competitive advantage (Grant & Phene, 2022; Curado & Bontis, 2006). Similarly, Organizational Learning Theory (OLT) emphasizes that learning occurs when knowledge flows across individuals, groups, and departments, enabling continuous adaptation and improvement (Argyris & Schön, 1978; Chiva, Lapiedra Alegre & Miralles, 2018). Dimma (2020) highlighted that employee participation in meetings, job shadowing, and cross-departmental engagements enhances knowledge transfer, promotes feedback exchange, and fosters a learning culture, aligning with both KBV and OLT principles.

Respondents were also undecided on whether the organization offers reward incentives to reinforce knowledge transfer and learning. According to KBV, motivating employees to share and apply knowledge ensures that the organization maximizes the utility of its knowledge resources, thereby supporting sustained competitive advantage (Alavi & Leidner, 2001). OLT further suggests that reinforcement mechanisms such as incentives encourage the repetition of knowledge-sharing behaviors, strengthening organizational memory and learning (Easterby-Smith & Lyles, 2019). Mariel (2015) emphasized that well-structured reward systems not only align individual behaviors with organizational goals but also cultivate a culture that supports collaborative learning and knowledge dissemination.

The study indicated uncertainty regarding the use of inter-departmental exchanges and face-to-face communication as channels for knowledge transfer. According to Nonaka and Takeuchi's SECI model, these interactions facilitate socialization the sharing of tacit knowledge through direct experience and interpersonal interaction allowing employees to internalize insights from colleagues (Nonaka & Takeuchi, 1995; Hislop *et al.*, 2021). Zamfir (2020) noted that organizations often rely on multiple channels, including documentation and

interdepartmental communication, but the effectiveness of these methods depends on consistent organizational support, culture, and leadership commitment.

Respondents were also uncertain about whether peer-to-peer learning and informal knowledge exchange are encouraged. OLT emphasizes that informal networks, mentoring, and coaching are crucial mechanisms for organizational learning, as they allow tacit knowledge to flow naturally and support skill development across the workforce (Argyris & Schön, 1978; Mwangi, 2019). From a KBV perspective, peer learning ensures that knowledge as a strategic resource is effectively disseminated and applied, enhancing overall performance.

Digital platforms such as intranets, knowledge portals, and collaboration tools were also reported as inconsistently used for knowledge exchange. SECI theory highlights that technology facilitates combination (integrating explicit knowledge from multiple sources) and internalization (transforming explicit knowledge into tacit understanding), which are essential for organizational learning and innovation (Nonaka & Takeuchi, 1995; Mnasi, 2022). The effectiveness of digital tools depends on accessibility, training, and organizational support, emphasizing the role of infrastructure in enabling knowledge transfer.

Uncertainty was further noted regarding leadership support for knowledge-sharing initiatives. Leadership is central in OLT as it establishes the structures, norms, and culture necessary for continuous learning and knowledge flow (Saadat & Saadat, 2016). Similarly, KBV asserts that managerial commitment is critical for promoting knowledge as a strategic resource, ensuring it is created, shared, and applied to achieve competitive advantage. Leaders who champion knowledge-sharing initiatives facilitate both formal and informal mechanisms of learning, reinforcing organizational capacity for adaptation and innovation.

Finally, respondents were undecided on the presence of formal training and mentorship programs. According to SECI theory, such programs support externalization, where tacit

knowledge is articulated into explicit forms through structured learning activities, enhancing its transfer across the organization (Nonaka & Takeuchi, 1995; Mnasi, 2022). Ongoing training and mentorship also support double-loop learning by enabling employees to question assumptions and adopt improved practices, reinforcing organizational learning cycles.

5.3.4 Effect of Influence of Knowledge Application on Organizational Learning

The study revealed that respondents could not reach a consensus on whether the organization has an effective culture that supports knowledge application and learning. From a Knowledge-Based View (KBV) perspective, organizational culture is a critical enabler for transforming knowledge into actionable resources that create strategic advantage (Grant & Phene, 2022; Alavi & Leidner, 2001). If culture does not support sharing and applying knowledge, valuable intellectual resources remain underutilized, limiting organizational effectiveness. Similarly, Organizational Learning Theory (OLT) highlights that culture, together with leadership values, shapes the norms and practices through which knowledge is applied, transferred, and institutionalized (Argyris & Schön, 1978; Chatterjee *et al.*, 2018). A culture that encourages experimentation, reflection, and learning enhances double-loop learning, enabling employees to question assumptions and adopt improved practices.

Respondents were also undecided on the extent to which technology is used to support knowledge application and learning. The SECI model emphasizes that technological tools facilitate internalization, allowing explicit knowledge to be converted into tacit understanding through practical application (Nonaka & Takeuchi, 1995; Hislop *et al.*, 2021). From a KBV perspective, technology enables the efficient deployment of knowledge as a strategic resource, enhancing decision-making and operational efficiency (Mobolade & Ibojo, 2023). Mtawali (2018) similarly noted that managers who leverage technological tools such as knowledge repositories, workflow platforms, and collaboration software can promote the application of knowledge across organizational processes, improving learning outcomes and performance.

There was also a lack of agreement on whether knowledge application has led to increased organizational learning or whether structured training initiatives exist to support knowledge application. According to OLT, training programs serve as formal mechanisms for reinforcing learning, helping employees internalize and apply knowledge, thereby improving performance and promoting innovation (Noor *et al.*, 2017; Kordab *et al.*, 2020). These programs support both single-loop learning (correcting errors) and double-loop learning (challenging assumptions), ensuring that knowledge application leads to continuous improvement.

The study further revealed uncertainty regarding whether lessons learned and knowledge from past projects are routinely applied to address present challenges or foster innovation. From a SECI perspective, this represents the combination and internalization phases, where explicit knowledge from past experiences is integrated and transformed into actionable insights (Nonaka & Takeuchi, 1995; Zaim, 2010). KBV also underscores that systematically applying stored knowledge enhances organizational capabilities and sustains competitive advantage by preventing the loss of critical expertise and avoiding redundant efforts.

Lastly, respondents did not agree on whether incentive programs exist to encourage knowledge application and sharing. OLT suggests that reinforcement mechanisms, including rewards, strengthen learning behaviors and encourage knowledge dissemination throughout the organization (Argyris & Schön, 1978; Nzau, 2017). Similarly, KBV emphasizes that motivating employees to actively apply and share knowledge maximizes the value of knowledge as a strategic resource, fostering collaboration, improving performance, and enhancing innovation.

5.4 Conclusions

5.4.1 Effect of Knowledge Creation on Organizational Learning

The study shows that the organization has created an enabling environment for knowledge creation and innovation. Through cross-functional collaboration, brainstorming platforms, and formal processes for sharing experiences, employees are provided with opportunities to exchange and develop ideas. The organization also provide regular training programs, use of technology, and a workplace culture that values innovation, risk-taking and knowledge creation.

5.4.2 Effect of Knowledge Storage on Organizational Learning

The study indicates that the organization has put in place systems for storing, managing, and tracking knowledge, including the use of technology to maintain historical data and project reports. These practices help ensure that employees can access relevant information and reduce the risk of losing institutional memory due to staff turnover. However, respondents did not fully agree on whether stored knowledge is well-indexed and easily searchable, there are gaps in ensuring efficiency and ease of retrieval of knowledge stored.

5.4.3 Effect of Knowledge Transfer on Organizational Learning

The study shows that the organization has implemented a wide range of strategies to promote knowledge sharing, including meetings, inter-departmental exchanges, peer-to-peer learning, informal interactions, and the use of digital platforms. Leadership plays an important role in supporting these initiatives, while reward incentives, training, and mentorship programs further strengthen knowledge transfer and learning. However, respondents did not reach agreement on the effectiveness of cross-functional collaboration in relation to knowledge transfer.

5.4.4 Effect of Influence of Knowledge Application on Organizational Learning

The study reveals that the organization has adopted several approaches to promote knowledge application and learning, including the use of technology, training initiatives, and incentive programs. Knowledge gained from past projects and experiences is also applied to address current challenges, foster innovation, and enhance organizational learning. However, respondents did not fully agree on whether the organization has an effective culture that consistently supports knowledge application.

5.5 Recommendations

5.5.1 Effect of Knowledge Creation on Organizational Learning

It is recommended that the organization should continue to increase knowledge creation and innovation by expanding cross-functional initiatives in the organization so as to create knowledge among employees. Training programs should be regularly updated to address emerging skills, while digital tools should be enhanced to make knowledge sharing more efficient and accessible. The water sector in Kenya should also develop effective policies to increase innovation among employees and increase knowledge creation.

5.5.2 Effect of Knowledge Storage on Organizational Learning

The organization should increase its knowledge storage systems by using indexing and search functions to make information retrieval faster and more reliable. Regular reviews and updates of stored knowledge should be carried out to maintain accuracy and relevance. In addition, employees should be trained on how to effectively use the knowledge storage systems, while technology platforms should be continuously upgraded to enhance accessibility and efficiency.

5.5.3 Effect of Knowledge Transfer on Organizational Learning

To increase knowledge transfer, the water sector in Kenya should increase cross-functional collaboration by creating structured opportunities such as joint projects, cross-departmental workshops, and problem-solving forums that bring together employees from different departments. Digital platforms for knowledge transfer should be used to ensure ease of use and active participation across departments.

5.5.4 Effect of Influence of Knowledge Application on Organizational Learning

It was recommended that the water sector in Kenya should develop a culture that supports knowledge application by incorporating it into their policies, values, and everyday practices. Training programs should be increased to emphasize the practical use of knowledge. In contrast, digital tools such as mobile phones, tablets and computers can be used to make knowledge application easier in the organization.

5.6 Recommendations for Future Research

Since this study focused on water sector in Kenya, future research could be conducted in other sectors within Kenya and in other sectors to examine the effects of knowledge creation, storage, application, and transfer on organizational learning. Such studies would help to determine whether the patterns observed in the water sector are unique or consistent across different industries.

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Appendix I: Introductory Letter

Naomi M. Mwema,

P.O. Box 104858 – 00101

Nairobi, Kenya

Dear Respondent,

REF: REQUEST FOR RESEARCH DATA COLLECTION

I am Naomi M. Mwema, a Master of Science in Knowledge Management and Innovation student at KCA University (REG. 23/08386). I am conducting a study on the "Strategic Knowledge Management Practices and Organizational Learning of the Water Sector in Kenya."

The purpose of this questionnaire is to gather data on the influence of strategic knowledge management practices (knowledge creation, storage, transfer, and application) on organizational learning in Kenya's water sector. Your insights are crucial for the success of this research.

Your participation in this study is entirely voluntary, and you have the right to withdraw at any time. All information provided will be treated with the utmost confidentiality and anonymity, and will be used solely for academic purposes. Please do not write your name on this questionnaire.

Thank you for your time and valuable contribution.

Sincerely,



Naomi M. Mwema

Appendix II: Informed Consent Form

Project Title: Strategic Knowledge Management Practices and Organizational Learning in the Water Sector in Kenya

Lead Researcher: Naomi Mwikali Mwema, KCA University (REG. 23/08386)

You are invited to participate in a research study on knowledge management in Kenya's water sector by completing a brief, 15-minute questionnaire.

Your participation is voluntary, and you can withdraw at any time. All responses will be kept confidential and anonymous and used for academic purposes only.

For questions, please contact Naomi M. Mwema at Mnaomi153@gmail.com

Statement of Consent: By signing below, I confirm that I understand the study's purpose and voluntarily agree to participate.

Participant's Signature: _____

Date: _____

Appendix III: Research Questionnaire

Section A: Demographic Information

Please tick (✓) the appropriate box or fill in the blank.

1. What is your gender?
 - ☐ Male
 - ☐ Female

2. What is your age bracket?
 - ☐ 18-25 years
 - ☐ 26-35 years
 - ☐ 36-45 years
 - ☐ 46-55 years
 - ☐ 56 years and above

3. What is your highest level of education?
 - ☐ Certificate
 - ☐ Diploma
 - ☐ Bachelor's Degree
 - ☐ Master's Degree
 - ☐ PhD
 - ☐ Other (please specify): _____

4. What is your current position/role in your organization?
 - ☐ Entry-level Staff
 - ☐ Middle-level Management
 - ☐ Senior Executive
 - ☐ Policymaker
 - ☐ Other (please specify): _____

5. How many years have you worked in the water sector in Kenya?
 - ☐ Less than 1 year
 - ☐ 1-5 years

- 6-10 years
- 11-15 years
- More than 15 years

6. Which organization do you primarily work for?

- WASREB,
- Ministry of Water,
- WRA, NWSC,
- Athi Water Works

Other WSP, NGO/Partner) _____

Section B: Knowledge Creation

This section assesses the extent to which knowledge creation practices are implemented in your organization. Using the scale below, please indicate your level of agreement with each statement: **1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**

	Statement	1	2	3	4	5
1.	There are formal processes in place for employees to share their experiences and tacit knowledge (socialization).					
2.	The organization regularly conduct training programs and workshops to foster new knowledge and skills among employees.					
3.	My organization offers a workplace culture that supports innovation and risk-taking					
4.	My organization encourages cross-functional collaboration					
5.	The use of technology in the organization promote knowledge creation and learning					

6.	There are platforms and forums within my organization for brainstorming and generating new ideas.					
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Section C: Knowledge Storage

This section assesses the extent to which knowledge storage practices are implemented in your organization. Using the scale below, please indicate your level of agreement with each statement: **1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**

No.	Statement	1	2	3	4	5
1	The knowledge stored is well-indexed and searchable, allowing for efficient retrieval.					
2	My organization historical data and project reports are effectively stored					
3	Our knowledge strong process is done regularly					
4.	I can easily access relevant information stored in the organization					
5.	My organization stores and manage knowledge by using technology					
6.	Our knowledge storage systems help prevent loss of institutional memory due to staff turnover.					
7.	My organization uses a tracking system to check the accessibility of knowledge stored					

Section D: Knowledge Transfer

This section assesses the extent to which knowledge transfer practices are implemented in your organization. Using the scale below, please indicate your level of agreement with each statement: **1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**

No.	Statement	1	2	3	4	5
-----	-----------	---	---	---	---	---

1.	My organization offers reward incentives to encourage and reinforce effective knowledge transfer and learning.					
2.	My organization has formal employee training and mentorship programs.					
3.	We use digital knowledge-sharing platforms (e.g., intranets, knowledge portals) for information exchange.					
4.	Cross-functional collaboration and meetings are frequently used to share knowledge between departments.					
5.	Leadership actively promotes and supports knowledge-sharing initiatives within the organization.					
6.	My organization uses inter-departmental exchange and face to face communication to increase transfer of knowledge					
7.	My organization encourages peer-to-peer learning and informal knowledge exchange.					

Section E: Knowledge Application

This section assesses the extent to which knowledge application practices are implemented in your organization. Using the scale below, please indicate your level of agreement with each statement: **1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**

No.	Statement	1	2	3	4	5
1.	Knowledge gained from past projects and experiences is regularly applied to solve current problems, increase innovation and promote learning					
2.	Technology is used in the organization to increase knowledge application and learning					
3.	My organization has an effective culture in place that support knowledge application and learning					

4.	My organization offers training initiatives so as to increase learning and knowledge application					
5.	Incentive programs are used to motivate employees to apply and share their knowledge at work with other individuals					
6.	Knowledge application has increase learning in my organization					

Section F: Organizational Learning

This section assesses the level of organizational learning in your organization. Using the scale below, please indicate your level of agreement with each statement: **1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**

No.	Statement	1	2	3	4	5
1	My organization effectively adapts to changes in the regulatory environment and external conditions.					
2	Employees are encouraged to continuously learn and develop new skills relevant to their roles.					
3	New knowledge is consistently applied to improve our operational processes.					
4	My organization effectively integrates lessons learned into future planning and strategies.					
5	My organization is proactive in identifying and addressing knowledge gaps that hinder performance.					

Appendix IV: Research Budget

Budget	Cost
Proposal Development	
Printing	2,500
Photocopying	1,500
Data Collection	
Photocopying	8,500
Travelling	4,000
Research assistants	5,000
Binding and Dissemination	10,000
Miscellaneous	500
Total	32,000

Appendix V: Work Plan

Activity/Timeline	Jan - Jun	July	Aug	Sep	Oct
Proposal Development					
Proposal Presentation & Submission					
Data Collection and Data Entry					
Data Analysis and Dissertation Writing					
Dissertation Defence					

Appendix VI: Ethical Clearance Certificate

	Thika Road, Ruwaka P.O. Box 50808-00200 Nairobi Kenya Plot Lines: +254 20 8070408/9 Tel: +254 20 3537842 Fax: +254 20 8561077 Mobile: +254 734 888022, 710 888022 Email: kca@kca.ac.ke Website: www.kca.ac.ke
KCA UNIVERSITY SCIENTIFIC & ETHICS REVIEW COMMITTEE	
REF: KCAU/SERC/SO80287	Date: 8TH SEPTEMBER, 2025
TO: NAOMI MWIKALI MWEMA (23/08386)	
Dear Sir/Madam,	
RE: STRATEGIC KNOWLEDGE MANAGEMENT PRACTICES AND ORGANIZATIONAL LEARNING OF THE WATER SECTOR IN KENYA	
This is to inform you that the KCA University Scientific Ethics Review Committee (KCAUSERC) has reviewed and approved your research proposal. Your application approval number is KCAUSERC/SO80287. The approval period is 8th September, 2025 – 8th September, 2026. This approval is subject to compliance with the following requirements. i. Only approved documents, including informed consents, study instruments, and MTAs, will be used. ii. All changes, including (amendments, deviations, and violations), are submitted for review and approval by KCAUSERC. iii. Death and life-threatening problems and serious adverse events or unexpected adverse events, whether related or unrelated to the study, must be reported to KCAUSERC within 72 hours of notification. iv. Any changes, anticipated or otherwise, that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to KCAUSERC within 72 hours. v. Clearance for export of biological specimens must be obtained from relevant institutions. vi. Submission of a request for renewal of approval at least 60 days before expiry of the approval period. Attach a comprehensive progress report to support the renewal. vii. Submission of an executive summary report within 90 days upon completion of the study to KCAUSERC. Before commencing your study, you will be expected to obtain a research license from the National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.	
Yours sincerely,	
	
Dr. Caroline Ntara, Chairperson, KCA University Scientific & Ethics Review Committee.	
Advancing Knowledge, Driving Change	

Appendix VII: NACOSTI Certificate

 REPUBLIC OF KENYA RefNo: 212641	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION Date of Issue: 08/October/2025
RESEARCH LICENSE	
	
This is to Certify that Ms. Naomi Mwikali Mwema of KCA University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: STRATEGIC KNOWLEDGE MANAGEMENT PRACTICES AND ORGANIZATIONAL LEARNING IN THE WATER SECTOR IN KENYA for the period ending : 08/October/2026.	
License No: NACOSTI/P/25/4180341	
212641 Applicant Identification Number	
Ag. Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
Verification QR Code	
	
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