Current Research Bulletin

Volume 03 Issue 05 May 2026, Page no: 174-181

Available Url: http://crbjour.org/

Article DOI: 10.55677/CRB/I5-05-CRB2026

e-ISSN: 3050-5933
p-ISSN: 3050-5925

Open Access

Factors Affecting Road Construction Delays in Region XI

Priam S. Lumandong Jr.[1], Garry L. Bastida[2*]

[1]Master in Business Administration, Faculty of Advanced and International Studies

[2]Davao Oriental State University, Mati, Davao Oriental, Philippines

Published Online:
27 May 2026

Article DOI:
10.55677/CRB/I5-04-CRB2026

ABSTRACT: This study investigates the factors contributing to delays in road construction projects in Region XI, Philippines, using descriptive and inferential research designs. Data were collected from 150 project engineers and investigators involved in DPWH-funded projects. Exploratory factor analysis identified four major components influencing delays: environmental/external conditions, design and planning issues, economic and policy constraints, and operational inefficiencies. Among these, design-related factors, particularly design errors and incomplete feasibility studies, emerged as the most potent causes of delay. Conversely, labor shortages, economic crises, and bureaucratic processes were found to have comparatively lesser influence. Analysis of variance revealed no significant differences in perceptions across project cost categories, indicating that delay factors are systemic across project scales. The findings emphasize the critical importance of strengthening pre-construction planning and financial management to improve project timeliness and efficiency..

KEY WORDS: road construction delays, project planning, feasibility study, infrastructure development, project management, Philippines

Cite the Article: *Lumandong, P.S., Bastida, G.L. (2026). Factors Affecting Road Construction Delays in Region XI. Current Research Bulletin, 3(5), 174-181. https://doi.org/10.55677/CRB/I5-05-CRB2026*

INTRODUCTION

Road infrastructure plays a vital role in national and regional development by supporting economic growth, social mobility, public service delivery, and community connectivity. In the Philippines, continuous investments in public infrastructure, particularly road construction, have been recognized as essential to sustaining economic growth and improving citizens' quality of life. However, despite increased government spending and intensified infrastructure programs, road construction projects continue to experience significant delays, affecting project costs, quality, and public trust. Studies have shown that these delays are commonly associated with poor project planning, inadequate project management, a shortage of skilled labor, delayed procurement processes, right-of-way acquisition issues, financial constraints, and external disruptions such as extreme weather conditions and political interference (Egwim et al., 2023; World Bank, 2024). These recurring problems demonstrate that construction delays are not isolated incidents but are deeply rooted in managerial, institutional, technical, and environmental challenges.

Globally, numerous studies have examined the causes of delays in road and infrastructure projects. Research conducted in developing and developed countries consistently identified contractor-related issues, poor scheduling, design changes, inadequate communication, financial difficulties, and regulatory bottlenecks as major contributors to project delays. Kumar (2020) emphasized that highway projects are often affected by right-of-way disputes, delayed progress payments, and insufficient manpower, while Kassa (2020) identified poor coordination, inaccurate forecasting, and political interests as major determinants of delays in infrastructure projects. Similarly, Alhinai et al. (2020) and Karunakaran et al. (2019) highlighted improper project planning and inexperienced personnel as persistent issues in road construction. Local studies in the Philippines likewise revealed that weather disturbances, peace and order concerns, material shortages, and contractor capability limitations significantly affect project timelines (Cabahug et al., 2018). These studies collectively indicate that road construction delays are influenced by a

combination of managerial, financial, technical, institutional, and environmental factors that interact and create complex implementation challenges.

Although several international and local studies have investigated construction delays, there remains a significant research gap in localized, region-specific analyses, particularly in Region XI (Davao Region), the Philippines. Most existing studies focus on national trends or generalized infrastructure issues without examining how local conditions shape delay patterns within a specific regional context. Region XI presents unique challenges, including geographical remoteness, seasonal heavy rainfall, logistical constraints in transporting materials and equipment, right-of-way conflicts in rural and peri-urban areas, and varying contractor capacities. Moreover, limited empirical studies have quantitatively identified the most potent and least influential factors in delays among DPWH-funded road projects in the region. There is also insufficient analysis of whether these factors differ significantly by project characteristics, such as project amount and duration. Addressing these gaps is important because Region XI serves as a strategic economic corridor connecting communities, markets, and production areas across Mindanao.

Anchored on Project Management Theory, Theory of Constraints, Resource-Based View Theory, and Institutional Theory, this study examined the factors contributing to delays in road construction projects in Region XI, Philippines. Specifically, it sought to determine the profiles of construction firms in terms of project amount and duration, identify the most potent and least common delay factors, and examine whether significant differences exist when these factors are grouped by firm profile. The study recognizes that delays may arise from deficiencies in project planning, resource allocation, stakeholder coordination, institutional processes, and external environmental conditions. By integrating these theoretical perspectives, the study provides a comprehensive framework for understanding delays as outcomes of interconnected managerial, organizational, and institutional constraints.

The significance of this study lies in its potential contribution to both practice and scholarship. For contractors, project managers, and construction professionals, the findings may offer practical insights into improving planning, scheduling, and resource management to minimize project delays. For government agencies and Provincial Local Government Units (PLGUs), the study may serve as a basis for improving procurement systems, streamlining approval processes, and strengthening infrastructure governance. Academically, the study contributes to the growing body of knowledge in construction management by offering a localized, empirically grounded analysis of road construction delays in Region XI. Furthermore, the use of multivariate analysis strengthens the study's methodological rigor and may serve as a foundation for future researchers investigating infrastructure performance, risk management, and project delivery in similar contexts.

MATERIAL AND METHODS

The methodology used to examine the factors causing delays in road construction projects in Region XI, Philippines. The study employed both descriptive and inferential research designs to describe the current conditions of road construction projects and determine significant patterns and relationships among the identified delay factors. A universal sampling or census approach was used, with all 150 Project Engineers and Project Investigators involved in DPWH-funded road projects serving as respondents. Data were collected using a structured, validated questionnaire that included the demographic profile of construction firms and the factors contributing to project delays. Before actual data collection, the instrument underwent expert validation and pilot testing to ensure reliability and accuracy. Responses were measured using a 4-point Likert scale, while trained enumerators conducted one-on-one interviews to facilitate data collection. Both primary and secondary data sources, including journal articles, government reports, and related studies, were used to support the investigation and identify commonly cited causes of delays in road construction projects.

The gathered data were analyzed using frequency counts and percentages to summarize project profiles by amount and duration. Exploratory Factor Analysis (EFA) was employed to identify underlying dimensions of delay factors, guided by acceptable factor loadings, communalities, Kaiser-Meyer-Olkin (KMO) values, and Bartlett's Test of Sphericity. Analysis of Variance (ANOVA) was applied to determine significant differences in perceived delay factors across project characteristics, with Tukey's HSD used for post hoc analysis when necessary. Ethical standards were strictly observed throughout the study, including voluntary participation, informed consent, confidentiality, and compliance with Republic Act No. 10173 or the Data Privacy Act of 2012. Measures such as data anonymization, restricted access, and secure storage were implemented to protect participants' information and ensure the integrity and credibility of the research process.

RESULTS

Table 1. Profile of the Respondents

Project Cost	Counts	% of Total
1M to 5M	4	2.67%
5M to 20M	15	10.00%

Project Cost	Counts	% of Total
30M to 35M	22	14.67%
More than 45M	109	72.67%

The results show that most respondents (72.67%) were involved in projects costing more than ₱45 million, while only a small proportion handled projects costing ₱1M–₱5M (2.67%). This indicates that the study primarily reflects the experiences of professionals engaged in large-scale infrastructure projects.

Factors Affecting Road Construction Delays in Region XI

Table 2. KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.886
Bartlett's Test of Sphericity	Approx. Chi-Square	14782
	df	300
	Sig.	< .001

The KMO value of 0.886 and the significant Bartlett's Test ($p < .001$) indicate that the dataset is suitable for factor analysis and that the variables are significantly interrelated.

Table 3. Component Loadings

	Component			
	1	2	3	4
Q11. Unexpected ground conditions and terrain problems	0.890			
Q7. Inadequate local production of raw materials	0.859			
Q4. Peace and order, and security concerns	0.835			
Q9. Social and Cultural Impacts	0.810			
Q3. Political conditions and political interests	0.746			
Q5. Equipment breakdowns or a lack of efficient equipment	0.680			
Q21. Errors in design		0.948		
Q20. Incomplete feasibility study before project approval		0.947		
Q24. Poor financial control on-site		0.712		
Q25. Shortage of skills laborers and technical personnel			0.764	
Q17. Global financial or economic crises			0.754	
Q16. Government policies and slow bureaucratic decision-making			0.753	
Q22. Late completion of design works			0.667	
Q23. Payment delays by the client/owner			0.663	
Q14. Contractors' excessive workload				0.893
Q15. Community-related issues: traffic congestion, local community concerns, and site safety conditions				0.787
Q10. Poor project management and supervision				0.688
Mean	***0.803***	***0.869***	***0.720***	***0.789***

The rotated component matrix identified four major dimensions affecting road construction delays. Component 1 represents external and environmental factors; Component 2, planning and design issues; Component 3, economic and policy-related concerns; and Component 4, operational and management-related issues.

Table 4. Total Variance Explained

	Initial Eigenvalues		
	Eigenvalue	% of Variance	Cumulative %
Component 1	4.96	19.83	19.80
Component 2	3.67	14.67	34.50
Component 3	3.01	12.05	46.50
Component 4	2.54	10.18	56.70

The four extracted components explained 56.70% of the total variance, indicating that the identified factors sufficiently explain the major causes of road construction delays.

Most Potent Factors Causing Road Construction Delays

Table 5: Most Potent Factors that Cause Road Construction Delays

Factors	Factor Loading
Errors in design	0.948
Incomplete feasibility study before project approval	0.947
Poor financial control on-site	0.712

The results indicate that planning and design-related factors are the strongest contributors to delays in road construction projects.

Least Influential Factors Causing Road Construction Delays

Table 6: Least Factors that Cause Road Construction Delays

Factors	Factor Loading
Shortage of skills laborers and technical personnel	0.764
Global financial or economic crises	0.754
Government policies and slow bureaucratic decision-making	0.753
Late completion of design works	0.667
Payment delays by the client/owner	0.663

The findings show that although these factors have lower loadings compared to the most potent factors, they still contribute to project delays.

Significant Difference in the Most Potent Factors According to Project Cost

Table 7. Analysis on the Difference in the Most Potent Factors across Demographic Profile of the Respondents

Factors	*Project Cost (Means)*				F-value	p-value	*Remarks*
	1M to 5M	5M to 20M	30M to 35M	More than 45M			
Errors in design	2.75	2.73	2.59	2.72	*0.383*	*.766*	*Not Significant*
Incomplete feasibility study before project approval	2.75	2.80	2.59	2.72	*0.596*	*.631*	*Not Significant*
Poor financial control on-site	3.25	3.00	3.18	3.14	*.425*	*.732*	*Not Significant*

The analysis revealed no significant differences in the most potent delay factors across project cost categories since all p-values exceeded 0.05.

Significant Difference in the Least Factors According to Project Cost

Table 8. Analysis on the Difference in the Least Factors across Demographic Profile of the Respondents

Factors	*Project Cost (Means)*				F-value	p-value	*Remarks*
	1M to 5M	5M to 20M	30M to 35M	More than 45M			
Shortage of skills laborers and technical personnel	3.00	3.07	3.14	3.15	*0.451*	*.658*	*Not Significant*
Global financial or economic crises	3.75	3.20	3.32	3.29	*1.07*	*.395*	*Not Significant*
Government policies and slow bureaucratic decision-making	3.00	2.93	2.91	2.86	*0.843*	*.551*	*Not Significant*
Late completion of design works	2.25	2.73	2.77	2.69	*1.21*	*.348*	*Not Significant*
Payment delays by the client/owner	2.25	2.73	2.82	2.70	*1.55*	*.252*	*Not Significant*

The results indicate no significant differences in respondents' perceptions of the least influential delay factors across project cost categories.

DISCUSSIONS

The findings indicate that most respondents were involved in large-scale infrastructure projects, suggesting that the study reflects the realities and challenges experienced in high-budget road construction projects. Large-scale projects are often more vulnerable to delays due to their complexity, multiple stakeholders, and extensive coordination requirements. This supports previous studies that emphasize that megaprojects are highly susceptible to schedule disruptions and cost overruns due to planning inaccuracies and management challenges.

The factor analysis revealed that road construction delays in Region XI are multidimensional, involving environmental, planning, economic, operational, and managerial factors. Among these, planning and design-related issues emerged as the most significant causes of delays, particularly design errors and incomplete feasibility studies. These findings highlight the critical importance of the pre-construction phase, where inaccurate designs, insufficient feasibility assessments, and weak financial planning create problems that extend throughout project implementation. Poor planning often leads to rework, schedule adjustments, and increased project costs, significantly affecting project completion timelines.

Although labor shortages, economic crises, bureaucratic delays, and payment issues were identified as less influential factors, they still contributed to project delays. Their lower impact may indicate improvements in workforce management, financial systems, and administrative processes; however, they remain relevant challenges that continue to affect project efficiency. The absence of significant differences across project cost categories further suggests that the causes of delays are systemic and affect projects similarly regardless of size. This implies that the identified issues are deeply embedded within the construction industry and are not exclusive to either small- or large-scale projects.

The findings strongly support the study's theoretical foundations. Project Management Theory explains that delays arise from failures in managing time, cost, scope, and quality. Similarly, the Theory of Constraints emphasizes that bottlenecks such as design deficiencies, financial limitations, and bureaucratic inefficiencies restrict project performance. The Resource-Based View Theory further explains that inadequate management of financial, technical, and human resources contributes to delays, while Institutional Theory highlights the influence of government policies, regulatory procedures, and external institutional conditions on project implementation. Overall, the study confirms that road construction delays in Region XI are driven by interconnected managerial, organizational, environmental, and institutional factors that require comprehensive, coordinated solutions.

CONCLUSION

This study examined the factors causing delays in road construction projects in Region XI, Philippines, and revealed that construction delays are influenced by multiple interrelated environmental, managerial, financial, operational, and institutional factors. The findings showed that most respondents were involved in large-scale infrastructure projects, suggesting that the study

primarily reflects the experiences and challenges of high-value road construction projects. Exploratory Factor Analysis identified four major dimensions of delay factors: external and environmental conditions, planning and design issues, economic and policy-related concerns, and operational and management inefficiencies. These results confirm that road construction delays are multidimensional and cannot be attributed to a single cause alone.

Among the identified factors, design errors and incomplete feasibility studies emerged as the most potent contributors to delays. This indicates that weaknesses during the planning and pre-construction stages significantly affect project implementation and completion. Poor on-site financial control also contributed substantially to project delays, underscoring the importance of effective financial and project management practices. On the other hand, factors such as labor shortages, economic crises, bureaucratic delays, and payment delays were found to be less influential, although they still affected project performance to some extent. These findings suggest that improving project planning, strengthening design accuracy, conducting comprehensive feasibility studies, and enhancing financial management systems are critical in minimizing construction delays.

Furthermore, the study found no significant differences in respondents' perceptions of the most potent and least influential factors, regardless of project cost. This implies that the causes of road construction delays are systemic and consistently experienced across different project categories, regardless of project size or budget. The consistency of these findings strengthens the conclusion that delay-related issues are deeply embedded within the construction industry and require industry-wide solutions rather than project-specific interventions.

The findings support the study's theoretical foundations, particularly Project Management Theory, Theory of Constraints, Resource-Based View Theory, and Institutional Theory. The study concludes that delays in road construction projects in Region XI result from deficiencies in project planning, resource management, institutional processes, and stakeholder coordination. Therefore, addressing these issues requires integrated strategies involving improved project preparation, stronger governance mechanisms, enhanced resource allocation, and better coordination among government agencies, contractors, consultants, and project stakeholders. Through these measures, the efficiency and timely completion of road construction projects in Region XI may be significantly improved.

REFERENCES

1. Alhinai, S., Widyarto, S., & Bhuiyan, A. B. (2020, January). A Conceptual Paper: Factors Causing Delays in Road Construction in the Sultanate of Oman. In *Post Grad. Res. Symp*(Vol. 1, No. 1).
2. Alinaitwe, H., Apolot, R., & Tindiwensi, D. (2013). Investigation into the causes of delays and cost overruns in Uganda's public sector construction projects. *Journal of Construction in Developing Countries*, *18*(2), 33.
3. Atibu, M. (2015). An investigation into factors causing delays in road construction projects in Kenya.
4. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108.
5. Bekr, G. A. (2015). Causes of Delay in Public Construction Projects in Iraq. *Jordan Journal of Civil Engineering*, *9*(2).
6. Cabahug, R. R., Arquita, M. B., De La Torre, S. M. E., Valledor, M. S., & Olivares, S. M. D. (2018). Factors influencing the delay of road construction projects in Northern Mindanao, Philippines. *Mindanao Journal of Science and Technology*, *16*(1).
7. Castañeda, K., et al. (2025). *Deficiencies in road construction scheduling.* ScienceDirect. https://www.sciencedirect.com/science/article/pii/S2405844024175457
8. Chileshe, N., Berko, P. D., & Haupt, T. (2010). *Causes of project cost overruns within the Ghanaian road construction sector* (Doctoral dissertation, Association of Schools of Construction of Southern Africa).
9. Corbo, A. (2022). "What is Inferential Statistics?" Retrieved from bttps://builtin.com/data-science/inferential-statistics.
10. Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
11. Garapim, B. (2025). Infrastructure development, particularly road construction, plays a crucial role in Thailand's overall progress. DOI: http://dx.doi.org/10.13140/RG.2.2.13723.37929.
12. Department of Public Works and Highways — Regional Office XI. (2022, April 8). *DPWH Region 11 vows to maintain the momentum of huge projects.* https://www.dpwh.gov.ph/dpwh/news/26235.
13. Egwim, C. N., et al. (2023). Systematic review of critical drivers for delay risk prediction. *[Journal/Publisher]*. https://www.emerald.com/febe/article/3/1/16/69677/Systematic-review-of-critical-drivers-for-delay.
14. Ezeldin, A. S., & Abdel-Ghany, M. (2013). Causes of construction delays for engineering projects: An Egyptian perspective. In *AEI 2013: Building solutions for architectural engineering* (pp. 54-63).
15. Hair, J.F. et al. (2010). Multivariate data analysis (7th ed). Pearson.
16. Hasan, R., Suliman, S. M., & Malki, Y. A. (2014). An investigation into the delays in road projects in Bahrain. *International Journal of Research in Engineering and Science*, *2*(2), 38-47.

17. International Bank for Reconstruction and Development / World Bank. (2024). *Drivers of delays in the procurement of infrastructure projects.* Open Knowledge Repository. https://openknowledge.worldbank.org/entities/publication/f7f49cae-f0a6-44af-9bf1-bb6ed45e605d.
18. Islam, M. S., Trigunarsyah, B., Hassanain, M., & Assaf, S. (2015). Causes of delay in construction projects in Bangladesh. In *International conference on construction engineering and project management* (pp. 82-86). Korea Institute of Construction Engineering and Management.
19. Goldratt, E. M. (1990). *Theory of constraints*. Croton-on-Hudson, NY: North River Press.
20. Gunduz, M., & AbuHassan, M. H. (2016). Causes of construction delays in Qatar construction projects. *International Journal of Civil, Environmental, Structural, Construction and Architectural Engineering*, *10*(4), 516-521.
21. Kaliba, C., Muya, M., & Mumba, K. (2009). Cost escalation and schedule delays in road construction projects in Zambia. *International journal of project management*, *27*(5), 522-531.
22. Kamanga, M. J., & V d M Steyn, W. J. (2013). Causes of delay in road construction projects in Malawi. *Journal of the South African Institution of Civil Engineering= Joernaal van die Suid-Afrikaanse Instituut van Siviele Ingenieurswese*, *55*(3), 79-85.
23. Karunakaran, S., Malek, M. A., & Ramli, M. Z. (2019). Causes of delay in construction of highway projects: A review.
24. Kassa, Y. F. (2020). Determinants of infrastructure project delays and cost escalations: the cases of federal road and railway construction projects in Ethiopia. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, *63*(1), 102-136.
25. Khair, K., Mohamed, Z., Mohammad, R., Farouk, H., & Ahmed, M. E. (2018). A management framework to reduce delays in road construction projects in Sudan. *Arabian Journal for Science and Engineering*, *43*(4), 1925-1940.
26. Kerzner, H. (2017). *Project management: A systems approach to planning, scheduling, and controlling* (12th ed.). Hoboken, NJ: John Wiley & Sons.
27. Kumar, A., & coauthors. (2020). A study on causes of delay in road construction projects across 25 developing countries. *[Journal]*. (Published 2020). https://www.researchgate.net/publication/346213970_A_Study_on_Causes_of_Delay_in_Road_Construction_Projects_across_25_Developing_Countries.
28. Kumar, V. (2020). Delay in construction of highway and expressway projects. *Int. Res. J. Eng. Technol*, *7*, 2136-2142..
29. Le-Hoai, L., Lee, Y. D., & Lee, J. Y. (2008). Delay and cost overruns in Vietnam large construction projects: A comparison with other selected countries. *KSCE journal of civil engineering*, *12*(6), 367-377.
30. MacCullam, R. C. et al. (1999). Sample size in factor analysis. Psychological Methods, 4(1), 84-89. https://doi-org/10.1037/1082-989X.4.1.84.
31. Mahamid, I. (2017). Schedule delay in Saudi Arabia road construction projects: size, estimate, determinants and effects. *International Journal of Architecture, Engineering and Construction*, *6*(3), 51-58.
32. Mahamid, I., Bruland, A., & Dmaidi, N. (2012). Causes of delay in road construction projects. *Journal of management in engineering*, *28*(3), 300-310.
33. Neural-network forecasting of construction cost for DPWH Region XI road projects (Author(s)). (2022). *[Thesis / Journal]*. ResearchGate. https://www.researchgate.net/publication/362691786_Forecasting_Construction_Cost_Using_Artificial_Neural_Network_for_Road_Projects_in_the_Department_of_Public_Works_and_Highways_Region_XI
34. Philippine Statistics Authority — Regional Statistical and Economic Trends (RSET) Davao Region. (2022). *RSET 2022 Davao Region.*https://rsso11.psa.gov.ph/sites/default/files/11RSSOXI/Attachment/2022%20RSET%20Davao%20Region_0.pdf
35. Research on delays from risk-management perspective (2025). *Delays in the road construction projects from risk management perspective.* ResearchGate. https://www.researchgate.net/publication/354750773_Delays_in_the_Road_Construction_Projects_from_Risk_Management_Perspective
36. Rivera, L., Baguec, H., Jr., & Yeom, C. (2020). A Study on Causes of Delay in Road Construction Projects across 25 Developing Countries. *Infrastructures*, *5*(10), 84. https://doi.org/10.3390/infrastructures5100084.
37. Sanbato, M. T. (2024). Descriptive research design: Foundations and applications. Addis Ababa: Research & Development publishing.
38. Santoso, D. S., & Soeng, S. (2016). Analyzing delays of road construction projects in Cambodia: Causes and effects. *Journal of Management in Engineering*, *32*(6), 05016020.
39. Scott, W. R. (2004). *Institutional theory: Contributing to a theoretical research program*. In K. G. Smith & M. A. Hitt (Eds.), *Great minds in management: The process of theory development* (pp. 460–484). Oxford University Press.
40. Shinija, P. (2024). Understanding research methodologies in the social sciences. New Delhi: Academic press.

41. Thapanont, P., Santi, C., & Pruethipong, X. (2018). Causes of delay on highway construction projects in Thailand. In *MATEC Web of Conferences* (Vol. 192, p. 02014). EDP Sciences.
42. Wheaton, B. et al., (1977). Assessing reliability and stability in panel models. In D. R. Heise (Ed.), Sociological methodology (pp.84-136). San Francisco: Joseey-Bass.
43. Worthington, R. L. & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. The Counseling Psychologist, 34(6), 806-838. https://doi-org/10.1177/0011000006288127.
44. Yang, J. B., Yang, C. C., & Kao, C. K. (2010). Evaluating schedule delay causes for private participating public construction works under the Build-Operate-Transfer model. *International Journal of Project Management*, *28*(6), 569-579.