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Contractor Engagement and Performance in Public Infrastructure Development: An Assessment of DPWH Projects in Catanduanes, Philippines

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Abstract

Effective contractor engagement is critical to the success of public infrastructure projects, yet deficiencies in communication, coordination, and collaboration often undermine project quality, timeliness, and safety outcomes. This study examined contractor engagement and performance in Department of Public Works and Highways (DPWH) infrastructure projects in Catanduanes, Philippines, to understand how engagement practices influence project outcomes. Grounded in Social Exchange Theory, Systems Theory, and Project Management Theory, a descriptive-correlational design was employed to assess the relationship between engagement dimensions—communication, collaboration, and coordination—and performance indicators, including timeliness, quality, and safety adherence. A structured, researcher-developed survey instrument was administered to a stratified sample of 86 respondents (58 DPWH personnel, 28 project stakeholders), with instrument reliability confirmed via a pretest–posttest procedure ($r = 0.98$). Weighted mean scores indicated high engagement (AWM = 3.26) and moderate contractor performance (AWM = 2.95). Independent-samples t-tests revealed no significant differences between personnel and stakeholder perceptions of engagement ($t = 0.00$, $p > 0.05$) or performance ($t = 0.00$, $p > 0.05$), while Pearson correlation analysis showed a weak, non-significant relationship between engagement and performance ($r = 0.049$, $p > 0.05$).

Keywords: contractor engagement, project performance, DPWH, infrastructure projects, Philippines, descriptive-correlational study, strategic intervention

INTRODUCTION

In recent years, the infrastructure sector has increasingly emphasized the importance of effective contractor engagement as a determinant of project success. Research consistently demonstrates that strong relationships between contractors, project owners, and project managers—rooted in open communication, mutual collaboration, and efficient coordination—lead to higher project quality, improved timeliness, and enhanced safety outcomes (Prebanić & Vukomanović, 2023). Early contractor involvement during planning and design phases also facilitates proactive risk management, cost efficiency, and the seamless allocation of resources (Rousakis & Roberts, 2021). Conversely, deficiencies in communication, fragmented coordination, and inadequate stakeholder collaboration have been identified as persistent causes of project underperformance and cost overruns in construction industries worldwide (Chen & Messner, 2020; Fadipe, 2023). Moreover, transparent contractor performance evaluation mechanisms have become indispensable in promoting accountability, quality assurance, and sustainability in public sector infrastructure projects (Saep, Florencondia, & Cabrera, 2024). While these global findings provide valuable insights, the contextual realities of developing economies, marked by uneven institutional capacity and governance structures, demand more localized empirical studies that reflect their unique project environments and evolving socio-economic dynamics.

Within the Philippine context, understanding contractor engagement and performance is both timely and significant. The Department of Public Works and Highways (DPWH), mandated to implement national and local infrastructure programs, heavily relies on partnerships with private contractors through its regional and district offices. However, local contractors frequently encounter challenges related to technical expertise, financial capacity, and logistical efficiency, which may constrain their ability to meet project standards. Recent national assessments reveal persistent issues in procurement processes, contractor capacity development, and monitoring and evaluation mechanisms across public works projects (World Bank, 2025). Although initiatives such as the Constructor's Performance Evaluation System (CPES) have been adopted to standardize assessments and foster continuous improvement (Open Government Partnership, 2025), the empirical link between contractor engagement—operationalized through communication, collaboration, and coordination—and project performance—measured through timeliness, quality, and safety compliance—remains insufficiently explored, particularly in provincial contexts like Catanduanes.

This study addressed this gap by examining the level of contractor engagement and performance in the implementation of DPWH infrastructure projects in the Province of Catanduanes. Specifically, it analyzed how engagement practices influence contractor performance and explored perceptual differences between DPWH personnel and key stakeholders regarding engagement and performance indicators.

By focusing on a geographically isolated and resource-constrained province, this study provides empirical evidence on the engagement–performance nexus within a developing-country infrastructure setting. Its findings offer policy-relevant insights for enhancing contractor collaboration, strengthening accountability mechanisms, and improving the efficiency and quality of public infrastructure delivery across the Philippines.

Statement of the Problem. This study aimed to assess the level of contractor engagement and performance in the implementation of infrastructure projects under the Department of Public Works and Highways (DPWH) in the Province of Catanduanes, Philippines. Recognizing that effective collaboration between contractors and project managers is vital to ensuring timely, high-quality, and safe infrastructure delivery, the study sought to evaluate how engagement practices influence overall project performance. Specifically, the study sought to answer the following research questions:

1. What is the level of engagement between DPWH local contractors and project managers, as evaluated by DPWH personnel and key stakeholders, in terms of:
   1.1 Communication;
   1.2 Collaboration; and
   1.3 Coordination?

2. What is the level of performance of DPWH local contractors in infrastructure project implementation as perceived by DPWH personnel and stakeholders in terms of:
   2.1 Project completion time;
   2.2 Quality of work, and
   2.3 Adherence to safety standards?

3. Is there a significant difference between the evaluations of DPWH personnel and stakeholders regarding the level of engagement between contractors and project managers?

4. Is there a significant difference between the perceptions of DPWH personnel and stakeholders regarding the performance of DPWH local contractors in infrastructure projects in Catanduanes?

5. Is there a significant relationship between the level of engagement between contractors and project managers and the

level of performance of DPWH local contractors?

6. What strategic interventions can be proposed to strengthen contractor engagement practices and enhance the performance and accountability of DPWH local contractors in the province?

Hypotheses. In alignment with the study's inferential research questions (Items 3–5 in the Statement of the Problem), the following null hypotheses were tested at 0.05 significance level:

Ho1. There is no significant difference between the evaluations of DPWH personnel and stakeholders regarding the level of engagement between contractors and project managers.

Ho2. There is no significant difference between the perceptions of DPWH personnel and stakeholders regarding the performance of DPWH local contractors in infrastructure projects in Catanduanes.

Ho3. There is no significant relationship between the level of engagement between contractors and project managers and the level of performance of DPWH local contractors.

Scope of the Study. This study was conducted in the Province of Catanduanes, focusing on infrastructure projects implemented by contractors under the supervision of the Department of Public Works and Highways (DPWH) Catanduanes District Engineering Office. It examined contractor engagement and performance in projects such as the construction and rehabilitation of roads, bridges, and flood control systems under national and local programs, including the Convergence and Special Support Program (CSSP), Sustainable Infrastructure Program Alleviating Gaps (SIPAG), Basic Infrastructure Program (BIP), and Local Program (LP). Respondents comprised DPWH engineers, inspectors, and municipal stakeholders from eleven municipalities. Data were collected through structured questionnaires during fiscal year 2025–2026.

Theoretical/Conceptual Framework. This study is anchored on three complementary theories that collectively frame the analysis of contractor engagement and performance in DPWH infrastructure projects, with each theoretical lens explicitly aligned with the study's problem statements. Social Exchange Theory corresponds to Problem Statements 1 and 3 by explaining how trust, reciprocity, and relational norms between contractors and DPWH personnel shape levels of engagement, cooperation, transparency, and compliance, thereby influencing performance outcomes (Xue et al., 2022). Systems Theory directly informs Problem Statement 2 by elucidating how interdependent subsystems within infrastructure projects, such as procurement, planning, supervision, and quality control, interact to influence implementation efficiency and underscore contractor performance as a systemic rather than isolated outcome (Sirovs, 2022). Project Management Theory corresponds to Problem Statement 4 by providing a structured basis for examining strategies that enhance contractor performance through stakeholder engagement, communication, risk management, and coordinated oversight, in accordance with established project management standards (PMBOK, 2021). Collectively, these theories establish an integrated conceptual foundation that captures relational dynamics, systemic interdependencies, and managerial mechanisms, thereby offering a comprehensive framework for understanding and improving contractor performance in public infrastructure projects.

The conceptual paradigm (Figure 1) adopts an Input-Process-Output (IPO) model, where inputs comprise engagement dimensions, stakeholder characteristics, and project attributes; processes involve evaluation, comparison, and statistical analysis; and outputs include measured levels of engagement and performance, identification of perception gaps, and strategic interventions to

enhance accountability and project outcomes (Hallinger, 2022). This framework provides a systematic, empirically testable basis for examining the dynamic interplay between relational, systemic, and managerial factors in public infrastructure projects within diverse contextual settings.

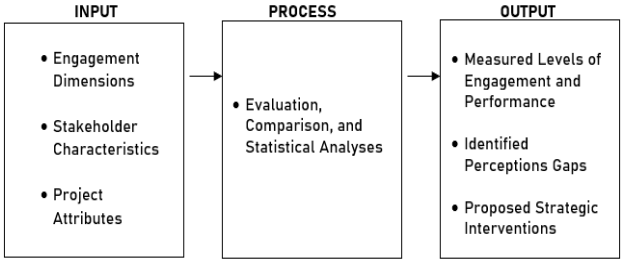

Figure 1
Conceptual Paradigm of the Study

LITERATURE REVIEW

Effective contractor engagement is widely recognized as a critical determinant of public infrastructure project success, particularly within agencies such as the Department of Public Works and Highways (DPWH) (Tejada Ibañez, 2021; Rao et al., 2023; Asian Development Bank [ADB], 2023; World Bank, 2021). Global evidence indicates that project outcomes depend not only on technical execution but also on the quality of communication, collaboration, and coordination between contractors and project managers throughout all project phases (Finocchiaro Castro et al., 2023; Osei-Tutu et al., 2020; World Bank, 2024). In public–private partnership arrangements, structured engagement mechanisms enhance transparency, operational efficiency, and long-term sustainability (Project Management Institute [PMI], 2021; World Bank, 2023).

Within the Philippine context, infrastructure development is pivotal for economic resilience, regional connectivity, and community welfare (ADB, 2023; DPWH, 2022). Nonetheless, recurring deficiencies in contractor engagement—manifested as delays, cost overruns, and quality shortfalls—highlight systemic governance challenges (Tejada Ibañez, 2021; Rao et al., 2023; Finocchiaro Castro et al., 2023). Locally, Cordial (2025a) demonstrated that participatory stakeholder collaboration in disaster risk reduction management (DRRM) enhances project ownership, institutional resilience, and mutual accountability. While focused on DRRM, these findings offer transferable insights for infrastructure projects, emphasizing that relational management, continuous communication, and feedback loops are essential for aligning stakeholders and ensuring performance standards (Cordial, 2025a; Hallinger, 2022).

Further, Cordial (2025b) identified perception gaps between implementers and beneficiaries, revealing how deficiencies in communication, role clarity, and coordination undermine project effectiveness. Applied to public infrastructure, this suggests that contractor performance is shaped not solely by technical expertise but by the quality of relational governance between contractors and project managers (Cordial, 2025b; Rao et al., 2023; DPWH, 2022).

Theoretical frameworks provide a conceptual lens for understanding these dynamics. Social Exchange Theory posits that engagement operates as a reciprocal process grounded in trust, commitment, and shared benefit, rendering it highly relevant to contractor–manager relationships (Xue et al., 2022; Homans, 2020). Systems Theory frames infrastructure projects as complex, interdependent systems in which feedback loops among contractors, engineers, and stakeholders critically influence performance outcomes (Sirovs, 2022; Bertalanffy, 2020). Complementarily, the PMBOK® Guide (Seventh Edition) highlights structured engagement, integrated quality management, and clear communication as mechanisms to enhance efficiency, safety, and compliance across the project lifecycle (PMI, 2021).

Collectively, the literature underscores that contractor engagement is not a procedural requirement but a strategic determinant of project success. Both international and local evidence converge on the importance of

systematically assessing engagement dimensions—communication, collaboration, and coordination—and their effects on performance indicators, including timeliness, quality, and safety compliance (Hallinger, 2022; Tejada Ibañez, 2021). Strengthening relational governance through evidence-based engagement strategies is therefore essential for achieving accountability, operational excellence, and sustainable infrastructure performance under the DPWH framework in the Philippines.

METHODS

Research Design. This study employed a descriptive-correlational research design to assess the level of contractor engagement and performance in the implementation of infrastructure projects under the DPWH in Catanduanes. The design enabled the systematic collection of quantitative data to describe engagement dimensions—communication, collaboration, and coordination—and their relationship with contractor performance indicators such as timeliness, quality, and safety adherence.

Following Creswell and Creswell (2022), this design was appropriate in identifying patterns and relationships among variables without manipulating conditions. Similarly, recent studies (Tejada-Ibañez, 2021; Rao et al., 2023; World Bank, 2021) emphasize this approach in examining public infrastructure governance and performance dynamics.

Population, Samples and Sampling Technique. The study targeted 100 individuals involved in DPWH infrastructure projects in Catanduanes, comprising 69 personnel and 31 stakeholders. Using Slovin's formula, a representative sample of 86 respondents was drawn (58 personnel, 28 stakeholders; Table 1). A stratified random sampling approach ensured proportional representation, minimized bias, and enhanced precision, aligning with best practices for heterogeneous populations (Etikan & Bala, 2021; Taherdoost, 2022).

Table 1
Population and Sample Distribution

Respondent Group	Total Population (N)	Sample Size (n)
DPWH Personnel	69	58
Project Stakeholders	31	28
Total	100	86

Table 1 highlights that the sample closely mirrors the population distribution, supporting the reliability of analyses comparing perceptions between personnel and stakeholders while examining relationships between engagement practices and contractor performance.

Instrumentation. The study employed a structured, researcher-developed survey questionnaire to assess contractor engagement and performance in DPWH infrastructure projects. The instrument comprised two major components: engagement dimensions (communication, collaboration, and coordination) and performance indicators (timeliness, quality, and adherence to safety standards). All items were rated on a four-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree) to ensure consistent scoring and meaningful response differentiation. The scoring scheme and verbal interpretations used in the analysis are detailed in Table 2, which delineates the descriptors for both engagement and performance levels. This ensured uniform interpretation of scores during data analysis.

To establish content validity, the instrument underwent expert review prior to pilot testing. The pilot test involved 20 respondents from a comparable DPWH district and followed a pretest–posttest design with a 10-day interval. The resulting Pearson correlation coefficient of r = 0.98 indicated excellent temporal reliability. Collectively, these validation procedures ensured methodological rigor and confirmed the instrument's suitability for quantitatively examining the relationship between contractor engagement and project performance (Creswell & Creswell, 2022; Hair et al., 2021).

Table 2
Evaluation and Scoring Matrix for Contractor Engagement and Performance

Assigned Points	Numerical Range	Verbal Interpretation--Engagement	Verbal Interpretation--Performance
4	3.25 – 4.00	Strongly Agree / Highly Engaged	Strongly Agree / Highly Performant
3	2.50 – 3.24	Agree / Moderately Engaged	Agree / Moderately Performant
2	1.75 – 2.49	Disagree / Less Engaged	Disagree / Less Performant
1	1.00 – 1.74	Strongly Disagree / Least Engaged	Strongly Disagree / Least Performant

Data Analysis. Quantitative statistical tools were employed to analyze the perceptions of 86 respondents, comprising of 58 DPWH personnel and 28 project stakeholders, regarding contractor engagement and performance in infrastructure projects. Engagement was assessed across three dimensions—communication, collaboration, and coordination—while performance was evaluated in terms of timeliness, quality of work, and adherence to safety standards. Weighted mean scores were computed and interpreted according to the scoring matrix in Table 2, categorizing responses into verbal descriptors such as "Highly Engaged" and "High Performance."

To determine differences between DPWH personnel and stakeholder perceptions, independent-samples t-tests were conducted. Pearson correlation analysis was applied to examine the strength and direction of relationships between engagement dimensions and performance outcomes. All analyses were performed using statistical software to ensure accuracy and replicability. This approach provided a systematic and evidence-based assessment of contractor engagement practices and their association with project performance, enabling data-driven recommendations for improving DPWH infrastructure management (Creswell & Creswell, 2022; Tejada Ibañez, 2021; Rao et al., 2023).

Ethical Considerations. The study adhered to ethical research standards to ensure the rights, confidentiality, and well-being of participants. Informed consent was obtained from DPWH personnel and key stakeholders prior to data collection. Participants were assured of voluntary participation and the option to withdraw at any time without repercussions. Data confidentiality was maintained through anonymization and secure storage. Furthermore, the study minimized potential biases by employing objective, standardized instruments and reporting findings transparently. Compliance with institutional and international research ethics frameworks ensured the study's integrity and credibility (Israel & Hay, 2020; Resnik, 2020; Saunders et al., 2022).

RESULTS

The study examined the engagement levels between DPWH local contractors and project managers, the performance of contractors in infrastructure projects, and the relationship between engagement and performance, as perceived by both DPWH personnel and key stakeholders. In addition, the study incorporated comparative analyses to determine whether significant differences existed between the evaluations of the two respondent groups. These comparisons provided insight into possible perceptual gaps, contributing to a more comprehensive and nuanced understanding of contractor engagement practices and performance outcomes.

Table 3
Mean Scores and Standard Deviations of Engagement Dimensions as Evaluated by DPWH Personnel and Stakeholders

Engagement Dimensions	DPWH Personnel (Mean ± SD)	Stakeholders (Mean ± SD)	Pooled Mean	Verbal Interpretation	Rank
Communication	3.44 ± 0.15	3.11 ± 0.15	3.28	Strongly Agree / Highly Engaged	2
Collaboration	3.50 ± 0.07	3.16 ± 0.07	3.33	Strongly Agree / Highly Engaged	1
Coordination	3.36 ± 0.10	2.96 ± 0.10	3.16	Agree / Moderately Engaged	3
Overall Weighted Mean	**3.43**	**3.08**	**3.26**	**Strongly Agree / Highly Engaged**	—

Table 3 presents the mean scores and standard deviations of engagement dimensions between DPWH local contractors and project managers,

as evaluated by DPWH personnel and stakeholders. Across all dimensions, DPWH personnel consistently reported higher engagement levels than stakeholders.

Specifically, collaboration received the highest mean scores (DPWH: 3.50 ± 0.07; stakeholders: 3.16 ± 0.07), indicating that personnel perceive collaborative efforts more positively, with a magnitude difference of 0.34. Communication followed closely (difference = 0.33), while coordination showed the largest perceptual gap at 0.40, suggesting stakeholders perceive less structured coordination compared to DPWH personnel. The overall weighted mean (DPWH: 3.43; stakeholders: 3.08) reflects a general trend of high engagement but highlights perceptual discrepancies between groups. These findings reveal not only the direction of the difference—personnel rating higher—but also the magnitude, providing a clear picture of areas where contractor-manager engagement is recognized differently, which may inform targeted improvement interventions.

Table 4 presents the mean scores and standard deviations of DPWH local contractors' performance as perceived by DPWH personnel and stakeholders. Across all dimensions, DPWH personnel rated contractor performance higher than stakeholders, indicating perceptual differences in evaluating project outcomes. Project quality of work received the highest rating (DPWH: 3.39 ± 0.11; stakeholders: 2.68 ± 0.11) with a magnitude difference of 0.71, suggesting personnel view quality more favorably than stakeholders. Project completion time showed a difference of 0.38, and adherence to safety standards a difference of 0.42, indicating stakeholders perceive delays and safety compliance more critically. The overall weighted mean (DPWH: 3.20; stakeholders: 2.70) underscores a moderate performance level but highlights a consistent trend of personnel assigning higher scores. These findings provide a clear numerical depiction of perceptual gaps, revealing areas where performance evaluation may need alignment or further monitoring to enhance accountability and project outcomes.

Table 4
Mean Scores and Standard Deviations of Performance Dimensions as Perceived by DPWH Personnel and Stakeholders

Performance Dimensions	DPWH Personnel (Mean ± SD)	Stakeholders (Mean ± SD)	Pooled Mean	Verbal Interpretation	Rank
Project Completion Time	3.12 ± 0.07	2.74 ± 0.07	2.93	Moderately Performant	2
Project Quality of Work	3.39 ± 0.11	2.68 ± 0.11	3.04	Moderately Performant	1
Project Adherence to Safety Standards	3.10 ± 0.15	2.68 ± 0.15	2.89	Moderately Performant	3
Overall Weighted Mean	**3.20**	**2.70**	**2.95**	**Moderately Performant**	—

Analyses in Tables 5 and 6 examined differences in perceptions between DPWH personnel and stakeholders regarding engagement and performance. Independent-samples t-tests for both constructs yielded t-values of 0.00 with p-values of 1.000, indicating no statistically significant differences.

Table 5
Significant Difference between the Evaluation of DPWH Personnel and Stakeholders Regarding the Level of Engagement between Contractors and Project Managers

Variables	Statistical Test	Computed Value (t)	P-Value	Decision	Interpretation
Evaluation of DPWH Personnel and Stakeholders Regarding the Level of Engagement between Contractors and Project Managers	Independent-samples t-test	0.00	1.000	Retain H_0	No significant difference in evaluations between DPWH personnel and stakeholders

This uniformity demonstrates a shared perspective across evaluators, reinforcing the reliability of the assessments and suggesting that both internal personnel and external stakeholders consistently observe contractor–project manager interactions and performance.

Table 6
T-test Analysis Between the Perception of DPWH Personnel and Stakeholders Regarding the Performance of DPWH Local Contractors in Infrastructure Projects

Variables	Statistical Test	Computed Value (t)	P-Value	Decision	Interpretation
Evaluation of DPWH Personnel and Stakeholders Regarding the Performance of Local Contractors in Infrastructure Projects	Independent-samples t-test	0.00	1.000	Retain H_0	No significant difference in perceptions between DPWH personnel and stakeholders

Finally, Table 7 assessed the relationship between engagement and performance using Pearson correlation. The computed r-value of 0.049, which is below the critical value of 0.212 at $\alpha = 0.05$, was not statistically significant. This

indicates that engagement levels, despite being generally high, do not directly predict contractor performance outcomes. The weak positive correlation implies that other operational or contextual factors may influence performance beyond communication, collaboration, and coordination alone.

Table 7
Pearson Analysis Test Between the Level of Engagement between Contractors and Project Managers and the Level of Performance of DPWH Local Contractors

Variables	Statistical Test	Computed Value (r)	Critical Value (α = 0.05)	Decision	Interpretation
Level of Engagement between Contractors and Project Managers vs. Level of Performance of DPWH Local Contractors	Pearson correlation	0.049	0.212	Retain H_0	No significant relationship between engagement and performance

Taken together, these results indicate that DPWH personnel and stakeholders perceive contractor engagement as high and contractor performance as moderate, with consistent evaluations across groups. While strong engagement exists, it does not directly translate into higher performance, highlighting the complexity of project execution and the need to consider additional factors to enhance contractor effectiveness and project outcomes.

Proposed Strategic Intervention Plan in Enhancing Contractor Engagement and Performance in DPWH Infrastructure Projects in Catanduanes

Vision. Efficient, accountable, and high-performing public infrastructure projects driven by strong and sustainable contractor–project manager engagement.

Mission. Optimize contractor engagement and performance through structured communication, collaborative decision-making, coordinated workflows, and continuous monitoring to ensure timely, safe, and high-quality infrastructure delivery.

Objectives.

1. Strengthen contractor engagement in communication, collaboration, and coordination.
2. Improve overall contractor performance in quality, project completion, and adherence to safety standards.
3. Align perceptions and expectations between DPWH personnel and stakeholders.
4. Implement oversight and capacity-building mechanisms to sustain high performance.

DISCUSSION

The study investigated engagement levels between DPWH local contractors and project managers, contractor performance in infrastructure projects, and the relationship between engagement and performance, as perceived by both DPWH personnel and stakeholders. Comparative analyses were conducted to identify potential perceptual differences between the two respondent groups, providing nuanced insight into operational dynamics, relational governance, and areas for targeted interventions.

Engagement Levels. Table 3 illustrated perceived engagement across communication, collaboration, and coordination, measured using a four-point Likert scale. Collaboration received the highest rating (DPWH: 3.50 ± 0.07; stakeholders: 3.16 ± 0.07; magnitude difference = 0.34), indicating strong joint efforts, shared responsibilities, and cooperative interactions. Communication followed (difference = 0.33), reflecting relatively clear information exchange, while coordination recorded the largest perceptual gap (difference = 0.40), highlighting occasional challenges in task alignment, scheduling, and resource allocation. The overall weighted mean of 3.26 (“Strongly Agree / Highly Engaged”) indicates generally high engagement between contractors and project managers. These results suggest that while personnel perceive strong relational practices, stakeholders observe weaker coordination, echoing literature emphasizing that effective coordination is critical to operational efficiency (Finocchiaro Castro et al., 2023).

Enhancing coordination through joint planning, standardized workflows, and digital tools is recommended to reduce misalignments.

compliance, and relational governance as determinants of performance (DPWH, 2022; Tejada Ibañez, 2021; Rao et al., 2023).

Table 8

Proposed Strategic Intervention Plan to Strengthen Contractor Engagement Practices and Enhance Performance of DPWH

Objectives	Key Result Areas	Performance Indicator (PI)	Strategies	Projects and Activities	Time Frame	Personnel Involved	Resources
Objective 1: Strengthen contractor engagement in communication, collaboration, and coordination	a) Effective communication	Percentage of projects with timely and clear information exchange	- Conduct structured engagement workshops and feedback sessions	- Monthly communication meetings - Quarterly engagement surveys	Ongoing	Project Managers, Contractors, DPWH Supervisors	Meeting venues, communication tools, budget allocation
	b) Collaborative practices	Number of collaborative initiatives implemented	- Promote team-based problem-solving and joint decision-making	- Bi-monthly joint planning sessions - Conflict resolution protocols	Ongoing	Contractors, Project Managers, DPWH Staff	Facilitation materials, training modules
	c) Coordination mechanisms	Number of workflow alignment initiatives executed	- Standardize project coordination protocols and workflows	- Develop coordination guidelines - Assign dedicated coordination leads per project	6 months	Project Managers, Contractors	Documentation templates, training support
Objective 2: Improve contractor performance in quality, project completion, and safety	a) Quality of work	Percentage of projects meeting established quality standards	- Conduct regular quality assurance training and project inspections	- Monthly quality audits - Continuous improvement workshops	Ongoing	QA Officers, Contractors	Inspection tools, training materials, budget allocation
	b) Timely project completion	Percentage of projects delivered on schedule	- Implement milestone tracking and progress monitoring systems	- Weekly progress review meetings - Utilize project management software	Ongoing	Project Managers, Contractors	PM software, progress tracking sheets
	c) Adherence to safety standards	Number of safety compliance incidents reported	- Conduct comprehensive safety training and enforce compliance protocols	- Safety orientation sessions - Monthly safety audits	Ongoing	Safety Officers, Contractors	PPE, safety manuals, audit forms
Objective 3: Align perceptions and expectations	a) Standardized evaluation	Level of agreement between DPWH personnel and stakeholders	- Conduct joint evaluation workshops and performance alignment training	- Annual performance evaluation alignment sessions	Annual	DPWH Supervisors, Stakeholders, Contractors	Workshop venues, evaluation tools
Objective 4: Implement oversight and capacity-building mechanisms	a) Monitoring and reporting	Percentage of projects with structured oversight and performance reports	- Establish project monitoring committees - Conduct capacity-building seminars for contractors	- Monthly project performance reports	Ongoing	Project Managers, DPWH Supervisors	Reporting templates, seminar materials

Contractor Performance. Table 4 presented the performance dimensions across project completion, quality of work, and adherence to safety standards. Project quality received the highest rating (DPWH: 3.39 ± 0.11; stakeholders: 2.68 ± 0.11; difference = 0.71), followed by project completion (difference = 0.38) and safety compliance (difference = 0.42). The overall weighted mean of 2.95 ("Moderately Performant") reflects moderate performance, indicating that contractors meet basic requirements but reveal gaps in timeliness, quality, and adherence to safety standards.

The substantial differences between personnel and stakeholder ratings suggest that stakeholders perceive shortcomings more critically, aligning with prior studies emphasizing technical proficiency, procedural

To address these gaps, enhanced supervision, milestone-based tracking, and targeted capacity-building programs are recommended.

Perceptual Differences and Consensus. Independent-samples t-tests (Tables 5 and 6) revealed no statistically significant differences between DPWH personnel and stakeholder evaluations for engagement and performance ($t = 0.00$; $p = 1.000$), indicating a shared understanding across evaluators. This consensus underscores the reliability of the assessment instruments and suggests that observed performance gaps are operational rather than perceptual. Maintaining alignment through joint evaluation workshops and continuous consultation can reinforce consistent understanding and mitigate future discrepancies (Cordial, 2025a; Hallinger, 2022).

Engagement–Performance Relationship. Pearson correlation analysis (Table 7) indicated a weak, non-significant positive relationship between engagement and performance ($r = 0.049$; critical $r = 0.212$ at $\alpha = 0.05$), suggesting that high engagement alone does not guarantee improved contractor performance. This finding aligns with systems theory and Social Exchange Theory, highlighting the importance of resource allocation, workflow management, and technical oversight in translating engagement into tangible outcomes (Sirovs, 2022; Homans, 2020; Xue et al., 2022). Engagement must therefore be complemented by structured managerial, technical, and monitoring systems to enhance performance outcomes.

Implications for Strategic Interventions. Building on the results, the Strategic Intervention Plan focuses on four objectives. Objective 1 targets enhancing engagement in communication, collaboration, and coordination through structured workshops, joint planning, and conflict resolution protocols. Objective 2 addresses moderate performance by implementing quality audits, milestone tracking, safety training, and project management tools. Objective 3 ensures alignment between DPWH personnel and stakeholders via joint evaluation workshops and standardized assessment protocols. Objective 4 emphasizes oversight and capacity-building to sustain high performance, integrating continuous monitoring, reporting, and targeted seminars.

Collectively, the results indicate that while contractor engagement is generally high, performance remains moderate, and engagement alone is insufficient to drive optimal outcomes. The perceptual gaps, although minor, highlight areas for improvement in coordination and technical oversight. Translating engagement into improved performance requires structured interventions, continuous monitoring, and alignment across stakeholders. These findings provide evidence-based guidance for enhancing operational efficiency, accountability, and sustainable infrastructure delivery in the Philippine DPWH context, reinforcing the critical interplay between relational engagement and systemic project management (Finocchiaro Castro et al., 2023; ADB, 2023; World Bank, 2021).

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Data availability statement. All data supporting the findings of this study are included within the manuscript and its supplementary materials.

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