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Field Engineer-To-Project Ratio and Quality of DPWH Infrastructure Projects

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ABSTRACT

This study examined the relationship between the profile of field engineer allocation and the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3. Specifically, it determined the profile of field engineer allocation in terms of number of engineers assigned per project, number of projects handled by each engineer, project size, project duration per engineer, and workload and assigned duties. It also assessed the level of project quality in terms of compliance with standards, defects or errors found, reworks or corrections needed, timeliness of completion, and safety and durability of projects.

The study employed a descriptive-correlational research design and involved 46 technical personnel from the DPWH Isabela Third District Engineering Office. Data were gathered using a survey questionnaire and were analyzed using frequency and percentage distribution, weighted mean, and Chi-Square Test of Independence. Findings revealed that most projects were assigned with 3 to 5 engineers, while most field engineers handled more than 6 projects. The projects were mostly medium-scale, commonly lasted 6 to 12 months, and the workload was generally described as moderate, although some respondents experienced heavy to very heavy duties. The level of project quality was rated as high, with an overall mean of 3.85. Among the quality indicators, compliance with standards obtained the highest rating, while reworks or corrections needed obtained the lowest but still remained within the high level category. The Chi-Square Test showed that there was no significant relationship between the profile of field engineer allocation and the level of project quality, leading to the acceptance of the null hypothesis. Based on the findings, the study recommends strengthening workload monitoring, balanced engineer allocation, regular supervision, and improved project management practices to sustain and further enhance the quality of DPWH infrastructure projects.

Keywords: field engineer allocation, engineer-to-project ratio, project quality, DPWH infrastructure projects, project management, workload distribution, Isabela Legislative District 3

INTRODUCTION

Public infrastructure is essential for societal development, with roads, bridges, and flood-control structures serving as lifelines that support mobility, commerce, social connectivity, and disaster resilience. In the Philippines, the Department of Public Works and Highways (DPWH) is responsible for delivering these projects across diverse terrains. With increasing pressure to complete multiple large-scale projects within limited timeframes, ensuring quality, safety, and durability is as important as meeting deadlines and budgets. Consequently, internal factors such as manpower allocation and supervision capacity must be carefully examined, as they can significantly affect whether infrastructure projects achieve their intended benefits or create long-term challenges.

According to Bahr & Laszig (2021), construction and infrastructure projects, and on-site supervisory staff is commonly referred to as field engineers or site engineers that play a central role in guaranteeing that works proceed according to design specifications, safety regulations, and quality standards. Their duties often include daily supervision, coordinating contractors and laborers, verifying material use, monitoring workmanship, enforcing compliance, and documenting progress. When such responsibility is spread too thin for example, when one engineer must cover many projects, the risk of oversight lapses increases. This can result in substandard workmanship, design deviations, safety compromises, rework, or eventual failure of structures. The adequacy of supervisory manpower is thus a critical determinant of project quality. In a broader sense, human capital plays a pivotal role in construction productivity and quality: declines in skilled labour availability, insufficient training, and workforce shortages have been linked to deteriorations in project outcomes.

Recent global research conducted by Sitohang, Mohamed, & Ismail (2022) supports the significance of labor adequacy and manpower quality in construction performance. For example, a study on contractor companies in Indonesia found that management strategies focused on manpower including training, competency standards, and internal capacity-building in which it is significantly improved contractor performance. Their findings indicate that when workforce skills and competencies are aligned with recognized standards, the likelihood of timely delivery, adherence to specifications, and overall project success increases.

Meanwhile, a conceptual framework study on skilled labor shortages and project performance in the broader construction industry demonstrated that shortages in skilled labor significantly impair project performance, affecting cost, time, and quality outcomes (Yusoff, Rahim & Chuing, 2021).

Quality management remains a critical challenge in construction projects worldwide. The study of Ibrahim, Zayed & Lafhaj (2023) attempted to quantify the “cost of quality” in construction projects noted that failures in quality control, defects, and rework represent just the visible part of a much larger problem, many quality failures remain latent, manifesting later as structural defects or maintenance issues.

Despite the strong body of work on manpower quality, labor shortages, and general quality management practices, there appears to be a notable gap when it comes to quantifying how the ratio of field engineers (supervisors) to number or scale of projects affects quality, especially in public sector infrastructure agencies like DPWH. Most existing studies interpret manpower issues in broad terms such as shortage of skilled labor, inadequate training, and labor well-being, without focusing on supervision capacity per project.

A study conducted by Sitohang et al. (2022) states that general manpower quality is an important factor for contractor performance; however, the study does not analyze how many projects each engineer supervises. Similarly, Yusoff et al. (2021) show that shortage of skilled labor affects performance, but do not disaggregate by supervisory-to-project ratio. Moreover, review studies on construction performance measurement note that performance evaluations often overlook human resource allocation metrics, such as supervisor workload or staffing adequacy (Ibrahim, Zayed & Lafhaj, 2024). In the field of developing countries undergoing rapid infrastructure expansion such as the Philippines under DPWH, this gap becomes critical: without data on supervision capacity, decisions about staffing, resource allocation, and project assignment may rely on intuition or tradition rather than empirical evidence.

Background of the Study

Given the strategic role of public infrastructure in facilitating regional development, the implementation and quality outcomes of Department of Public Works and Highways (DPWH) projects have become significant areas of scholarly interest in the Philippines.

In Isabela Province, infrastructure services delivered by government entities have been studied through citizen - based assessments showing that residents perceive public works and infrastructure services, including roads and flood management systems, as essential to local development and service delivery (Bulos, 2021).

This research suggests that local populations are aware of infrastructure services and that the quality of these services influences satisfaction and community engagement. Meanwhile, studies focused on Isabela Second District Engineering Office found that attributes of project engineers especially soft skills such as analytical capability and leadership accountability play a crucial role in achieving successful project outcomes across flood control, school buildings, and road concreting projects (Valdez & Quezon, 2025). These findings point to the importance of personnel characteristics and competencies in shaping infrastructure performance in the province.

Despite such efforts, there remains a gap in the literature regarding systematic, empirical examination of how manpower allocation specifically the field engineer - to - project ratio correlates with measurable quality outcomes in local DPWH infrastructure projects. Focusing on Isabela Legislative District 3 office, it is a specific area in which this relationship can be explored in depth, considering the district's unique project portfolio and administrative boundary. By evaluating actual staffing profiles and comparing these with recorded project quality indicators such as compliance with standards, occurrence of defects, timeliness, and durability the study aims to provide evidence - based recommendations for resource allocation, staffing policies, and project management practices.

Therefore, this study's main purpose is to assess the relationship between the field engineer - to - project ratio in DPWH infrastructure projects within Isabela Legislative District 3 and the quality of those projects. Specifically, it will determine whether variations in supervisory staffing levels are associated with measurable differences in quality outcomes. The results are expected to inform effective infrastructure management practices and staffing policies by offering actionable guidance for DPWH and similar government agencies. Ultimately, this research aims to contribute to the broader discourse on public sector infrastructure governance, human resource management in construction, and sustainable infrastructure delivery in Isabela Province.

Objectives of the Study

This study aimed to examine the field engineer-to-project ratio and quality of DPWH infrastructure projects as basis for enhanced project management.

Specifically, this study seeks to answer the following questions:

1. What is the profile of the field engineer allocation in DPWH infrastructure program in terms of:

1.1. Number of engineers assigned per project,

1.2. Number of projects handled by each engineer,

1.3. Project size (small, medium, large),

1.4. Project duration per engineer, and

1.5. Workload and assigned duties?

2. What is the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 in terms of:

2.1. Compliance with standards,

2.2. Defects or errors found,

2.3. Reworks or corrections needed,

2.4. Timeliness of completion, and

2.5. Safety and durability of projects?

3. Is there a significant relationship between the profile of field engineer allocation in the DPWH infrastructure program and the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3

4. What strategies, based on the results of the study, can improve the engineer-to-project ratio to enhance project quality and project management?

METHODOLOGY

Research Design

This study employed a descriptive-correlational research design. The descriptive component focused on identifying the profile of field engineer allocation in the DPWH infrastructure program in terms of engineers assigned per project, number of projects handled by each engineer, project size, project duration per engineer, and workload and assigned duties. The correlational component examined the relationship between the profile of field engineer allocation and the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3.

Locale of the Study

This study was conducted at the Department of Public Works and Highways — Isabela Third District Engineering Office. The research focused on DPWH infrastructure projects within Isabela Legislative District 3, particularly on the field engineer allocation and the quality of project implementation in the district.

Respondents of the Study

The respondents of the study were the members of the Project Management Team of the DPWH Isabela Third District Engineering Office. They included Project Engineers, Junior Project Engineers, Materials Engineers, Project Inspectors, and other technical personnel who were directly involved in planning, supervising, monitoring, and evaluating infrastructure projects. A total of forty-six (46) personnel participated in the study.

Sampling Procedure

Purposive sampling was used in this study. The respondents were intentionally selected because of their direct involvement in DPWH infrastructure project implementation and supervision. This sampling method was appropriate because the study required respondents who had actual knowledge and experience in field engineer allocation, workload distribution, project monitoring, and quality assurance.

Research Instrument

The main instrument used in this study was a survey questionnaire designed to gather data on the profile of field engineer allocation and the level of project quality in DPWH infrastructure projects. The questionnaire was composed of two parts. The first part focused on the profile of field engineers, including the number of engineers assigned per project, number of projects handled by each engineer, project size, project duration, and workload and assigned duties.

The second part measured the level of project quality in terms of compliance with standards, defects or errors found, reworks or corrections needed, timeliness of completion, and safety and durability of projects. This section used a five-point Likert scale ranging from Strongly Agree to Strongly Disagree. The instrument was adapted from established research constructs and DPWH quality assurance guidelines to ensure that the items were relevant to the study. The reliability of the instrument was supported by a Cronbach's alpha of 0.90, indicating high internal consistency.

RESULTS AND DISCUSSIONS

Profile of The Field Engineer Allocation in DPWH Infrastructure Program

Table 1

Distribution of the Field Engineer Allocation in the DPWH Infrastructure Program

Number of Engineers Assigned Per Project	f	%
1-2	15	32.6
3-5	26	56.5
6-10	4	8.7
More than 10	1	2.2
Number of Projects Handled by Each Engineer	f	%
3-4	1	2.2
5-6	3	6.5
More than 6	42	91.3
Project Size	f	%
Small Scale	4	8.7
Medium Scale	30	65.2
Large Scale	12	26.1
Project Duration Per Engineer	f	%
Less than 6 Months	5	10.9
6-12 Months	35	76.1
1-2 years	5	10.9
More than 2 years	1	2.2
Workload and Assigned Duties	f	%
Light	1	2.2
Moderate	24	52.2
Heavy	15	32.6
Very Heavy	6	13.0

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Table 1 presents the distribution of field engineer allocation in the DPWH infrastructure program. In terms of the number of engineers assigned per project, most respondents reported that there are 3 to 5 engineers assigned per project, with 26 respondents or 56.5%. This is followed by 1 to 2 engineers, reported by 15 respondents or 32.6%. Only a few indicated that 6 to 10 engineers are assigned per project, with 4 respondents or 8.7%, while only 1 respondent or 2.2% reported having more than 10 engineers assigned per project. This shows that most projects are commonly handled by a small to moderate number of engineers.

For the number of projects handled by each engineer, the table shows that a large majority of the respondents, 42 or 91.3%, handle more than 6 projects. Meanwhile, 3 respondents or 6.5% handle 5 to 6 projects, and only 1 respondent or 2.2% handles 3 to 4 projects. This indicates that most field engineers are managing several projects at the same time.

In terms of project size, most of the projects handled are medium-scale, as reported by 30 respondents or 65.2%. This is followed by large-scale projects, with 12 respondents or 26.1%, while small-scale projects were reported by only 4 respondents or 8.7%. This suggests that the infrastructure projects under the program are mostly of moderate size, with a considerable portion also involving larger projects.

For project duration per engineer, most respondents stated that projects usually last 6 to 12 months, with 35 respondents or 76.1%. Meanwhile, 5 respondents or 10.9% reported projects lasting less than 6 months, and another 5 respondents or 10.9% reported projects lasting 1 to 2 years. Only 1 respondent or 2.2% indicated that projects last more than 2 years. This shows that most projects handled by engineers are completed within a one-year period.

Lastly, regarding workload and assigned duties, the highest number of respondents, 24 or 52.2%, described their workload as moderate. This is followed by 15 respondents or 32.6% who described their workload as heavy, while 6 respondents or 13.0% considered it very heavy. Only 1 respondent or 2.2% reported having a light workload. The table shows that while most engineers describe their workload as moderate, a notable number still experience heavy to very heavy duties in relation to the number and size of projects they handle.

Level of Project Quality in DPWH Infrastructure Projects in Isabela Legislative District 3

Table 2

Level of Project Quality in DPWH Infrastructure Projects in Isabela Legislative District 3

Compliance With Standards	M	Interpretation
1. The project meets DPWH standards.	4.10	High Level of Quality
2. Construction follows plans and specifications.	4.05	High Level of Quality
3. Materials used meet required quality.	4.00	High Level of Quality
Category Mean	4.05	High Level of Quality

Table 2 presents the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 in terms of Compliance with Standards. The highest mean was obtained by the statement "The project meets DPWH standards" with a mean of 4.10, interpreted as a High Level of Quality. This is followed by "Construction follows plans and specifications" with a mean of 4.05, also interpreted as a High Level of Quality. Meanwhile, "Materials used meet required quality" received a mean of 4.00, which likewise falls under a High Level of Quality. The category mean of 4.05 indicates that compliance with standards is generally rated at a High Level of Quality, showing that the respondents agree that the projects meet DPWH standards, follow the required plans and specifications, and use materials of acceptable quality.

Table 3

Level of Project Quality in DPWH Infrastructure Projects in Isabela Legislative District 3

Defects or Errors Found	M	Interpretation
4. Occurrence of defects is minimal.	3.76	High Level of Quality
5. Errors found during inspection are addressed quickly.	3.85	High Level of Quality
6. Workmanship quality prevents future issues.	3.91	High Level of Quality
Category Mean	3.84	High Level of Quality

Table 3 presents the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 in terms of Defects or Errors Found. The highest mean was obtained by the statement "Workmanship quality prevents future issues" with a mean of 3.91, interpreted as a High Level of Quality. This is followed by "Errors found during inspection are addressed quickly" with a mean of 3.85, also interpreted as a High Level of Quality. Meanwhile, "Occurrence of defects is minimal" received a mean of 3.76, which likewise falls under a High Level of Quality. The category mean of 3.84 indicates that the respondents rated this area as having a High Level of Quality, showing that defects and errors are generally minimal, inspection issues are addressed promptly, and workmanship helps prevent future problems.

Table 4

Level of Project Quality in DPWH Infrastructure Projects in Isabela Legislative District 3

Reworks or Corrections Needed	M	Interpreation
7. Rework is kept to a minimum.	3.74	High Level of Quality
8. Completed work rarely needs corrections.	3.61	High Level of Quality
9. Rework does not significantly delay progress.	3.70	High Level of Quality
Category Mean	3.68	High Level of Quality

Table 4 presents the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 in terms of Reworks or Corrections Needed. The highest mean was obtained by the statement "Rework is kept to a minimum" with a mean of 3.74, interpreted as a High Level of Quality. This is followed by "Rework does not significantly delay progress" with a mean of 3.70, also interpreted as a High Level of Quality. Meanwhile, "Completed work rarely needs corrections" received the lowest mean of 3.61, but it is still interpreted as a High Level of Quality. The category mean of 3.68 indicates that this area is rated as having a High Level of Quality, showing that reworks and corrections are generally manageable and do not greatly affect project progress.

Table 5

Level of Project Quality in DPWH Infrastructure Projects in Isabela Legislative District 3

Timeliness of Completion	M	Interpretation
10. Projects are completed on schedule.	3.63	High Level of Quality
11. Supervision helps prevent delays.	4.13	High Level of Quality
12. Work progresses according to milestones.	3.80	High Level of Quality
Category Mean	3.86	High Level of Quality

Table 5 presents the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 in terms of Timeliness of Completion. The highest mean was obtained by the statement "Supervision helps prevent delays" with a mean of 4.13, interpreted as a High Level of Quality. This is followed by "Work progresses according to milestones" with a mean of 3.80, also interpreted as a High Level of Quality. Meanwhile, "Projects are completed on schedule" received the lowest mean of 3.63, but it still falls under a High Level of Quality. The category mean of 3.86 indicates that timeliness of completion is rated as having a High Level of Quality, showing that supervision contributes to preventing delays and that project activities generally move according to set schedules and milestones.

Table 6

Level of Project Quality in DPWH Infrastructure Projects in Isabela Legislative District 3

Safety and Durability of Projects	M	Interpretation
13. Safety protocols are followed.	3.65	High Level of Quality
14. Completed structures are durable.	4.02	High Level of Quality
15. The project will last without major repairs.	3.83	High Level of Quality
Category Mean	3.83	High Level of Quality

Table 6 presents the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 in terms of Safety and Durability of Projects. The highest mean was obtained by the statement "Completed structures are durable" with a mean of 4.02, interpreted as a High Level of Quality. This is followed by "The project will last without major repairs" with a mean of 3.83, also interpreted as a High Level of Quality.

Meanwhile, "Safety protocols are followed" received the lowest mean of 3.65, but it still falls under a High Level of Quality. The category mean of 3.83 indicates that safety and durability are rated as having a High Level of Quality, showing that the projects are generally perceived as safe, durable, and capable of lasting without major repairs.

Relationship Between The Profile Of Field Engineer Allocation In The Dpwh Infrastructure Program And The Level Of Project Quality In Dpwh Infrastructure Projects In Isabela Legislative District 3

Table 7
Chi-Square Test Of Independence on the Relationship between the Profile of Field Engineer Allocation in DPWH Infrastructure Program and the Level of Project Quality in DPW Infrastructure Projects in Isabela Legislative District 3

Profile		Project Quality				
		Compliance with Standards	Defects or Corrections Found	Reworks or Corrections Needed	Timeliness of Completion	Safety and Durability of Projects
Number of Engineers Assigned Per Project	x^2	12.173	11.009	16.761	3.536	9.797
	df	9	9	9	6	9
	p-value	0.204	0.213	0.053	0.739	0.367
Number of Projects Handled by Each Engineer	x^2	3.546	4.454	3.531	4.590	1.463
	df	6	6	6	4	6
	p-value	0.738	0.615	0.740	0.332	0.962
Project Size	x^2	7.224	4.947	2.762	6.620	12.455
	df	6	6	6	4	6
	p-value	0.301	0.551	0.838	0.157	0.053
Project Duration Per Engineer	x^2	14.096	9.181	16.418	10.890	18.862
	df	9	9	9	6	9
	p-value	0.119	0.421	0.059	0.092	0.076
Workload and Assigned Duties	x^2	11.837	6.633	9.605	7.673	6.624
	df	9	9	9	6	9
	p-value	0.223	0.675	0.383	0.263	0.676

Table 7 presents the Chi-Square Test of Independence on the relationship between the profile of field engineer allocation and the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3. The results show that all p-values for the number of engineers assigned per project, number of projects handled by each engineer, project size, project duration per engineer, and workload and assigned duties are greater than the 0.05 level of significance. This means that none of these profile variables has a significant relationship with the project quality indicators, including compliance with standards, defects or corrections found, reworks or corrections needed, timeliness of completion, and safety and durability of projects.

This means that differences in engineer assignment, number of projects handled, project size, project duration, and workload do not statistically affect the reported level of project quality. Although some results are close to the 0.05 level, they are still not significant. Therefore, the findings lead to the acceptance of the null hypothesis, which states that there is no significant relationship between the engineer-to-project ratio and project quality.

Enhanced Engineer Allocation and Project Quality Management Plan

This proposed plan serves as the output for the study which shows strategies that can improve the engineer-to-project ratio to enhance project quality and project management. Since the statistical results showed no significant relationship between the profile of field engineer allocation and project quality, the plan focuses on practical management actions that can sustain the high level of quality while addressing observed workload and implementation concerns.

The strategies are aligned with the descriptive findings of the study, particularly the high number of projects handled by engineers, the presence of heavy to very heavy workloads, and the relatively lower means in reworks or corrections needed, safety protocols, and project completion on schedule. These actions are designed to make engineer assignment more balanced, supervision more systematic, and project monitoring more responsive. *(please see attached file)*

CONCLUSION

Based on the findings of the study, the following conclusions are drawn:

1. The profile of field engineer allocation in the DPWH infrastructure program shows that most projects are assigned with 3 to 5 engineers, while most field engineers handle more than 6 projects at the same time. The projects are mostly medium-scale, commonly completed within 6 to 12 months, and the workload of engineers is generally described as moderate, although a notable number still experience heavy to very heavy workload.

2. The level of project quality in DPWH infrastructure projects in Isabela Legislative District 3 is interpreted as having a High Level of Quality. Among the five indicators, Compliance with Standards received the highest rating, followed by Timeliness of Completion, Defects or Errors Found, and Safety and Durability of Projects, while Reworks or Corrections Needed received the lowest rating but still remained within the high level category.

3. The profile of field engineer allocation has no significant relationship with the level of project quality in DPWH infrastructure projects in Isabela Legislative District 3, since all computed p-values were greater than the 0.05 level of significance. This leads to the acceptance of the null hypothesis, which states that there is no significant relationship between the engineer-to-project ratio and project quality; however, the findings still suggest the need for strategies that improve workload distribution, manpower monitoring, supervision practices, and project management systems to sustain and further enhance project quality.

RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. DPWH management may strengthen the monitoring of field engineer workload and project assignments. Since most field engineers handle more than six projects, it is recommended that the office regularly review the number of projects assigned to each engineer to ensure that workloads remain manageable. A workload tracking system may be used to monitor engineer assignments, project duration, project size, and supervision responsibilities.

2. A more balanced engineer-to-project allocation system may be developed. Although the study found no significant relationship between field engineer allocation and project quality, proper distribution of engineers remains important in maintaining effective supervision. Assignments should consider not only the number of available engineers, but also the size, complexity, duration, and technical requirements of each project.

3. DPWH may continue strengthening compliance with standards, plans, and specifications. Since compliance with standards obtained the highest rating, existing quality assurance practices should be sustained. Regular site inspections, proper documentation, material testing, and strict implementation of DPWH standards should be continuously observed to maintain the high level of project quality.

4. Greater attention may be given to reducing reworks and corrections. Since reworks or corrections needed received the lowest category mean among the project quality indicators, DPWH may improve early defect detection, inspection procedures, and coordination between engineers and contractors. This can help ensure that construction activities are done correctly the first time and that corrections will not delay project progress.

5. Field engineers may be provided with continuous training and capacity-building activities. Trainings on quality control, project monitoring, documentation, safety management, and time management may help engineers perform their supervisory duties more effectively. These activities may also help them manage multiple project assignments while maintaining project quality.

6. A structured supervision and inspection schedule may be implemented. Since supervision was shown to help prevent delays, DPWH may adopt a more organized monitoring schedule for field visits, progress checking, and milestone evaluation. This can help ensure that project issues are identified and addressed immediately.

7. Safety and durability monitoring may be further improved. Although safety and durability were rated at a high level, DPWH may still strengthen the implementation of safety protocols on-site. Regular safety checks, contractor compliance monitoring, and post-construction assessment may help ensure that completed structures remain safe, durable, and functional.

8. Future researchers may conduct a similar study using a wider scope and additional variables. Future studies may include other DPWH district engineering offices, contractors, project beneficiaries, and actual project records. They may also consider other factors such as budget allocation, contractor performance, material availability, weather conditions, procurement delays, and inspection frequency to better explain the factors affecting project quality.

REFERENCES

1. Abd Muien, N. (2023). Supervisory workload and its impact on construction project performance: A quantitative study. Universiti Teknologi MARA (UiTM) Thesis Repository.
2. Aljassmi, H., & Han, S. (2022). Quality control challenges and rework factors in construction projects. Journal of Construction Engineering and Management, 148(3), 04022002.
3. Alruqaishi, A., & Scott, D. (2023). Durability failures in construction and their impact on long-term performance. Buildings, 13(2), 421.
4. Bahr, M., & Laszig, L. (2021). Productivity development in the construction industry and human capital: A literature review. ArXiv.
5. Bulos, R. (2021). Citizen-based assessment of public works and infrastructure services in Isabela Province.
6. Guo, B., Zhang, L., & Fan, Y. (2023). Digital workforce allocation models for improving construction project supervision. Automation in Construction, 149, 104802.
7. Hwang, B. G., Shan, M., & Zhu, L. (2020). Factors affecting productivity in construction projects: Role of manpower allocation. Engineering, Construction and Architectural Management, 27(2), 383–402.
8. Ibrahim, A., Zayed, T., & Lafhaj, Z. (2023). Quantifying the cost of quality in construction projects. Journal of Construction Engineering and Management, 149(1), 04022120.
9. Ibrahim, A., Zayed, T., & Lafhaj, Z. (2024). Construction performance measurement and human resource allocation in construction projects.
10. Kim, J., & Kim, S. (2021). Workload imbalance and decision fatigue among construction managers: Implications for project outcomes. Journal of Management in Engineering, 37(4), 04021033.
11. Love, P. E. D., Matthews, J., & Fang, W. (2020). Rework in construction: The role of errors and violations. Safety Science, 124, 104580.
12. Mokhlespour Esfahani, M., Al-Hajj, A., & Hamid, Z. (2024). Effect of site supervision on construction project performance: Evidence from multiple countries. Sustainability, 16(4), 2456.
13. Olanrewaju, A., Abdul-Azeez, O., & Adesina, T. (2022). Influence of supervisory load on construction quality in public infrastructure projects. Organization, Technology and Management in Construction, 14(2), 1091–1105.
14. Perera, B. A. K. S., Rameezdeen, R., & Chileshe, N. (2021). Competency-based manpower allocation for improving construction supervision quality. Built Environment Project and Asset Management, 11(5), 777–792.
15. Shan, M., Le, Y., & Chan, A. P. C. (2020). Effects of monitoring frequency on construction quality in large-scale infrastructure projects. Journal of Construction Engineering and Management, 146(11), 04020134.
16. Sitohang, A., Mohamed, S., & Ismail, F. (2022). Construction contractor performance improvement strategy based on the quality of the construction manpower using Indonesia standards. Journal of Human Resource Management, 10(4), 106–122.
17. Valdez, R., & Quezon, M. (2025). Attributes of project engineers and successful project outcomes in Isabela Second District Engineering Office.
18. Yusoff, N. I. M., Rahim, N. A., & Chuing, S. W. (2021). Skilled labor shortage and its impact on construction project performance. Journal of Engineering, Design and Technology, 19(3), 712–729.

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Author's Bionote

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He completed his elementary education at Echague East Central School, Echague, Isabela, and his secondary education at Isabela State University Laboratory High School – Echague Campus. He pursued higher education at Isabela State University College of Engineering – Echague Campus, where he earned a degree in Bachelor of Science in Civil Engineering.

At present, he is working at the Department of Public Works and Highways (DPWH) Isabela 3rd District Engineering Office, located in Tagaran, Cauayan City, Isabela. He has been in government service for five years and currently holds the position of Engineer II / Project Engineer I. Through his profession, he continues to contribute his knowledge and skills in civil engineering and public infrastructure service.

Strategic Action Plan to Improve the Engineer-to-Project Ratio and Enhance Project Quality

Strategies	**Basis from Study Results**	**SMART Goals**	**Activities / Interventions**	**Time Frame**	**Success Indicators**	**SDG Alignment**
1. Establish an Engineer Assignment and Workload Mapping System	Most engineers handled more than 6 projects, while a notable number reported heavy to very heavy workload. This shows the need for a clearer view of engineer assignments and workload distribution.	Within 3 months, develop and use an engineer workload matrix covering 100% of active DPWH infrastructure projects in Isabela Legislative District 3.	Prepare a list of all active projects, assigned engineers, project size, duration, and major duties. Classify projects as small, medium, or large. Review assignments monthly and identify engineers with excessive project loads. Responsible: District Engineer, Assistant District	Short-term: 1 to 3 months Review: Monthly	Engineer workload matrix prepared and updated. 100% of active projects included in the matrix. Overloaded assignments identified and reported for managem	SDG 8: Decent Work and Economic Growth SDG 9: Industry, Innovation and Infrastructure SDG 16: Strong Institutions

			Engineer, Section Chiefs, Project Engineers.		ent action.	
2. Adopt a Risk-Based Engineer-to-Project Assignment Guide	Most projects were medium-scale, with some large-scale projects. Since project size and duration may require different levels of supervision, assignment should consider project complexity, not only the number of projects.	Within 6 months, implement a risk-based assignment guide so that 100% of large-scale or high-risk projects receive appropriate supervisory coverage.	Create assignment criteria based on project size, cost, duration, location, complexity, and quality risk. Prioritize additional supervision for large-scale, long-duration, or technically difficult projects. Use the guide when assigning new projects or redistributing workload. Responsible: District Management and Planning/Construction Sections.	Medium-term: 4 to 6 months Review: Quarterly	Risk-based assignment guide approved. High-risk projects identified. Engineer assignments matched with project size and complexity. Reduction in unmanaged or unclear project assignments.	SDG 9: Industry, Innovation and Infrastructure SDG 11: Sustainable Cities and Communities SDG 16: Strong Institutions
3. Strengthen Rework Reduction and Corrective Action Monitoring	Reworks or corrections needed received the lowest category mean among the quality dimensions. Completed work rarely needing corrections also had one of the lower item means.	Within 12 months, reduce recurring rework concerns by at least 10% and ensure that 95% of identified corrective actions are documented and acted upon within the required period.	Use a corrective action log for defects, corrections, and rework. Require root-cause notes for repeated errors. Conduct pre-work orientation before critical activities. Review common rework causes during monthly technical meetings. Responsible: Project Engineers, Materials Engineers, Project	Long-term: 6 to 12 months Review: Monthly	Corrective action log maintained. Rework causes identified. Percentage of closed corrective actions monitored. Fewer repeated defects and corrections reported over time.	SDG 9: Industry, Innovation and Infrastructure SDG 12: Responsible Consumption and Production SDG 16: Strong Institutions

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			Inspectors, Contractors.			
4. Improve Milestone Tracking and Delay Prevention	Projects completed on schedule received a relatively lower mean compared with other timeliness indicators. This suggests the need for closer monitoring of milestones and early response to possible delays.	Within 6 months, require 100% of active projects to have a milestone monitoring sheet and reduce overdue milestones by at least 15% within one year.	Prepare a simple milestone tracking sheet for each project. Monitor planned versus actual progress weekly. Flag delays early and conduct coordination meetings with contractors when slippage appears. Escalate repeated delays to management for action. Responsible: Project Engineers, Construction Section, Contractors.	Medium to long-term: 4 to 12 months Review: Weekly and monthly	Milestone sheets available for all active projects. Delays identified early. Corrective meetings documented. Reduced number of overdue milestones and delayed project activities.	SDG 9: Industry, Innovation and Infrastructure SDG 11: Sustainable Cities and Communities SDG 16: Strong Institutions
5. Enhance Safety Compliance and Durability Assurance	Safety protocols received the lowest item mean under safety and durability, although the category was still interpreted as high level of quality. This points to a need for stronger and more consistent safety monitoring.	Within 12 months, conduct monthly safety and durability checks for 100% of active projects and ensure that critical safety findings are corrected before work proceeds.	Use standard safety checklists during site visits. Conduct regular toolbox meetings and safety reminders. Monitor material testing, workmanship quality, and durability-related requirements. Document safety findings and actions taken. Responsible: Safety Officers, Project Engineers, Materials Engineers, Contractors.	Long-term: 6 to 12 months Review: Monthly	Monthly safety checks completed. Safety findings documented and corrected. Material testing records updated. Improved compliance with safety and durability requirements.	SDG 3: Good Health and Well-being SDG 9: Industry, Innovation and Infrastructure SDG 11: Sustainable Cities and Communities
6. Provide Competency-Based	The study showed that engineers handle multiple	Within one year, ensure that 100% of field engineers	Conduct a training needs assessment.	Long-term: 6 to 12	Training sessions conducte	SDG 4: Quality Education

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Training and Mentoring for Field Engineers	projects and perform various duties. Continuous training can support engineers in supervision, documentation, quality control, and decision-making.	attend at least two relevant training or mentoring sessions on project supervision, QA/QC, safety, and project monitoring.	Organize short learning sessions on QA/QC, supervision checklists, documentation, safety, and delay management. Pair junior engineers with experienced engineers for mentoring. Responsible: District Management, HR/Training Unit, Senior Engineers.	months Review: Semi-annually	d. Attendance records completed. Mentoring pairs established. Improved confidence and consistency in supervision and reporting.	SDG 8: Decent Work and Economic Growth SDG 9: Industry, Innovation and Infrastructure
7. Use a Simple Digital Project Monitoring and Reporting Tool	The results suggest a need for organized tracking of assignments, workload, project progress, quality concerns, and corrective actions. A simple digital tool can make monitoring easier and more timely.	Within 9 months, implement a shared digital monitoring file or dashboard where 100% of active projects are updated at least once a month.	Develop a shared spreadsheet or dashboard containing project name, assigned engineer, status, milestones, inspection findings, reworks, safety concerns, and actions taken. Assign a focal person to consolidate updates. Responsible: Project Engineers, Planning/Monitoring Staff, ICT or Records Staff.	Medium-term: 4 to 9 months Review: Monthly	Digital monitoring tool created and used. Monthly updates submitted. Management can easily track project status, engineer workload, and quality concerns.	SDG 9: Industry, Innovation and Infrastructure SDG 16: Strong Institutions SDG 17: Partnerships for the Goals