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DELAYS, DEFICIENCIES, AND DEVIATIONS: A DECADAL AUDIT OF PROJECT IMPLEMENTATION CHALLENGES IN TANZANIA'S WATER SECTOR

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Abstract

This study examines the persistent challenges affecting the implementation of government-funded water sector projects in Tanzania over a ten-year period, from 2014/15 to 2023/24 financial years. Drawing primarily on audit evidence from the Controller and Auditor General's Reports on Central Government audit, the research identifies recurring implementation issues such as prolonged project delays, incomplete and non-functional infrastructure, cost overruns, and deviations from approved plans and contractual terms. Using a qualitative documentary analysis approach, these issues were categorized and analyzed within a practical project performance framework. The findings reveal that, despite the establishment of specialized agencies like RUWASA and adoption of policy reforms, systemic weaknesses in planning, supervision, contractual management, and institutional coordination continue to undermine value-for-money and service delivery in the water sector. The study concludes that sustainable improvement requires a shift toward adaptive project governance, strengthened oversight mechanisms, and integrated monitoring systems. It recommends strategic actions including design validation, role clarity among institutions, real-time tracking of project progress, and enforcement of audit recommendations. These measures are critical not only for achieving water access targets, but also for enhancing public trust in government infrastructure programs.

Key words: Water sector project, Project Implementation challenges, Scope Deviations, Project Management

1. INTRODUCTION

Access to safe and adequate water remains a cornerstone of Tanzania's development agenda, underpinning health outcomes, economic productivity, environmental sustainability, and poverty alleviation. To address disparities in water supply and sanitation, the Government of Tanzania is implementing the National Water Policy of 2002, which aims to achieve water supply coverage of 85% in rural areas and 95% in urban areas by June, 2025 (Annual General Report 2023/24). However, despite significant financial allocations, donor support, and institutional reforms, recurring implementation challenges threaten the achievement of these targets. The challenges

are frequently documented in the Controller and Auditor General's Annual General Reports on Central Government Audit, which officer a reliable empirical lens into systemic weaknesses within the water sector.

According to the 2023/24 audit, urban water supply coverage reached 90%, and rural coverage improved to 79.6%, yet critical bottlenecks persist. These include a water supply deficit of over 26 billion litres, non-revenue water losses worth TZS 8.75 billion, and unfinished infrastructure in the 900 Boreholes Program, where only 642 boreholes were operational due to incomplete installations. These inefficiencies indicate gaps in the planning, execution, and monitoring of water projects, despite having institutional mechanisms such as the Ministry of Water, RUWASA, and Water Supply and Sanitation Authorities (WSSAs) in place.

From a project management perspective, the problems seen in water sector projects such as delays, poor-quality work, and unfinished infrastructure, show that there is a gap between what was planned and what was delivered. The PMBOK® Guide (*Seven Edition*) highlights that successful project implementation should focus on delivering value, involving the right stakeholders, adapting to changes, and thinking in terms of the bigger system. It also outlines key areas that are important for any project, such as good planning, doing the work as planned, measuring progress, and managing risks and uncertainties. However, the audit reports show that man water sector projects in Tanzania lack proper planning, have weak supervision, and do not respond well to problems as they arise. This means that the principles and key areas of project management are not being fully applied. To improve results, public institutions need to focus more on engaging stakeholders, planning realistically, monitoring work regularly, and adjusting when conditions changes.

The objectives of this study are threefold:

1. To analyze the project implementation challenges identified into the CAG's audit reports related to Tanzania's water sector from 2014/15 to 2023/24 Financial Year;
2. To classify these challenges using a project performance domain framework (PMBOK Seventh Edition), identifying systemic project delivery risks and failure points; and
3. To recommend project governance and execution strategies to enhance the delivery, sustainability, and impact of water infrastructure investments.

This study employs a qualitative document analysis approach, using official audit reports as primary data and peer-reviewed literature as secondary sources. By linking audit findings with project management theory and practices, the study aims to contribute to the discourse on public sector project performance and offer actionable insights for policymakers, auditors, and project managers.

2.0 LITERATURE REVIEW

2.1. Theoretical Frameworks in Project Implementation

Effective project implementation in public infrastructure necessitates a comprehensive understanding of systemic processes, stakeholder dynamics, and institutional capacities. The Public Sector Project Cycle, comprising stages such as identification, appraisal, approval, implementation and evaluation, provides a structured approach aligning project activities with institutional accountability and governance expectations (Asian Development Bank [ADB], 2006). Each phase presents potential challenges, particularly in environment where oversight is weak, coordination among implementing agencies is fragmented, and institutional capacities are limited.

The Theory of Constraints (TOC), introduced by Godratt (1990), posits that every system has limiting factors (Constraints) that hinder performance. In project environments, these constraints may manifest as inadequate funding flows, weak supervision, delayed procurement, or capacity gaps among implementing agencies. Identifying and systematically addressing these bottlenecks is crucial for enhancing performance, especially in large-scale, multi-stakeholder infrastructure projects like water supply systems.

Additionally, systems thinking and adaptive management framework have gained increasing recognition for addressing the dynamic, interconnected nature of development projects. These approaches emphasize flexible

planning, iterative feedback loops, and responsiveness to changing environmental, fiscal, and political conditions-characteristics that are particularly valuable in contexts such as Tanzania's water sector (OECD & IISA, 2020). By shifting the focus to linear, prescriptive plans toward systems-informed, adaptive value delivery, these models support more resilient, contextually responsive, and locally attuned project outcomes.

2.2. Common Implementation Challenges in Water Infrastructure

2.2.1 Delays, Cost Overruns, and Technical Failures

Water infrastructure projects in developing countries frequently encounter a range of implementation challenges. These include delays, cost overruns, contractual disputes, technical failures, low-quality works, and scope creep. Delays often result from poor contractor performance, delayed payments, or supply chain disruptions. Cost overruns often stem from under-scoped feasibility studies or unrealistic budgeting assumptions (Adamu & Olunilua, 2020: Flyvbjerg, 2014). These issues are exacerbated in contexts where institutional coordination is weak, and monitoring frameworks are underdeveloped.

2.2.2 Non-Revenue Water (NRW) and Service Disruption

A significant challenge in water infrastructure delivery is non-revenue water (NRW), often resulting from leaks, illegal connections, and poor metering systems. This not only affects financial sustainability but also limits service coverage, especially in urbanizing regions. According to the World Bank (2016), developing countries lose about 45 million cubic meters of water daily due to NRW which is enough to serve nearly 200 million people. In Tanzania, audit findings from National audit Office (CAG, 2015-2024) have consistently highlighted cases of non-functional boreholes, incomplete water supply schemes, and water supply projects left at less than 50% completion due to budgetary or administrative lapses. Poor supervision and inadequate quality control mechanisms further contribute to premature system failure or deterioration shortly after commissioning.

2.2.3 Scope Creep in Donor -Funded and Politically Driven Projects

Scope creep, the uncontrolled expansion of project scope without proportionate adjustments in time, cost, or resources allocations, is a recurrent issue in water sector initiatives. It frequently occurs in donor-funded or politically influenced projects, where midstream design alterations are introduced without systematic reassessment of risks or feasibility (Ika et al., 2012; Williams, 2016). Such changes, while often justified on social or political grounds, can destabilize implementation plans, exhaust resources, and dilute intended development outcomes.

2.3. Global and Regional Evidence from Similar Contexts

Across Sub-Saharan Africa, similar implementation challenges have been documented in public water infrastructure projects. A World Bank (2017) review of water sector investments in East Africa identified recurring weaknesses such as fragmented institutional mandates, weak procurement systems, and insufficient maintenance planning. In Kenya and Uganda, studies found that projects often fail due to poor coordination between central governments and local authorities, lack of community ownership, and weak monitoring frameworks (Hope & Rouse, 2013).

In Ghana, Agyekum-Mensah et al. (2012) reported that up to 40% of rural water supply systems became non-functional within two years of commissioning due to inadequate technical support and failure to budget for long-term operational costs. In Nigeria, Adamu and Olonilua (2020) found that despite the availability of funds, projects were delayed due to lack of timely supervision and poor alignment between procurement schedules and implementation plans.

These findings reflect a regional trend where the design-execution divide is exacerbated by bureaucratic inefficiencies, capacity shortfalls, and weak project governance. They reinforce the need for adaptable, context-aware project management strategies that emphasize early risk identification, continuous performance monitoring, and flexible implementation modalities.

2.4. Previous Use of Audit Reports in Empirical Research

Audit reports are increasingly recognized as valuable empirical sources for studying public project performance. They offer systematic, government-validated documentation of anomalies, financial irregularities, and implementation gaps. In particular, supreme audit Institutions (SAIs) such as the National Audit Office of Tanzania produce annual reports that detail project-level findings-ranging from incomplete infrastructure and unaccounted funds to contract mismanagement and failures in service delivery.

In academic literature, audit reports have been used to complement primary fieldwork or to triangulate findings in governance and public administration studies. For example, Grafton and Knowles (2010) used national audit findings to assess the effectiveness of public expenditure in the water and sanitation sector in southern Africa. In Ethiopia, Gebregziabher and Tsegaye (2019) applied audit findings to analyze how institutional weaknesses in public financial management affect the delivery of rural water schemes.

Within Tanzania, while the Controller and Auditor General's reports are widely disseminated and discussed in Parliament and the media, their use in scholarly research remains limited. Yet, these reports present an underutilized but highly credible data source for evaluating not only financial compliance but also implementation efficiency and project effectiveness over time. They offer a unique longitudinal perspective, making them particularly valuable for studies such as this, which examine trends over a ten-year period.

3.0 METHODOLOGY

3.1. Research Design

This study applies a qualitative research design based on documentary analysis. It focuses on identifying, categorizing, and analyzing project implementation challenges in Tanzania's water sector over a ten-year period. The Annual General Reports of the CAG for the Central Government, from the financial years 2014/15 to 2023/24, serve as the primary data source. These reports were selected due to their credibility, comprehensive coverage of government-funded infrastructure projects, and their regular reporting on sector-specific issues, including those related to water supply and sanitation.

3.2. Data Sources

Two main sources of data were used in this study. The primary data consist of official CAG audit findings related to the water sector, including audit observations on project delays, financial mismanagement, incomplete infrastructure, and contractual issues. These reports offer rich longitudinal evidence of project performance and compliance across multiple government entities. Secondary data were drawn from scholarly literature, institutional assessments (e.g., World Bank, African Development Bank), and previous studies on water sector governance and public project implementation in Tanzania and other developing countries. These secondary sources supported contextual interpretation and comparative analysis.

3.3. Data collection and Coding

A manual review of each report was undertaken to extract relevant content specifically form chapters or sections that focus on water-related projects. For each identified issue, key information was recorded, including the

year of reporting, the name or location of the project (where stated), the nature of the implementation challenge, and any explanatory details provided in the report narrative. Data were categorized according to recurring themes and implementation dimensions such as planning and scheduling, financial and resources management, contract execution, quality control, and stakeholder engagement.

The coding was guided by a practical project implementation performance framework that allowed the classification of challenges into relevant domains. These included: (i) project planning and scheduling; (ii) resource and financial management; (iii) contract and procurement management; (iv) monitoring and quality assurance; and (v) risk and change management. This framework enabled the comparison of issues across years and allowed the identification of patterns and trends in water sector project execution.

3.4. Analytical Framework

The study employed thematic and content analysis to evaluate the frequency, consistency, and severity of the project implementation challenges highlighted in the audit reports. The aim was to detect recurring issues, institutional weaknesses, or systemic bottlenecks that may explain persistent delays or failures. The findings were then compared across years to identify whether specific problems (e.g., borehole incompletion, no-revenue water, contactor non-performance) were isolated incidents or chronic concerns. Descriptive summaries and visual tools, such as frequency tables and trend graphs, were prepared to support narrative analysis.

3.5. Limitations

While audit reports offer valuable insights, they are limited to issues identified during specific audit periods and do not necessarily capture all on-the ground realities. Furthermore, the reports emphasize financial and procedural compliance, which may overlook community engagement, environmental risks, or local-level institutional capacity. To mitigate these limitations, findings from the audit reports were triangulated with insights from peer-reviewed literature and development reports. This ensured a broader interpretation while keeping the analysis firmly rooted in documented audit evidence.

4. RESULT AND ANALYSIS

4.1 Identified Delay Factors and Frequency Over the Ten Years

Delays in project implementation were consistently highlighted across all ten audit years, affecting both small and large-scale water projects, a notable finding from the 2021/21 audit was that 65% of sampled water projects, initially planned for completing within 3 to 12 months took between 2 to 9 years, with no completion achieved in many cases. In the 2022/23 report, 62 projects implemented by RUWASA valued at TZS 149.96 billion were delayed, with slippages ranging from 11 to 1,564 days.

The 2019/20 audit similarly fount that some projects had been ongoing for over 34 months without progress, despite contractual periods of less than a year.

4.2 Categorization of Project Deficiencies

Audit findings consistently categorized project decencies into several key areas. The most prevalent include incomplete infrastructure (such as boreholes, pipelines, and domestic points), poor workmanship, and abandonment of sites. For example, in financial year 2021/22, 57 out of 250 drilled boreholes (23%) were found to be unproductive, 44 had not undergone pump testing, and 40 had not been drilled at all. The 2020/21 report documented sites where contractors vacated without notice for over two years, and others where only a small portion (e.g., 17%) of works had been completed. Furthermore, quality deficiencies were revealed through site visits that identified non-functioning domestic points, abandoned systems, or projects built using outdated or expired designs. These deficiencies were often attributed to poor project supervision, inadequate feasibility studies, or failure to align designs with current population demand.

4.3 Recurring Deviations from Project Plans, Scope, and Contract Provisions

Recurring deviations from contractual provisions and approved project plans were a major theme. These include changes in scope without technical or financial justification, failure to execute projects within the agreed timeframes, and improper design modifications. In 2021/21, several projects were executed using expired design assumptions, requiring post-construction redesign and additional resources to meet actual demand. Additionally, procurement of unnecessary materials in anticipation of non-existent Phase II projects resulted in cost overruns and tied-up public funds.

Deviation from plans also occurred due to political and administrative overlap. For instance, the Ministry of Water directly implemented several complex projects, which deviated from its supervisory role, causing delays and potential duplication of functions.

4.4 Trend analysis of Audit Observations in Project Implementations

Trend analysis over the ten-year period reveals persistent implementation weaknesses despite policy reforms and the establishment of agencies like RUWASA. While some projects initiated in years like 2014/15 and 2018/19 were more likely to be completed, projects from 2013/14 and 2017/18 were consistently lined to extended delays and underperformance.

Moreover, recurring remarks in the reports show that the root causes such as inadequate designs, delayed payments, and poor contractor oversight- have not been fully addressed. Even as the water sector evolved institutionally, with new agencies and revised policies, fundamental project execution problems persisted, suggesting structural and systemic challenges in project governance.

4.5 Summary Tables and Charts for Key Findings

The following table summarizes some key issues from selected years:

Table 1: Summary of some issues from selected years.

Year	Key Issues Identified	Project Affected	Estimated Cost (TZS)
2020/21	Delayed completion (2-9 years duration)	48 projects (65% of sample)	30.53 billion
2021/22	Unproductive boreholes (23%)	57 out of 250	Not specified
2022/23	Delay in 62 water projects	62 projects	149.96 billion
2019/20	Abandoned projects for > 2 years	At least 2 major projects	1.13 billion
2018/19	Under-release of funds (WSDP)	Basin Water Boards	31.3 billion
2023/24	Weak contract oversight, project slippage (1-92%)	136 projects	1.34 trillion

5. DISCUSSION

The findings of this study reveal persistent and systemic project implementation challenges in Tanzania's water sector over the past decade, as documented by the CAG. Despite continuous institutional reforms, increased budget allocations, and the creation of dedicated agencies such as RUWASA, the same core issues: delays, cost

overruns, incomplete works, poor quality, and contractual deviations have recurred with striking consistency. This section interprets these findings through a practical project management lens, drawing attention to root causes and their implications for governance and development outcomes.

5.1 Interpreting Delay Factors and Institutional Bottlenecks

Delays emerged as the most consistent implementation challenge. The causes- ranging from delayed payments to contractors and inadequate project designs to procurement delays-reflect institutional coordination failures and weak contract management practices. These issues align with broader public sector project delivery problems in developing countries, where administrative complexity, fiscal rigidity, and skills gaps contribute to the slow pace of infrastructure development (World Bank, 2022).

The recurrence of delays across multiple financial years, with some projects remaining incomplete more than five year after initiation, highlights deficiencies in planning and pre-project readiness. It is evident that many projects are launched without finalized technical designs or full funding guarantees, leading to implementation paralysis. Moreover, ineffective risk identification and mitigation at the planning stage has led to avoidable site challenges, such as inaccessible locations or failed boreholes, further compounding delays.

5.2 Weakness in Project Control, Supervision, and Quality Management

A consistent theme across the reports is the poor quality of project outputs, including unproductive boreholes, unfinished distribution networks, and abandoned domestic water points. These failures suggest that quality assurance mechanisms are either absent or not rigorously applied during implementation. Supervision consultants, where engaged, often underperform due to weak contract terms or limited accountability.

Furthermore, internal oversight units within implementing agencies do not appear to function effectively in many cases. The findings also raise concern about the limited use of real-time performance monitoring tools and the absence of early warning systems to flag underperformance. The lack of robust project tracking mechanisms undermines the ability to make course corrections or enforce contractual remedies when targets are missed.

5.3 Deviation from Plans and the Undermining of Value-for-Money

The frequent deviations from original plans-whether through scope changes, unjustified delays, or abandoned works signal a disconnect between intended development outcomes and actual delivery. These deviations undermine the principle of value-for-money, which is central to public financial management. Moreover, such shifts often occur without formal variation approval, technical justification, or financial recalibration, leading to inefficiencies and potential audit qualifications.

In several cases, the audit reports indicated that projects were executed using outdated or expired designs, rendering them obsolete upon completion. This points to weak institutional learning and poor application of adaptive project management practices. It also reflects a bureaucratic rigidity in updating project scopes to align with dynamic water demand, climate challenges, and urbanization trends.

5.4 Institutional Roles and Overlaps in Project Implementation

Another critical insight from the analysis is the confusion and overlap in institutional mandates. Although the Ministry of Water is expected to provide strategic oversight, it has been directly involved in project execution, potentially duplicating roles assigned to implementing agencies such as RUWASA or basin water boards. This duplication creates accountability gaps and undermines efficiency. It also blurs lines of responsibility, making it difficult to enforce performance expectations or assess institutional effectiveness.

Such institutional overlaps suggests that Tanzania's water sector project governance would benefit from clearer role delineation, enhanced inter-agency coordination, and the establishment of a centralized project tracking dashboard for all major infrastructure works.

5.5 Broader Implications for Public Sector Project Management

The audit evidence aligns with the broader understanding that public infrastructure projects often suffer from limited capacity in project planning, weak integration of risk management practices, and underutilization of learning and feedback mechanisms. These issues are not unique to Tanzania but are characteristic of many low-and middle-income countries (AfDB, 2021; UNDP, 2020). However, the ten-year persistence of these issues suggests that corrective actions taken to date have either been inadequate or poorly implemented.

Improving the effectiveness of water sector project delivery requires more than just institutional restructuring or increased funding. It demands a shift toward adaptive project governance, with greater emphasis on pre-implementation appraisal, dynamic risk management, continuous stakeholder engagement, and accountability for results. Lessons learned from previous projects must be systematically captured, analyzed, and incorporated into future project planning to break the cycle of underperformance.

6. RECOMMENDATIONS AND CONCLUSION

6.1 Recommendations

Based on the analysis, the following recommendations are proposed to address the persistent implementation challenges in Tanzania's water sector:

6.1.1 Strengthen Project Planning and Design Validation

Projects should not proceed to implementation without comprehensive feasibility studies, site verification, and technical design validation. Pre-project readiness assessments must be enforced, and design assumptions updated to reflect current conditions and water demand.

6.1.2 Improve Risk and Change Management Practices

Implementing agencies should adopt structured risk identification and mitigation frameworks during planning and execution stages. Mechanisms for handling project changes whether in scope, cost, or timeline must be formally documented, justified, and approved.

6.1.3 Enhance Contract Management and Supervision Capacity

Procurement and contracting processes must be professionalized, with clear performance expectations and penalty clauses. Supervision consultants should be independently evaluated, and government staff trained in basic contract oversight and quality assurance.

6.1.4 Institute Real-Time Project Monitoring and Reporting Systems

A centralized digital dashboard should be established to track project progress, expenditures, milestones, and emerging risks across all agencies under the Ministry of Water. This will enable timely decision-making and provide transparency to stakeholders and citizens.

6.1.5 Clarify Institutional Roles and Mandates

The Ministry of Water should focus on strategic planning, policy coordination, and oversight, while day-to day implementation should rest with dedicated technical agencies. Institutional overlaps must be resolved to ensure clarity in accountability and resource use.

6.1.6 Promote Learning and Institutional Memory

A national repository of project lessons both successes and failures should be developed and used to guide future project design. Audit findings should be systematically reviewed within implementing institutions and tied to performance improvement plans.

6.1.7 Enforce Implementation of Audit Recommendations

The NAOT, in collaboration with Parliament and oversight committees, should establish mechanisms to track and publicly report on the status of implementation of audit recommendations. Non-compliance should trigger administrative consequences or funding conditions.

By acting on these recommendations, Tanzania's water sector can begin to close the gap between project ambitions and actual delivery. Addressing these governance and capacity weakness will not only improve water access outcomes but also build public confidence in the institutions entrusted with managing vital national resources.

6.2 Conclusion

This study set out to examine project implementation challenges in Tanzania's water sector using a ten-year analysis of audit evidence from the CAG's Annual Reports on Central Government (2014/15-2023/24). The findings reveal that despite various institutional reforms and substantial public investments, the sector continues to face persistent implementation setbacks. Key issues include chronic project delays, incomplete and low-quality infrastructure, contract management failures, deviations from planned scopes, and weak supervision mechanisms.

These challenges are not only technical or procedural in nature but are deeply rooted in systemic governance and capacity limitations. The consistency of audit findings over the years suggests a failure to internalize lessons and apply corrective actions in a sustainable and structured manner. Moreover, the deviation between intended outputs and actual results highlights the erosion of value-for-money and accountability principles in the delivery of essential water infrastructure.

From a project governance perspective, the study demonstrates the urgent need for a shift toward more adaptive, integrated, and performance-focused management practices. The findings reinforce that strengthening Tanzania's water sector is not simply a matter of increased investment, but one of improving how projects are conceived, implemented, and monitored for results.

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