

KNOWLEDGE MANAGEMENT APPLICATION STRATEGIES ON ORGANIZATIONAL PERFORMANCE AT KENYA FORESTRY RESEARCH INSTITUTE

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ABSTRACT

Knowledge Application is critical for enhancing research and operational efficiency in knowledge-intensive institutions. This study sought to determine the impact of knowledge application strategies on organizational performance at the Kenya Forestry Research Institute (KEFRI). The study adopted descriptive research design to determine the effect between the independent and dependent study variables. The target population included 178 employees from various department at KEFRI Headquarters, Muguga. This study adopted census method due to the small target population. Primary data was collected using structured online questionnaires which were sent via email. A pilot group of 18 employees working at KEFRI Eco-region, the Rift Valley Research Eco-Region Program in Londiani was used to test the validity and reliability of the instrument. The collected data was entered into MS. excel and SPSS for further analysis computation. The findings provided actionable insights into optimizing knowledge application practices to enhance institutional capacity and achieve strategic objectives. The finding of the study established that knowledge application positively and significantly influenced organizational performance in KEFRI. The study concluded that knowledge application plays a pivotal role in enhancing organizational performance at KEFRI. The study recommends strengthening of KEFRI internal processes that are tasked with knowledge application should be prioritized.

Key words: *Knowledge application strategies, organizational performance, Kenya Forestry Research Institute*

1. Introduction

Knowledge can be defined as justified true belief that emerges from cognitive reflection and experiential learning (Sahibzada et al., 2022; Ullah, 2020). It comprises facts, theories, and practices that accumulate through individual or collective learning. Within organizations, knowledge is classified as tacit or explicit. Tacit knowledge is personal, experiential, and difficult to formalize, while explicit knowledge is codified, easily documented, and transferable (Gamble, 2020). Effective organizations harness both forms to enhance decision-making, innovation, and overall performance.

Historically, knowledge was shared informally through storytelling and apprenticeship. With the advent of formal education and technological progress, organizations began establishing structured systems to manage knowledge (Wilson & Campbell, 2020). In the modern era, firms employ Big Data and Artificial Intelligence (AI) to automate knowledge processes and inform decision-making (Himeur, 2023). Knowledge application represents the final and most critical phase of knowledge management (KM), where accumulated knowledge is translated into action to improve efficiency, innovation, and organizational performance. It involves the practical use of knowledge—both tacit and explicit to solve problems, make informed decisions, and enhance productivity. In essence, knowledge application determines the value of all preceding KM processes, since creation, storage, and sharing only contribute to performance when knowledge is effectively utilized (Ode & Ayavoo, 2020). Knowledge application is a dynamic process that integrates individual and organizational learning to achieve strategic goals. It ensures that insights generated through research, experience, or innovation are applied to improve decision-making and optimize operations (Abuezhayeh et al., 2022). In an organizational context, knowledge application may take the form of adopting best practices, implementing new technologies, enhancing service delivery, or redesigning processes to achieve efficiency and customer satisfaction. It transforms knowledge from static information into a productive resource that drives competitive advantage.

Globally, organizations such as Google, IBM, and Huawei demonstrate the power of knowledge application. Google's innovation labs allow rapid experimentation, converting theoretical ideas into real-world applications that sustain market leadership (Kim, 2020). IBM utilizes its global knowledge platforms to apply shared expertise in solving complex client problems (Alsharhan et al., 2021). Similarly, Huawei leverages applied knowledge to respond swiftly to technological changes and maintain profitability (Abbas et al., 2022). These cases underline that organizational performance improves when knowledge is effectively embedded in processes, culture, and decision-making systems.

In the African context, knowledge application has been key in improving organizational outcomes despite infrastructural and financial challenges. South African banks, for instance, apply knowledge from customer data analytics to deliver personalized financial services, enhancing customer loyalty and operational efficiency (Mantje et al., 2023). Nigerian healthcare institutions use applied knowledge through electronic health records and telemedicine to improve patient care and extend services to remote areas (Ogunkoya et al., 2023). Similarly, Rwandan SMEs apply shared knowledge to develop innovative products, strengthen collaboration, and sustain competitiveness (Nahimana, 2024). These examples reveal that knowledge application is a catalyst for innovation and performance improvement across diverse sectors.

In Kenya, knowledge application has become a strategic driver for both private and public institutions. Organizations increasingly recognize that knowledge must be integrated into their operational systems to achieve tangible results (Muthee, 2023). For instance, Kenya Medical

Research Institute (KEMRI) applies research knowledge to improve healthcare outcomes and streamline research processes (Bongei et al., 2020). Safaricom applies customer data and market insights to refine service delivery and sustain innovation, ensuring superior customer satisfaction (Githii, 2021). Likewise, KenGen's knowledge application in energy research and development has enhanced operational efficiency and supported sustainable energy solutions.

A notable example of effective knowledge application in Kenya's public sector is the Kenya Forestry Research Institute (KEFRI). As a state corporation mandated to conduct research and disseminate knowledge on forestry and allied natural resources, KEFRI's performance heavily relies on how well it applies research-based knowledge to promote sustainable forest management and environmental conservation. Under the Science, Technology, and Innovation (ST&I) Act No. 28 of 2013 and the Forest Conservation and Management Act No. 34 of 2016, KEFRI's operations are anchored in generating, sharing, and applying scientific knowledge to support Kenya's sustainable development goals.

KEFRI applies knowledge strategically to enhance environmental sustainability, innovation, and organizational performance. It utilizes research findings on forest productivity, tree breeding, and climate change adaptation to inform national forestry policies, reforestation programs, and biodiversity conservation. Through technology transfer and capacity-building initiatives, KEFRI disseminates forestry technologies such as improved seed varieties and sustainable harvesting methods to communities and stakeholders, promoting forest productivity and rural livelihoods. Additionally, by leveraging digital platforms and knowledge repositories, the institute streamlines operations, reduces duplication, and accelerates research implementation, fostering continuous improvement, innovation, and organizational learning.

Moreover, KEFRI applies knowledge to support Kenya's Vision 2030 agenda and global commitments such as climate change mitigation and the Sustainable Development Goals (SDGs). For example, applied research on forest carbon sequestration informs Kenya's climate policies and international reporting obligations. Similarly, applied socio-economic research guides the development of community-based forest management models that balance conservation with livelihood improvement. Despite its success, KEFRI faces challenges in applying knowledge effectively, including limited financial resources, technological gaps, and information silos. Inadequate funding can constrain investment in knowledge management tools, while fragmented information systems may slow the translation of research findings into practice. Nonetheless, KEFRI's continuous investment in capacity building and digital transformation under its Strategic Plan (2022–2027) demonstrates its commitment to overcoming these barriers.

Knowledge management application is critical in research organizations as it enhances their ability to acquire, store, share, and apply knowledge to support innovation, problem-solving, and continuous research improvement (Galgotia & Lakshmi, 2022). Despite its importance, many organizations face challenges in fully integrating knowledge management practices into their operations. At the Kenya Forestry Research Institute (KEFRI), several initiatives—such as the Knowledge Management Policy (2019) and the Knowledge Management Strategy (2022–2027)—have been introduced to streamline the creation, use, storage, and sharing of knowledge across departments and with stakeholders. However, KEFRI has not fully achieved its goal of adopting and implementing knowledge management practices across all functions. The systems for storing and retrieving knowledge are still underutilized, limiting the effective application of research outputs and institutional data that could enhance research, innovation, and overall organizational performance. Previous studies (Kavalic et al., 2021; Chuma, 2019) have examined knowledge

management and organizational performance but failed to address how knowledge application influences performance in research-based institutions. Therefore, the problem of this study is the limited understanding of how knowledge application affects organizational performance at KEFRI, creating a gap that this study seeks to address.

2. Theoretical and Empirical Review

The section reviewed theory and empirical studies that underpinned the study.

Theoretical Review

In research, a theoretical review serves as a critical component that anchors the study within existing scholarly literature and theoretical frameworks (Matias, 2021). It involves synthesizing and analyzing relevant theories, concepts, and models that are pertinent to the research topic or problem under investigation. The main purpose of a theoretical review is to establish a foundation of knowledge, identify gaps or inconsistencies in current understanding, and provide a theoretical framework that guides the research design, methodology, and interpretation of findings (Matias, 2021). This study was anchored by Resources Based View Theory.

The Resource-Based View (RBV) theory posits that an organization's resources and capabilities are critical to achieving sustainable competitive advantage. The theory was formulated in the 1950s by Penrose, who viewed organization as a pool of knowledge. The theory then became prominent in the 1990s through the introduction of the concept of firm resources as the foundation for sustainable competitive advantage. According to Barney (1991), knowledge is considered a key strategic resource within this framework. RBV suggests that for a resource to provide a sustainable competitive advantage, it must be valuable, rare, inimitable, and non-substitutable (Lubis, 2022).

A fundamental ideology of RBV is that not all resources have the potential to contribute to competitive advantage. For a resource to be valuable, it must enable the firm to exploit opportunities or neutralize threats in the environment. Rarity implies that the resource is not widely possessed by competitors, thus giving the firm a unique position (Lubis, 2022). Inimitability means that competitors cannot easily replicate the resource, due to factors such as complex social relationships, unique historical conditions, or causal ambiguity. Non-substitutability indicates that there are no equivalent resources that can replace the original resource, ensuring its continued value to the firm. Such approach is beneficial for the organization as intellectual resources can be utilized effectively to cause positive changes that will subsequently lead to improved performance of the organization.

RBV theory provides a framework that supports knowledge management by emphasizing the competitive advantage achieved through strategic values obtained from the knowledge created and shared among the stakeholders of the organization (Makina & Oundo, 2020). Knowledge creation and sharing enables organizations to determine knowledge gaps and bridge them through implementation of new ways of management and operations. Subsequently, the organization builds capabilities to remain competitive in the corporate environment. Knowledge, particularly tacit knowledge that is deeply embedded in organizational processes and culture, often meets these criteria. Effective knowledge application leverages this strategic asset to improve decision-making, innovation, and operational efficiency.

RBV is based on the assumption that resources are either distributed heterogeneously across organizations or non-transferable from one institution to the other with no cost (Hendi et al. (2022), Given the two assumptions, RBV holds that only an intangible resource that is valuable, rare, hard to imitate and without strategically equivalent substitutes is critical in sustaining a firm's competitiveness. Therefore, RBV emphasize that critical resources in organizational management practices are based on tangible and intangible resources.

From this perspective, the wealth of knowledge that an organization possesses is critical resource for competitive advantage and enhancing performance. KM focuses on the strategies of knowledge creation, storage, sharing and application. Resource based theory view is relevant for this study, as it views knowledge as a unique resource that needs to be effectively and efficiently managed to ensure that the organization generates benefits from the intellectual capabilities of its stakeholders in developing and growing its performance and gaining competitiveness among its competitors (Makina & Oundo, 2020).

3. Empirical Review

Knowledge application refers to the practical use of acquired knowledge to enhance decision-making, innovation, problem-solving, customer-centric approaches, and strategic alignment and execution within an organization (Empire State University, 2024). Knowledge application involves how effectively an organization integrates and utilizes its collective knowledge to drive operational processes and achieve strategic goals. When knowledge is effectively applied organizations can improve efficiency, foster creativity, solve complex challenges, and align their actions towards customer satisfaction.

Knowledge can be applied in an organization in Decision making which is a crucial aspect that affects organizational performance (Abuezhayeh *et al.*, 2022). It involves using available knowledge and information to make informed choices that guide organizational actions and strategies. Effective decision making relies on the timely and accurate application of both tacit and explicit knowledge. Integrating knowledge management practices into decision-making processes, ensures that decisions are well-informed, strategic, and aligned with the organization's goals.

Moreover, the quality of decision making directly affects the efficiency and effectiveness of organizational operations. Sound decisions can lead to improved resource allocation, better risk management, and enhanced problem-solving capabilities (Joseph & Gaba, 2020). Inclusive and transparent decision-making process influences organizational culture which boost employee morale and engagement leading to improvement productivity. Additionally, organizational issues will be addressed swiftly leading to better customer service, thus enhanced competitiveness in the industry.

Also, knowledge can be applied during innovation and problem-solving which drive organizational performance (Nguyen *et al.*, 2022). They involve using existing knowledge to develop new solutions and address complex challenges. Innovation and problem-solving can be seen in the development of new techniques, sustainable practices, and research methodologies. Furthermore, fostering an environment that encourages innovation and problem-solving requires a robust knowledge management framework (Vaio *et al.*, 2021) includes providing access to relevant information, encouraging collaboration, and supporting continuous learning.

Knowledge can be applied in an institution to in designing its services towards customer satisfaction (Al-Shammari, 2023). This approach involves using knowledge about customer needs, preferences, and feedback to inform product development, service delivery, and overall organizational strategies. Adopting a customer-centric approach means understanding the needs of stakeholders, including researchers, policymakers, and the public, and tailoring research outputs and services to meet those needs (Al-Shammari, 2023). In addition, a customer-centric approach requires continuous gathering and analysis of customer feedback, market trends, and emerging needs (Okeyo, 2024). This information can be used to refine research agendas, develop relevant projects, and enhance service delivery.

Strategic alignment involves ensuring that the organization's actions and initiatives are in line with its overall goals and objectives (Yoshikuni & Albertin, 2020). This requires the effective application of knowledge to align resources, processes, and activities with the strategic vision. Strategic alignment can be achieved by using research findings, industry insights, and internal expertise to inform strategic planning and decision-making processes.

Execution, on the other hand, involves the practical application of knowledge to implement strategic plans and initiatives effectively (Gudeta *et al.*, 2023). This includes translating strategic objectives into actionable plans, monitoring progress, and making adjustments as needed. By integrating knowledge management into strategic alignment and execution, entities ensure that their strategies are well-formulated and effectively implemented, leading to sustained organizational success and impact.

Rezaei, Khalilzadeh and Soleimani (2021) studied factors affecting knowledge management and its effect on organizational performance indicate that the systematic use of knowledge ensures that valuable insights and expertise are translated into tangible actions that drive productivity, innovation, and competitive advantage. One of the primary effects of knowledge application on organizational performance is improved decision-making. When organizations effectively apply knowledge, they leverage their collective expertise to make informed and strategic decisions. This involves using historical data, industry insights, and best practices to guide choices at all levels of the organization. For instance, managers who utilize applied knowledge can anticipate market trends, mitigate risks, and allocate resources more efficiently.

A study by Mustafa et al. (2021) on the impact of Knowledge Management on Institutional Performance through the Balanced Scorecard," indicates that knowledge application significantly contributes to the various dimensions of the balanced scorecard. For instance, the effective use of knowledge in decision-making can lead to improved financial performance by optimizing resource allocation and reducing operational costs. Innovation and problem-solving driven by applied knowledge can enhance internal processes, leading to greater efficiency and effectiveness. A customer-centric approach, informed by knowledge application, can improve customer satisfaction and retention, positively impacting the customer perspective. Finally, strategic alignment and execution supported by knowledge application can foster organizational learning and growth, ensuring that the institution remains competitive and adaptive to changes in the external environment.

A systematic review by Kassa and Ning (2023), highlights the critical role of knowledge application in enhancing organizational performance in the public sector. Through themes of organizational improvement, citizens’ satisfaction, and collaborative innovation management, the study demonstrates how the practical use of knowledge can lead to significant improvements in efficiency, effectiveness, and innovation within public sector organizations. It is by systematically applying knowledge that public sector entities can better achieve their mandates, meet citizens' needs.

4. Conceptual Framework

In this study the independent variable is knowledge application while dependent variable is organization performance as shown in the figure 1

Conceptual framework diagram

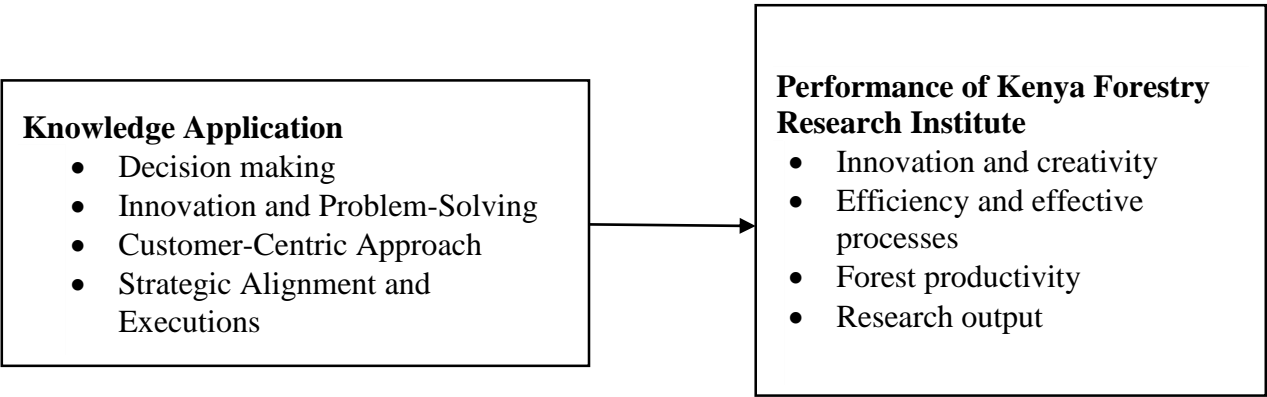


Figure 1 Conceptual framework

5. Methodology

This study adopted descriptive research design. Employing quantitative research methods to ensure a comprehensive understanding of the research topic. The quantitative component involved the distribution of electronic questionnaires to collect structured data on knowledge management strategies and organizational performance. These instruments were administered via email, providing a two-week window for completion. Follow-up reminders were employed to maximize response rates. This technique ensures the triangulation of facts from diverse resources, enhancing the validity and richness of the findings (Nanthagopan, 2021)

The study area for the study was at Kenya Forestry Research Institute (KEFRI), the headquarters located in Muguga, Kiambu County, Kenya. KEFRI is a state corporation mandated to conduct research in forestry and allied natural resources. The headquarters has various departments: Research, Administration, Human Resources, Accounts, ICT, Knowledge Management, Laboratories, and Supply Chain. The area was selected because it is the central hub for KEFRI’s organizational activities and knowledge management practices.

The target population were 178 staff from various departments. The sampling frame comprised a list of all employees working in various department at KEFRI headquarters: Research,

Administration Human resource, Accounts, ICT, Knowledge management, Laboratories and Supplies chain. For this study, a census sampling technique was employed to select the sample, given that KEFRI headquarters has only 178 employees. Since the population size is relatively small, a census allows for data collection from every researcher, ensuring comprehensive representation across various categories. A sample size of 178 employees was selected.

Data was collected using a semi structured questionnaire. The following procedures were used during data collection: An introduction letter requested from postgraduate school were used to secure approval of data collection at KEFRI. The researcher booked appointment with management heads to discuss the reasons for data collection. The researcher shared an online survey form (questionnaire) to appropriate personnel in the organization, allowing participants two weeks to complete and return.

SPSS was used to conduct analyses. Descriptive statistics, including means, frequencies, and standard deviations, provided an overview of the dataset's characteristics, offering a clear understanding of the data without drawing inferences or predictions (Breslin, 2020). Inferential statistics, specifically regression analysis, was applied to test hypotheses and assess the impact of knowledge management strategies on organizational performance, making it possible to generalize findings to the broader population (Carlucci & Wright, 2020).

6. Results

Knowledge Application

Knowledge application refers to the practical use of organizational knowledge in decision making, innovation, process improvement and customer responsiveness hence turning insights into measurable performance outcomes. In this study, it was construed as a key dimension of knowledge management, capability and assessed through activities that enhance efficiency and competitiveness. Prior studies affirm its significance, with Rezaei et al. (2021) and Mustafa et al. (2021) linking it productivity and balanced performance, while Kassa and Ning (2023) underscored its role in fostering efficiency, effectiveness and innovation. The observations that were made by the researcher on marketing capability have been summarized in Table 1.

Table 1 Knowledge Application Descriptive statistics Findings

Statement	Mean	Standard Deviation
Knowledge application drives innovative solutions to organizational challenges	4.46	0.59
Decision-making processes are informed by well-applied organizational knowledge	4.38	0.74
Knowledge is used effectively to align strategic goals with operational processes	4.30	0.71
Applied knowledge enhances customer satisfaction and service delivery	4.13	0.92
KEFRI uses knowledge collected to improve its internal processes	4.11	0.81
Composite Mean and Standard Deviation	4.276	0.754

The observation gathered on aspect of knowledge application as demonstrated in the tabulated statement form the basis of understanding its role in organizational performance and for generating the summary measures necessary for further analysis. From the results, it is evident that participants were largely in agreement that knowledge application is a key capability of KEFRI as demonstrated by composite mean of 4.28 with relatively standard deviation of 0.75 signifying consistency in responses. The highest mean response of 4.46 with a standard deviation of 0.59 was captured for the aspect that knowledge application drives innovative solutions for challenges organization face, depicting strong agreement with low variability in responses. Conversely, the aspect that KEFRI use knowledge collected to improve its internal process registered the lowest mean response of 4.11 with a standard deviation of 0.81, though still showing a favorable perception. Further, the study examined the frequency on how stored knowledge is applied and the findings are presented in figure 2.

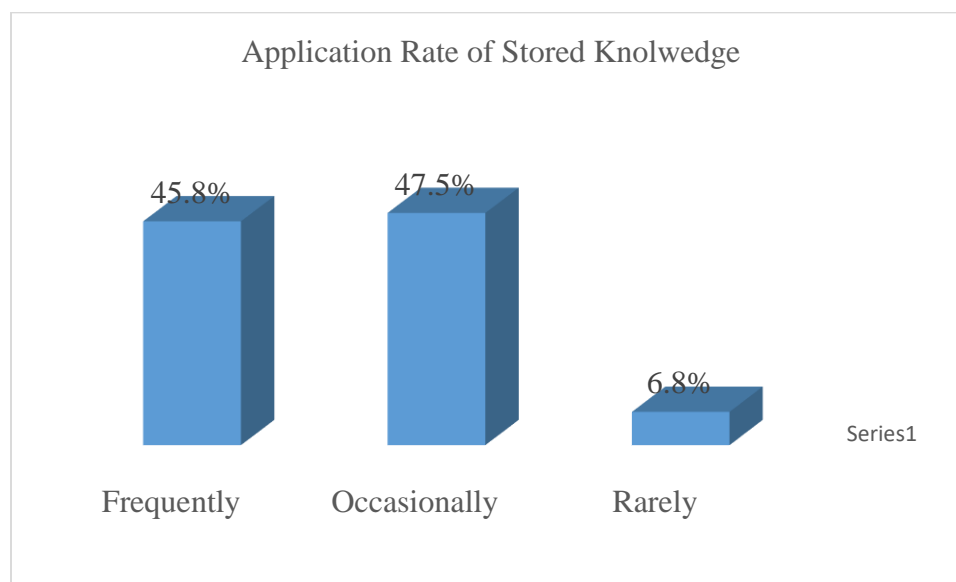


Figure 2 Application Rate of Stored Knowledge

The results show that 47.5% of respondents occasionally apply stored knowledge, 45.8% do so frequently, and only 6.8% rarely use it. This suggests that most staff at KEFRI actively utilize stored knowledge in their work, reflecting effective knowledge retention and application, though there remains room to enhance consistent and widespread use across departments. Generally, the response conform that knowledge application is well manifested in KEFRI, particularly in driving innovation supporting informed decision making, aligning strategy with operations and improving customer satisfaction thereby enhancing institutional performance. This aligns with Rezaei, Khalilzadeh, and Soleimani (2021), who noted that systematic application of knowledge transforms insights into tangible actions that improve productivity, innovation, and competitiveness. Similarly, Mustafa et al. (2021) found that effective knowledge use enhances all dimensions of the balanced scorecard by optimizing financial outcomes, improving processes, and increasing customer satisfaction through innovation. Moreover, Kassa and Ning (2023) emphasized that knowledge application in public institutions improves efficiency, innovation, and citizen satisfaction. Therefore, effective knowledge application enables KEFRI to achieve operational excellence, sustain competitiveness, and remain adaptive in a dynamic environment.

Organizational Performance

The study deployed mean and standard deviations to assess the distribution of data set regarding organizational performance of KEFRI as presented in Table 2.

Table 2 Organizational Performance at KEFRI

Statement	Mean	Standard Deviation
Knowledge management practices has improved the quality of research output at KEFRI.	4.50	1.05
Effective knowledge management enhances operational efficiency and reduces costs.	4.54	0.92
Knowledge sharing and application contribute to forest yields	4.26	1.14
KEFRI's competitive advantage is strengthened through robust knowledge management strategies.	4.36	1.10
KEFRI has improved its efficiency levels in the work processes	4.13	1.21
Improved silvicultural practices	3.21	1.42
Research output in the organization	4.21	1.26

The observations obtained on the measured aspect organizational performance of KEFRI as indicated in the tabulated statements form a strong foundation of conducting further statistical analysis. The findings indicate that respondents generally agreed that knowledge management practices positively influence organizational performance with high mean scores across all the aspects. The highest mean of 4.54 with relatively low standard deviation of 0.92 was recorded for the aspect that effective knowledge management enhances operational efficiency and reduces costs reflecting consensus among participants. Similarly, knowledge management practices improving research output (M=4.50, SD=1.05) and strengthening competitiveness advantage (M=4.36, SD=1.10), were highly rated. However, the lowest mean of 3.21 with highest variability (SD=1.42) was noted for performance of silvicultural practices. Overall, the findings demonstrate that robust knowledge management practices contribute significantly to efficiency, research quality, competitiveness, and employee engagement at KEFRI.

This evident as respondents noted that;

“The findings reveal that effective knowledge application at KEFRI is largely supported by four key enablers: availability of well-structured research data, easy access to past research findings, collaboration with other researchers, and the use of digital knowledge management tools. Together, these factors enhance efficiency, promote innovation, and facilitate informed decision-making”.

The respondent suggested array of measures that should be undertaken to ensure that quality of knowledge management strategies enhance performance.

The respondents' suggestions include;

“To strengthen knowledge management at KEFRI, the organization should enhance collaboration and networking with other leading institutions, digitize and archive historical records, and integrate AI-powered tools such as chatbots for real-time access. Continuous staff training, motivation, and leadership involvement are key to fostering a strong knowledge-sharing culture. Establishing centralized, user-friendly digital repositories, implementing effective metadata systems, and recognizing contributors can further improve accessibility and utilization of knowledge resources. Regular system upgrades, awareness creation, and integration of knowledge management into daily operations will sustain continuous learning and innovation across departments.”

Further the study examined the impact of knowledge application on creativity and innovation, customer satisfaction, operational efficiency and strategic alignment. The study commenced by enquiring about creativity and innovation and the findings are presented in figure 3.

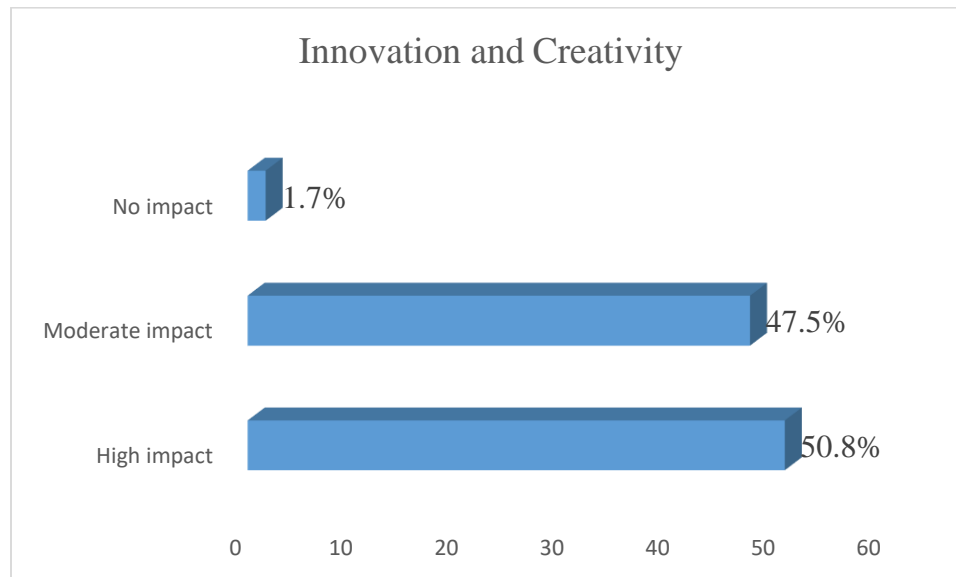


Figure 3 Innovation and Creativity

Findings reveal that 50.8% of respondents believe knowledge application has a high impact on creativity and innovation, while 47.5% rate the impact as moderate, and only 1.7% see no impact. This indicates that applying knowledge at KEFRI strongly enhances creativity and innovation, fostering a culture of continuous improvement and problem-solving among researchers and staff. In addition the study also enquired on impact of knowledge application on customer satisfaction and the findings are presented in figure 4.

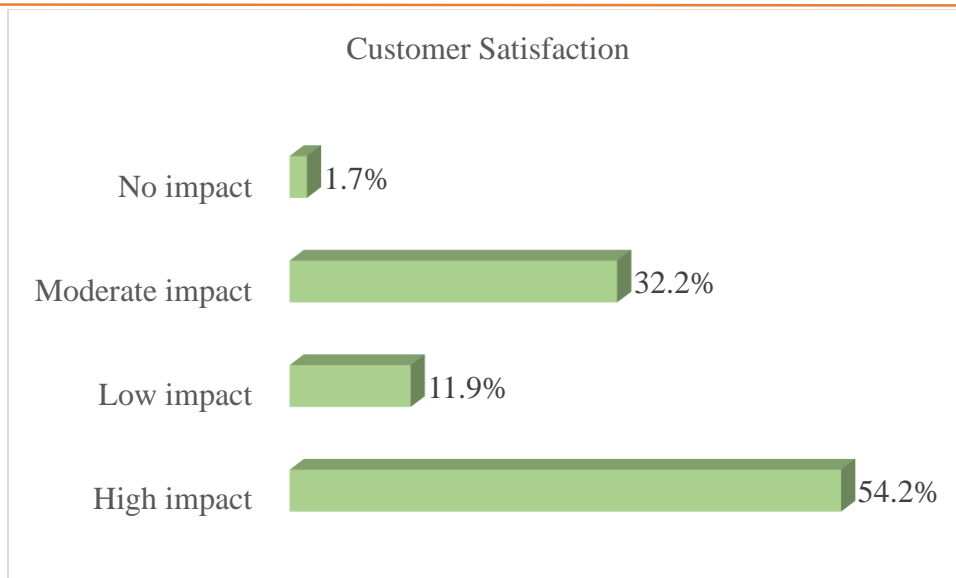


Figure 4 Customer Satisfaction

The findings indicate that 54.2% of respondents believe knowledge application has a high impact on customer satisfaction, 32.2% view it as having a moderate impact, 11.9% perceive a low impact, and only 1.7% report no impact. This suggests that effective application of knowledge at KEFRI enhances service quality, responsiveness, and overall stakeholder satisfaction. The study examined the impact of knowledge application on operational efficiency and the findings are presented in figure 5.

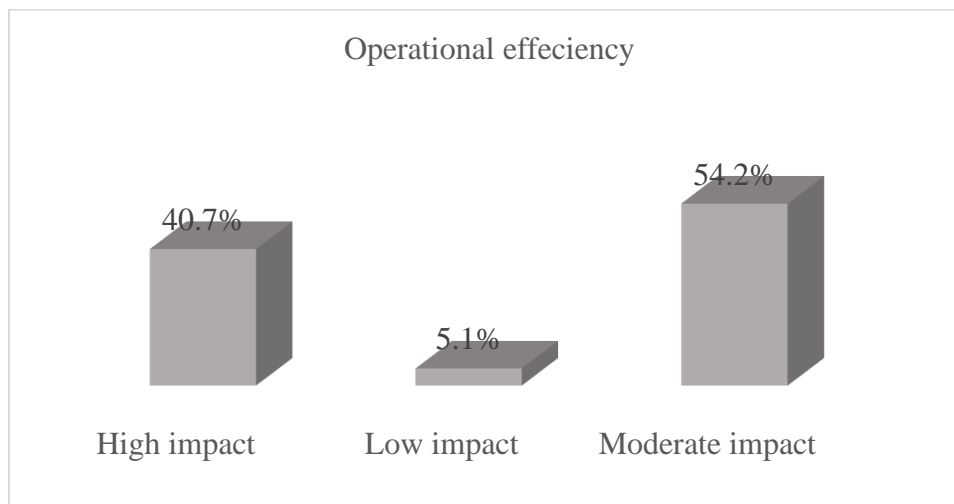


Figure 5 Operational efficiency

The results show that 40.7% of respondents believe knowledge application has a high impact on operational efficiency, 54.2% perceive a moderate impact, while 5.1% indicate a low impact. This implies that applying knowledge at KEFRI enhances workflow coordination, decision-making, and resource utilization, leading to improved operational processes and overall institutional effectiveness.

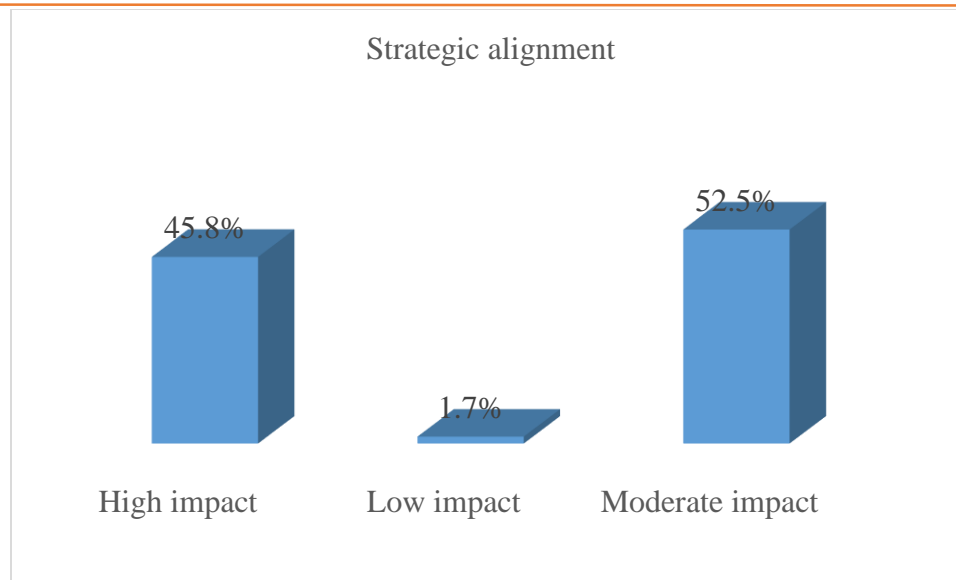


Figure 6 Strategic alignment

The findings reveal that 45.8% of respondents believe knowledge application has a high impact on strategic alignment, 52.5% view it as having a moderate impact, and only 1.7% perceive a low impact. This indicates that effective knowledge application at KEFRI supports alignment of activities with institutional goals, enhances coordination, and strengthens strategic decision-making.

Relationship between Knowledge Application and Organizational Performance

The observations made on the dimension of knowledge application strategies and organizational performance were analyzed through simple linear regression to examine how knowledge application affected organizational performance. The summary of the output is tabulated and discussed accordingly.

Table 3 Output of Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.754a	0.568	0.552	0.69822

a Predictors: (Constant), Knowledge application

The output determined from the regression analysis for the model summary reveal that the correlation R for the model is 0.754, indicating a strong positive linear relationship between the knowledge application and organizational performance. Further assessment of the model shows that after adjusting for number of predictor variables, the adjusted R square value is 0.552 implying that knowledge application jointly explain 55.2 percent of the variation in the organizational performance. The corresponding R square value of 0.568 further supports the conclusion that the model exhibits a good fit. Additional statistics that provide crucial information regarding the overall significance of the model are presented and discussed as follows.

Table 4 Output of Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.018	4	17.004	34.88	.000b
	Residual	51.676	106	0.488		
	Total	119.694	110			

a Dependent Variable: Performance
b Predictors: (Constant), Knowledge application

The manifested from the F-test indicates that the estimated equation has an F statistics of 34.880 and a p-value of 0.000, which is far below the 0.05 threshold. These results confirm that the model derived from the regressed data is statistically significant and provides a good fit for predicting organizational performance based on knowledge application. The regression sum of square (68.018) compared to residual sum of square (51.676) further demonstrates that a substantial portion of variation in performance is explained by the model. Thus, the overall model is appropriate and reliable for estimating firm performance using the identified knowledge management dimensions.

Table 5 Coefficient Regression Analysis

Model		Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
		B		Beta		
1	(Constant)	-1.371	0.532		-2.576	0.011
	Knowledge application	0.447	0.144	0.256	3.098	0.002

a Dependent Variable: Performance

It can be clearly be observed from the regression statistics that when knowledge application is held constant at zero, the level of organization performance would stand at -1.371, representing the y-intercept of the model. The negative constant that in the absence of knowledge management practices performance tend to decline. The remaining of the knowledge management constructs are useful for further statistical analysis.

The survey sought to verify whether knowledge application has an effect on organizational performance. The regression revealed that the beta coefficient for knowledge application is 0.447 with a p value of 0.000, which is below the 0.05 significant level. This indicates that when other dimension of knowledge management, knowledge application exhibits the strongest influence on performance. It can therefore be inferred that the performance of organization is significantly and positively affected by the extent to which knowledge is effectively applied within operational processes.

The respondent further affirmed by acknowledging that knowledge application is essential in enhancing desirable performance;

“Knowledge application at KEFRI enhances organizational performance by improving decision-making, efficiency, and innovation. It enables faster problem-solving, reduces errors, and strengthens stakeholder confidence through transparency and improved project outcomes. Applying existing knowledge prevents duplication of effort, fosters skill enhancement, and supports capacity building, leading to sustainable growth, competitive advantage, and better service delivery.”

The regression findings revealed a significant positive relationship between knowledge application and organizational performance, confirming that the systematic use of knowledge enhances productivity, innovation, and competitiveness. Rezaei, Khalilzadeh, and Soleimani (2021) emphasize that applying knowledge transforms insights into actionable strategies that improve decision-making, operational efficiency, and innovation. When organizations effectively apply knowledge, they make data-driven and timely decisions, anticipate market trends, and optimize resource allocation. Moreover, applied knowledge fosters a problem-solving culture where employees leverage expertise to create innovative solutions, streamline workflows, and reduce redundancies. In dynamic environments, such application enables firms to respond swiftly to emerging trends and customer needs. Hence, knowledge application strengthens organizational agility, improves business outcomes, and drives sustainable competitive advantage through effective utilization of intellectual assets.

Empirical evidence by Mustafa et al. (2021) demonstrates that knowledge application contributes significantly to multiple perspectives of the Balanced Scorecard, including financial, customer, internal process, and learning dimensions. Effective application of knowledge improves financial outcomes through cost optimization, enhances innovation within internal operations, and strengthens customer satisfaction through responsiveness and tailored services. Likewise, Kassa and Ning (2023), in their systematic review of the public sector, found that knowledge application enhances organizational efficiency, innovation, and citizen satisfaction by facilitating evidence-based decision-making and collaborative improvement. These findings align with the Resource-Based Theory, which views knowledge as a strategic asset that yields sustained competitive advantage when effectively deployed. Therefore, applying organizational knowledge transforms intellectual resources into measurable performance gains across all operational domains.

7. Conclusion and Recommendations

The study concluded that knowledge application plays a pivotal role in enhancing organizational performance at KEFRI. It is strongly reflected in innovation, informed decision-making, strategic alignment, and customer satisfaction, all of which drive institutional success. Both correlation and regression analyses confirmed a strong positive relationship, with knowledge application emerging as the most influential factor in improving performance and ensuring organizational effectiveness.

The study recommends strengthening of KEFRI internal processes that are tasked with knowledge application. These internal processes are supposed to embrace technology so that innovative initiatives are leveraged on in knowledge application. The internal processes are supposed to store and generate knowledge without duplication. The KEFRI management should invest in structured systems that facilitate the conversion of research knowledge into actionable practices, such as knowledge management platforms, regular knowledge-sharing workshops, and mentorship

programs. Strengthening a culture that values continuous learning and collaboration can bridge the gap between research outputs and practical implementation, improving service delivery, decision-making, and research outcomes.

At the policy level, the findings suggest that institutional and governmental policies should support the integration of knowledge management frameworks within public research organizations. Policies that promote open access to research findings, interdepartmental collaboration, and partnerships with universities, industry, and local communities can amplify the impact of knowledge application. Furthermore, national policies on forestry and environmental management could benefit from embedding knowledge utilization requirements, ensuring that research institutions like KEFRI contribute directly to evidence-based policy formulation and sustainable resource management.

Future research should explore the specific mechanisms and contextual factors that enhance or hinder knowledge application within public research institutions. Comparative studies between KEFRI and other research organizations in Kenya or the region could reveal best practices and scalable models for knowledge-driven performance improvement.

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