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STREET LEVEL BUREAUCRACY: RESOURCE AVAILABILITY AMONG ENVIRONMENTAL OFFICERS AND ITS EFFECTS ON IMPLEMENTATION OF WATER QUALITY REGULATION POLICY IN KISUMU COUNTY, KENYA

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ABSTRACT

The study addressed a persistent challenge in water policy implementation, focusing on Kenya's water sector where policy formulation was not the challenge; instead, it was the implementation as still grappled with loss, depletion, and degradation of water resources. The research investigated how key policy actors, particularly street-level bureaucrats, influenced water policy regulations in Kisumu County's Kibos River, considering the impact of resource availability on the implementation. Employing Thomas's theorem, Principal-Agent theory, and Street-Level Bureaucratic theory, a descriptive research design was used with 154 participants, including county environmental officials, NEMA county officers, community leaders, and NGOs. Compliance with ethical guidelines was ensured. Results revealed strong agreement (66.7%) on officers' knowledge sufficiency but varying responses (50.5%) on database accessibility, aligning with previous studies. Diverse opinions were noted on funding availability (41.4%), integration of water resource development (30.0%), and SLBs' skills in water management (44.0%). Correlation analysis ($r = 0.248$, $p < 0.01$) indicated a moderate positive link between water policy implementation and resource availability. In conclusion, the study emphasized resource availability's pivotal role in implementing water quality regulation policies in Kisumu County, Kenya. While environmental officers possessed expertise, disparities existed in database accessibility and stakeholder funding. Diverse perspectives on Kibos River's management and technology effectiveness highlighted the need for strategic approaches and collaboration for effective water policy implementation. Furthermore, the influence of street-level bureaucrats on policy implementation underscored the necessity for clear policies and equitable material access. Addressing these aspects is critical for efficient water resource management in Kenya.

***Keywords**: Water Quality Regulation, Policy Implementation, Resource Availability,* Environmental Officers, *Principal-Agent Theory, Street-Level Bureaucratic Theory, Policy Formulation, Water Resource Management.*

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INTRODUCTION

This study elucidated the impact of bureaucratic practices on the effective implementation of the Water Quality Regulation Policy (WQRP). Extensive research has been conducted to delve into the experiences of environmental officers and frontline officers from the National Environment Management Authority (NEMA) concerning this vital policy. This exploration encompasses resource availability within NEMA and other environmental agencies. The review underscores the pivotal role these officers play in executing the water quality regulations outlined in the WQRP.

The escalating global population, surpassing 7 billion according to the World Health Organization, underscores the pressing issue of dwindling Earth resources, notably water. Water, a critical resource for survival, is becoming increasingly scarce, jeopardizing economic growth, social progress, and various industries worldwide, particularly affecting Africa's rural population (Beekman & Peterson, 2017).

Access to safe water and sanitation is acknowledged as a fundamental human right by the United Nations, a necessity in both domestic and commercial regions. Unfortunately, escalating demands and conflicts over water resources, as seen in the Nile River dispute, demonstrate the critical challenges we face globally (Palakovic, 2021).

Water scarcity intertwines with sanitation, impacting global health, education, and economic productivity. Shockingly, hundreds of millions lack access to safe drinking water, leading to widespread disease and mortality. Climate change, population growth, and urbanization intensify these challenges, projecting dire water shortages for nearly half of the global population by 2025 (WHO, 2019).

In Kenya, insufficient access to clean water and basic sanitation in healthcare facilities highlights a pressing issue. The nation grapples with chronic water scarcity, falling below UN-recommended standards. Addressing this crisis is integral to achieving Kenya's developmental goals and international agreements within the sector (Parliament of Kenya, 2021).

To address these issues, Kenya has developed policies and frameworks, with notable advancements in water access yet gaps persist. There is, therefore, a need to strengthen policy implementation to ensure universal access to clean water. Overcoming challenges linked to consumption patterns, population growth, and climate change necessitates a robust policy framework. Aligning with global initiatives like SDG6 is crucial to ensuring equitable water access and management (Parliament of Kenya, 2021).

This study centers on the Kibos River in Kisumu County, examining the Environmental Management and Co-Ordination (Water Quality) Regulations, 2006. The aim is to prevent detrimental waste release into the environment, protect water sources from pollution, and promoting sustainable water management (NEMA, 2021).

Statement of the Problem

Insufficient knowledge exists regarding the pivotal role played by street-level bureaucrats (SLBs) in the enforcement and execution of environmental management policies. While several studies have delved into the actions and conduct of SLBs and their influence on policy, most of these inquiries maintain a broad perspective, lacking specific focus on various environmental legislations. This study narrows its lens to shed light on the impact of SLBs in executing water policies within Kisumu County, Kenya.

Kenya has formulated significant legislative reforms within its water sector, aiming to bolster efficiency and effectiveness in the management and utilization of water resources. Despite these proactive measures, water quality remains compromised due to loss, depletion, and degradation, highlighting the need for a closer examination of the strategies employed for implementation and the policy actors shaping these strategies. This discrepancy often materializes as a gap between policy aspirations and actual outcomes, a consequence of interpretive and enforcement divergence from the original policy intent.

Policy implementation frequently falls short of achieving the desired objectives, despite policymakers' earnest endeavors to steer the process from the top-down. Challenges in policy implementation encompass inadequate formulation, erroneous interpretation, and insufficient execution (Peters, 2018; Siddha, 2021). While a growing body of literature discusses the role of public agencies in shaping and executing water quality policies, scant attention has been directed towards comprehending the actions of SLBs on environmental management. A comprehensive grasp of policy implementation necessitates a meticulous examination of the primary policy actors, often referred to as "street-level bureaucrats" by Michael Lipsky, due to their profound influence on policy execution.

Objectives of the Study

The main objective was to establish the effect of resource availability by SLBs on the implementation of water quality regulations policy in Kibos County Kenya. Specifically, the study assessed the resources allocated to Street Level Bureaucrats, including funding, staffing, capacity building and technology, with a focus on their sufficiency and appropriateness for effectively implementation of water quality regulations. Additionally, it uncovered challenges and limitations faced by Street Level Bureaucrats regarding resource availability through interviews and questionnaires. The goal was to formulate targeted recommendations to optimize resource allocation and thereby enhance the efficacy and efficiency of Street Level Bureaucrats in enforcing water quality regulations.

LITERATURE REVIEW

Water Quality Regulations Policy

The Water Quality Regulation Policy (WQRP) extends its jurisdiction over various water usages, including domestic, industrial, fisheries, wildlife, and recreational purposes. Its overarching goal is to thwart the discharge of effluents into the environment in violation of established standards. Water sector breaches encompass the diversion of water bodies, water pollution, and unlawful development of riparian areas (Kamweti, Osiro & Mwiturubani, 2009). Water contamination is chiefly driven by industrial and agricultural effluents as well as soil erosion, leading to sanitation issues affecting nearly 30% of the population residing in 142 urban areas (Kamweti, Osiro & Mwiturubani, 2009). Kenya's 2010 Constitution acknowledges the right to sanitation under Article 43(1)(c) and mandates affirmative action to provide water for marginalized groups. The Constitution delegates the responsibility of regulating international waterways and resources to the national government while assigning water and sanitation duties to the 47 counties (Constitution of Kenya, 2010).

However, the effectiveness of water policies is contingent on their implementation. Policies often falter due to inadequate execution, misinterpretation, and a disconnect between policy objectives and actions (Peters, 2018). Mueller argues that policy failures also result from insufficient monitoring and control by policymakers, who struggle to regulate how policies are understood and enacted by diverse stakeholders (Mueller, 2019). Intermediaries, acting as bridges between policymakers and service providers, assume a pivotal role in policy implementation. These intermediaries, often comprising bureaucratic personnel with expertise and knowledge, warrant closer scrutiny to enhance implementation practices (Mueller, 2019).

While government bureaucracies and career civil servants are globally recognized as essential for policy execution (Ikechukwu, 2013), the role of environmental bureaucrats in policy implementation remains underexplored, despite their substantial influence. It is also important to consider the resulting contribution of collaboration between environmental non-governmental organizations (NGOs) and local bureaucrats for achieving environmental safety and sustainability goals (Sevä, 2015). Therefore, this study endeavors to deepen our understanding of how street-level bureaucracy, particularly among environmental officers, shapes the implementation of water regulation policy in Kisumu County.

Resource Availability among Street-Level Bureaucrats

Environmental officers serve as vital conduits between the government and the public, tasked with managing environmental concerns and allocating resources efficiently. However, Michael Lipsky's research on street-level bureaucracy (2010) reveals that these officers often grapple with chronic resource shortages due to the overwhelming demand for their services. Consequently, the resources allocated to them are frequently insufficient to fulfill their responsibilities adequately. Resource inadequacies manifest in various forms, such as a lack of staff or qualified personnel to handle a burgeoning caseload of clients. Cumbersome administrative tasks, including excessive paperwork, consume valuable time that could otherwise be dedicated to addressing clients' needs. Furthermore, inadequate training and experience leave employees ill-prepared to cope with the demanding and stressful nature of their work (Ermin Erasmus - Alliance for Health Policy and Systems Research, n.d.). Enforcing environmental laws remains a significant challenge, especially in underdeveloped nations, due to factors such as institutional capacity limitations, inadequately trained enforcement officials, and limited access to information and national guidance materials (UNEP, 2017).

To cope with these resource limitations, strategies like resource rationing and standardized approaches may be enforced, even when adaptability is necessary (Michael Lipsky, 2010). Such strategies encompass actions like limiting information, creating lengthy consumer queues, introducing inconvenience in access, and imposing complex application processes. An excessive focus on success metrics, cost-effectiveness, and quantitative improvements may prompt hasty decision-making by workers, leading to abrupt policy changes that impact people's lives and opportunities. Environmental officers may also find themselves lacking essential resources under these circumstances (Michael Lipsky, 2010). Logistical constraints may further hinder the work of environmental officers, potentially resulting in the failure to conduct scheduled inspections. Such lapses can lead to unmonitored effluent discharges into rivers, compromising water quality. Instances of illegal discharges into rivers and lakes persist in various parts of the country, exemplified by the recent closure of the Kibos Sugar Factory due to sludge dumping into the river Kibos, causing environmental pollution (NEMA, 2021).

To address these challenges effectively, the establishment of a feedback mechanism allowing street-level bureaucrats to contribute to policy implementation from the ground up is imperative. This approach empowers them to provide input, report findings, and advocate for adequate resourcing and policy effectiveness evaluations.

Theoretical Framework

This study employed Michael Lipsky's Street Level Theory to analyze the behavior, actions, and decision-making processes of street-level bureaucrats (SLBs), particularly environmental bureaucrats, in the enforcement of water regulation policies. Lipsky's theory offered a bottom-up perspective, emphasizing the pivotal role of SLBs in the implementation of water regulation policies, which often contrasted with the top-down intentions of policy designers. It underscored SLBs' discretionary authority and their capacity to navigate the opacities present in water regulation policies (Lipsky, 2010). In public policy implementation, there are generally three approaches: top-down, bottom-up, and hybrid models. This study specifically focused on the bottom-up approach, as advocated by proponents who argued that local environmental bureaucrats' discretion is essential to accommodate local conditions and enhance the effectiveness of water regulation policies (Tummers, 2018).

Thomas Theorem

The Thomas theorem, focusing on individuals' interpretations shaping their actions, is pertinent to understanding how street-level bureaucrats (SLBs) respond in the context of resource availability. When resources are scarce or abundant, SLBs' perceptions of the situation can influence their actions in policy implementation (Thomas and Thomas, 1928).

In line with Michael Lipsky's perspective, resource availability further interacts with SLBs' interpretations and actions. Adequate or limited resources can impact their ability to effectively implement policies, especially in

crucial sectors like water management. This underscores the importance of resource allocation and support for SLBs to achieve policy goals (Lipsky, 2021).

Specifically, in water policy, resource availability affects the discretion and decisions of Environmental Officers (EOs). If resources are constrained, EOs may prioritize certain tasks or struggle to execute policy mandates effectively. Conversely, sufficient resources can empower EOs to carry out their roles diligently, promoting better adherence to policy objectives in the water sector (Thomas and Thomas, 1928; Lipsky, 2021). It's essential to strike a balance between resource availability and effective policy implementation, ensuring that SLBs have the necessary support to carry out their duties effectively.

Principal-Agent Theory (PAT)

In an agency relationship, where one party acts on behalf of another, the principal-Agent Theory (PAT) involves principals hiring agents to carry out tasks, often with decision-making authority (Shapiro, 2005; Sidha, 2017). PAT is based on three key *assumptions*: both principals and agents aim to maximize their *benefits*; bureaucrats possess more information than policymakers; and bureaucrats may deviate from superiors' preferences, exercising autonomy (Waterman, Rouse & Wright, 2006).

Studies have revealed how agents, including street-level bureaucrats, sometimes prioritize personal interests over those of their principals or clients, leading to disagreements (Lewis, 2019). Street-level bureaucrats, such as environmental officers, act as agents, while policy designers or the government serve as principals (Peterson & Hartz, 1998). Conflicts often arise due to divergent policy goals and bureaucrats' superior information. This places street-level bureaucrats in a challenging position between government-represented policy and the citizens they serve.

PAT underscores the bottom-up nature of street-level bureaucracy, emphasizing the discretionary power of street-level bureaucrats to interpret and adapt laws in complex local contexts (Funder & Marani, 2015). The resulting ambiguity in policy implementation places environmental officers in a difficult position as they strive to execute high-level policies and laws with limited resources within intricate local realities often overlooked during policy design.

Street-Level Bureaucracy Theory (SLBT)

Michael Lipsky's "Street Level Bureaucracy" (1980) emphasizes the critical role of frontline workers, known as street-level bureaucrats (SLBs), in the implementation of public policy. Situated at the street level, SLBs act as intermediaries between society and the state, exercising some discretion in resource allocation and decision-making (Lipsky, 2010). They play a fundamental role in translating policy into actionable steps, influencing policy outcomes (Brodkin, 2021).

Lipsky acknowledges a significant challenge faced by SLBs—structural constraints often limit their discretion and adaptability. Consequently, SLBs may resort to strategies like standardized procedures and work within resource limitations, potentially impacting policy outcomes and fairness (Lipsky, 2010).

In the context of water quality regulations (WQR), environmental bureaucrats at NEMA offices ensure compliance to make freshwater safe for human consumption (NEMA, 2021). Environmental Officers (EOs), akin to Environmental Street Level Bureaucrats (ESLBs), significantly impact resource allocation and policy outcomes by enforcing regulations and addressing environmental challenges (Seva, 2015).

Though SLBs may face resource constraints, they remain pivotal actors in policy implementation, navigating challenges while striving to fulfill policy objectives (Brodkin, 2021). Understanding the interplay between SLBT, resource availability, and policy ambiguity is crucial for effective policy execution and equitable allocation of resources. Policymakers' role in providing adequate resources and aligning policies with ground realities further complements this dynamic landscape (Tummers & Bekkers, 2014).

METHODOLOGY

Research Design: The study centered on a sociological phenomenon, utilized a descriptive research design to examine the impact of front-line Environmental bureaucrats' practices on environmental policy implementation.

Site of the Study: The study was conducted in Kisumu County targeting the environmental and other related officers in Kisumu County and concerning water policy regulations and policy enforcement in river Kibos and its environs.

Target Population: The target population of this study was 154 participants comprising County Environmental officials (County assembly committees, Staff of environment county sector), NEMA County officers, Community leaders (Chiefs, leaders of water committees etc.) and non-governmental organizations.

Table 2: Target population

Target Population	Number of people
County Environmental officials (County assembly committees, Staff of environment county sector)	68
NEMA County officers	32
Community leaders (Chiefs, leaders of water committees etc.)	65
Non-Governmental organization	84
TOTAL	**249**

Sampling Techniques: The study used simple random and stratified sampling methods for participant selection, ensuring an unbiased conclusion and a true representation of the population. These methods were chosen for efficiency and accuracy, considering time and budget limitations.

Sampe Size: A sample is a subgroup of the target population selected to represent the entire population in a study (Brink, 2000). Kothari (2008) views sample size determination as an exercise of great importance in planning study activities. The sample size should be ideal to fulfil the study conditions, efficient, representative, reliable and flexible. Slovin's formula (1960) was used to obtain the desired sample size for the target population, which was 154.

Research Instruments: Key informant Interviews and participant observation techniques were the primary approaches for data collection; semi-structured questionnaire techniques were also used for more accurate screening and to capture all moments, including emotions and behaviors. It is also useful for selecting the appropriate participants for the study.

Reliability*:* For trustworthy and accurate data, a thorough multi-method data collection approach, specifically the "case cluster method" (McClintock, Brannon, and Maynard, 1985; Colorado State University, 2021), was employed. The researcher meticulously organized interview questions to be concise, clear, and logically structured, aiming to prevent any misrepresentation of information. Additionally, prior research on the subject area was conducted to ensure smooth and well-informed interviews, minimizing confusion, and promoting reliable data collection.

Validity: Validity was guaranteed by well-defined variables and interviewees were not pressured in any way to select specific choices among the answer set. the study also ensured validity by ensuring accuracy and quality control in data collection, sampling, and analysis.

Data Collection Procedure: The study used a variety of data collection methods, including semi-structured interviews, focus groups and participant observation to gain a full understanding of the theory under study. Discussions were also held with a variety of specialists and the public about the implementation of the water

quality regulations policy. To further corroborate the information, documents, and records on NEMA and water policies previous actions to enforce the policy were investigated. (Colorado State University, 2021).

Data Analysis: Data analysis is essential for conducting genuine research (Delahunt, 2017). Since methodology was based on qualitative research, the gathered primary data from the interviews, participant observations, focus groups and document review was carefully analyzed utilizing a qualitative data analysis approach since the study dealt with non-numerical data.

Deductive thematic data analysis was employed, influenced by the researcher's theoretical perspective and research focus, to review and describe common themes within the dataset. This method enables a detailed examination of specific data aspects and facilitates the extraction and summarization of information from raw data efficiently (Majumdar, 2018; Braun, 2012).

Linear Regression

n Linear formula is $\mathbf{Y = a + b_1X_1 + e}$

Where?

Y = Implementation of Water Regulations Policy

a = intercept

$\mathbf{b_1}$, $\mathbf{b_2}$, **and** $\mathbf{b_3}$, = Beta Coefficients

$\mathbf{X_1}$ = Resource Allocation by SLBs

e = Error term.

Data Presentation: Descriptive statistics which included frequency distribution were used to describe the analyzed data set; the results were then presented in descriptive tabular presentation and chart diagrams. (Braun, 2012).

FINDINGS

Response Rate

The study involved 154 environmental conservation and water committee officers as its sample size. Out of the 154 distributed questionnaires, 111 responses were received, resulting in a response rate of 72%. Kothari (2004) suggests that a response rate of 50% or higher is considered sufficient for analysis. Hence, the obtained responses, surpassing this threshold, are deemed acceptable and reliable for drawing conclusions.

Reliability of the Study

The study conducted a pilot study to assess the reliability of the study tool. It was noted that the reliability results obtained through Cronbach's alpha suggested that the tool was reliable in capturing the desired results. This was as shown in table 3 below.

Table 3: Reliability analysis

Items	Cronbach's Alpha
Resource availability	0.942
Implementation of Water policy	0.794
The questionnaire	0.923

Social Demographic information

Gender demographics provide information about the distribution of individuals based on their gender identity. Understanding gender demographics is important for addressing gender disparities, promoting gender equality, and designing policies and programs that consider the specific needs and experiences of different genders.

Table 4: Gender of the Participants

Gender	n	%
Male	63	56.8
Female	48	43.2
Total	111	100.0

The table above presented the gender distribution among participants of this study. Among the sample, 63 individuals (56.8%) identified as male, while 48 individuals (43.2%) identified as female. This gender disparity within the sample may reflect an underlying trend or characteristic within the population from which the sample was drawn.

Resource Availability Analysis

In Table 5, the authors presented an analysis of respondent perspectives on resource availability concerning the implementation of water quality regulation policy by environmental officers. Participants were surveyed to gauge their agreement or disagreement with specific statements related to resource availability. The study, centered in Kisumu County, Kenya, zeroes in on the role of street-level bureaucracy (SLB) within the environmental officer domain. Responses were categorized into five levels: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree, shedding light on the perceived resource availability impact on policy implementation.

Table 5: Resource availability

	Strongly Agree		**Agree**		**Neutral**		**Disagree**		**Strongly Disagree**		**Total**	
Resource Availability	n	%	n	%	n	%	n	%	n	%	n	%
Officers involved in water management and conservation have enough knowledge regarding policies.	26	23.4	74	66.7	6	5.4	3	2.7	2	1.8	111	100.0
Data bases of water resources including actions invoked in managing Kibos river are accessible to all stakeholders involved in water management	6	5.4	34	30.6	56	50.5	10	9.0	5	4.5	111	100.0
There is enough funding from relevant stakeholders to enforce the water protection policy	8	7.2	21	18.9	46	41.4	31	27.9	5	4.5	111	100.0
There is Integrated water resources development and management framework for Kibos river	7	6.4	23	20.9	33	30.0	24	21.8	23	20.9	110	100.0
We have effective technology	11	10.1	41	37.6	24	22.0	22	20.2	11	10.1	109	100.0
I/SLBs possess the necessary skills for the job	6	5.5	48	44.0	42	38.5	9	8.3	4	3.7	109	100.0
I/SLBs have amassed significant experience for the job	5	4.6	45	41.3	40	36.7	18	16.5	1	.9	109	100.0

Environmental Officers' Knowledge:

A notable majority of respondents (66.7%) concurred that environmental officers possessed adequate knowledge, with 23.4% strongly supporting this notion. Conversely, only a minor percentage (2.7%) disagreed, while an even smaller fraction (1.8%) strongly disagreed. A small group (5.4%) adopted a neutral stance on this matter. This finding aligns with research emphasizing the significance of knowledge and expertise among environmental officers involved in water management (Brinkerhoff and Goldsmith, 2002; Kenney et al., 2009).

Accessibility of Water Resource Databases:

Responses on the accessibility of water resource databases displayed greater diversity. The largest share of respondents (50.5%) expressed neutrality on this issue, followed by agreement from 30.6%—the second-largest segment. Additionally, 9.0% disagreed, and 5.4% strongly agreed. This observation resonates with research highlighting challenges related to data accessibility and availability in the water management domain (Van Beers et al., 2018; Delgado et al., 2021).

Funding for Water Protection Policy Enforcement:

The presence of varying opinions surfaced concerning the availability of adequate funding from relevant stakeholders for enforcing water protection policy. A notable proportion (41.4%) remained neutral, while 27.9% disagreed. In contrast, 18.9% agreed, and 7.2% strongly agreed, with 4.5% strongly disagreeing. This reflects the diverse perspectives surrounding funding in water protection policy enforcement.

Integration of Water Resource Development:

Perceptions regarding the integration of the water resource development and management framework for Kibos River spanned multiple viewpoints. A significant share (30.0%) adopted a neutral stance, followed by agreement (20.9%) and disagreement (21.8%). A smaller portion (20.9%) strongly disagreed, with 6.4% strongly agreeing. These findings underscore the mixed perceptions commonly observed in research on stakeholder views and conflicts in water resource management (Reed, Graves, Dandy, Posthumus, Hubacek, Morris et al., 2009; Sadoff, Grey, & Connors, 2008).

Effectiveness of Water Management Technology:

Regarding the effectiveness of technology in water management, most participants (37.6%) agreed, while 22.0% maintained neutrality, and 20.2% disagreed. A comparable portion (10.1%) strongly agreed, with a similar proportion (10.1%) strongly disagreeing. These findings reflect the mixed views often reported in studies on technology's role in water management. Concerns about cost, maintenance, and its impact on traditional practices are common (Zwart et al., 2018).

Skills and Experience of Street-Level Bureaucrats (SLBs):

A substantial percentage (44.0%) believed that SLBs possessed the necessary skills, with a significant portion (38.5%) adopting a neutral stance. Smaller fractions indicated disagreement (8.3%), strong agreement (5.5%), and strong disagreement (3.7%). This mirrors findings from previous research that highlighted diverse stakeholder perspectives on SLBs' abilities in addressing complex water management challenges effectively (Smith et al., 2019).

Experience of Street-Level Bureaucrats (SLBs):

Approximately 41.3% of participants agreed that SLBs had accumulated significant job experience. However, a substantial proportion (36.7%) remained neutral, indicating variations. This group was followed by those who disagreed (16.5%) and those who strongly agreed (4.6%). This finding aligns with studies reporting mixed perceptions regarding SLBs' experience and tenure in water management agencies (Johnson and Brown, 2017).

Correlation Between Water Policy Implementation and Resource Availability

Table 6: Correlation between the water policy implementation and resource availability

Correlations

		Water policy implementation	Resource availability
Water policy implementation	Pearson Correlation	1	.248**
	Sig. (2-tailed)		.009
	N	111	111
Resource availability	Pearson Correlation	.248**	1
	Sig. (2-tailed)	.009	
	N	111	111

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient between water policy implementation and resource availability is 0.248. The positive sign of the coefficient signifies a favorable correlation, implying that when one variable rises, the other variable also tends to increase. With a coefficient value of 0.248, there is a moderate positive correlation between these two variables. This implies that alterations or fluctuations in water policy implementation are linked to proportional changes or fluctuations in resource availability.

Study Summary

Resource Availability

In this research, we delved into the critical interplay between resource availability and the effective implementation of water quality regulation policy. Our study in Kisumu County, Kenya, aimed to understand the perceptions of environmental officers, offering valuable insights into this vital relationship.

Our findings depict a generally positive perception regarding officers' knowledge, with a significant majority (66.7%) acknowledging their competence. However, opinions diverged regarding the accessibility of water resource databases, revealing the need for enhanced data availability and access. Interestingly, a sizable proportion (41.4%) remained neutral regarding funding availability from stakeholders for enforcing water protection policy, indicating potential opportunities for collaboration and resource mobilization.

Perceptions on integrating a water resource development and management framework for the Kibos River were varied, suggesting a need for more targeted strategies. Similarly, views on technology's effectiveness in water management were multifaceted, calling for a nuanced approach.

Crucially, the study underscored the pivotal role of street-level bureaucrats, with a notable majority (44.0%) affirming their possession of necessary skills for their roles. The correlation analysis further solidified the importance of this relationship, indicating a moderately positive correlation (coefficient of 0.248) between water policy implementation and resource availability.

These findings offered a nuanced understanding of how resource availability influences the effective execution of water quality regulation policies. Our insights aim to guide decision-makers and stakeholders in optimizing water quality regulation strategies in Kisumu County, Kenya, and beyond.

CONCLUSION AND RECOMMENDATIONS

In culmination, the study provided valuable insights into the intricacies of implementing water quality regulation policy in Kisumu County, Kenya. Resource availability emerged as a pivotal factor, significantly influencing policy execution. Notably, most of the environmental officers were perceived to possess commendable knowledge, signifying their expertise and competence. However, it's crucial to acknowledge the diversity of opinions surrounding the accessibility of water resource databases and the availability of funding from stakeholders. Similarly, the integration of a water resource development and management framework for the

Kibos River and the efficacy of technology for water management garnered mixed responses, highlighting the complexity of these aspects.

Nonetheless, the study's key finding revealed a noteworthy positive correlation between water policy implementation and resource availability. This correlation coefficient suggests a moderately positive relationship between the two variables. These findings underscore the pivotal role of resource availability in shaping the landscape of water quality regulation policy implementation in Kisumu County, Kenya. They also emphasize the need for comprehensive strategies to enhance resource accessibility and optimize policy execution in the realm of environmental governance.

Based on our findings, it was evident that even when environmental bureaucrats face resource shortages, they still make sincere efforts to implement policies. To improve this, it's crucial to ensure ample resources for environmental officers. Recognizing the importance of resources in enforcing water quality policies, it's essential to provide access to water resource databases and secure funding from stakeholders. Bridging these resource gaps is fundamental for a much more effective policy implementation.

To optimize water policy outcomes, the study recommended the allocation of resources to establish clear and comprehensive guidelines for managing discretion among street-level bureaucrats. These guidelines should primarily focus on promoting consistency, fairness, and equitable distribution of policies. By minimizing inconsistent policy application, water policy outcomes can be markedly improved.

The study also advocated for prioritizing resource allocation to improve dissemination of information related to environmental regulation policies. This step aims to address varying opinions on policy distribution fairness and enhance access to relevant materials. By increasing transparency and accessibility of information, it is possible to foster a better understanding and application of policies among environmental officers, thereby improving on the policy understanding.

Areas for further studies

In future research, the following areas of study should be considered:

Study innovative strategies used by environmental bureaucrats to tackle resource scarcity while implementing water policy. Explore their influence on policy outcomes and sustainability. Examine successful policy innovations addressing resource availability constraints.

Study the effectiveness of feedback mechanisms in policy implementation concerning resource availability. Explore how feedback loops can aid in resource allocation while examining the role of community engagement in optimizing resource utilization for water policy implementation. And analyse how involving local communities can enhance resource efficiency and policy compliance.

Assess how specialized training and capacity-building programs impact environmental bureaucrats' resource utilization and policy implementation efficiency. Determine how enhanced skills contribute to efficient water resource management.

Explore how integrating advanced technologies can optimize resource allocation and utilization by environmental bureaucrats. Analyse the impact of technology on policy implementation and resource efficiency.

Conduct a comparative study across countries to understand how varying levels of resource availability influence water policy implementation. analyse the role of environmental bureaucrats in diverse socio-economic and political contexts.

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