

Labor Shortage Management in Construction Projects within Central and Northern Aurora

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Abstract- *Construction workers contribute significantly to the execution and erection of all structures, including residences, public buildings, industrial buildings, highways, and bridges. Perhaps construction workers are labeled as skilled or unskilled. They both play crucial roles since completing a building project necessitates the participation of a diverse group of personnel. However, when the world's construction industry struggled during the 2008 financial crisis, the demand for skilled and unskilled manual workers increased (Ceric & Ivic, 2020). Determining the labor shortage of expert and unskilled labor in various construction projects is advantageous. It will give significance to the construction industry of what areas skilled workers have a labor shortage and provide reliable information in determining the shortage of unskilled labor within areas of consideration. In this study, the researchers selected a hundred construction projects within Central and Northern Aurora, Philippines - encompassing Project Engineers, Site Engineers, and Foremen working either on private or government construction projects. The researchers focused on the labor shortage in the construction industry with the goals of determining the degree of shortage in different types of skilled labor; determining the extent of shortage in unskilled labor in construction projects; distinguishing labor shortage risk; comparing the degree of skilled labor in constructions; and, to propose a long-term solution to minimize labor shortage in either public or private construction sites. As the study concluded, the findings revealed that there is a labor shortage in terms of skilled and unskilled labor on building sites in Central and Northern Aurora.*

Indexed Terms- *Construction workers, Labor shortage, Skilled labor, Construction projects*

I. INTRODUCTION

In construction, "labor" refers to the workers completing and achieving a project's purpose (M. Hafez, 2014). It is well renowned that the construction industry requires many workers to complete a project on time. Similarly, skilled and unskilled labor is important, as construction projects primarily depend on workers' availability (Azar et al., 2018). Nonetheless, construction workers greatly help the execution and erection of all structures, such as homes, public building facilities, industrial buildings, roads, and bridges. Perhaps construction workers are classified as skilled and unskilled workers. They both play important roles, as completing a building project requires various workers with different skill sets. On the other hand, skilled laborers have been trained in the necessary skills by performing building and construction-related tasks as part of the labor workforce. On the other hand, non-skilled workers do routine duties requiring little or no experience or Training.

However, after the world's construction industry faced problems from the financial crisis in 2008, the need for enough manual workers, both skilled and unskilled, became in demand (Ceric & Ivic, 2020). Determining the labor shortage of skilled and unskilled labor in different construction projects is beneficial. It will give significance to the construction industry of what areas in skilled works have a labor shortage and provide reliable information in determining the shortage for unskilled labor within Central and Northern Aurora. In previous studies about the labor shortage, most research topics have only focused on determining the causes of skilled labor shortage and its impact on the performance of construction projects. Different studies have cited various factors that can contribute

to the labor shortage. Some factors include geographical location, wages, high expenses, and lack of skills training.

Nonetheless, the decline in labor productivity has become a severe problem in different countries over the past years. Shortage of workers faces issues such as changes in the construction design, delays in the delivery of materials, and a need for a competent project management team over the projects (Porntepkasemsant & Charoenpornpattana, 2015). The workforce could be exhausted when there is a discrepancy between worker skills and available roles on a construction site. (B. Oseghale et al., 2021).

The Department of Labor and Employment (DOLE) reports that construction employees increased from 8.5% in October 2017 to 9.5% in October 2018. There is also an increasing number of 328,000 jobs, bringing the total number of construction workers to 3.9 million. Furthermore, by 2020-2030 the Construction Industry Authority of the Philippines (CIAP) will raise jobs in the construction sector by up to 7 million. Former president Rodrigo Roa Duterte said in February 2019 that a scarcity of trained workers was to blame for the infrastructure program's delay. The former President noted the need for more trained laborers, primarily plumbing, carpentry, and electricians. Therefore, the researchers want to conduct this study by examining the shortage of skilled and unskilled labor in construction projects within Central Aurora. Also, the researchers want to precisely determine the areas of skill works in construction projects with labor shortages.

This study aims to:

1. Determine the degree of shortage in different types of skilled labor in building and road construction projects.
2. To determine the extent of the shortage of unskilled labor in building and road construction projects.
3. Distinguish the labor shortage risk if it is evident in public and private building construction projects.
4. Compare the degree of the types of skilled labor in public and private building constructions.

5. To propose a long-term solution to minimize the labor shortage in construction projects.

The importance of this study is:

1. The proponent would be able to inform the contractors, civil engineers, and the communities within Central Aurora Province that a labor shortage exists in public or private construction.
2. The proponent will be able to let the Local Government Unit (LGU) use the data and findings of the study to make essential decisions on labor shortages in construction projects.

This study aims to address the issue of labor shortages in the construction industry in Central Aurora Province. The study will evaluate the degree of shortage of both skilled and unskilled labor, and differentiate between public and private construction projects. The insights gathered from this study will be valuable to contractors, civil engineers, local government units, and the wider community. Ultimately, the findings will enable informed decision-making and the development of long-term solutions to minimize labor shortages, ensuring the successful execution of construction projects and the sustained growth of the region's infrastructure.

II. METHODOLOGY

The researchers in this study collected data within the natural environment of the phenomenon under investigation by conducting surveys and interviews. In addition, they gathered information about the Department of Public Works and Highways (DPWH) and Municipal Engineering offices to determine the number of construction projects within Central Aurora. This data collection aims to gather information on the lack of skilled and unskilled workers needed for building and road construction projects, as well as identify potential long-term labor management solutions.

A survey questionnaire is developed to gather accurate data for the study and is divided into four parts to measure different aspects of the data.

1. *The degree of shortage in terms of skilled labor.*
2. *The extent of the shortage of unskilled labor.*
3. *The possible causes of labor shortage.*

4. An open-ended interview questions to determine long-term solutions that can be prepared to manage the onset of labor shortage effectively – the questions are as follows:
 - a. What do you think are applicable to use as long-term solutions to the onset of shortage in the types of skilled labor?
 - b. What could be your strategies to inform the public that you need a skilled and unskilled labor workforce for your projects?
 - c. What are the best ways to maintain the required workforce in your projects?
 - d. Do you experience a labor shortage due to youth’s lack of interest in entering the construction industry? If yes, what solutions can be proposed to encourage them to work in the industry?
 - e. What other considerations can you propose as long-term solutions to manage the labor shortage effectively?

The purpose of this research is to determine if there is a significant difference in labor shortage between public and private building construction in Central and Northern Aurora Province whereas,

Hypothesis: There is no significant difference in the labor shortage between public and private building construction projects.

A survey questionnaire was distributed to Project Engineers, Site Engineers, and foremen working on private or government construction projects in Central and Northern Aurora. The respondents were randomly selected and asked to rate their answers on a five-point Likert scale as shown below. This was done to gain insights into their responses. The use of the Likert scale in evaluating the degree of labor shortage in construction projects has been beneficial. Unlike simple "yes" or "no" questions, the Likert scale measures the degree of opinion and leads to more accurate and reliable data. To determine whether there is a significant difference in the labor shortage between public and private building construction projects, the researchers used a t-test. This statistical method allowed them to compare the two types of projects and identify any discrepancies. The researchers conducted both two-tailed and one-tailed tests to ensure accurate results.

III. RESULTS AND FINDINGS

Table 1 shows that some types of skilled labor for residential building construction have shortages ranging from low to neutral. Carpenters, Mason, Tile setters, Painters, Plumbers, Sheet Metal Workers, electricians, foremen, leadmen, and pipefitters are Neutral. On the other hand, iron and steel workers, roofers, scaffolders, backhoe operators, dump truck drivers, welders, and compactor operators belong to those with a low degree of skilled labor shortage. Ceiling installers and built-in cabinet makers are in demand on one of the building sites.

Table 1

DEGREE OF SHORTAGE ON TYPE OF SKILLED LABOR		
TYPE OF SKILLED LABOR	AVERAGE	OVERALL SCALE
Carpenters	2.88	NEUTRAL
Mason	2.72	NEUTRAL
Tile setter	2.88	NEUTRAL
Iron and steel worker	2.56	LOW
Painters	3.04	NEUTRAL
Plumbers	3.08	NEUTRAL
Roofers	2.52	LOW
Scaffolders	2.48	LOW
Sheet metal workers	2.68	NEUTRAL
Electrician	2.88	NEUTRAL
Backhoe operator	2.36	LOW
Dump truck driver	2.32	LOW
Foreman	2.88	NEUTRAL
Leadman	2.80	NEUTRAL
Formwork crew	2.60	LOW
Pipefitters	3.16	NEUTRAL
Welder	2.52	LOW
compactor operator	2.40	LOW
Others: Ceiling Installer, Built-In Cabinet Maker		

Table 2 shows a shortage of skilled workers in commercial building construction. Tile setters, painters, plumbers, electricians, and pipefitters are in high demand, while carpenters, masons, iron and steel workers, roofers, sheet metal workers, scaffolders, foremen, leadmen, formwork crew, and

welders are in neutral demand. Compactor operators are in low demand.

Table 2

DEGREE OF SHORTAGE ON TYPE OF SKILLED LABOR		
TYPE OF SKILLED LABOR	AVERAGE	OVERALL SCALE
Carpenters	2.96	NEUTRAL
Mason	3.24	NEUTRAL
Tile setter	3.48	HIGH
Iron and steel worker	3.28	NEUTRAL
Painters	3.48	HIGH
Plumbers	3.56	HIGH
Roofers	2.76	NEUTRAL
Scaffolders	2.72	NEUTRAL
Sheet metal workers	2.72	NEUTRAL
Electrician	3.68	HIGH
Backhoe operator	2.12	LOW
Dump truck driver	2.00	LOW
Foreman	2.76	NEUTRAL
Leadman	2.68	NEUTRAL
Formwork crew	2.68	NEUTRAL
Pipefitters	3.44	HIGH
Welder	2.72	NEUTRAL
compactor operator	2.08	LOW
Others:	N/A	N/A

Table 3 shows a high shortage of skilled laborers in masonry, plumbing, and electrical trades. There is a neutral degree of shortage for carpenters, tile setters, iron and steel workers, painters, foremen, leadmen, and pipefitters. There is a low degree of shortage for public building construction in trades such as roofing, scaffolding, sheet metal work, backhoe operation, dump truck driving, formwork crew, welding, and compactor operation.

Table 3

DEGREE OF SHORTAGE ON TYPE OF SKILLED LABOR		
TYPE OF SKILLED LABOR	AVERAGE	OVERALL SCALE
Carpenters	2.72	NEUTRAL

Mason	3.68	HIGH
Tile setter	3.28	NEUTRAL
Iron and steel worker	2.80	NEUTRAL
Painters	3.04	NEUTRAL
Plumbers	3.48	HIGH
Roofers	2.48	LOW
Scaffolders	2.16	LOW
Sheet metal workers	2.28	LOW
Electrician	3.84	HIGH
Backhoe operator	2.48	LOW
Dump truck driver	2.44	LOW
Foreman	2.68	NEUTRAL
Leadman	2.68	NEUTRAL
Formwork crew	2.36	LOW
Pipefitters	3.32	NEUTRAL
Welder	2.60	LOW
compactor operator	2.44	LOW
Others:	N/A	N/A

Skilled workers in road construction with a high degree of shortage include backhoe, grader, and roller compactor operators. Workers with a neutral degree of shortage include bulldozer operators, foremen, leadmen, rough carpenters, dump truck drivers, transit mixer operators, and skip loader operators. Front-end loaders and spotters have a low degree of shortage.

Most skilled labor types in residential buildings have a neutral degree of shortage. Respondents said they are multi-skilled laborers. A carpenter can do mason, sheet metal, and iron works. Foremen interviewed said there is a shortage of workers for the 3-story residential building they are constructing. Hiring depends on the owner's budget. Therefore, the hiring of multi-skilled laborers is one of the strategies taken by the contractor to manage the skilled labor shortage (Mohd-Rahim et al., 2016).

On the other hand, tile setters, painters, plumbers, electricians, pipefitters, and masons are the types of skilled labor that are evident to have a shortage when it comes to commercial and public building construction projects within Central and Northern Aurora Province. According to DOLE Secretary

Silvestre Bello III, the Philippines is facing a scarcity of skilled workers such as carpenters, electricians, and plumbers the reason is because they chose to work overseas for a much higher pay. As a result, the Department of Labor and Employment is looking at the level of shortage of skilled workers on the local front (*DOLE Cites Tightening Supply of Skilled Workers | Philstar.Com, 2017.*). Similarly, Emmanuel Geslani a migration expert said that there are not enough skilled workers to fill the construction gap because those who had adequate training eventually found work abroad, with paid higher salaries.

The data from Table 4 also shows that the types of skilled labor that have a shortage in road construction are the backhoe operator, grader operator, and roller compactor operator. According to a contractor from a certain construction company (RVA Construction Company) in Central Aurora Province, they experience a labor shortage when it comes to heavy equipment operators. As it is said, the labor shortage in the heavy equipment construction industry is a real issue that demands attention immediately. Workforce surveys point to a growing problem affecting more and more Heavy equipment companies. The best mitigation for the situation is a dedicated effort to strengthen the pipeline of new workers into the field (*Heavy Equipment Operator Labor Shortages and Solutions, 2019.*). Correspondingly, According to a report from The Globe and Mail, heavy equipment operation is one of ten industries that could experience a shortfall in workers needed because of additional large construction projects expected in a locality or province (*B.C. to Face Heavy Equipment Operator Shortage? - Rock to RoadRock to Road, 2014.*).

Table 4

DEGREE OF SHORTAGE ON TYPE OF SKILLED LABOR IN ROAD CONSTRUCTION		
TYPE OF SKILLED LABOR	AVERAGE	OVERALL SCALE
Backhoe Operator	3.44	HIGH
Bulldozer Operator	3.36	NEUTRAL

Front-End Loader Operator	2.60	LOW
Grader Operator	3.60	HIGH
Roller Compactor	3.84	HIGH
Foreman	3.00	NEUTRAL
Leadman	3.00	NEUTRAL
Rough Carpenter	3.00	NEUTRAL
Dump Truck Driver	2.76	NEUTRAL
Transit Mixer Driver	3.12	NEUTRAL
Skip Loader Operator	3.12	NEUTRAL
Spotter	2.36	LOW
Others:	N/A	N/A

Table 5 indicates that electricians and plumbers are in high demand in both private and public building construction. Masons are in low demand in private building construction, with a neutral rating, but are in high demand in public building construction.

Table 5. Degree of Skilled Shortage in Private and Public Building Construction

TYPES OF SKILLED LABOR	PRIVATE Mean	PUBLIC Mean
CARPENTERS	2.96	2.64
MASON	2.96	3.84
TILE SETTER	3.41	3.52
IRON AND STEEL WORKER	3.01	2.80
PAINTERS	3.52	3.32
PLUMBERS	3.56	3.72
ROOFERS	2.72	2.44
SCAFFOLDERS	2.84	2.00
SHEET METAL WORKERS	2.76	2.12
ELECTRICIAN	3.53	4.00
BACKHOE OPERATOR	2.17	2.16
DUMP TRUCK DRIVER	2.20	2.12
FOREMAN	3.00	2.72
LEADMAN	2.76	2.72
FORMWORK CREW	2.72	2.36
PIPEFITTERS	3.43	3.44
WELDER	2.60	2.48
COMPACTOR OPERATORS	2.25	2.12

Table 6 shows the extent of the shortage of unskilled laborers for residential building construction is mostly not evident and they rarely experience the shortage of unskilled since they often hire their previous laborers or hire unskilled workers who lived also on the place of the project.

Table 6. Extent of Unskilled Labor Shortage on Residential Buildings

EXTENT OF SHORTAGE ON UNSKILLED LABOR		
QUESTIONS	AVERAGE	OVERALL SCALE
Do you have enough supply for unskilled labor?	3.28	<i>SOMETIMES</i>
How often do you encounter unskilled labor shortages in your construction projects?	2.36	<i>RARELY</i>
Is there a significant inadequacy of unskilled labor in your construction projects?	2.04	<i>RARELY</i>
Are there times when you struggle to find enough unskilled laborers for your projects?	2.32	<i>RARELY</i>
Do you hire unskilled laborers to other neighboring towns in Aurora?	2.04	<i>RARELY</i>
If you still lack the laborers needed for your project, do you hire laborers outside Aurora?	2.08	<i>RARELY</i>
Are there times that you borrowed laborers from other construction projects that you also handle?	2.12	<i>RARELY</i>
If there are any future projects that you will implement, are you hiring former laborers to work on the new project?	3.88	<i>OFTEN</i>

Table 6 indicates that there is a low shortage of unskilled laborers for commercial construction. Residential construction has had enough supply and

rarely experienced a shortage, but they sometimes hire laborers from neighboring towns.

Table 7

EXTENT OF SHORTAGE OF UNSKILLED LABOR SHORTAGE ON COMMERCIAL BUILDINGS		
QUESTIONS	AVERAGE	OVERALL SCALE
Do you have enough supply for unskilled labor?	3.56	<i>OFTEN</i>
How often do you encounter unskilled labor shortages in your construction projects?	2.52	<i>RARELY</i>
Is there a significant inadequacy of unskilled labor in your construction projects?	2.48	<i>RARELY</i>
Are there times when you struggle to find enough unskilled laborers for your projects?	2.68	<i>SOMETIMES</i>
Do you hire unskilled laborers to other neighboring towns in Aurora?	2.96	<i>SOMETIMES</i>
If you still lack the laborers needed for your project, do you hire laborers outside Aurora?	2.64	<i>SOMETIMES</i>
Are there times that you borrowed laborers from other construction projects that you also handle?	2.44	<i>RARELY</i>
If there are any future projects that you will	3.96	<i>OFTEN</i>

implement, are you hiring former laborers to work on the new project?		
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For public building construction, unskilled labor shortage is rarely encountered but there are instances where they borrow laborers from their other projects or hire from neighboring towns and outside of Aurora.

Table 8

EXTENT OF SHORTAGE OF UNSKILLED LABOR SHORTAGE ON PUBLIC BUILDINGS		
QUESTIONS	AVERAGE	OVERALL SCALE
Do you have enough supply for unskilled labor?	4.16	<i>OFTEN</i>
How often do you encounter unskilled labor shortages in your construction projects?	2.48	<i>RARELY</i>
Is there a significant inadequacy of unskilled labor in your construction projects?	2.80	<i>SOMETIMES</i>
Are there times when you struggle to find enough unskilled laborers for your projects?	3.04	<i>SOMETIMES</i>
Do you hire unskilled laborers to other neighboring towns in Aurora?	3.40	<i>SOMETIMES</i>
If you still lack the laborers needed for your project, do you hire laborers outside Aurora?	3.20	<i>SOMETIMES</i>
Are there times that you borrowed laborers from other construction	2.80	<i>SOMETIMES</i>

projects that you also handle?		
If there are any future projects that you will implement, are you hiring former laborers to work on the new project?	4.16	<i>OFTEN</i>

Table 9 data reveals that road and bridge constructions face a shortage of unskilled laborers. They hire laborers from outside Aurora more often than from neighboring towns.

Table 9

EXTENT OF SHORTAGE OF UNSKILLED LABOR ON ROAD CONSTRUCTION		
QUESTIONS	AVERAGE	OVERALL SCALE
Do you have enough supply for unskilled labor?	3.96	<i>OFTEN</i>
How often do you encounter unskilled labor shortages in your construction projects?	3.32	<i>SOMETIMES</i>
Is there a significant inadequacy of unskilled labor in your construction projects?	2.64	<i>SOMETIMES</i>
Are there times when you struggle to find enough unskilled laborers for your projects?	2.76	<i>SOMETIMES</i>
Do you hire unskilled laborers to other neighboring towns in Aurora?	3.24	<i>SOMETIMES</i>
If you still lack the laborers needed for your project, do you hire laborers outside Aurora?	3.44	<i>OFTEN</i>
Are there times that you borrowed laborers from other	2.64	<i>SOMETIMES</i>

construction projects that you also handle?		
If there are any future projects that you will implement, are you hiring former laborers to work on the new project?	4.28	ALWAYS

The survey results indicate that the majority of respondents in residential construction prefer construction trade seminars for workers with a total tallied survey of 33% followed by skills development training with a total of 23% from the survey as a long-term solution to manage the onset labor shortage from Residential Building Constructions.

Based on the survey conducted to determine the most effective strategies for informing the public of the need for workers, it was found that the use of verbal communication is generally preferred with a total tallied score of 41% from the survey. Some construction workers believe that verbal hiring is more efficient and convenient compared to other methods such as organizing career fairs, partnering with government agencies like the Department of Labor and Employment (DOLE), posting job hiring notices on social media, and utilizing referral programs.

The respondents in the residential building construction industry suggest that maintaining the required workforce can be achieved by practicing good communication with workers with a 28% total tallied score from the survey, and increasing wage payments by 25%. This is considered more effective than providing medical benefits, financial incentives, job security, and simply communicating well with workers.

Several respondents reported encountering challenges when trying to hire young people, particularly those who are not enrolled in school. To address this issue, they suggested organizing construction trade seminars (31% of the survey respondents) and introducing the construction industry to high school students (23% of the survey respondents) as a means of generating interest in construction among young people.

Proposed Long Term Solution to manage the onset of labor shortage from Residential Building Construction.

The survey results (Figure 1.1) indicate that the majority of respondents in residential construction prefer construction trade seminars for workers with a total tallied survey of 33% followed by skills development training with a total of 23% from the survey as a long-term solution.

Figure 1.1 Proposed Skills Training Program



Based on the survey conducted (Figure 1.2) to determine the most effective strategies for informing the public of the need for workers, it was found that the use of verbal communication is generally preferred with a total tallied score of 41% from the survey. Some construction workers believe that verbal hiring is more efficient and convenient compared to other methods such as organizing career fairs, partnering with government agencies like the Department of Labor and Employment (DOLE), posting job hiring notices on social media, and utilizing referral programs.

Figure 1.2 Strategies for Informing the Public of the Need for Worker



The respondents in the residential building construction industry (Figure 1.3) suggest that maintaining the required workforce can be achieved by practicing good communication with workers with a 28% total tallied score from the survey and by increasing wage payments by 25%. This is considered more effective than providing medical

benefits, financial incentives, job security, and simply communicating well with workers.

Figure 1.3 Ways to Maintain the Required Workforce



From Figure 1.4, several respondents reported encountering challenges when trying to hire young people, particularly those who are not enrolled in school. To address this issue, they suggested organizing construction trade seminars (31% of the survey respondents) and introducing the construction industry to high school students (23% of the survey respondents) as a means of generating interest in construction among young people.

Figure 1.4 Boosting Youth's Interest in Construction

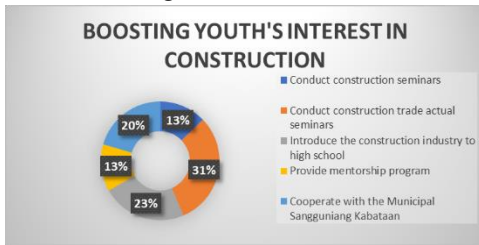
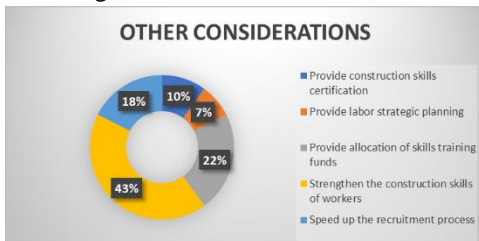


Figure 1.5 shows the other considerations selected by the respondents. Generally, strengthening the construction skills of the workers is what they prefer followed by providing allocation of skills training funds and the need to speed up the recruitment process.

Figure 1.5 Other Considerations



Proposed Long Term Solution to manage the onset of labor shortage from Commercial Building Construction.

Figure 2.1 shows that the respondents selected training programs for commercial building construction, emphasizing the need for apprenticeship and accredited skill training.

Figure 2.1 Skills Training Program



Figure 2.2 shows that the respondents from commercial building construction prefer verbal hiring and referral methods when hiring skilled and unskilled workers. They also prefer cooperating with the Department of Labor and Employment (DOLE).

Figure 2.2 Strategies for informing the Public of the need for worker



According to Figure 2.3, respondents perceived that maintaining the needed workforce is better achieved through good communication with the workers, providing medical benefits, and increasing wage payments

Figure 2.3 Ways to Maintain the Required Workforce



Figure 2.4 shows the youth’s interest in construction can be boosted by conducting construction trade seminars and introducing the field of construction to high school. Additionally, some of them also prefer to conduct construction seminars.

Figure 2.4 Boosting Youth’s Interest in Construction

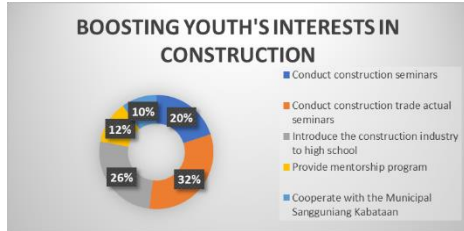
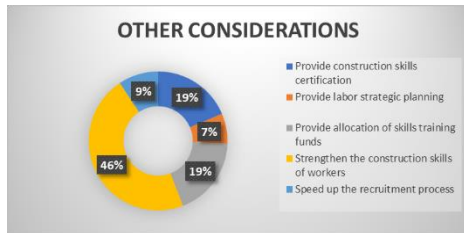


Figure 2.5 illustrates that, as a long-term solution, the majority of respondents prefer to enhance the construction skills of workers, provide certification for construction skills, and allocate funds for skills training.

Figure 2.5 Other Considerations for Long-Term Solution



Proposed Long Term Solution to manage the onset of labor shortage from Public Building Construction According to Figure 3.1, construction trade seminars and apprenticeship training are the most preferred methods of skills development in public building construction, as reported by the respondents.

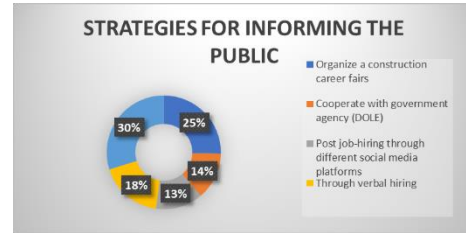
Figure 3.1 Proposed Skills Training Program



According to Figure 3.2, respondents from public building construction found that informing the public through referral was the most effective method. The

second most effective method was organizing construction career fairs.

Figure 3.2 Strategies for informing the Public of the need for worker



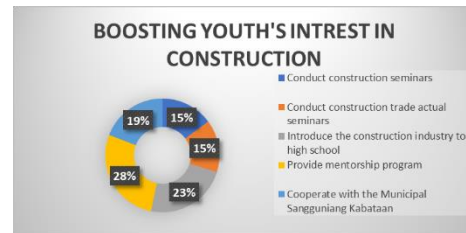
Respondents perceived that providing job security, financial incentives, and good communication with workers are effective ways of maintaining the required workforce for construction as shown in Figure 3.3.

Figure 3.3 Ways to Maintain the Required Workforce



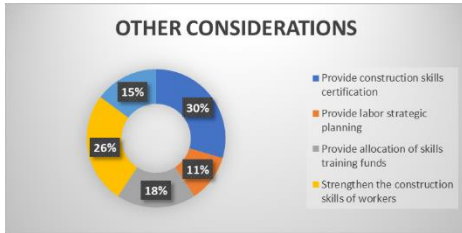
According to Figure 3.4, to capture the attention of young people, it was agreed that one effective approach is to offer a mentorship program and introduce the construction industry to high schools. Furthermore, collaborating with the Municipal Sangguniang Kabataan can also help generate their interest.

Figure 3.4. Boosting Youth’s Interest in Construction



According to Figure 3.5, the survey results indicate that respondents want to provide certification for construction skills and strengthen them to reduce labor shortage.

Figure 3.5 Other Considerations for Long-Term Solution



Proposed Long-term Term Solution to manage the onset of labor shortage from Road Construction According to Figure 4.1, the respondents mostly prefer conducting skills development training and providing apprenticeship training. The third most preferred option is to offer an accredited training skills program, followed by skills training lectures. Other suggestions include conducting thorough examinations of physical and emotional health before hiring.

Figure 4.1 Proposed Skills Training Program



According to Figure 4.2, the most effective informing strategy for fulfilling the worker needs in construction projects is to post job-hiring announcements on various social media platforms. This approach was favored by 24% of the respondents.

Figure 4.2 Strategies for informing the Public of the need for workers



Figure 4.3 displays the methods to maintain a required workforce, with the chosen solutions being an increase in wage payment and provision of medical benefits. These solutions received a 21%

approval rating in minimizing the onset of labor shortage.

Figure 4.3 Ways to Maintain the Required Workforce



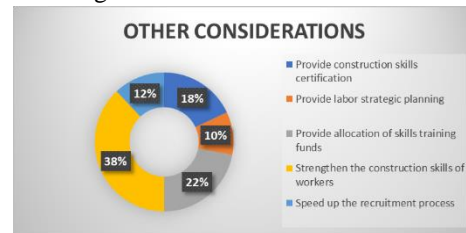
Figure 4.4 displays that 35% of respondents suggest that construction trade seminars are better for the youth, compared to 24% of respondents

Figure 4.4 Boosting Youth's Interest in Construction



Figure 4.5 illustrates the measures to minimize labor shortage in road and bridge construction. It shows that 38% of the responses prioritize strengthening construction skills through training funds

Figure 4.5 Other Considerations



CONCLUSION

Skilled labor shortages are being faced by various tradespeople in both private and public construction projects in Central and Northern Aurora Province. Tile setters, painters, plumbers, electricians, pipefitters, and masons are the most affected, which is causing difficulties in completing these projects efficiently. The shortage is more severe in public construction, where electricians, plumbers, tile setters, and masons are in highest demand compared

to private building projects. On the other hand, road construction projects in the same region are experiencing shortages in specific skilled roles such as backhoe operators, grader operators, and roller compactor operators. Additionally, road construction projects are also facing a scarcity of unskilled labor, which is more critical than in building construction endeavors. Labor recruitment patterns show that there is a reliance on hiring workers from outside Aurora Province, particularly for road and bridge construction projects, rather than hiring from neighboring towns within Aurora Province. To address these shortages and enhance the skill set of the workforce, construction trade seminars, skills development training, and apprenticeship programs are recommended as essential interventions. Such initiatives are deemed necessary for strengthening the construction industry and resolving persistent labor shortages in both building and road construction projects.

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