



Delivery of road construction projects in Kenya: A review of causes, trends, and research gaps

Edwin Kipkemai Cheserek¹

Alexander Khaemba²

Samuel Waweru³

Janet Oyaro⁴

Edwin Kimutai Kanda⁵

¹ekanda@mmust.ac.ke

^{1,2,3,4,5} Masinde Muliro University of Science and Technology

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ABSTRACT

Construction projects in Kenya continue to experience delays and there is no noted improvement in the completion of road construction projects in the recent past. This has been worsened by the fact that some projects are started for political reasons leading to poor planning and skewed resource allocation. Delays in project completion have continued to cost tax payers millions of shillings with no tangible solution on sight necessitating this review. Therefore, this review synthesizes studies on construction project delivery in Kenya, revealing persistent delays affecting 35–73% of projects with no improvement over time. It was guided by the triple constraints theory, systems theory, resource-based view theory and institutional theory. Contractor-related factors such as cash flow constraints, poor scheduling, and inadequate site management are the dominant delay causes, followed by client factors which included delayed payments and bureaucracy. Consultant factors such as design deficiencies, slow responses, and external factors which include price escalations, weather, and wayleave disputes are other significant causes of delay in project delivery. A causal domino effect is identified whereby client payment delays trigger contractor liquidity crises and work stoppages. This review makes three important contributions: establishing delay persistence, mapping causal chains, and identifying critical research gaps such as the absence of project duration prediction models for Kenya and undetermined effects of site meetings, personnel capacity, and variations on delays. Based on this review, the following interventions are desirable: improved contractor vetting, assured client funding, enhanced supervision, and development of empirically validated duration prediction models tailored to Kenya.

Keywords: Project Completion, Road Construction, Time-Overrun, Triple Constraints Theory

I. INTRODUCTION

Construction projects are meant to deliver a structure or a road through planned activities executed within a given time frame. Any execution outside the time frame causes delays in the delivery of construction projects and the benefits expected. Delay in project completion is a problem worldwide with a delay of 30% being recorded in New Zealand, 40% in United Kingdom, 51% in Nigeria, 70% in Saudi Arabia and Hong Kong, and up to 73% in Kenya (Mbatha, 1986, Velumani *et al*, 2021, Musyoka *et al*. 2025).

Construction projects in Kenya are initiated and executed to meet specific needs in the society and their timely delivery is critical for socio economic development. The benefits of timely completion of construction projects cannot be overemphasised and include enhanced public satisfaction, improved government reputation, cost control due to limited price escalation, higher quality work due to no rushing to complete activities, better resource management through optimal allocation, risk mitigation through flexibility of well managed timelines and increased productivity through workload management. Ellis and Thomas (2003) argue that a significant annoyance occurs when the actual construction takes longer than necessary to the disadvantage of the public. It is our view that timely delivery of projects leads to a wealthy, happy and a prosperous nation.

Timely delivery is not always achieved as many factors come into play during project implementation. The determined project duration plays a key part in the project delivery since it is the total amount of time it takes to finish a project. This time usually depends on resource availability such as construction materials, construction personnel, construction equipment and environmental conditions among others. A well-timed project requires that the resources be available on time and at the right places. A poorly timed project may seem to be delayed or completed on time yet the project duration was not correctly determined in the first place.

Construction projects in Kenya continue to experience delays (Mbaluka & Bwisa, 2013) and there is no noted improvement in the completion of road construction projects in the recent past. The fact that some projects are started for political reasons has worsened the situation due to poor planning and skewed resource allocation. Delays in project

completion have continued to cost tax payers millions of shillings with no tangible solution on sight. In Kenya, delay in project completion occurs due to various factors such as lack of monitoring, government policies, cash flow challenges, poor estimation of project duration, poor contract planning, awarding projects to unqualified contractors, variations and poor estimation of project scope (Talukhaba, 1999, Munyoki, 2014).

Despite the importance of accurately and reliably predicting construction duration, few tools, practices and procedures are available in Kenya. This has affected the delivery of construction projects. In this study, literature on construction projects in Kenya was considered and a review of the literature is presented with highlights on the gaps that require to be addressed from studies by Mbatha (1986), Al-Mamlook et al. (2020) and Tulakhaba (1999), among others. This review aims to address the following research questions i) what are the primary causes of construction project delays in Kenya? ii) How have these causes and the extent of delays evolved over time? iii) What are the critical research gaps that need to be addressed to improve project delivery?"

1.2 Research Objectives

The general objective of this review is to synthesise and critically appraise the existing body of knowledge on the delivery of road construction projects in Kenya, with a view to: -

- i. Establishing the persistence of delays
- ii. Mapping delays causal mechanisms
- iii. Identifying actionable research gaps that can inform policy, practice, and future empirical inquiry.

II. THEORETICAL REVIEW

The theoretical framework adopted in this review is underpinned by four complementary theories: the Triple Constraints Theory, Systems Thinking Theory, the Resource-Based View (RBV), and Institutional Theory (Figure 1). Together, these theories provide a holistic explanatory lens for understanding why road construction projects in Kenya continue to experience persistent delays despite decades of research and policy attention. The framework is consistent with recent applications in the Kenyan construction and water sectors, where Kanda et al. (2016) demonstrated that project completion is a function of the interplay between resource availability, institutional arrangements, and stakeholder capacity.

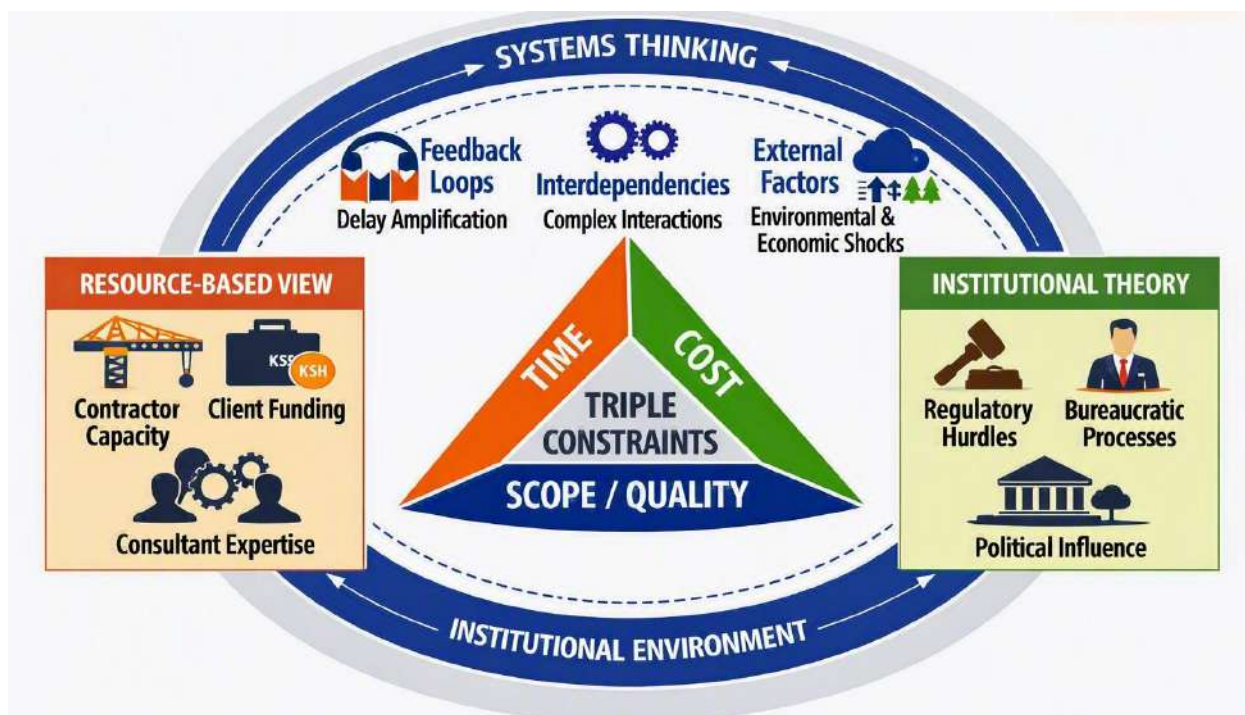


Figure 1
Theoretical Review

The Triple Constraints Theory posits that project success is determined by the simultaneous balancing of time, cost, and scope/quality (Dobson, 2004). In the context of Kenyan road construction, the persistent schedule overruns of 35–73% reported across the reviewed studies (Mbatha, 1986; Seboru, 2015; Musyoka et al., 2025) represent a systemic failure to manage the time constraint, which in turn disrupts cost and scope equilibrium. Price escalations, inflation, and



delayed payments distort the cost constraint, while frequent variations, incomplete designs, and rushed work compromise scope and quality. The theory thus provides the foundational logic for treating delay as a multidimensional performance failure rather than a purely temporal phenomenon. This is consistent with Kanda et al. (2016), who applied the triple constraints logic to water projects in Kakamega County and established that time, cost, and quality are jointly determined by financial capacity and monitoring.

Systems Thinking Theory conceptualizes projects as complex, dynamic systems in which stakeholders, processes, and external factors interact through feedback loops, interdependencies, and emergent behaviour (Kanda et al, 2016; Elia et al, 2021). Applied to Kenyan road projects, this theory explains the domino effect identified in this review: client payment delays trigger contractor liquidity crises, which precipitate work stoppages and schedule overruns, which in turn generate claims and further payment delays. Similarly, bureaucratic approval processes slow consultant responses, compounding contractor inefficiencies and reinforcing delay. External shocks such as adverse weather, price escalations, and wayleave disputes ripple through the system, amplifying existing vulnerabilities. Systems thinking therefore justifies the argument that delays are systemic rather than isolated, and that effective interventions must be holistic encompassing funding assurance, contractor capacity building, consultant quality assurance, and realistic scheduling.

The Resource-Based View (RBV) asserts that organisational performance is a function of the possession and effective management of valuable, rare, inimitable, and non-substitutable resources (Almarri & Gardiner, 2014). In the Kenyan road construction sector, contractors frequently lack sufficient working capital, reliable equipment, and skilled personnel; clients face funding gaps and bureaucratic inefficiencies; and consultants struggle with technical capacity and timely supervision. These resource deficiencies explain why even well-planned projects fail to meet their delivery targets. The RBV thus provides the theoretical basis for recommending enhanced contractor vetting, capacity building, and financial management support.

Institutional Theory holds that organisational behaviour is shaped by formal rules, norms, and regulatory frameworks that create pressures for conformity and legitimacy (Biesenthal *et al*, 2018; Sankaran et al, 2023). In Kenya, delayed approvals, rigid procurement rules, and political interference skew project delivery. Agencies such as Kenya National Highways Authority (KeNHA), Kenya Urban Roads Authority (KURA), and Kenya Rural Roads Authority (KeRRA) operate under institutional pressures that slow decision-making, while political considerations in project initiation lead to poor planning and skewed resource allocation. The theory explains why delays persist despite technical knowledge of their causes: institutional inertia and path dependency sustain dysfunctional practices. It therefore justifies calls for governance, procurement, and accountability reforms as complementary to technical interventions.

III. METHODOLOGY

This study employed a scoping review approach to map and synthesize the existing literature on construction project delivery in Kenya. A scoping review was considered appropriate for this study as it allows for the broad examination of available evidence, identification of key concepts, and mapping of research gaps across a diverse body of literature. The scoping review framework enabled the inclusion of both peer-reviewed publications and grey literature to provide a comprehensive overview of construction delays in Kenya spanning nearly four decades.

The literature search was conducted through electronic databases including Google Scholar, Scopus, and Web of Science and university repositories. The sources were complemented by manual search of theses in major university repositories in Kenya. Search terms included combinations of "construction project," "delay," "time overrun," "project delivery," "road projects" and "Kenya." From an initial pool of 47 potential sources, twenty studies were selected for in-depth review based on their relevance, empirical grounding, and explicit discussion of delay factors. Studies with explicit discussion of delay causes in Kenya were included and those without or not for Kenya were excluded. Data were extracted using a standardized template and synthesized thematically, with delay causes categorized according to the four stakeholder groups: client, contractor, consultant, and external factors.

IV. FINDINGS & DISCUSSION

4.1 Finding

The specific data collection methods, target populations, and sample/tool types used across the reviewed studies were taken into consideration and the summary is given in Table 1.

**Table 1***Literature sources*

Study / Author	Research Design	Primary Data Collection Tool(s)	Target Respondents / Secondary Sources
Mbatha (1986)	Empirical / Descriptive Survey	Structured Questionnaires & Archival Audit	Contractors, Public Works Engineers, Building Project Files
Al-Mamlook et al. (2020)	Cross-Sectional Survey	Questionnaires & Project Document Reviews	Civil Engineering Contractors, Site Consultants, Project Files
Tulakhaba (1999)	Descriptive Field Study	Questionnaires & Semi-Structured Interviews	Project Managers, Quantity Surveyors, Main Contractors
Mbaluka & Bwisa (2013)	Explanatory Survey	Self-Administered Questionnaires	Road Construction Project Managers, Engineers, Contractors
Munyoki (2014)	Descriptive Survey Design	Structured Questionnaires (Likert Scale)	Clients (Agencies), Resident Engineers, Class A Contractors
Oloo et al. (2015)	Mixed-Methods Approach	Structured Questionnaires & Document Analysis	Kenya National Highways Authority (KeNHA) Officials & Contractors
Seboru (2015)	Descriptive Survey	Questionnaires & Field Observations	County Engineers, Project Consultants, On-Site Contractors
Kogi & Were (2017)	Descriptive Survey Design	Closed-Ended Structured Questionnaires	Project Managers, Site Engineers, Procurement Officers
Mwakajo & Kidomo (2017)	Correlational Survey Design	Structured Questionnaires & Key Informant Interviews	Resident Engineers, Project Managers, Site Supervisors
Lukale (2018)	Descriptive Survey	Self-Administered Questionnaires & File Reviews	Kenya Rural Roads Authority (KeRRA) Engineers & Contractors
Samo et al. (2024)	Cross-Sectional Survey	Questionnaires (5-point Likert Scale)	Project Directors, Resident Engineers, Contractors
Mugo et al. (2019)	Mixed-Methods Survey	Structured Questionnaires & Archival Audit	Kenya Urban Roads Authority (KURA) Staff, Consultants
Onenga et al. (2020)	Descriptive Research Design	Self-Administered Questionnaires	Project Engineers, Quantity Surveyors, Contractors
Oburu (2020)	Descriptive Survey	Questionnaires & Document Analysis	Construction Project Managers, Site Engineers
Wandiri & James (2020)	Descriptive Survey Design	Structured Questionnaires	Project Staff, Field Consultants, Registered Contractors
Saya and Onyango (2024)	Descriptive Research Design	Structured Questionnaires	County Public Works Officers, Subcontractors, Project Managers
Kitungo & Musembi (2024)	Explanatory Survey Design	Questionnaires & Document Reviews	Infrastructure Project Managers, Consultants, Contractors
Samo et al. (2024)	Descriptive Field Survey	Structured Questionnaires & Field Interviews	Project Engineers, Site Agents, Client Representatives
Bii et al. (2026)	Cross-Sectional Survey	Questionnaires (Likert Scale) & Interviews	Registered Contractors, Consultants, Government Project Officers
Musyoka et al. (2025)	Mixed-Methods Design	Questionnaires, Key Informant Interviews, Project Audit Reports	Road Authority Engineers, Consultants, Main Contractors

From the review, it was clear that the data collection strategy employed by the authors was in three broad categories: - Primary Instrument: Over 90% of these studies utilized structured questionnaires utilizing a 5-point Likert scale (ranging from 1 = *Very Low/Strongly Disagree* to 5 = *Very High/Strongly Agree*) to measure the perceived severity and frequency of delay causes. Triangulation via Secondary Sources: Earlier foundational studies (e.g., Mbatha, 1986; Al-Mamlook et al. 2020) heavily integrated archival research and project record audits (payment certificates, site instruction books, meeting minutes) alongside questionnaires to verify the recorded versus the actual delay durations. Triangulation via Key Informant Interviews: Recent studies (e.g., Bii et al. 2026; Musyoka et al., 2025) incorporated semi-structured key informant interviews with lead consultants and government project directors to gain qualitative insights into administrative bureaucracy and price escalation dynamics.

4.2 Methodological Trends and Implications

The causes of delay in relation to the data collection methods in addition to the findings of the studies were analysed and the results are presented in Table 2.

**Table 2***Methodological Evolution Over Time*

Period	Dominant Design	Primary Data	Secondary Data	Key Analysis
1986-1999	Descriptive Survey	Questionnaires + Interviews	Project files	Descriptive Stats
2000-2015	Survey-based	Questionnaires	Limited/None	RII, Correlation
2016-2022	Mixed Methods	Questionnaires + Documents	Authority records	RII, Regression, ANOVA
2023-2025	Mixed/Cross-Sectional	Questionnaires + Interviews + Documents	Audit Reports	RII, Regression, ANOVA, Qualitative

The methodological approaches employed in construction delay research in Kenya have evolved significantly over the four-decade period covered by this review (Table 2). This evolution reflects broader trends in construction management research, from foundational descriptive studies to increasingly sophisticated mixed-methods approaches incorporating multiple data sources and analytical techniques.

Period 1: Foundational Studies (1986-1999). The earliest studies employed descriptive survey designs, utilizing structured questionnaires complemented by semi-structured interviews with key project stakeholders. A distinguishing feature of this period was the heavy reliance on secondary data sources, particularly project files, payment certificates, and completion logs from government ministries. This archival approach enabled researchers to verify reported delays against actual project records, providing a level of validity that later perception-based studies sometimes lacked. Analytical methods during this period were primarily descriptive, employing frequencies, percentages, and mean scores to quantify delay extent and rank causal factors. Only one study made an early methodological contribution by introducing the Relative Importance Index (RII), which became a standard analytical tool in subsequent Kenyan studies.

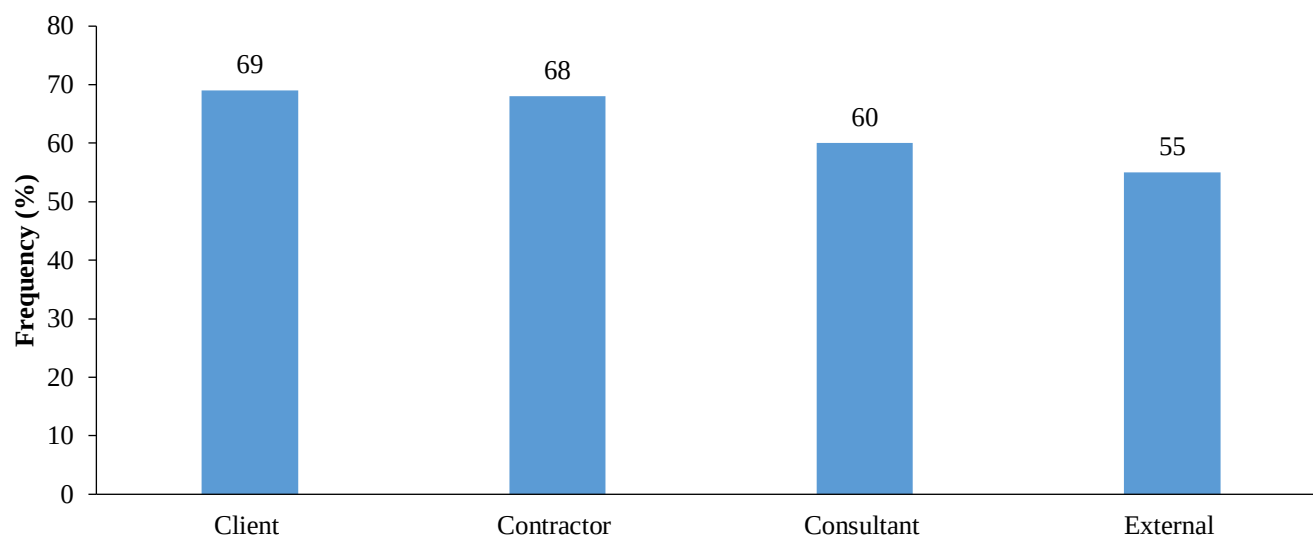
Period 2: Survey-Based Expansion (2000-2015). The period from 2000 to 2015 witnessed a proliferation of delay studies, characterized predominantly by questionnaire-based surveys targeting the tripartite construction stakeholder structure of clients, consultants, and contractors. Studies largely relied on self-administered or structured questionnaires utilizing 5-point Likert scales to measure perceived delay severity. Unlike the foundational period, these studies incorporated limited secondary data verification, with most findings based entirely on respondent perceptions. However, this period saw methodological advancement through the introduction of correlation analysis and more sophisticated statistical techniques, including regression modelling using software tools such as statistical package for Social Scientists (SPSS). Only two studies introduced inferential statistics such multiple linear regression and to Pearson correlation analysis to examine relationships between variables under consideration. The adoption of RII rankings also became more widespread, providing a standardized approach to factor prioritization.

Period 3: Mixed-Methods Integration (2016-2022): The period from 2016 to 2019 marked a significant methodological shift toward mixed-methods approaches and the reintegration of secondary data sources. This triangulation of data sources addressed a key limitation of earlier perception-based studies by allowing cross-validation of questionnaire responses against actual project performance records. Inferential statistics are now more prevalent with the use of analysis of variance (ANOVA), RII, correlation analysis and Chi-Square tests. This period also saw the reintroduction of qualitative content analysis to provide richer contextual understanding of delay mechanisms.

Period 4: Contemporary Mixed-Methods and Triangulation (2023-present): The most recent studies represent the methodological apex of construction delay research in Kenya, characterized by comprehensive mixed-methods designs and multi-source data triangulation. These contemporary studies combine structured questionnaires with key informant interviews and project audit reports, providing both quantitative breadth and qualitative depth. Both descriptive and inferential statistics analysis is incorporated. This comprehensive triangulation enables validation of findings across multiple data sources and provides richer insights into the administrative and bureaucratic processes underlying delay causation.

4.2.1 Categories of causes and extent of delays in construction projects in Kenya

The summary of the study outcomes and findings from the various studies were categorized according to the major players in the construction industry; the client, the consultant, the contractor and external factors as well as the extent of delays and the results are presented in Table 3 and Figure 2. Client- and contractor-related factors were the frequently cited causes of project delays with an average of 69% and 68% respectively (Figure 1). Consultant and external factors had an average frequency of 60% and 55% respectively.

**Figure 2**

Factors causing delays in road projects in Kenya

Table 3

Categorization of delay Causes and Extent of Delays

Stakeholder Category	Primary Delay Factors	Frequency (%)	Reported Impact Range
CLIENT-RELATED	Delayed interim payments and payment certificates	90	35-73% schedule overrun
	Administrative bureaucracy and slow decision-making	75	30-65% time escalation
	Scope changes and client-initiated variations	70	30-73% duration overrun
	Inadequate funding and budget allocation	60	40-65% schedule delays
	Delayed project approvals and decisions	50	40-70% completion delay
CONTRACTOR-RELATED	Cash flow constraints and liquidity deficits	85	35-70% time overrun
	Poor project planning and scheduling	80	40-73% duration expansion
	Inadequate site management and supervision	70	35-65% schedule overrun
	Equipment breakdowns and resource shortages	55	30-60% execution delays
	Poor technical skills and incompetent workforce	50	35-60% time overrun
CONSULTANT-RELATED	Incomplete design documentation and specifications	80	30-73% schedule overrun
	Delayed response to Requests for Information (RFIs)	65	35-65% project delay
	Late issuance of revised drawings and variations	60	35-60% time overrun
	Inadequate supervision and site inspections	55	30-65% schedule escalation
	Inaccurate initial site surveys and estimations	40	30-55% project delay
EXTERNAL FACTORS	Material price escalations and inflation	75	35-70% cost and time overrun
	Adverse weather conditions and rainfall	70	30-70% schedule disruption
	Wayleave disputes and land acquisition challenges	55	35-73% completion delay
	Macroeconomic instability and currency fluctuations	40	35-60% project overrun
	Regulatory and statutory approval delays	35	30-60% time escalation

The synthesis of delay factors across twenty studies spanning nearly four decades reveals a consistent pattern of stakeholder-specific causes that have persistently undermined construction project delivery in Kenya. The findings demonstrate that project delays are not attributable to isolated incidents but rather constitute a systemic challenge rooted in structural deficiencies across the entire project delivery ecosystem. Client-related factors represent the most severe delay causes, with delayed interim payments emerging as the single most critical factor, identified in 90% of reviewed studies and associated with schedule overruns of 35-73%. This finding is particularly significant because payment delays



trigger a cascade of contractor failures: reduced liquidity, inability to procure materials, demobilization of staff and equipment, and eventual work stoppages. This is also true for housing projects where Asinza et al (2016) noted that availability of finance and budgetary allocations which are client-related functions have significant effect in project completion.

Contractor-related factors are the most frequently cited delay causes, with cash flow constraints (85%) and poor project planning (80%) being particularly dominant. These findings suggest that many Kenyan contractors operate with insufficient working capital and inadequate project management capabilities. The persistence of these factors across the time period suggests that contractor capacity building has not kept pace with industry demands, necessitating enhanced registration criteria, training programs, and financial management support. These review for road projects is consistent with the findings by Kanda et al (2016) where contractor related factors were the most important factor affecting completion of water projects.

Consultant-related factors, while ranking third in frequency, are particularly consequential due to their early-stage influence on project execution for example, incomplete design documentation (80%) and delayed response to Requests for Information (65%) create conditions for rework, variations, and claims during construction, with reported impacts of 30-73% schedule overruns. Similarly, the late issuance of revised drawings (60%) and inadequate supervision (55%) amplify these challenges, particularly when coupled with inaccurate initial site surveys (40%). The impact of consultant deficiencies is often magnified because they occur during critical early project phases when design decisions have cascading effects on subsequent construction activities (Oloo, 2015; Musyoka et al., 2025). Therefore, addressing these deficiencies requires improved design quality assurance protocols, enhanced supervision frameworks, and timely response mechanisms to contractor queries.

External factors, though ranking lowest in frequency, present unique challenges as they are beyond direct stakeholder control. Material price escalations (75%) and adverse weather conditions (70%) are the most prominent external causes, reflecting Kenya's vulnerability to global commodity price fluctuations and the particular challenges posed by seasonal rainfall patterns for road construction projects. Wayleave and land acquisition disputes (55%) have emerged as increasingly significant delay factors in contemporary studies (Musyoka et al., 2025; Samo, 2024), reflecting growing urbanization pressures and land tenure complexities in Kenya. Macroeconomic instability (40%) and regulatory approval delays (35%) further compound these challenges. The reported delay impacts of 30-73% for external factors highlight the importance of realistic project scheduling those accounts for weather patterns, market conditions, and land acquisition timelines.

From the analysis, the top five delay factors across in road projects in Kenya based on the frequency are delayed payments to contractors, cash flow/liquidity constraints, poor project planning/Scheduling, incomplete design documentation and Material Price Escalations in that order. The ranking of the factors and the stakeholder category in given in Table 4.

Table 4

Top 5 Delay Factors Across in road projects in Kenya

Rank	Delay Factor	Stakeholder Category	Frequency (%)
1	Delayed Payment to Contractors	Client	90
2	Cash Flow/Liquidity Constraints	Contractor	85
3	Poor Project Planning/Scheduling	Contractor	80
4	Incomplete Design Documentation	Consultant	80
5	Material Price Escalations	External	75

4.3 The Domino Effect: Interconnected Causality

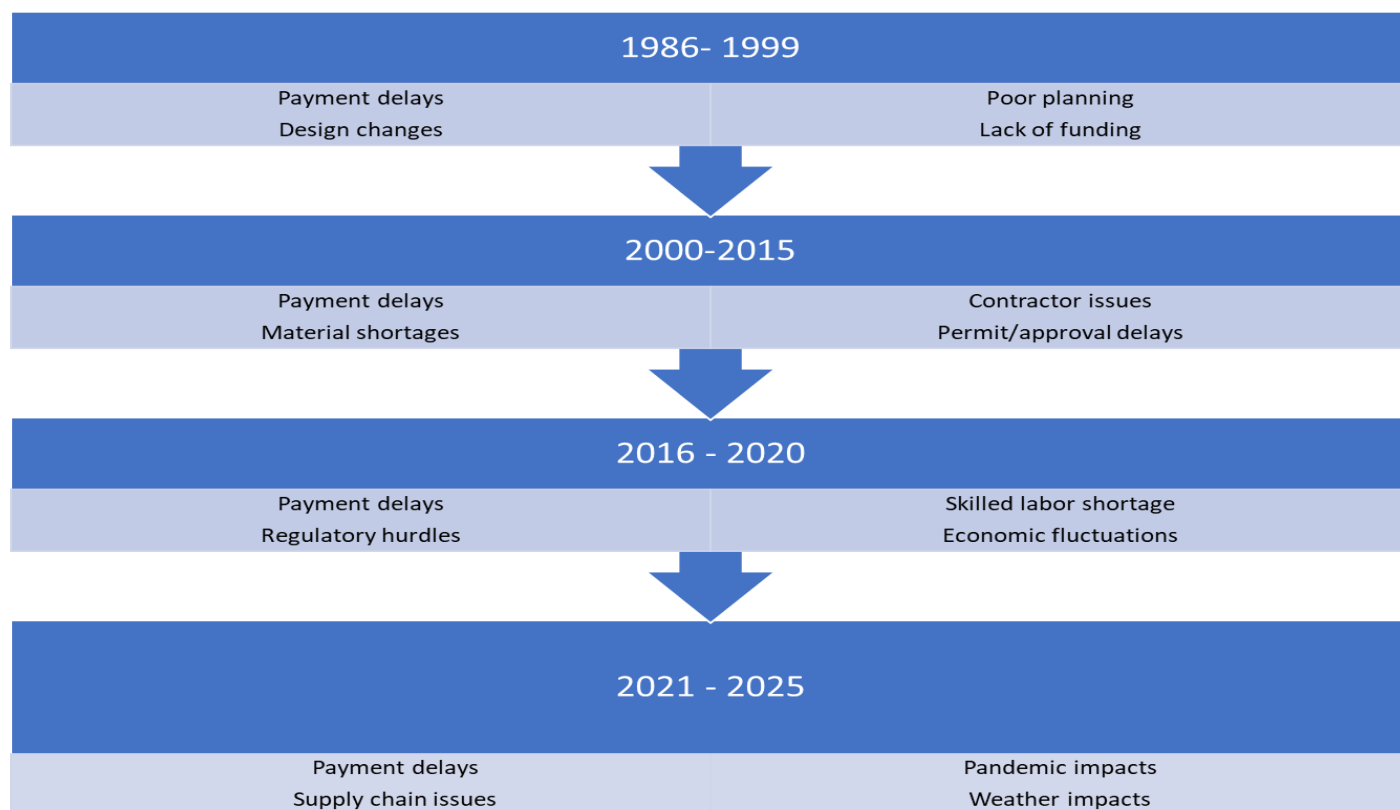
A critical insight emerging from this synthesis is the interconnected nature of delay causation. Delays rarely occur in isolation but rather cascade through the project delivery system in identifiable causal chains (Table 5). Client payment delays trigger contractor cash flow crises, which in turn lead to work stoppages and schedule overruns. Incomplete consultant design generates site revisions and variations, which require client approval through bureaucratic processes, creating further delays. External price escalations render initial bill-of-quantities rates unviable, triggering contractor claims and client approval delays. This domino effect explains why delay causes that appear separate in isolation are often causally linked, and why addressing single factors in isolation is unlikely to yield significant improvements in project delivery.

**Table 5***Dominant Causal Chains in Construction Delays in Kenya*

Primary Trigger	Category	Secondary Effect	Tertiary Outcome
Client Payment Delays	Client -related	Contractor cash flow crisis → Inability to pay suppliers/staff	Work stoppages, demobilization, schedule disruption
Incomplete Consultant Design	Consultant-related	RFIs and clarifications → Site revisions and variations	Rework, extended construction phase, claims
Material Price Escalation	External	BOQ rates become unviable → Contractor requests price adjustment	Client approval delays, work slowdowns, renegotiation
Inadequate Contractor Planning	Contractor-related	Poor resource allocation → Low productivity	Schedule compression, quality compromise, delays
Wayleave/Land Disputes	External	Limited site access → Inability to execute planned activities	Work stoppages, alternative routing, claims
Client Bureaucracy	Client-related	Slow variation order approvals → Prolonged decision cycles	Idle resources, demobilization, activity interruption
Adverse Weather/Rainfall	External	Site inaccessibility → Earthworks stoppage	Schedule disruption, rework, extension claims

4.4 Temporal Trends in Delay Causes

The temporal trends of delays factors show that payment delays are consistently ranked number one factor across the time periods signifying the important contribution in the construction industry and the inability of clients to meet their contractual obligations (Figure 3). Beyond 2020 Covid-19 pandemic which disrupted the supply chain, labour mobility and macro-economic environment. These factors eased somewhat towards the end of 2022 but the conflicts in the eastern Europe between Russia and Ukraine and the middle east conflict pitting USA/Israel and Iran has further complicated the supply chain dynamics. For example, the shipping disruptions at the Strait of Hormuz have greatly affected bitumen supply in Kenya, a key component in road construction.

**Figure 3***Temporal Variation of Delay Factors***4.5 Discussion**

The research design employed by studies on delay factors in construction industry evolved from simple descriptive to advanced multivariate techniques from 1986 to 2025. The use of mixed methods approach allows for triangulation of qualitative and quantitative findings allowing for greater understanding of causal factors as done by



Oloo (2015) and Mugo et al (2019). Despite these methodological advances, important gaps remain. For example, the geographic concentration of studies in major urban centres/cities and specific counties limits generalizability to the entire construction landscape in Kenya. The predominance of perception-based data, even in mixed-methods studies, introduces potential response bias. Another crucial gap is the absence of longitudinal studies tracking delay patterns over project lifecycles represents a significant methodological gap. It is therefore imperative that future research work should consider adopting prospective study designs, larger and more diverse samples, and the development of standardized delay measurement protocols that enable more meaningful cross-study comparison.

The causes of project delivery delays show that contractor related and client related are dominant. The consistent ranking of client payment delays as the primary cause indicates that improved budget planning, timely fund disbursement, and streamlined payment processes should be prioritized. This agrees with studies by Tulakhaba (1999), Mogoa and Muchelule (2023), and Samo et al. (2020). The prevalence of contractor-related factors points to the need for enhanced contractor registration criteria, capacity building programs, and financial management support. Here the role of the National Construction Authority (NCA) should be able to ensure capacity building programmes are enhanced for local contractors who form a bulk of the firms dealing with road projects in rural parts of Kenya under Kenya Rural Roads Authority (KeRRA). In addition, the road agencies should organize sensitization workshops for contractors to improve on their project management skills, a key component in project delivery (Lukale, 2018, Mugo et al., 2029). The frequency of consultant-related deficiencies suggests that improved design quality assurance and supervision protocols are necessary. Therefore, the Institution of Engineers of Kenya (IEK) together with the Association of Consulting Engineers of Kenya (ACEK) should continuously capacity built engineers in the road sector on emerging trends and practices. The ongoing challenges, on the other hand, posed by external factors highlight the importance of realistic project scheduling that accounts for weather patterns, market conditions, and land acquisition timelines. This agrees with the findings of Kitungo and Musembi (2024).

There are contractual actions that are critical in project delivery as they affect timing of activities. Decision making is noted as a factor in project delivery and this can be enhanced by having regular site meetings. Site meetings are important in project delivery but their effect in Kenya on delays in project completion has not been documented. However, Seboru (2015) notes slow decision making as one of the top causes of project delays yet many decisions are made during site meetings. Skills, experience and competence of key personnel in projects have come out strongly as a factor affecting project delivery and yet research on its effect on delays in project has not been determined and more so in Kenya. It is also evident that variations affect project delivery with major variations being of major concern (Oloo, 2015). Variations contribute in project cost overruns and its effect on project delays has needs to be determined. Project funding is a challenge in Kenya (Mugo et al (2019) and has come out from the review as a major contributor to project delays. The effect of cash flow on project duration has not been determined either. Therefore, there is need to establish the effect of key factors on construction delays in Kenya.

Finally, as found out in the review, there is no standard method of determining project duration in Kenya. The normal practice is determination by the client based on their needs of the project (Mbatha, 1986). This has resulted in overestimation and underestimation of project duration. Very little information on project duration prediction was found. Although different approaches are used to tackle project duration prediction, no model has been developed for Kenya. This is a gap in the body of knowledge to be addressed. Therefore, there is need to develop project duration prediction models for Kenya. This agrees with the findings of Bii et al. (2026) that analytical modelling is crucial in performance of road projects.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

From the review, it is concluded that project delays are foremost due to contractor related factors, followed by client related factors, then consultant related factors and finally external factors in that order. Thus, to address the issue of project delays in Kenya, the contractor capacity must be prioritized. The client must have a solid funding arrangement before starting a project and the consultant must be accurate in scope determination and ensure thorough supervision. Secondly, the delay in project delivery in Kenya has generally increased over the years without any tangible solution on sight. Thus, there is need to develop strategies to reverse the trend and have continual reduction in the project delays. In addition, it is evident that there are many factors affecting project delays in Kenya and these factors have remained over the years indicating that there is no concerted effort to address them. Consequently, contractors, consultants and clients must endeavour to address the factors that lead to project delays.

The effect of site meetings, key personnel, equipment, variations, cash flow and project duration prediction models on construction delays in Kenya has not been determined. The determination of the extent to which project delay factors affect project delivery is critical in decision making on areas to prioritize for improved delivery of projects in



Kenya. Finally, from the studies reviewed there is no mention of any model for predicting project duration in Kenya. Consequently, the determined project duration can be under or overestimated leading to poor resource management.

5.2 Recommendations

The review recommends that clients should ensure adequate budget and funds disbursement is done for timely delivery of projects as a way of addressing causes of delays in projects. In addition, there is need to improve contractor capacity through training and thorough vetting during registration to reduce the contractor factors that affect project delivery and reverse the delay trends observed over the years.

A study to quantify the amount of delay in construction projects in Kenya in the recent times is necessary. There is need to analyse the factors affecting construction in Kenya for data driven decision making for policy review that is intended to address the specific causes of poor project performance and delays. The effect of site meetings, key personnel, equipment, variations, cash flow and project duration prediction models on construction delays in Kenya needs to be determined. Finally, there is need to develop project duration prediction models for Kenya.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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