

Factors Influencing the Successful Implementation of National Road Projects in the Fourth District of Laguna: Basis for a Proposed Action Plan

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Abstract

This study examined the factors influencing the successful implementation of national road projects in the Fourth District of Laguna, Philippines, to support the development of a targeted action plan. The research aimed to evaluate the effectiveness of current strategies in managing construction design changes, project cost control, and scheduling. Data were gathered through structured surveys completed by stakeholders involved in road project implementation. Respondents rated the effectiveness of strategies with mean scores of 4.353 for construction design changes, 4.200 for cost control, and 4.280 for scheduling, indicating generally effective implementation. However, only 39.39% of respondents considered strategies for design changes and cost control highly influential, and just 33.33% did so for scheduling, pointing to areas for improvement. Additional challenges cited included communication gaps, coordination issues, and varying levels of expertise among project team members. These findings underscore the need for continuous improvement in planning, enhanced stakeholder collaboration, and targeted capacity building. Based on these results, a proposed action plan has been formulated to address the identified gaps, improve project execution, and ensure more efficient and sustainable implementation of future national road projects.

Keywords: national road projects, construction design, project cost control, project team, Laguna 4th District



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INTRODUCTION

The national highway system is a vital component of the country's economic and social progress, acting as a key catalyst for development. It plays a vital role in connecting different sectors of society by enabling the movement of goods, people, and services. They link producers with markets, workers to their jobs, students to schools, and individuals to healthcare facilities, ensuring that daily activities and essential services can function smoothly. As such, road infrastructure is not only crucial for transportation but also serves as one of the most valuable public assets, driving growth and supporting the broader development goals of the nation.

The fourth district of Laguna, Philippines is composed of 16 municipalities namely Pila, Santa Cruz (the Capital of Laguna), Pagsanjan,

Lumban, Paete, Siniloan, Famy, Pakil, Pangil, Sta. Maria, Mabitac, Cavinti, Luisiana, Majayjay, Kalayaan, and Magdalena. All these municipalities were connected by different road sections. Delays in construction are typically defined as time overruns, where a project extends beyond its agreed-upon completion date or the date stipulated in the contract. This is a common occurrence in construction projects, and it often leads to significant consequences for both owners and contractors.

Since the launch of the Build, Build, Build program, the Department of Public Works and Highways (DPWH), the government's primary infrastructure agency, has significantly increased the number of projects being implemented. Under the leadership of President Rodrigo Roa Duterte, the program is touted as ushering in the "Golden Age of Infrastructure," aimed at tackling key issues such as poverty

reduction, economic growth, and alleviating congestion in Metro Manila. One of the primary objectives of the program is to raise annual infrastructure spending to 5% of the country's GDP. Public-Private Partnerships (PPPs) have been highlighted as a critical component in achieving these ambitious goals, ensuring the timely and efficient delivery of vital infrastructure projects ("Timeline for Duterte's economic agenda," 2017).

The research aimed to identify the factors affecting the implementation of national road projects in the Fourth District of Laguna, Philippines, serving as basis for a proposed action plan. Specifically, it sought answers to the following sub-problems:

1. How do the respondents assess the effectiveness of current strategies in mitigating challenges related to construction design changes, project cost control, and project scheduling?
2. What other challenges, issues, or concerns have the respondents encountered in the implementation of national road projects in the Fourth District of Laguna?
3. What action plan can be proposed in the implementation of the national road projects based from the findings of the study?

LITERATURES

In the Philippines, the national road network is divided into national primary road, national secondary roads, and national tertiary roads. This classification system is one of the five groups of roads managed by the Department of Public Works and Highways (DPWH). The framework for this road classification has been established through multiple Executive Orders, Republic Acts, and Presidential Proclamation with the most significant and foundational being Republic Act (RA) No. 917, also known as the Philippines Highway Act (Department of Public Works and Highways, 2022). This legislative act laid the groundwork for the development and maintenance of the national road network, ensuring the strategic connectivity and accessibility of major areas within the country.

As defined, national roads are those that are part of the main transportation network, extending continuously. This also includes roads that lead to national airports, seaports, national parks, and coast-to-coast routes. This road classification by the DPWH was mainly based on the administrative the specific responsibilities and jurisdiction of the concerned agencies in the funding of the project, planning stages, construction, or improvement and maintenance, rather than on the functions of roads (Department of Public Works and Highways, 2022).

According to Siy (2023), national roads in the Philippines, which fall under the jurisdiction of the Department of Public Works and Highways (Department of Public Works and Highways, 2022), have traditionally been designed to facilitate fast vehicular travel. However, this car-oriented approach often compromises the welfare of the majority of Filipinos who do not own private vehicles. Siy argues that prioritizing cars over pedestrians and public transport users makes urban areas less livable and environmentally sustainable. He further notes that while national roads were originally intended to connect cities and provincial capitals, they now traverse the centers of urban areas, passing in front of key public spaces such as schools, markets, hospitals, and government offices—areas where pedestrian accessibility and safety should be prioritized.

Eñano (2024) highlights that infrastructure projects are intended to ease traffic congestion, reduce the cost of goods and services by facilitating trade, and improve the daily commute for workers. Despite these goals, ongoing construction often results in significant inconvenience for motorists, stress for project proponents, and increased financial burdens on the government—particularly when projects are funded through loans. The National Economic and Development Authority (NEDA) reports that delays are commonly due to complications in land acquisition caused by deviations in parcellary plans, procurement issues requiring lender concurrence, and administrative changes affecting signatories. Persistent challenges such as right-of-way disputes and

last-minute design alterations continue to hinder timely completion. The Metro Rail Transit (MRT) Line 7 project, undertaken by San Miguel Corporation (SMC), serves as a prominent example of such delays. These were some of the delays mentioned by Eñano in his article. With this understanding of common delays, the technical team may plan proactively to minimize their impact or prepare mitigation strategies to ensure smoother implementation should such issues arise during the project.

Project implementation, also known as project execution, is the phase in which plans and visions are brought to life. It is the natural outcome following the processes of evaluation, decision-making, visioning, planning, securing funds, and obtaining financial resources (Dillon, 2020). Based on the Project Management framework of Barron and Barron (2019), the project implementation phase represents the third stage in the project management life cycle. This phase focuses on executing the project plan. During this phase, the project manager is responsible for coordinating and directing project resources to achieve the goals set out in the plan.

As the project advances, the project manager oversees and manages each activity to ensure progress aligns with the plan's objectives, addressing any issues that arise. The implementation phase is essentially following the plan and handling challenges as they occur.

The implementation phase is often the most rewarding as progress is made, but it can also be the most challenging. The details can become tedious and, at times, overwhelming. Certain issues have such extensive consequences that they can jeopardize the overall success of the project ("The four phases of project management," 2016).

The most frequent issues include delays, scope expansion, quality concerns, and challenges related to personnel. It is important to monitor for early indicators of potential problems, such as a team member's rising tension, irritability, lack of enthusiasm, or struggles with decision-making.

Changes in construction projects are unavoidable and frequently arise to adjust or modify the initial design or scope of work (Alnuaimi et al., 2015). According to Abdul-Rahman et al. (2017), design changes are described as frequent additions, deletions, and modifications to both the design and construction aspects of a project. These changes usually take place after the contract is awarded and can impact the contract terms and working conditions, contributing to the dynamic and unpredictable nature of construction projects.

Orczyk (2018) explained that control systems are essential for managing costs in construction projects. These systems include three main components: the element being managed, incorporating a feedback system, and corrective interventions. For construction projects, controlling the project cost account is essential. Project management collects actual cost data (feedback) for each account and evaluates them against the budgeted amounts. If discrepancies arise, prompt corrective actions must be taken by project management to prevent exceeding the budget.

Furthermore, it is stated in PMBOK Guide that poorly defined project scope or statement of work can result in higher final costs due to the unavoidable changes that disrupt the project's progress, lead to rework, increase timelines, and diminish workforce productivity and morale ("PMBOK Guide.....," 2017).

METHODS

The study employed a descriptive research design to examine the factors influencing the implementation of national road projects in the 4th District of Laguna. This approach is appropriate for documenting and analyzing current conditions without testing relationships or differences. A total of 33 technical respondents participated in the study, comprising 27 government engineers (81%) and 6 contractors' engineers or project-in-charge personnel (19%). These participants were selected using purposive sampling, a non-probability method where individuals are

chosen based on their expertise and relevance to the research objectives.

The sample size of 33 was considered sufficient given the study's focus on specialized knowledge. In descriptive studies using purposive sampling, the goal is to gather in-depth, informed responses from individuals who are most qualified to speak on the topic. The chosen respondents had direct involvement in road project planning and execution, making them reliable sources of technical insight. Their input supports the study's objective to explore implementation-related factors from a practitioner's viewpoint, rather than from a general public or administrative perspective.

The 4th District of Laguna consists of 16 municipalities: Pila, Sta. Cruz (capital), Pagsanjan, Lumban, Paete, Siniloan, Famy, Pakil, Pangil, Sta. Maria, Mabitac, Cavinti, Luisiana, Majayjay, Kalayaan, and Magdalena. The area is connected by several national highways, with an average of 3 to 5 infrastructure projects annually. Given this technical scope, only respondents with direct project involvement were included to ensure expertise and accuracy in assessment.

Other stakeholders—such as community members, local officials, or administrative personnel—were excluded, as the study focused on identifying factors that influence successful implementation from a technical standpoint. While this limits generalizability to the broader population, it enhances the depth and applicability of findings within the field of infrastructure project management.

The researcher utilized a self-designed questionnaire with Likert scale serving as the primary instruments for collecting data and information. The questionnaire was created specifically to explore factors affecting the implementation of national road projects. It was not standardized, but it underwent content validation by three subject matter experts in civil engineering and research ethics review committee. Their feedback was used to revise the questions for clarity and relevance. Also, a letter is attached together with the

questionnaire survey stating that the information gathered will be treated with strict confidentiality.

The development of the questions was based on an extensive review of literature and practical insights from previous infrastructure project evaluations. The survey was divided into sections covering demographic profile of the respondents in the first part of the instrument. This section encompasses sex, age, position, and length of experience in road projects. The second portion of the instrument examines the factors affecting the execution of national road projects. Three parameters were the focus of the study specifically the construction design changes, project cost control, and project scheduling. Furthermore, this part also involves the influence of these parameters on the effectiveness of road project implementation. The last part of the instrument consists of the challenges, issues, or concerns encountered in the implementation of national road projects in the 4th district of Laguna.

For the data collection process, questionnaires were administered face-to-face during project site visits and scheduled meetings with engineers and project personnel in the 4th District of Laguna. This method was chosen to ensure clarity of responses and encourage full participation. Follow-ups were conducted where necessary to complete the respondent pool. The collected data were analyzed using basic statistical tools to summarize the responses from the participants across all aspects of the study.

Frequency distribution was implemented to obtain the demographic data of the target respondents. The research is focused more on the events that occurred than on the explanation of how or why they happened.

The mean was calculated to determine the average response for each factor affecting the implementation of national road projects in the 4th District of Laguna. While weighted mean was utilized to analyze the data, focusing on extracting key concepts, perceptions, and insights from the participants. This involves

interpreting the categorization of subjects, measuring the extent of perceived significance and tracking the frequency of observable variations, and assessing the weighted mean to draw meaningful conclusions from the data.

A five-point Likert scale, ranging from 1 (not implemented) to 5 (highly implemented), was used to assess respondents' perceptions of the factors influencing the implementation of the national road project. Another five-point Likert scale, from 1 (not at all influential) to 5 (extremely influential), was employed to evaluate how respondents perceive the influence of different project aspects on the achievement of goals in the road project. Additionally, a four-point Likert scale, where 1 represents "not at all a problem" and 4 indicates a "serious problem," was used to measure the challenges, issues, and difficulties encountered by respondents in the national road project implementation.

RESULTS

The primary aim of this study is to elucidate the factors affecting project implementation, assess the effectiveness of current strategies, and identify the challenges encountered throughout the process. The data offers a comprehensive view of the current state of national road project implementation in the district, serving as a foundation for the proposed action plan aimed at improving future efforts. The findings will guide subsequent discussions and recommendations, contributing to the broader goal of enhancing infrastructure development in the 4th District of Laguna.

Table 1
Distribution of Respondents in terms of Age

Age Group	Frequency	Percent
20 – 29 years old	17	51.51
30 – 39 years old	11	33.33
40 – 49 years old	4	12.12
50 – 59 years old	1	3.04
Total	33	100

The frequency and percentage of respondents divided into four age categories: 20-29 years old, 30-39 years old, 40-49 years old, and 50-59

years old. A total of 33 respondents participated in the study. The majority of respondents (51.51%) were aged 20-29 years, followed by 33.33% in the 30-39 years old group. The 40-49 years old group had 12.12%, and the smallest group, 50-59 years old, accounted for just 3.04% with 1 respondent.

The predominance of respondents aged 20-29 in the study aligns with several converging trends within the Philippine workforce. According to Philippine Statistics Authority (2020), the 25-34 age group made up the largest share of the employed population as of January 2020. This age group represents a generation entering the workforce with fresh perspectives and technological fluency, likely drawn to the government for its blend of career opportunities and public service.

Table 2
Gender Distribution of the Respondents

Gender	Frequency	Percent
Male	23	69.69
Female	10	30.31
Total	33	100

Among the 33 total respondents, 69.69% were male, and 30.31% were female. This gender distribution suggests a predominance of male participants, which may reflect traditional gender roles within fields such as engineering and construction, potentially limiting diversity in perspectives and approaches, as noted in the literature (CIB, 2019).

Table 3
Distribution of Respondents in terms of Job Role

Job Role	Frequency	Percent
Government Engineer	27	81.82
Contractor's Engineer	2	6.06
Construction Crew	1	3.03
Others		
Laboratory Technician	2	6.06
Job Order	1	3.03
Total	33	100

A total of 81.82% of the 33 respondents held the position of Government Engineer, which includes roles such as Project Engineer, Project Inspector, Materials Engineer, and Resident Engineer. These individuals are responsible for overseeing the overall supervision of the

project, including ensuring the quality of materials used. A smaller proportion of respondents were Contractor's Engineers (6.06%), Laboratory Technicians (6.06%), Construction Crew (3.03%), and Job Order (3.03%). The high number of Government Engineers suggests a strong emphasis on oversight and management roles within the project, which could lead to a more bureaucratic approach to project implementation. This may introduce potential challenges in communication and flexibility, which can impact the overall efficiency of the project.

Table 4
Distribution of Respondents in terms of Length of Experience

Length of Experience	Frequency	Percent
0-1 year	7	21.21
2-4 years	11	33.33
5-7 years	8	24.24
8-10 years	4	12.12
10 years and above	3	9.10
Total	33	100

The majority of respondents had varying levels of experience. The largest group, 33.3% (11 respondents), had 2-4 years of experience. The second largest group, 24.24% (8 respondents), had 5-7 years of experience, followed by 21.21% (7 respondents) with less than one year of experience. The 12.12% (4 respondents) had 8-10 years of experience, and the remaining 9.10% (3 respondents) had 10 years or more of experience. This mix of experience levels presents valuable opportunities for knowledge transfer, where more experienced engineers can mentor those with less experience. However, it may also require targeted training programs to address potential gaps in expertise and ensure all respondents are properly equipped to perform their roles effectively. The total percentage sums to 100.0%, confirming that all respondents are accounted for by their years of experience.

The following tables and discussions summarizes how the respondents perceive the factors that influence the implementation of national road projects.

Table 5
Mean Distribution on the Assessment of Construction Design Changes as Factors Affecting the Implementation of National Roads Projects

Statement	Mean	Verbal Interpretation
• Design with engineering and project plans	4.545	Highly Implemented
• Public consultation with stakeholders	4.242	Implemented
• Scope of work is specific, measurable, achievable, realistic, and time-bound	4.355	Implemented
• Feasibility study conducted for funding requirements	4.121	Implemented
• Topographic/parcellary survey before program preparation	4.212	Implemented
• Notices served to concerned citizens	4.576	Highly Implemented
• Project duration based on scope of work	4.424	Implemented
Overall Mean	4.353	Implemented

Table 5 presents the assessment of construction design changes. The overall mean score of 4.353 falls within the "Implemented" category, which suggests that, generally, the elements affecting the execution of national road projects are being addressed with a reasonable level of success. While there is some variation in how well each factor is executed, the overall implementation of these key aspects is strong, indicating that the project management processes in place are mostly effective in supporting successful project outcomes.

Table 6
Mean Distribution on the Assessment of Project Cost Control as Factors Affecting the Implementation of National Roads Projects

Statement	Mean	Verbal Interpretation
• Project cost estimates prepared before commencement	4.424	Implemented
• Adherence to project budget during implementation	4.121	Implemented
• Complete project specifications included in cost determination	4.333	Implemented
• Planned project cost incurred during execution	4.364	Implemented
• Standardized cost reporting done regularly	4.273	Implemented
• Claims for price adjustment during calamities	3.788	Implemented
• Specifications complete at the time of budget determination	4.094	Implemented
Overall Mean	4.200	Implemented

Table 6 reveals the assessment of respondents with respect to the project cost. The 4.200 mean score demonstrates that, on the whole, project cost control factors are Implemented, reflecting that cost control measures are effectively incorporated into national roads projects, though there may be areas for improvement, particularly in managing cost adjustments during unforeseen events.

Table 7

Mean Distribution on the Assessment of Project Scheduling as Factors Affecting the Implementation of National Roads Projects

Statement	Mean	Verbal Interpretation
• Specifications complete when project duration was determined	4.182	Implemented
• Project has a schedule management plan	4.242	Implemented
• Scheduling techniques used (Gantt Charts, Critical Path Analysis)	4.515	Highly Implemented
• Gantt Charts/Bar Charts used in scheduling	4.485	Implemented
• Critical Path Analysis utilized	4.273	Implemented
• Technology choice well-constructed during duration determination	4.182	Implemented
• Program evaluation and review methods used	4.182	Implemented
• Construction methodology defined prior to project	4.182	Implemented
Overall Mean	4.280	Implemented

The total mean score of 4.280 (Table 7) reveal that, in general, project scheduling factors are Implemented, with particular strength in the use of scheduling techniques such as Gantt charts and Critical Path Analysis. This suggests that scheduling is well-structured and plays a primary contributor to the successful execution of national roads projects.

When assessing the issues, challenges, and concerns in the implementation of national road projects in the 4th District of Laguna, such as information delays, lack of communication between parties, incompetent supervision consultants, inadequate contractors, financing difficulties, lack of cooperation, insufficient knowledge among site workers, environmental conditions, conflicts among project participants, ignorance of informal settlers regarding road widening, and delays in the relocation of utility poles, these issues, while impactful, are generally not perceived as critical. However, they can be managed and reduced through effective intervention and management strategies. Key challenges, particularly the incompetence of contractors, delays in information exchange, and poor communication, underscore the need for more stringent contractor selection, improved communication channels, and targeted training programs. Addressing these concerns is crucial for enhancing project outcomes, minimizing delays, and fostering a more efficient and cooperative project environment. Incompetent contractors can cause significant delays and quality issues, while communication breakdowns can lead to misunderstandings, errors, and conflicts among stakeholders.

Table 8

Proposed Action Plan

Action plan area	Action steps	Responsible party	Timeline	Expected outcome	Estimated cost
I. Improve Communication and Information Exchange					
1. Set Up a Centralized Communication System	Implement an easy-to-use project management platform for stakeholders to access documents, submit updates, and communicate. Provide training for effective use.	Project Manager, IT Team	1-2 months	Improved communication, reduced miscommunication.	P280,000 - P560,000 (Software subscription, Training sessions)
2. Standardize Reporting Procedures	Create standardized templates for progress reports, design change requests, and other communications for consistency and clarity.	Project Manager, Engineers	1 month	Consistent, clear reporting for all stakeholders. All progress reports submitted using the new template, ensuring uniformity in data presentation and easier comparison across teams.	P112,000 - P168,000 (Template design, document management system)
3. Organize Regular Meetings	Schedule bi-weekly or monthly meetings with stakeholders to discuss progress, raise concerns, and collaborate on solutions.	Project Manager	Ongoing (Bi-weekly/Monthly)	Better collaboration, problem-solving, and decision-making. Improved project alignment and a 25% reduction in misunderstandings among team members. Positive feedback from stakeholders on meeting effectiveness.	P56,000 - P112,000 (Meeting facilities, communication tools)
4. Implement a Feedback System	Create a feedback system (surveys/email) to gather stakeholder suggestions and address concerns promptly.	Community Liaison, Project Manager	Ongoing	Higher stakeholder satisfaction and timely issue resolution. 90% of concerns raised by the community were addressed within 48 hours, leading to higher community satisfaction scores (85%+).	P28,000 - P56,000 (Survey tools, Email setup, Analytics)
II. Strengthen Contractor Selection Process					
1. Refine the Evaluation Criteria for Contractors	Develop detailed, objective criteria for contractor selection, focusing on experience, technical expertise, and past performance.	Procurement Team, Project Manager	1-2 months	Selection of qualified contractors with relevant experience. A shortlist of contractors who scored above 90% in the evaluation process, leading to the selection of highly skilled contractors.	P112,000 - P224,000 (Consultant fees, research, evaluation tools)
2. Conduct Thorough Background Checks on Contractors	Verify licenses, review past projects, and perform due diligence to ensure contractors are capable and trustworthy.	Procurement Team	1-2 months	Identified a contractor with a history of delays, preventing potential issues on the project.	P56,000 - P112,000 (Background check services, verification fees)
3. Include Site Visits as Part of the Evaluation	Conduct site visits as part of the evaluation process to assess contractor capabilities and project understanding.	Procurement Team	Ongoing	Better assessment of contractor abilities and project fit. Site visits revealed key differences in quality between contractors, allowing for the selection of the most capable firm.	P168,000 - P228,000 (Travel, accommodation, site visit logistics)
4. Adopt a Multi-Stage Selection Process	Implement pre-qualification, shortlisting, and final interviews to choose the best contractors.	Procurement Team	Ongoing	Improved contractor selection, leading to better project outcomes. Multi-stage selection led to hiring contractors who met 100% of the project's technical and safety requirements.	P112,000 - P168,000 (Interview coordination, selection process)
III. Improve Worker Training Programs					
1. Conduct a Training Needs Assessment	Conduct surveys, interviews, and site observations to identify skill gaps among workers and understand their training needs.	HR, Project Manager	1 month	Tailored training programs that address specific skill gaps. Identified a need for more training in safety procedures, leading to a 40% reduction in minor accidents on site after training.	P84,000 - P168,000 (Surveys, staff interviews, training materials)
2. Design Targeted Training Programs	Create training programs focused on areas like quality control, safety practices, and emerging technologies to boost worker efficiency.	HR, Training Department	2-3 months	Improved skills and productivity among workers. A new safety training program reduced workplace injuries by 25% in the first quarter after implementation.	P168,000 - P280,000 (Program development, instructor fees, materials)
3. Offer Continuous Learning Opportunities	Provide ongoing workshops, online courses, and mentoring programs to keep workers updated with industry best practices.	HR, Training Department	Ongoing	Workers remain skilled and knowledgeable in new techniques and regulations. 70% of workers participated in additional training, improving productivity by 15% in key tasks.	P160,000 - P224,000 (Online courses, workshops, mentoring programs)
4. Partner with Educational Institutions	Collaborate with organizations like TESDA to offer accredited certifications and training programs that add value to workers' qualifications.	HR, Project Manager, TESDA	3-6 months	Better-trained workforce with recognized certifications. 50 workers received industry-recognized certifications, improving project quality and worker morale.	P224,000 - P392,000 (Partnership agreements, certification fees)
IV. Implement Regular Monitoring and Evaluation					
1. Define Key Performance Indicators (KPIs)	Establish measurable KPIs to track project progress, resource use, and milestones.	Project Manager, Engineers	1 month	Timely detection of issues and better project tracking. KPIs tracked the completion rate, and resource allocation, resulting in early identification of delays and corrective actions taken.	P56,000 - P112,000 (Consultants, KPI tracking tools)
2. Undertake regular site evaluations	Develop a plan for consistent site inspections to ensure quality and safety standards are met.	Site Supervisors, Project Manager	Ongoing	High-quality work and compliance with safety standards. Identified safety issues early on and resolved 100% of compliance issues before they became significant problems.	P168,000 - P336,000 (Inspection logistics, staff, and equipment)
3. Use Project Management Software for Tracking	Utilize project management software to track progress, resources, and generate reports in real-time.	Project Manager, IT Team	Ongoing	Efficient project tracking and management. Real-time tracking allowed for better resource allocation, preventing delays and optimizing team productivity.	P280,000 - P672,000 (Software licenses, setup, and training)
4. Conduct Post-Project Evaluations	After project completion, evaluate the overall success, identify lessons learned, and improve future processes.	Project Manager, Stakeholders	After project completion	Improved future project processes and decision-making. Post-project evaluation identified 5 process improvements that saved 10% in costs for the next project.	P112,000 - P168,000 (Evaluation process, consultant fees)
V. Strengthen Stakeholder Engagement					
1. Hold Regular Public Consultations	Host public forums to inform the community and gather feedback regarding project plans and concerns.	Community Liaison, Project Manager	Ongoing	Increased trust and cooperation from the community. Increased community involvement, with 85% of attendees reporting a positive experience and feeling more informed about the project.	P168,000 - P280,000 (Event logistics, materials, venue)
2. Appoint a Community Liaison	Assign a dedicated liaison to facilitate interaction and communication between the project team and the local population.	Community Liaison	1 month	Better community relations and faster issue resolution. The liaison resolved 90% of community concerns within a week, improving local support for the project.	P168,000 - P280,000 (Salary, communication tools, outreach)
3. Use Multiple Communication Channels	Share updates through social media, websites, and newsletters to ensure that the public is well-informed about the project.	Community Liaison, Project Manager	Ongoing	Expanded outreach and improved transparency with the public. Increased public engagement, with social media posts receiving 3x more interaction, improving transparency.	P56,000 - P112,000 (Social media ads, newsletters, website updates)
4. Incorporate Community Feedback into Decision-Making	Actively involve community feedback in project planning and decision-making processes to reflect local needs and concerns.	Project Manager, Community Liaison	Ongoing	Improved community satisfaction and more successful project outcomes. Implemented 5 community-suggested changes, resulting in higher satisfaction (90%) and smoother project progress.	P168,000 - P280,000 (Consultation fees, implementation costs)

The action plan presented outlines a strategic approach to enhancing communication, optimizing contractor selection, improving workforce training, ensuring effective monitoring, and strengthening stakeholder engagement. The associated budget estimates have been carefully calculated to align with the aim of the project while considering the cost of necessary resources, tools, and services. These costs reflect the essential investments required to streamline project operations, foster collaboration, and secure the overall achievement of the project's goal.

Each section of the plan requires specific financial commitments. For instance, the implementation of a centralized communication system involves expenses related to project management software, training, and system setup. Although these costs may be substantial upfront, they are expected to significantly improve communication efficiency, reduce miscommunication, and support better project tracking in the long term.

Similarly, the costs associated with refining contractor selection criteria, conducting background checks, and performing site visits are essential for mitigating potential risks related to quality and performance. These investments are crucial for ensuring that only qualified contractors are selected, thus, minimizing the likelihood of delays or subpar work that could incur additional costs down the line.

In total, the estimated costs were calculated to reflect a balance between ensuring the success of each action step and the financial realities of the project, with each action step aligned to achieve significant improvements in project management, efficiency, and stakeholder satisfaction. These costs will help ensure the project is well-resourced and set up for long-term success.

DISCUSSION

The intention of this study was to investigate the factors affecting the implementation of national road projects in the 4th Legislative District of Laguna. The analysis of data from various respondents revealed several key insights:

1. **Demographic Profile.** The respondents primarily consisted of male professionals, with a significant representation of government engineers and contractors. Most respondents were within the age range of 20 to 29 years and had varying lengths of experience in road projects. This signifies the workforce trend in the Philippines as per the Philippine Statistics Authority (2020), the 25–34 age group made up the largest share of the employed population as of January 2020.

The Philippines has a notably youthful population, which results in a significant number of recent graduates entering the job market. As these young professionals begin their careers, government agencies emerge as appealing options due to their reputation for providing job stability and attractive benefits. And also, the government is undergoing a period of modernization and technology advancement. This focus on innovation resonates with a generation comfortable with digital tools and eager to contribute to progress. Younger employees are more likely to embrace new technologies and methodologies, potentially leading to increased efficiency and project innovation within the agency. And Finally, the government provides diverse career paths and opportunities for professional development. This appeals to ambitious young professionals seeking upward mobility and skill enhancement within a structured environment.

2. **Effectiveness of Strategies.** The evaluation of construction design changes showed that a majority of respondents found these strategies to be effective. However, assessments of project cost control revealed a concerning lack of effectiveness, with majority of the respondents rating these strategies as less implemented or not implemented at all.

The construction design changes shows that the national road projects in the region are being implemented with a focus on proper planning, community involvement, and realistic scheduling. However, there may still be areas that could benefit from further improvement, particularly in ensuring that all projects adhere more strictly to SMART criteria, funding assessments, and timely surveys. These findings provide a solid foundation for refining future road projects and addressing any gaps that may still exist in the implementation process.

In the project cost control, it indicates confidence in budgeting practices; however, the lack of completeness in specifications

suggests potential risks for budget overruns, necessitating tighter controls and clearer guidelines. While respondents are confident in the implementing of projects in the national road budgeting practices, the lack of completeness in specifications and the potential for budget overruns are concerns. This highlights the need for tighter controls, clearer guidelines, and potentially more thorough cost estimation processes to ensure projects stay within budget.

As for the assessment of project scheduling, the effectiveness of the techniques is employed, the integration of specifications into the scheduling process must improve to mitigate potential delays and ensure timely project completion. The implementation of national road projects in the 4th District of Laguna employs effective scheduling techniques, but the integration of specifications into the scheduling process needs improvement. This could lead to delays if specifications are not fully considered when determining project timelines.

Overall, the data suggests that respondents believe strategies related to construction design changes and project cost control are the most influential in mitigating project challenges, while project scheduling is still considered important but slightly less influential. These findings imply that while current strategies are effective, continuous evaluation and improvement should be prioritized to address emerging challenges. The perception of effectiveness demonstrates the need for sustained training and resources to adapt to changing project dynamics. Respondents generally perceive current strategies for managing construction design changes, project cost control, and project scheduling as effective. However, the need for continuous evaluation and improvement is highlighted. This suggests that the implementation of National road projects in the 4th District of Laguna should not become complacent and must adapt its strategies to address emerging challenges and ensure long-term

effectiveness. The perception of effectiveness also demonstrates the need for sustained training and resources to support employees in adapting to changing project dynamics.

3. **Challenges Identified.** Several key challenges were identified in the study, including delays in information exchange, lack of cooperation among stakeholders, and issues related to contractor competency. These challenges were frequently described as serious, indicating an urgent need for effective intervention. Notably, problems such as the selection of incompetent contractors, communication breakdowns, and stakeholder disengagement underscore the importance of improving management practices. These issues can be mitigated through the implementation of more rigorous contractor selection procedures, the establishment of clearer and more efficient communication channels, and the introduction of targeted training programs. Addressing these challenges is crucial for enhancing project outcomes, minimizing delays, and fostering a more collaborative and efficient project environment. In particular, incompetent contractors contribute to significant delays and quality issues, while poor communication often leads to misunderstandings, errors, and conflict among project participants.
4. **Influence of Aspects.** Respondents rated aspects such as changes in construction design and project scheduling as influential on project effectiveness. However, there remains considerable room for improvement in the areas of project cost control and stakeholder engagement.

The study reveals the diverse characteristics of implementing national road projects, revealing both successes and areas requiring improvement. While certain strategies, particularly those related to construction design, have shown effectiveness, there are notable deficiencies in project cost management and stakeholder engagement. These gaps point to a pressing

need for more robust communication and stronger collaboration among all involved parties to ensure smoother project execution.

Additionally, the study identifies that the varying levels of experience among the respondents may play a major influence on shaping the success of project implementation. The expertise and readiness of team members appear to directly impact the efficiency and outcomes of the project. Therefore, addressing these challenges in a comprehensive manner—focusing on better communication, more effective training, and fostering stronger partnerships—will be crucial in improving the success rate of future road projects.

In light of the findings and conclusion of this study, the following recommendation are suggested:

1. **Enhance Communication Protocols.** To enhance communication and information exchange, the implementation of national road projects in the 4th District of Laguna should implement a centralized communication platform, such as project management software, where all stakeholders can access documents, submit updates, and communicate. Standardizing reporting procedures with clear guidelines and templates for progress reports and design change requests is also crucial. Regular meetings (bi-weekly or monthly) with all stakeholders should be conducted to discuss progress, address concerns, and foster collaboration. Additionally, a structured feedback process should be set up for stakeholders to contribute input during the project lifecycle. This could involve regular surveys, suggestion boxes, or dedicated email addresses for feedback. These measures should be established early in the project, ideally during the initiation phase, and maintained throughout.
2. **Strengthen Contractor Selection Processes.** Strengthening contractor selection processes is essential for ensuring project success. The implementation of national road projects in the 4th District of Laguna should refine evaluation criteria to include not only experience and past performance but also financial stability and technical expertise relevant to the specific project requirements. Thorough background checks, including license verification, review of past projects, and scrutiny of legal and ethical history, should be mandatory. Site visits should be incorporated into the evaluation process to assess the contractor's understanding of project needs and site management capabilities. A multi-stage selection process, starting with pre-qualification, followed by shortlisting and final interviews, can help ensure that only the most qualified contractors are chosen. These processes should be in place before the project procurement phase.
3. **Enhance Training Programs for Workers.** To Upgrade training initiatives for workers, the implementation of national road projects in the 4th Legislative District of Laguna should first conduct a needs assessment to identify specific knowledge and skill gaps among site workers through surveys, interviews, and observations. Based on this assessment, targeted training programs should be designed, focusing on areas such as quality control, safety procedures, and the use of new technologies relevant to the project. Providing ongoing training opportunities is crucial for workers to stay updated on industry best practices and new developments in road construction. This could involve workshops, online courses, or mentoring programs. Additionally, partnering with technical institutions like TESDA can provide accredited training programs and certifications for workers, enhancing their skills and employability. These training initiatives should be integrated into the project plan from the outset and continue throughout the project lifecycle.
4. **Foster Stakeholder Engagement.** Organize frequent public consultations to engage local communities and stakeholders, ensuring

their concerns are addressed throughout project planning and execution.

5. **Implement Regular Monitoring and Evaluation.** Implementing regular monitoring and evaluation is vital for ensuring project success. The implementation of national road projects in the 4th District of Laguna should implement KPIs that are well-defined, measurable, achievable, relevant, and time-sensitive to assess project progress and address potential issues at an early stage. Regular site inspections by qualified personnel should be scheduled to monitor work quality, adherence to safety standards, and compliance with project specifications. Utilizing project management software can help track progress, manage resources, and generate reports that provide insights into project performance. Finally, conducting comprehensive post-project evaluations is crucial for assessing the overall achievement of the project goals, highlighting key lessons, and informing future project planning. Monitoring and evaluation should be an ongoing process throughout the project lifecycle.

6. **Increase Stakeholder Engagement.** To increase stakeholder engagement, the implementation of national road projects in the 4th District of Laguna should conduct regular public consultations throughout the development of the project. This could involve holding public meetings and forums to inform the community about project plans, gather feedback, and address concerns. Establishing a community liaison can serve as a dedicated point of contact for residents and businesses affected by the project, facilitating communication and addressing issues promptly. Utilizing various information pathways, such as social media, websites, and newsletters, can help disseminate project information and updates to the wider community. Most importantly, the implementation of national road projects in the 4th District of Laguna should actively integrate local feedback into the project's planning and decision-making process,

demonstrating a commitment to transparency and collaboration.

Given these insights, several avenues for future research emerge that could further contribute to evaluating and enhancing the implementation of national road projects in the 4th District of Laguna:

1. **Investigating Best Practices.** Considering the challenges encountered with contractor competency, future research could focus on identifying and analyzing best practices in contractor selection, management, and performance evaluation. This could involve case studies of successful national road projects within the 4th District of Laguna or other regions of the Philippines, examining the specific criteria and processes used to select and manage high-performing contractors.
2. **Longitudinal Studies on Strategy Effectiveness.** While this study assessed the perceived effectiveness of current strategies, longitudinal studies could track the long-term impacts of the proposed action plan on project outcomes. This would involve collecting data on project performance (e.g., cost, schedule adherence, quality) before and after implementing the recommendations, providing empirical evidence of their effectiveness.
3. **Exploring the Impact of New Technologies.** Given the relatively young workforce and the potential for utilizing new technologies in road construction, future research could investigate the adoption and impact of specific technologies on project efficiency, cost, and quality. This could involve assessing the use of Building Information Modeling (BIM), drones, or other innovative tools in national road projects within the 4th District of Laguna.
4. **Addressing Gender Imbalance.** To address the observed gender imbalance in the respondent pool, future research could explore the barriers and opportunities for women in the field of road construction and

project management. This could involve qualitative studies to understand the experiences of women engineers and identify strategies to promote greater diversity and inclusion in the implementation of national road projects in the 4th District of Laguna and its partner organizations.

5. Community Engagement Strategies. Building on the emphasis on stakeholder engagement, future research could delve deeper into specific community engagement strategies that are most effective for national road projects. This could involve comparing different approaches to public consultation, information dissemination, and conflict resolution, identifying best practices for ensuring community support and minimizing project disruptions.

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