# INFLUENCE OF STAFFING METHODS ON CONSTRUCTION LABOUR PRODUCTIVITY IN ABUJA

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## ABSTRACT

The construction industry (CI) contributes significantly to the overall GDP of every nation; therefore, no nation can grow its economy without the growth of the construction industry. Without effective labour productivity, no construction company can grow and this has been a thing of concerns over the years. The goals or objectives of any construction project may not be met unless labour productivity is enhanced. This study assessed the influence of staffing methods on construction labour productivity in Abuja. Quantitative research methodology was adopted involving the administration of structured questionnaire to a sample size of 284 drawn from a target population of 979. Time study method was also used to determine the productivity of Plaster of Paris (POP) workers and tilers of both contract and permanent staff workers on building construction sites in Abuja Metropolis. The data was analysed using mean ranking and factor analysis with the help of SPSS and Microsoft Excel Software's. Findings show that two major staffing methods are used in the building construction sites in Abuja, which are contract staff and permanent staff. It was identified from the findings that the productivity of both the Tilers and POP workers of contract staff where better than that of the permanent staff of both the Tilers and POP workers. Out of 25 factors affecting the productivity of workers on site identified by the researcher 12 was found to be more pronounced on every site with a mean value of 3.5 and above. Also, from the finding 13 out of the 15 identified strategies for effective staffing methods seem to have been adopted by most of the construction firms in Abuja, though the two which have been majorly over looked borders much on the welfare of the workers which the researcher discovered from observation to be very instrumental to the workers productivity. In conclusion, two major staffing methods are commonly used in the building construction site in Abuja, the productivity of contract staff are better than permanent staff and should be considered when employing workers. The following factors must be given priority: wages, absenteeism, and incentive if you must see the best of any workers on site. Proper attention should be given to these strategies: enhance workers welfare and ensuring workers are pensionable, for a better output. The result of the study provides significant understanding that can support decision making on appropriate selection of the staffing methods most suitable for any construction work, putting into considerations, the knowledge of the available staffing methods, the factors affecting the productivity of workers on site, the difference in the productivity of contract and permanent staff on site and the various strategies for effective staffing methods.

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# CHAPTER ONE

## 1.0 INTRODUCTION

### 1.1 Background to the Study

The building sector, according to Liu and Ballard (2008), is a crucial industry for the national economy because it provides space for other economic activities to take place. Construction, according to Rabia *et al.* (2020), is a critical sector of the national economy for all nations throughout the globe. The industry is labour intensive comprising physical (human) labour and mechanical (using machine) labour. This human labour usually refers to as labour productivity (Agbo, 2014). Labour productivity is defined as the relationship between output and input (Rao & Sudhanva, 2017; Agbo & Izam, 2019). Labour productivity consist of about 30 -50% of the overall cost of project (Jakas & Bita, 2012). Labour productivity determine to a greater extent the profit margin of contractors. Thus, increasing productivity is a crucial priority for any profit-oriented organization (Wilcox *et al.*, 2000).

One of the key strategies for productivity increment is the quality of personnel. An organization with well qualified personnel has a higher chance of increased productivity (Gopal & Murali, 2015). This implies that in selection and recruitment of employee's emphasis should be on the quality of personnel being selected and recruited into the organization. The quantity and quality of the organization's production are directly impacted when low-quality workers are hired. Getting this quality employee depends so much on the method of recruitment and selection. In the 20$^{th}$ Century, emphasis was on permanent and pensionable employments system which has its disadvantage to the contractors and advantage to the employees (Agbo, 2014). However, in this 21$^{st}$ Century, emphasis has shifted from permanent and pensionable methods to contract and casual

employment in the quest to reduce production cost and increase productivity (Mahesh *et al*., 2017).

Staffing, according to Adeniyi (2019), is a crucial managerial responsibility that entails the recruiting, selection, training, development, promotion, placement, and remuneration of an organization's employees. Staffing is the process of employing and developing the number and types of employees that an organization requires (Badmus *et al*., 2020). Its goal is to hire, train, and manage competent people – Among others, daily wage earners, contract workers, consultants, and regular employees carry out numerous duties and activities in a business (Badmus *et al*., 2020). The performance of an organization's personnel determines whether it will succeed or fail (Siddiqui, 2014). Exceptional employees' improved proficiencies, knowledge, and abilities have proven to be key sources of competitive advantage all over the world. The staff of a company is its most valuable asset, as they have the power to enhance or detract from the company's image, as well as negatively affect profitability and productivity (Gopal & Murali, 2015). When it comes to client happiness and the quality of products and services delivered, employees play a critical role (Adeniyi, 2019).

## 1.2 Statement of the Research Problem

A major portion of the site labour force in the Nigerian construction industry is made up of bricklayers, carpenters, tilers, POP workers, painters, electricians, welders, plumbers, and plant operators, among others. Their contributions greatly influence the quality of the sector's output (Akinluyi & Adeleye, 2013). In Nigeria's construction business, the traditional problems with low skilled workers' performance have been related to unfair pay, poor site safety, a lack of defined career routes, the elimination of skilled worker training programs, and delays in work schedules (Oseghale *et al.*, 2015). Contractors are generally dissatisfied with the level of construction productivity since qualified

employees appear to be underperforming (Forcada *et al.,* 2013). The performance of skilled workers on construction project sites is currently declining, and the old way of a locally organized apprenticeship programme is becoming obsolete (Awasthi, 2016). Contrary to industrialized nations, where the demand for skilled apprenticeships is outpacing the quantity of training seats in the industry, the majority of the country's youth are no longer interested in learning new skills (Hamza *et al*., 2022). The underperformance of skilled labour, which is already having detrimental effects on business and the economy, is one of today's biggest concerns (Hamza *et al*., 2022).

Adienge *et al*. (2018) conducted a study in Kenya comparing the correlation between internal employee recruitment and performance to that of external employee recruitment and performance. While both internal and external recruiting failed to demonstrate a meaningful link with perceived service quality, internal recruiting was shown to be highly and significantly correlated with the cost of government-provided services. Ekwoaba *et al*. (2015) was of the opinion that recruiting and selection tactics includes newspaper ads, internal (internal) recruitment, labour offices, employee referrals, radio commercials, and online recruitment. Despite the existing recruitment and selection policies, the study recommended that management's objectives for recruiting people be evaluated in order to avoid significant failures.

From the studies reviewed, it is evident that there are scarce studies on the influence of staffing methods as it affects labour productivity in Nigeria's building sector. Many of the research examined concentrated on the labour productivity of craftsmen on the job site and the variables impacting their productivity, while the studies on recruitment strategies did not specifically target the construction industry. Without such a study, the construction sector may continue to struggle with the ongoing issue of poor personnel productivity and performance, which ultimately results in poor project performance. This

study is thus required to add to the limited literature that already exists on the effects of staffing practices on labour productivity in Abuja's construction sector. In order to improve project performance, it is also necessary to identify the best practices for hiring and selecting workers for the construction sector, whether as permanent or temporary labour. As a result, the difficulty with this study is that it doesn't know how staffing practices affect labour productivity in Abuja, Nigeria. The following research questions were addressed in an effort to address this issue;

i. What are the staffing methods used in Abuja building construction Sector?

ii. What is the level of productivity of POP workers and tilers employed using the two most common staffing methods?

iii. What are the factors affecting the labour productivity of workers employed using the two most common staffing methods?

iv. What are the strategies for effective staffing method(s) for improved productivity?

### 1.3 Aim and Objectives of the Study

The purpose of this study is to determine the influence of staffing methods on construction labour productivity in Abuja in other to ascertain the most effective staffing methods for improved productivity in the industry.

In other to achieved this aim the research objectives are to:

i. Identify the staffing methods used by selected organizations in Abuja.

ii. Measure the level of productivity of Tilers and POP workers employed using the two most common staffing methods.

iii. Identify the factors affecting the labour productivity of workers employed using the two-staffing method considered.

iv. Develop strategies for effective staffing methods for improve productivity.

## 1.4 Justification for the Study

It is impossible to overstate the importance of and need for labour productivity in the construction sector. Human labour must be prioritized in order for any site to be productive and deliver on time, which has a significant impact on the productivity of the construction site as a whole. Prior understanding of labour productivity during construction, according to Mahesh *et al*. (2017), can help save money and time. Due to the intricacy of construction, a number of variables can have a substantial impact on total productivity, resulting in a longer project timeline and higher project costs. According to Forcada *et al*. (2013), contractors are often unsatisfied with the level of construction productivity since skilled workers appear to be doing poorly. The performance of skilled workers on construction project sites is currently declining, and the old way of a locally organized apprenticeship plan is becoming obsolete (Awasthi, 2016). In Kenya, Adienge *et al.* (2018) compared the association between internal employee recruitment and performance to the relationship between external employee recruitment and performance. These and several other studies and research have been carried out as it relates to the productivity of craftsmen on site and that of the Nigeria construction industry is also not an exclusion. Most of the focus of these studies have been on the productivity of the craftsmen and professional on site as it relates to their output in comparison with time and the factors affecting their productivity on site. Other studies include the calculation of the productivity of craftsmen, the development of conceptual frame work for analyzing craftsmen productivity and lots more. The outcome of these studies show that several factors affect the productivity of craftsmen on site and possible solutions and way to improve their productivity were also highlighted (Rabia *et al.,* 2020; Badmus *et al.,* 2020; Akinluyi & Adeleye, 2013, Biren *et al.,* 2017, Oseghale *et al.,* 2015). However, there is

a key area which could be a high determinant factor of the productivity of craftsmen on site which has not being looked into, this is the area of the method of employment of those craftsmen. By method of employment the researcher implies that the craftsmen are either permanent staff or contract/temporary staffs which are only being used when there is need for them and relieved immediately there are through with their task with no assurance of recalling them back even when there is a similar task in future. Based on the reviewed literature it shows there is a need to look into the method of employment of craftsmen on site and how it affects their productivity which necessitate this study in trying to close this gap by considering "The influence of staffing methods on construction labour productivity in Abuja". Carrying out this study will further contribute to the existing knowledge in the industry to both the professionals and the academia. The outcome of this study will yield a path that will guide stakeholders in the construction industry on the types of policies to make to ensure craftsmen are not ill-treated on site for sole purpose of saving cost to the detriment of the craftsmen on site. This will also help the contractors and employers of labour in the building construction industry to make the right choice in the methods of employment of the craftsmen for optimum productivity with appropriate consideration of the staff welfare.

## 1.5 Scope and Delimitation

This research was limited to the influence of staffing methods on construction labour productivity in Abuja, Nigeria. The study focused on the productivity of skilled and unskilled workers using the two most common staffing methods on site in other to determine the influence of staffing methods on construction labour productivity in the building construction sites in Abuja. Structured questionnaire was administered to only Plaster of Paris (POP) workers and tilers, and their supervisors onsite to ensure unbiased view of the study these workers include both the skilled and unskilled one's. In measuring

the productivity of craftsmen on site only selected Tilers and POP workers were considered. A total of 10 building sites only were used for the time study, why 30 building sites were used for the administration of questionnaires inclusive of the first 10 used for the time study. Only registered building construction companies were used for the purpose of this study.

### 1.6 Definition of Terms

i. **Labour:** All the work and effort put into completing a certain task in order to support oneself (Hamza *et al.*, 2022).

ii. **Productivity:** The pace at which a worker, business, or nation creates goods and the quantity produced in relation to the time and resources required to make them (Sickles & Zelenyuk, 2019).

iii. **Contract Staff:** An individual with a temporary contract to complete a specific task who is not an employee of the organization they are working for. Their work ends the moment the contract is completed and may or may not be called back when there is a new contract (Plomp *et al.*, 2019).

iv. **Permanent Staff:** Permanent employees, who work for an employer and are paid directly by that company, are also known as regular employees or the directly employed. Employees that are permanent (regular) do not have a set expiration date for their work (Plomp, *et al.*, 2019).

# CHAPTER TWO

# 2.0 LITERATURE REVIEW

## 2.1 Overview of Construction Industry

Construction is one of the world's most important industries. It is predicted to contribute around 6% of worldwide Gross Domestic Product (GDP), and by 2020, it is expected to account for about 15% of global GDP (Babatunde & Low, 2015; Craveiroa *et al*., 2019). The construction industry occupies a significant position in many nations' resources as one of the main contributors to GDP. When compared to other industries including production, education, communication, vocational training, and entertainment, the building industry in Palestine increased its contribution to the Palestinian GDP from 22% to 33% in 2010 (Mahamid, 2011).

There are three primary sectors that make up the construction business. For instance, general contractors or construction contractors, construct buildings. These contractors construct homes, businesses, industrial facilities, and other structures. On the other hand, firms engaged in heavy and civil engineering construction work on projects like building sewers, roads, highways, bridges, and tunnels. The third category includes contractors that handle specialized construction work including carpentry, painting, plumbing, tiling, and mechanical and electrical work. Renters of large construction machinery, plant, and equipment are also included in this category (Austin *et al*., 2003).

According to Orozco *et al*. (2014), the construction sector contributes between 5 and 10% of the global GDP and employs around 10% of the labour force globally. With an average annual growth rate of 7 to 8%, the construction industry is seeing strong expansion in the industrial sector. According to Doloi *et al*. (2012), the construction industry will eventually contribute up to 6% to 9% of India's GDP, with an average annual growth rate

of 8% to 10%. However, construction is the second-largest industry after agriculture. According to Emeka (2016), the construction company is very vulnerable to economic change. It is the last sector in any nation to go through an economic expansion without government assistance and the first to go through an economic slump without it. It will therefore need a lot of financial assistance from the government, infrastructure banks, and/or business. The construction sector in the United Kingdom has been disproportionately hard hit during the 2008 recession. In 2007, the construction industry made up 8.9% of the UK's GVA, but by 2011, that percentage had fallen to 6.7 percent. Early in 2012, the UK's building contracting industry experienced its third recession in five years.

## 2.2 The Nigerian Construction Industry

The Nigerian construction sector (including infrastructure) contributed roughly 2% of the country's GDP at the end of 2011, which is statistically low when compared to its peak of 5.8% in 1981 - a change of 3.81 percent in 30 years (Abubakar *et al*., 2014). Despite the industry's variable growth (both positive and negative), the Central Bank of Nigeria (CBN) claimed that it contributed 3.7 percent to Nigeria's GDP in 2018. In addition, compared to 1.99 percent in 2011, there is a significant growth. However, the building industry is yet to realize the benefits of today's economic advances in practically all sectors. In recent years, the Nigerian GDP indices have fluctuated; it has been stated that the country's construction industry contributes 3–5% of the GDP. (Owolabi & Olatunji 2014). Regardless of a country's economic progress, the building industry is destined to be a crucial element of that country's economy (Owolabi & Olatunji, 2014). Furthermore, the construction industry is a big employer, employing around 10% of the overall workforce in most nations (Abdul-Rashid & Hassan, 2005). As a result, the

construction sector is one of the most important businesses that contribute to a country's socioeconomic growth, particularly in emerging economies.

In Nigeria, massive construction projects (both for buildings and infrastructure) are mostly funded by the federal and state governments. They mostly buy construction services through "conventional" contracts, with the exception of design and build (turnkey project) contracts (Okunlola *et al*., 2011; Ruya *et al*., 2017).

Nigeria's construction sector has developed into a significant contributor to the national economy. Although it contributes less to the economy than production and other industries, it is nonetheless essential. Due to the construction sector's higher cost-benefit and timeliness as a result of its contribution to the nation's economic growth, there may be cost savings for the entire country. The industry's quick development pace is the main criticism leveled against Nigeria's building sector (Aibinu & Jagboro, 2002).

Dantata (2018), claims that the Nigerian economy greatly benefits from the building sector. The construction industry is divided into three categories by the Department of Business, Innovation, and Skills: I, construction contracting businesses, (ii), the supply of professional services connected to construction, and (iii), construction-related goods and services (DBIS, 2013). Clients, contractors, subcontractors, consultants, and those in charge of the manufacture, delivery, and distribution of building materials are all included in the construction industry's system. Universities, polytechnics, and companies that do scientific and technology research are also included. Nigeria's building industry is neither organized nor controlled. There is no clear line between different contractors, and some of them solely exist to turn a profit, regardless of the type of work they are doing. Foreigners are the main participants in Nigeria's building market (Oyedele, 2012). Nnabugwu (2013) claims that the Nigerian federal government has warned regional

construction companies against using foreign labour since it goes against the principles of building up local capacity. By offering priority to foreign firms in the awarding of large contracts, the federal government is involved in the absence of local capacity building of indigenous contractors.

Because the Nigerian construction industry is uncontrolled, anyone can build any project without involving the government or following the rules of a building code. The National Building Code of 2006 was put into effect, yet this strategy has led to a continual stream of building collapses in Nigeria that have resulted in several fatalities (Nwachukwu *et al.,* 2018). Major building projects were completed in the 1970s and the early 1980s by expatriate (foreign) contractors who followed industry standards. Buildings were not erected near natural drainage systems due to potential consequences and the cost to the builders and contractors of maintaining their integrity. Today's economy is full of "emergency contractors" who lack integrity and adhere to ethical standards, both domestically and internationally (Nwachukwu *et al.,* 2018).

The industry experiences financial problems. Major players in the sector have advocated the creation of a Bank of Building that would be comparable to the Bank of Industry (BOI) and the Bank of Agriculture in response to their criticism of the underfunding of the Nigerian construction industry (BOA). As of 2011, this underfunding had led to a significant gap in the nation's road infrastructure and a shortage of 17 million homes (World Bank report, 2012). Nigeria's building industry is amateurish, with many unqualified people posing as contractors (Nigerian Institute of Building, 2014).

The construction industry has outperformed all other economic sectors in Nigeria, according to Dantata (2018), with double-digit growth rates over the past three years. However, it continues to make a minimal impact on Nigeria's GDP and labour force.

Despite its excellent success, the industry has a number of challenges, such as a shortage of competent local labour, a power limitation, a lack of resources, and pervasive unethical practices. Nigeria does not employ the Construction Skills Certification Scheme (CSCS), which construction industry believe is the best way to address the skills shortage (Mackenzie *et al*., 2000).

The Nigerian construction industry is rife with competitors on all three sides of the market. There is vertical competition between general contractors and subcontractors, or between the site manager and the tradespeople. Customers and contractors, or bricklayers, plumbers, electricians, and carpenters, have a lateral opponent. Managers in general contracting firms and lower-level consultants' employees, managers in consulting firms and tradespeople, managers in mechanical consultancy firms and tradespeople in electrical consultancy firms, and vice versa, are diagonally opposed to one another (Olufemi, 2016).

Due to the industry's infancy, there are a variety of opportunities, especially in the manufacturing of building materials, supply chain management, ICT, education, and the subcontracting sectors (Olufemi, 2016). According to Akintoye (2000), "it appears that developing Supply Chain Management (SCM) is still in its infancy, while some knowledge of the idea is clear." Suppliers, contractors, and subcontractors lack integration, collaboration, spirit, players, and orientation to the team, which has a big impact on the team's focus and objectives. The building sector is slow to adopt change and has not yet completely embraced project management (Oyedele, 2012).

It has a lengthy history of litigation in Nigerian courts and is a contentious firm. The Corporate Affairs Commission (CAC) reports that there is a high rate of contractor entry and exit in Nigeria's construction industry. In this sector, there is a substantial amount of

employee turnover. The National Organization of Civil Engineering, Construction, Furniture, and Wood Workers secretary general, Mr. Babatunde Liadi, told the News Agency of Nigeria (NAN, 2014) that "40,000 members of the union have been forced into the labour market in the previous two years because of abandoned projects." The Secretary General mentioned the Sango-Ota Road, the Lagos-Abeokuta Expressway Bridge, and the Abuja-Lokoja Road as instances of "abandoned projects" that resulted in the termination of construction employees.

In Nigeria, the government controls more than 80% of new construction ventures, making public funding of construction projects a common practice. Except for minor construction projects like buildings and offices, where the private sector contributes a small amount, governments only carry out major construction projects like roads, bridges, dams, and large residential estates like Gwarimpa Estate Teams 1 to 7, as well as the rehabilitation of Rainbow City in Port Harcourt, Rivers State (Oyedele, 2013).

The longevity of construction projects in Nigeria is unpredictable. Numerous projects have been shelved as a result of bad planning, legal action, and money issues. The three issues that construction projects deal with are "capital flight, capital stagnation, and capital sink" (Oyedele, 2013). Capital flight is a result of importing construction project components and technological know-how. Poor planning, bad procurement, bad project site, and excessive construction design all contribute to capital sink. Inflated contract sums and projects that were shelved because of insufficient cash flow are two examples of capital sinks. Capital stagnation occurs when a project's time excess is bigger than it should be. Additionally, Nigerian public projects lack a succession strategy, which has led to a significant number of abandoned and underutilized projects. The statute

mandating that a successor in office complete the projects begun by his predecessor is no longer in force (Olufemi, 2016).

## 2.3 Concept of Labour Productivity in Construction Industry

Jarosław *et al*. (2019) develop a mathematical model of construction worker productivity. They did it by grouping 17 elements that influence the productivity of construction workers into five categories. Fuzzy logic was utilized to describe the factors mathematically. A formula for calculating construction worker productivity has been proposed. The authors' approach is unique in that it takes into account a variety of elements that have the ability to influence construction workers' productivity. A single assessment of ceiling formwork was conducted to demonstrate how the formula works. The validation of a model demonstrated that it is capable of accurately analysing, evaluating, and predicting the productivity of construction employees.

Salehi *et al*. (2013) investigated labour productivity issues using the nearest neighbour algorithm (NNA) to categorize things. To determine the value of items and standardize outputs, a multiple regression approach is utilized, accounting for the labour requirements for standard parts in each category as well as their production processes. A case study was given to verify the viability of the suggested technique. This technique has a number of advantages, including raising labour productivity, bolstering the production system, improving planning, and responding to market volatility.

Aiming to increase labour productivity and its connection to wages in order to enhance employees' living conditions, Emilia (2020) studied the labour productivity-wage nexus in the Romanian manufacturing industry from 2008 to 2016. The findings revealed that Romania's manufacturing sector makes a significant contribution to the non-financial business economy's value added and employment. The findings of the correlation and

regression analysis demonstrate that, between 2008 and 2016, the level of labour productivity had a beneficial impact on salaries in the manufacturing industry of Romania. In addition, the researchers' findings imply that high labour productivity is the key reason for high wages in various manufacturing subsectors. Furthermore, the findings highlight, on the one hand, persistent and growing gaps between labour productivity and wages in the entire manufacturing sector from 2008 to 2016, as well as, on the other hand, high gaps between labour productivity and wages among some manufacturing subsectors, a fact that can lead to declining labour shares and, as a result, increased social inequality.

In Abia State, Nigeria, Obike *et al.* (2016) investigated the labour productivity and resource efficiency of smallholder cocoa growers. They chose 60 cocoa producers from three agricultural zones in the state using a purposeful random sampling technique. Inferential statistics such as means, frequency, and percentages are employed in the analysis. In addition, a loglinear regression analysis was employed. The findings reveal that level of education, experience, and planting material all influence labour productivity among cocoa growers. Furthermore, the research area's drivers of output found that planting materials, fertilizer use, and capital were all major determinants of output among cocoa growers. Seed was underutilized, whereas farm size, labour, fertilizer, and capital were overutilized, according to the drivers of allocative efficiency. Poor agricultural wages (labour payments) rated first (38.3%) among labour inhibitors in the study area, according to the findings.

In Nigeria, David and Jameelah (2013) investigated the effects of health capital on labour productivity. In order to estimate the unit root and probable co-integration, the GMM methodology was used. They discovered that health capital investment had a big impact on labour productivity. A substantial Wald coefficient, which is supported by the

hypotheses, strongly refutes the null hypothesis that health capital investments have no effect on labour productivity in Nigeria. According to the findings, health capital investment boosts labour force productivity. Given Nigeria's labour-intensive economy, the need of maintaining a healthier workforce must be prioritized in order to enhance production. Another significant finding in the study is the statistical significance of the education-labour and health capital-labour interaction factors. In order to increase labour force productivity, the Nigerian government must invest in education and build capacity. By doing this, the economy would be protected against future downward trends in productivity growth.

According to Salehi *et al.* (2013), productivity is a vital term in analysing economic performance of businesses in today's competitive environment. Organizations should produce a variety of products due to severe competition and varying client requirements. Businesses still struggle since there isn't a robust productivity measurement mechanism in place for this type of production. The production and delivery of goods and services are greatly influenced by labour productivity, which is one of the most significant indices among partial productivity indicators. They looked at labour productivity using the Nearest Neighbour Algorithm (NNA) to categorize items. Multiple regression approach was used to calculate the value of products and normalize outputs by taking into account the needed workforce for standard parts in each category, as well as their production procedures. In order to test the validity of the proposed strategy, a case study was provided. Increasing labour productivity, strengthening the production system, more precise planning, and responding to market fluctuations are some of the benefits of this strategy.

David and Sunday (2015) claim that productivity is a complex phenomenon that affects all spheres of human activity, including individual, organized private sector, and government, all over the world and in all fields of human endeavour, particularly in the execution of construction projects. Construction workers' declining skill levels, shift work, a lack of materials and equipment, change orders, a labour scarcity, bad weather, and a lack of project monitoring and control are some of the causes that contribute to the industry's low productivity. Investigations were made into the crucial factors that boost project delivery productivity in the building industry. A few of these are employee motivation, project planning, productivity measurement, avoiding construction site congestion, and good communication. Various tactics have been proposed to boost productivity in the construction industry. Time management, the use of project management tools like the precedence diagram and the pert master, research and development, the provision of new equipment, plant, and machinery to replace the outdated ones, the simplification of product variety, enhancing the overall effectiveness of the workforce through motivation, and paying close attention to the specifics of current best practices in the industry are some of these.

## 2.4 Methods of Measuring Productivity

Isaac *et al*. (2015) claim that productivity metrics may be analysed in terms of the entire range of production inputs, including labour as well as natural resources, intermediate commodities, and services. Average labour productivity (ALP), a single factor productivity metric, and total factor productivity, a multi-factor metric, are both used to quantify productivity. The output potential of a manufacturing process in proportion to its inputs is known as productivity (TFP). The impact of one input is measured by single factor productivity, but the influence of all inputs on output is measured by multi-factor or total factor productivity (labour). Tasks are specific construction operations including

pouring concrete, installing tiling, and erecting structural steel. According to Isaac *et al*. (2015) task-level productivity measurements are routinely used in the construction industry.

According to Attar *et al*. (2012), the majority of task-level productivity indicators are single factor measures that concentrate on labour productivity. According to Attar *et al*. (2012), contractors are frequently interested in the labour productivity at project sites, which can be categorized in one of two ways:

$$\text{Labour Productivity} = \frac{\text{Output}}{\text{Labour Cost}} \tag{2.1}$$

$$\text{Labour Productivity} = \frac{\text{Output}}{\text{Work-hour}} \tag{2.2}$$

The study also found that man-hours per unit (unit rate), which is the opposite of labour productivity, is frequently employed and that there is no universally recognized definition or measure of productivity.

Archana and Shibi (2018) Accountancy-based procedures and engineering-based methods are both used to generate productivity data. Accounting-based standards create work hour restrictions for various types of employment by analysing historical accounting data. Engineering-based standards entail breaking down complex work processes into small, manageable sections and analysing those parts for the time it takes to execute them. The accounting-based data is pretty easy to understand, but it does not account for the various working situations. Work measurement, work sampling, time and motion analysis, and modelling are some of the engineering methods for determining labour productivity. Work measurement is the calculation of how long it takes an average worker to complete a task according to a predetermined technique and level of performance.

Work sampling is observing specific aspects of the work process and categorizing the outcomes as productive or non-productive. It's useful for keeping track of production levels for comparison. The most accurate approaches for creating productivity standards are thought to be time and motion studies. Factor based modelling is perhaps the most adaptable engineering-based technique to the construction sector, and it has the ability to generate useful data (Attar *et al*., 2012).

The foundation of the notion of productivity assessment is work study, sometimes referred to as time-and-motion study. While work study is a part of operations management, operations research is not the same. Work study is the systematic analysis of work processes with the aim of determining and standardizing the least expensive technique, creating standard timings, and aiding in the training of staff in the chosen strategy. The approach tries to boost productivity by focusing on certain elements of a system rather than the entire system. A methodology study and a work-measurement study are the two basic aspects of a work study. Work-methods studies (also known as motion studies) are used to establish the preferable method of performing a task, whereas work-measurement or time studies are used to discover the standard time to complete a task (Isaac *et al.*, 2015).

Time, money, and quality are the three key planning considerations for construction projects. These concepts are inextricably intertwined. Another crucial idea in construction design is labour productivity, which is intricately tied to the three previously mentioned limits (Serdar *et al.*, 2014). Changes in work, disruptions, and rework are all strongly associated with reduced labour productivity. On average, efficiency decreases by 30% when modifications are made. The most frequent types of disruptions include needing to work outside of the prescribed order and running out of supplies or knowledge. These

interruptions cause daily efficiency losses that vary from 25% to 50% (Serdar *et al*., 2014). One of the performance measures used to judge the success of a construction project is labour productivity. Since labour is the most valuable producing resource, it might be claimed that the building sector is strongly dependent on it. Therefore, human effort and performance are the most important factors in raising productivity. Given that certain professions require specialized labour, labour productivity is an important measure (Wen & Albert, 2014).

Productivity is generally ratio of output to input. In the form of equation, it can be shown as follows: $\text{Productivity} = \frac{\text{Output}}{\text{Input}}$

$$= \frac{\text{Total Output}}{\text{Total work hour}}$$

Different measures of productivity serve different goals. Prachi *et al.* (2016) defined different aspects of measures as follows:

a) Economic Model: Total Factor Productivity (TFP)

$$(\text{TFP}) = \frac{\text{Total Output}}{\text{Labour+Material+Equipment+Energy+Capital}} \quad (2.3)$$

b) Project Specific Model:

$$\text{Productivity} = \frac{\text{Output}}{\text{Labour+Material+Equipment}} \quad (2.4)$$

c) Activity Oriented Model:

$$\text{Labour Productivity} = \frac{\text{Output}}{\text{Labour Cost}} \quad (2.5)$$

Or

$$\text{Labour Productivity} = \frac{\text{Output}}{\text{Work hour}} \quad (2.6)$$

## 2.5 Factors Affecting Labour Productivity in Construction Industries

Elements influencing productivity of labour in Libya's construction sector are identified and ranked by (Rabia *et al.*, 2020). To reach the aim, they used a scientifically verified sample of contractors, and embassies were obligated to take part in a standardized questionnaire survey. The data collection tool (questionnaire) included 30 secret productivity elements organized into three main categories: management, technological, and human/labour. The Supervisory Board came out on top, followed by the Technological and Human/Labour groups. The following five elements, listed in descending order, have the most impact on construction labour productivity, according to this study:

i. Inadequate labour supervision;
ii. Worker experience and expertise;
iii. Construction technology;
iv. Coordination between disciplines in the construction sector;
v. Design drawing errors.

Anu and Sudhakumar (2014) investigated the factors influencing India's productivity. In the Indian state of Kerala, a questionnaire survey of project managers, site engineers, supervisors, and craftsmen were conducted to determine the factors that impact construction labour productivity. The results are presented in this study. The following are the top five elements that have a considerable impact on productivity:

i. Timely material availability at the job site,
ii. Supplier material delivery delays,
iii. Political party or hater-called strikes,
iv. Frequent design/drawing adjustments resulting in extra work/rework,
v. Timely material availability at the job site.

Abdulaziz and Camille (2012) assess the relative relevance of elements that are thought to effect labour productivity on Kuwaiti construction sites. To accomplish this goal, a statistically representative sample of contractors was requested to take part in a standardized questionnaire survey that included forty-five productivity criteria divided into four categories: Management; Technological; Human/labour; and External. Among the factors investigated, the following ten are shown to have the greatest impact on labour productivity:

i. the precision of technical requirements,
ii. the quantity of variations or change orders made during execution,
iii. the degree of coordination between design disciplines,
iv. There is insufficient labour oversight,
v. Some work is subcontracted.
vi. degree of design complexity
vii. A lack of an incentive program,
viii. A lack of direction from the construction manager,
ix. A strict engineer inspection,
x. A delay in responding to information requests.

Adnan *et al*. (2007) examined the elements that affect labour productivity in construction related projects and rated them according to their relative relevance from the perspective of a contractor. The primary factors negatively affecting labour productivity, according to their analysis of 45 criteria considered in the survey are:

i. Lack of materials,
ii. Lack of skilled labour,
iii. Lack of oversight of the workforce,

iv. Miscommunication between the workforce and superintendent,
v. Changes made to the designs and specifications during execution are just a few of the problems that can arise.

Labour productivity in construction is of tremendous interest to construction project stakeholders, according to Opara (2019), since it influences project cost and time performance. Using a field survey research design, 40 variables influencing construction project labour productivity were disseminated to construction project experts in Nigeria's Imo and Abia states via stratified sampling. The mean score technique was employed to analyse the index of preponderance of the factors of labour productivity, which resulted in 82 percent of respondents. Motivation of workers placed top among the variables, with a mean score of 1.781, while political influences ranked last, with a mean score of 0.293. Administrative issues accounted for 65 percent of the variables causing low productivity, while technology issues accounted for 35 percent.

The key determinants influencing construction labour productivity in Zimbabwe are empirically determined (Thabani & Wellington, 2016). Data was collected using both structured and unstructured questions. The target population was chosen via diverse sampling, and fifty questionnaires were collected which was subsequently assessed. Using a straightforward ordinal scale based on a 5-point Likert scale, the contractors, consultants, and specialists provided their assessments of the relative relevance of twenty-two pre-selected criteria on labour productivity in the construction sector. The information was examined using the Relative Importance Index (RII). According to the outcome, the highest ranked (13) factors influencing construction labour productivity in Zimbabwe include availability of experienced personnel, late of wages and salary, suitability, non-payment to suppliers, and education and training.

Muhammad *et al*. (2021) draw on a thorough examination of the link between numerous factors influencing labour productivity in the construction of pre-stressed concrete structures in Ghana. Workers from a Ghanaian construction company provided a sample of 200 respondents. The developed questionnaire is categorized into two parts: the first piece covers background information about the construction company's employees, and the second component explores the employees' opinions on issues impacting labour productivity. To evaluate and estimate the link between construct variables, the Smart-PLS was used. Using the relative importance index and multiple linear regressions, it was found that management factors, such as a lack of incentives, material factors, such as poor quality of material, labour factors, such as poor quality and training of labours, supervision factors, such as an incompetent site supervisor, and equipment factors, such as frequent equipment damage, all have a cynical and significant relationship with labour productivity in the construction of prestresses.

The goal of one of the studies carried out by Chaturvedi *et al*. (2018) was to provide a framework for analysing the essential factors influencing labour productivity in the construction sector. Major findings are presented, and the framework's application is illustrated in the context of the Indian construction industry. The study offers a quantitative framework for investigating the relationships between the variables influencing labour productivity in the construction sector. The results for a typical case in the Indian construction industry showed that worker performance and productivity are significantly impacted by construction site safety.

Chitra *et al.* (2018) research sought to identify and rank people's opinions. The data was acquired using a questionnaire survey. Productivity is a major key factor in the building sector. Productivity is crucial in both industrialized and growing nations. This study aims

to identify the main factors affecting labour productivity in various construction sectors, evaluate the impact of the most affected components using the RII approach, and offer suggestions on how to lessen these factors. The following objectives were satisfied by the analysis of 25 surveys, which demonstrated that there are eight separate categories that have a considerable impact on labour productivity: Manpower, managerial, motivation, environmental, schedule, safety, equipment, and quality. According to the theoretical model, eight separate groups—the Manpower Group, Managerial Group, Environmental Group, Motivation Group, Material/Equipment, Schedule Group, Safety Group, and Quality Group—determine the variation in Labour Productivity in construction projects. In the past, contractors thought that the most crucial aspect of finishing a project on time was labour productivity. However, because to the pace at which work is accomplished, there is a high probability of error, and if this happens, a substantial sum of fund and time will be loss to fix the issue. Construction management judgments on matters impacting labour productivity in construction projects are crucial. The identification and measurement of project labour productivity are crucial approaches for project success. According to the results of the questionnaire study, accidents, project scale, and improper work planning by site management staff are the main reasons of productivity loss.

A study was conducted by Alaghbari *et al.* (2017) with the aim of identifying and ranking the factors that affect Yemen's construction labour productivity. A survey form was issued to structural and architectural engineers working on building projects. 52 specified criteria totalling four categories human resources/labour, management, technical and technological, and external made up the questionnaire. The relative significance index RII was computed after the criteria were graded. According to the outcome, the group of technical and technological variables came in first among the four groups. The

top five elements that have the biggest effects on Yemeni construction labour productivity are as follows:

i. Labour's qualifications and experience
ii. Materials on location are readily available
iii. Effectiveness and leadership in site management
iv. The materials' accessibility on the market, and
v. The political and security environment.

In this study, 52 variables affecting Yemeni construction labour productivity were found. These variables were categorized into four groups: human/labour, management, technical and technological, and external variables. The following are the key variables influencing Yemen's construction labour productivity:

i. Labour's qualifications and experience
ii. Materials on location are readily available
iii. Effectiveness and leadership in site management
iv. The materials' accessibility on the market
v. The security and political environment (demonstrations and political issues).

On the other hand, the technical and technological group is ranked first overall. The most interesting results, however, showed that five of the top ten factors were from the technical and technological group, three from the external factors group, and that each of the two other groups had two components in the top ten factors determining construction labour.

Thirty-seven (37) features were found by Kazaz *et al*. (2016) and were categorized into four groups: organizational, economic, physical, and socio physiological. Examination of each factor group's compactness as well as its internal factor dispersion. The outcome

demonstrate that the organizational factors group had both the lowest standard deviation and greatest weighted mean values. Therefore, craft workers value all elements of the organizational factors group equally. Craftspeople frequently viewed financial and physical factors as equally important. Only, components designated as socio-psychological elements had various degrees of importance according to craft workers' opinions.

In an effort to boost productivity, Attar *et al*. (2012) projects in the districts of Sangli, Kolhapur, and Pune were examined. Ten crucial factors that affect labour productivity in small, medium, and large firms were discovered by the authors. These four groups of traits supervision, material, execution strategy, and design are all very efficient. In large companies, he claims, equipment aspects can be quite helpful. Small and medium firms need to pay special attention to owner/consultant factors.

## 2.6 Concepts of Staffing Methods

A process of personnel recruitment, assessment, and selection that takes place within an organization to fill a job opening is referred to as staffing. The hiring, firing, and training departments of businesses are in charge of these tasks. Pahos and Galanaki (2019) smaller firms might only handle one case at a time, whereas larger ones might go through several staffing processes annually. Staffing may be used by any size of business to hire short- or long-term workers (Choi *et al*., 2021; Pahos & Galanaki, 2019). Ployhart (2006) explains that in order to achieve business goals, recruiting is "commonly characterized as the process of attracting, selecting, and keeping qualified people." The individual a company hires in the first place is also "the most efficient approach for a firm to develop their staff," (Parnes, 1984). Choosing, hiring, and keeping employees who have the necessary knowledge, skill-sets, and capacities to carry out the responsibilities of potential and

existing jobs in the organization is described as "the HRM technique" (Dyck & Neubert, 2009). Staffing is the process through which businesses sponsor and choose individuals in order to improve and expand their human resources (Pahos & Galanaki, 2019). In this situation, the hiring and hiring process could be viewed as a component of staffing. According to earlier research, there is a positive relationship between employing an effective staffing strategy and organizational success (Delery & Roumpi, 2017). A structured hiring process for outside employees determines a candidate's suitability for a particular position and lessens business ambiguity (Lado & Wilson, 1994). A stringent hiring and selection process also conveys a sense of elitism to those chosen employees, fosters greater efficiency, and conveys information about the value of each person to the company (Pfeffer, 1998). They may be unable to perform at a high level if they have employees who are incompatible with the organization (Lado & Wilson, 1994). Additionally, while minimizing training expenses, an efficient staffing process can offer the institution with people that are compatible with the skills of the current organization and fit into the current social framework (Abdelrahman *et al.*, 2021).

Badmus *et al*. (2020) believed that the pressures of industrialization and globalization had caused rivalry, the pursuit of low-cost labour, mass production, and frequent conflicts between managers and their employees in many businesses. Due to the aforementioned, workers are now socially protected from being overly exposed to hazardous working conditions and being taken advantage of by labour unions and other labour management actors. The potential contribution of the workforce to the economic and political development of a nation cannot be overestimated given the interconnectedness of people and material resources. Labour was viewed by classical economists like David Ricardo and Karl Marx as the basis of consumption, the means of exchange, the source of distribution, and a key component in the growth of the economy. Due to the unguided

pursuit of profit maximization by private investors, the new invocation of public-private partnerships, combined with the oversaturated labour market, numerous employers of labour in Nigeria have mortgaged employees' dignity and demands for dignified jobs in a conducive working environment. Without a doubt, the shift from traditional permanent employment to contract/casual labour has resulted in exploitation of people who wish to supply labour. As a result of this new development, questions such as how does a shift in employment practices lead to exploitation and affect economic growth have arisen. As a result, the creation of the machine in 1750 signalled the beginning of the Industrial Economy, which brought with it industrialization, modernization, and globalization, resulting in an increase in the number of job seekers. However, the recent trend of prioritizing profitability and efforts to reduce production costs has suffocated and sacrificed traditional permanent employment in favour of contract/casual recruitment. To summarize, industries' use of contract/casual workforce has been severely mismanaged and envisioned as a cash cow for industry owners, particularly in private organizations. Its advantages and rewards are not weighed against regular/permanent labour. As a result, there is a current paradigm shift in the labour market that favours modernisation of labour-management interactions (Badmus *et al.,* 2020). It is hardly an exaggeration to say that exploitation of casual/contract staff is more prevalent in many Nigerian organizations, as Okafor (2010) points out. Traditionally, poor income, meagre salaries, and late salary payment, as well as a lack of incentive and training, no or phony promotion, job dissatisfaction, and abuse of workers' rights, are all signs of labour exploitation.

According to LexisNexis Group (2003), the full-time, permanent contract has been the conventional paradigm of working life. On the other hand, the workplace is quickly changing, and during the past 20 years, employment relationships have taken on a variety of forms, many of which fall beyond the purview of traditional employment law.

Employers can choose from a variety of contract options when hiring staff. While the 'permanent' work contract remains the most popular type of employment. A common casual arrangement for retaining employees is becoming increasingly common, and it offers several benefits to both businesses and employees. The initial intent of employment protection legislation was to safeguard persons who were working on full-time, permanent contracts with a single employer. Many people nowadays, however, prefer to work part-time or on a casual basis, or seek and accept temporary contracts for a variety of reasons. Employers have become increasingly interested in using fixed-term contracts. Others opt to use job agencies or their own limited corporations to work for a range of businesses. The cost of higher education has increased, which has led to a rise in the number of students looking for temporary or part-time jobs. Due to the variety of employment relationships and practices, there are now legal distinctions between "employees," "workers," and self-employed individuals, with each group having certain legal rights and responsibilities.

According to LexisNexis Group (2003), the issue of different groups of workers having unequal employment rights has been acknowledged and somewhat addressed in the UK and by the European Union. As a result, part-time employees and those with temporary contracts are receiving equal treatment under UK employment law. Furthermore, it is conceivable that in the future, the distinction between employers and employees engaged on other forms of contracts may be even more hazy or perhaps abolished for the purposes of statutory employment rights. The UK government stressed the need to extend employment rights to those who are now excluded from them because of their employment status as workers in its "Fairness at Work" White Paper from 1998. Following that, the Employment Relations Act 1999 was passed, and section 23 of that law gave the Secretary of State the power to issue regulations that would extend many

present employment rights to those who are not covered by a contract of employment. Future workers, including contract employees, casual employees, and others, will be entitled to a number of employment rights that they are currently denied if such policies are put into place. The capacity to sue for an unfair termination, get redundancy compensation, or take maternity leave are just a few of the statutory employment protection rights that are no longer available to individuals who are not working under a contract of employment.

The requirement for a minimum qualifying period of time of continuous service for some employment protection rights presents another challenge for many, as many temporary workers and workers with frequent gaps between periods of employment do not accumulate enough continuous service to qualify for protection. It's important to note that statutory redundancy pay requires two years of continuous employment, whereas the right to make a claim for wrongful dismissal requires a minimum of one year of continuous service. The European Union has taken steps to improve the rights of a typical worker, after recognizing that they are frequently exploited by employers due to their lack of job protection rights. Since 1983, a succession of draft Directives has attempted to provide a typical worker with benefits equal to those offered to full-time, permanent employees (on a pro-rata basis). As a result, the UK's Purr-Time Workers (Protection of Employment) Regulations 2000 went into effect in July 2000, and the Fixed-Term Employees (Protection of Employment) Regulations 2001 went into effect in July 2002. Other safeguards for agency and casual workers are being implemented (LexisNexis Group, 2003).

### 2.6.1 Casual or Contract Staff

Employees whose services are contingent on the specific function or responsibility they were recruited to perform are referred to as "contract personnel." They are laid off when

their 'contract' expires, and they can only be rehired if another job is available. The fact that their employment is not permanent is the greatest distinguishing feature of this group of workers (Badmus *et al.*, 2020).

The word "casualization" refers to occupations that have a high degree of cyclical demand, such as port work, agricultural migratory labour, and other intermittent low-skilled jobs. Another form of involuntary servitude that lasts for a certain period of time is casualization. Labour abuse is pervasive in many Nigerian organizations. There are many instances of this, including low pay, wage and salary arrears systems, training, career progression, motivation, feeling of community, job satisfaction, and dehumanization of work and people (Badmus *et al.*, 2020).

Casualization is another term for temporary employment, which can be found in a variety of industries, including transnational, multinational, public, and private companies, as well as the informal sector. As Campbell and Brosnan (2004) point out, definitions of casual work are frequently a source of misunderstanding and debate, with contradictions between vernacular, regulatory, and contractual meanings.

Importantly, clear and explicit concept definitions are a need for any useful academic conversation and analysis. Casual and contract staff looks similar but slightly different, in both situations, an employee's employment is frequently described as a condition in which he or she must remain in the employer's service for a set period of time or until his or her employer resigns or terminates his or her employment. Simply defined, both contract and casual employment refer to a situation in which a person is employed for a specific work and is paid at a different rate than other permanent types of employees. As a result, both contract and casual work are for a specific time period that does not extend beyond that time period, and they are not eligible for some benefits that are available to permanent employees (Badmus *et al.*, 2020).

According to the Basso (2003), casual employees are those who have an express or implied contract of employment that is expected to be short-lived and whose tenure is determined by local circumstances. In Europe and the US, the word "casualization" is used to describe unconventional employment arrangements.

In a similar vein, Basso (2003) claimed that there are two possible interpretations for the relationship between casualization and underemployment. It is widely used in international literature to refer to the spread of unfavourable working conditions such job insecurity, irregular work schedules, sporadic employment, low wages, and the absence of essential employment benefits. They were referred to as conducting "casual labour" when workers were called in to complement full-time staff during periods of high economic activity, notably in retail. However, the situation has changed in the current labour market. Similarly, a casual employee is someone who works for less than six months and is paid at the end of each day (O ‟Donnell, 2004).

According to Okafor (2010), there are two categories of casualized employment in Nigeria: casual and contract labour. Insofar as their status is not defined and no measures are made for the regulation of their terms and conditions of employment, this category of workers' terms and conditions of employment are not covered by Nigerian labour laws, which leads to their widespread exploitation by employers. Casual and contract labour would be equivalent in Okafor's position. Particularly, the use of casual labour has increased. It has spread to a variety of professions and businesses, including computer technology, registered nursing, banking, and construction. Similar to this, as international rivalry intensifies and firms look for any opportunity to reduce costs to remain competitive, the number of companies hiring temporary labour is rising.

According to Foote (2004), there has been an upsurge in the number of firms using or using casual labour internationally during the previous three decades and beyond. This has a connection to the turbulence or uncertainty in the economy (Greer, 2001). The use of temporary labour can be largely attributed to the drive to reduce operating expenses and the intensifying global competition. Casual employment has grown significantly more concerning over the past three decades as a result of the ongoing changes in working circumstances around the world (Foote, 2004). For much of the 20th century in many developed and developing countries, casual work often differs from standard permanent employment vocations in terms of hours worked, job security, payment method, and even work location (Kalleberg, 2000).

According to Okougbo (2004), "work occupations in which there is a high demand for employment" include casual employees. such as in low-skilled, seasonal jobs in ports, agriculture, farm migration labour, and other He continued by stating that "Contract labour is a form of temporary, involuntary servitude" and that up to the end of the 19th century, it was a common sort of work in the United States of America, with strict rules in place to assure its survival before it was prohibited. In fact, casual workers are expected to work for any organization on an as-needed basis, are typically unskilled, and move with the labour market's seasonal fluctuations. In a more practical sense, casual labour is divided into the following categories: Part Time Casual Labour (PTCL)- shares responsibility and protection with a full-time employee, with the exception of the number of working hours. Part-time employees typically work less hours, which may or may not be specified. They also have a set rate of pay, which is usually determined by the number of hours that person works or the amount of work performed on the project. Fixed-term contract Casual workers frequently have contract criteria that must be met in order for the job to be terminated. Agency Casual Staff is a type of job that is given by a third-party

service. Casual personnel are typically hired by an agency for an organization; however, the agency, not the organization for which they work, determines their salary, terms, and conditions.

Voluntary employment - In this case, the employee works at his or her own discretion. The majority of volunteers are not paid, but they are recognized for their efforts. This style of work generates praise and rewards that aren't necessarily beneficial, but are extremely pleasant. This type of contract requires skilled labour and is available on demand. From time to time, job openings arise, and employees are contacted for a position that is currently open. Employees are free to look for new jobs once their work is completed. When employees work, they receive the most important benefit: safety. Because of the transient and uncertain nature of this type of work, employees are free to explore for other opportunities.

There are a number of factors relating to the management of temporary workers that may contribute to higher-than-normal rates of departure prior to contract expiration dates (Autor, 2001). According to Autor (2001), some of these factors include perceptions of unfairness, exclusion from decision-making, inadequate socialization, unmet expectations for permanent jobs, insufficient motivation, lowered age requirements and tenure, lesser tolerance for inequality, and low levels of commitment.

Casual employment, according to Kalleberg (2000), is a substantial part of the set of employment arrangements characterized in international labour law as nonstandard, contingent, atypical, insecure, and alternative work arrangements. As a result, traditional employment arrangements served as the foundation for the development of labour law, collective bargaining, and social security systems. In Nigeria, this type of job is rarely part-time or transitory; instead, it is frequently a long-term commitment (Danesi, 2011).

### 2.6.2 Permanent or Full-Time Staff

Editorial Team at Indeed (2021) When someone works for an employer and receives their pay directly from them, it is said that they are in a permanent employment relationship. With this kind of work arrangement, the end date is not specified. Part-time or full-time employment, as defined by the Bureau of Labour Statistics as workweeks averaging 35 hours or more, are both options for permanent employees. Benefit packages are typically provided to permanent employees by their employers, though these packages can change depending on whether they work full- or part-time.

Eight-hour days and 40-hour weeks are the standard for a full-time job, though this depends on the industry and position. The assumption of a five-day workweek varies based on the profession. Full-time employment is not specifically defined by the US Department of Labour; instead, it is up to individual businesses to do so. The idea of "business hours" or "9 to 5" employment gives people a common understanding of full-time employment. Monday through Friday, 9:00 a.m. to 5:00 p.m., are the typical office and corporate culture hours, while there may be some variance based on the company's culture and industry. There are no fixed requirements for when those hours must be completed; nonetheless, full-time employment demands a 40-hour workweek (or at least a schedule of at least 32 hours). Along with some degree of financial security, full-time employees typically get a variety of benefits as part of their employment agreement, such as paid time off (PTO), 401(k) plans, and insurance (Indeed Editorial Team, 2021).

### 2.6.3 Advantages of permanent employment

Being a permanent employee has a number of benefits, such as:

i. Paid time off: Permanent workers typically have the choice to take paid time off for personal reasons including vacations, illness, or parental leave. Your position and length of employment at the organization, as well as other factors, may affect

the amount of time off you receive. Employers regularly offer paid time off for holidays like New Year's or Independence Day (Indeed Editorial Team, 2021).

ii. Insurance provided by the employer: People typically use their permanent employment as a means of obtaining health insurance, with the employer contributing to the premium costs. You often have a selection of plans within your employer's group health coverage. Other types of insurance that companies may offer include worker's compensation insurance, life insurance, and disability insurance (Reshetnikova *et al*., 2019).

iii. Retirement benefits and pension plans: Another popular option is a 401(k)-retirement plan, which allows you to invest a portion of your pay check. Your donations may occasionally be matched by your employer up to a specified limit. Another choice is a pension plan, which is funded by the employer. Your employer will consistently deduct payments from your pension once you retire (Dosumu *et al*., 2021).

iv. Professional development: Full-time workers may receive opportunities for training or professional development from their employers. These resources can be used to assist you grow your career and improve your professional skills. Because they show that your manager cares about your achievement, these options may even make you like your job more (Reshetnikova *et al*., 2019).

v. Possibilities for career advancement: As a permanent employee, you can use your professional contacts and experiences to advance your position. Additionally, you might have access to people or resources that can help you reach your professional goals and advance more quickly or easily (Dhabuwala *et al*., 2021).

vi. Networking skills: Since you usually work with the same people every day, you may find it simpler to develop professional and social ties with your co-workers.

You can meet your social needs and grow your network with the aid of these relationships. Your co-workers may be able to introduce you to prospects within and outside of your organization (Reshetnikova *et al*., 2019).

vii. Predictable schedule: While some individuals favour the independence that comes with solo employment, others favour a more rigid timetable. Knowing your work hours enables you to plan your days effectively and balance your personal and business lives (Dosumu *et al*., 2021).

viii. A feeling of security: Because your job does not have a definite end date, you know you have somewhere to go every day, which can be comforting. Gaining financial stability also enables you to make significant financial decisions or plans because you know you will always receive a pay check (Dhabuwala *et al*., 2021).

### 2.6.4 Differences Between Permanent Employment and Other Types of Employment

A permanent job position varies from other employment arrangements, such those with contract or temporary workers, in the following ways:

Length of employment: A permanent employee's employment does not have a set end date, unlike a temporary or contract worker who is hired to complete a task for a predetermined amount of time. Temporary employment shouldn't continue for more than a year. Companies use independent contractors to work on certain projects, and they remain employed by the company until the project is over. You may be able to transition into a permanent role while working on a temporary or contract basis. The prospect of having their assignment extended or being hired permanently exists when a temporary employee works for a longer period of time, such as three to six months (Arestis *et al*., 2020).

The hiring process can take longer when a company is looking for and interviewing candidates for a permanent position. To find individuals that not only meet the

requirements for the post but also fit with the company's culture, they may undertake several rounds of interviews. Candidates may also be evaluated by employers to determine whether they have the potential to grow within the organization and significantly advance the goals of their team or organization. Companies that hire contract or temporary workers typically do so to meet a specific need or to temporarily fill a certain role. Because the company wants the candidate to start working as soon as possible, the interview process is reduced. Due to the tenuous relationship to the position at hand, they largely concentrate on candidates' capacity to carry out specific tasks connected to the position. Because temporary workers are frequently hired through a staffing agency, employers are not required to search for applications. Instead, they can pick from a selection of candidates the employment company provides (Liu *et al*., 2022).

Employee perks: Permanent employees are entitled to the full range of benefits offered by their employers, which typically includes insurance and retirement plans. Staffing companies hire temporary or contract workers to do work for another company. These workers may be able to enrol in a 401(k) plan or purchase health insurance through their staffing agency even though they are not qualified for the company's benefits. Some independent contractors are self-employed, which means they are responsible for covering their own benefits like health insurance. Contrary to permanent employees, contract or temporary workers are permitted to take personal or holiday time off, but they are not paid for those days (Liu *et al*., 2022).

Salary: Permanent employees may receive a salary or an hourly wage. At an hourly rate, they are compensated for each hour they labour within a given week. Salary workers, on the other hand, are paid a predetermined amount regardless of how many hours they work. They are given weekly, biweekly, or monthly pay checks.

The typical wage for temporary or contract employees is hourly, and they are required to record their weekly hours worked on a timesheet. On the other hand, some independent or self-employed contractors might receive a set payment for finishing a certain project or deliverable that their employer hired them to do. As a result, while temporary and permanent employees may be eligible to overtime pay, independent contractors who work for themselves are typically not (Arestis *et al*., 2020).

Flexibility: When permanent employees accept a job offer, they often agree to a set schedule and place of employment. These rules apply equally to temporary workers who often perform tasks that full-time workers accomplish during a seasonal period or cover for permanent personnel. However, by enabling them to work remotely for a predetermined period of days, some companies are now giving regular staff more independence. Independent contractors may have more scheduling and geographical flexibility if they are hired to complete a specific project or undertake freelance work. In these circumstances, they can decide to work remotely and choose their own hours (De Cuyper *et al*., 2019).

Unemployment compensation A permanent employee may be qualified for unemployment benefits if they lose their job, according to Aleksynska (2018). Even so, the company might be willing to offer them severance money. As part of a severance package, they might get help finding new employment as well as the continuation of their health care coverage. However, Individuals who worked as permanent workers would not be entitled for unemployment benefits if they were dismissed or quite due to wrongdoing. Depending on a number of factors, people who lose their temporary work might be eligible for unemployment compensation. Potential contributing factors include their prior income, length of employment, and reason for unemployment. They might be eligible to keep their health insurance through COBRA if it was provided through their

staffing agency. Independent or self-employed contractors often are not eligible for unemployment benefits. To assist independent contractors, however, some rules were changed during the coronavirus pandemic (Aleksynska, 2018).

## 2.7 Relationship Between Staffing Methods and Labour Productivity

Kim *et al*. (2013) investigated the impact of personnel and training on business productivity and profit growth before, during, and after the Great Recession. The goal of this study is to analyse how businesses might use their human resources to improve company performance and competitive advantage by integrating studies from applied psychology, economics, and strategy. Staffing and training are crucial human resource management strategies for enhancing corporate performance via the growth and acquisition of human capital resources. However, little study has looked at how, when, and why personnel and training affect an organization's ability to perform financially (increase in profits) in various business environments. We suggest that selective staffing and internal training directly and interactively influence firm profit growth through their effects on firm labour productivity using data from 359 firms with more than 12 years of longitudinal firm-level profit data. This shows that personnel and training contribute to the creation of slack resources that assist mitigate the impacts of the Great Recession before helping the economy recover. Additionally, staffing appears to be more helpful for recovery from a recession than internal training that develops particular human capital resources since it provides general human capital resources that allow for company flexibility and adaptability. Thus, how personnel and training may be strategically employed to weather economic volatility may be affected by the theory and data described in this article (recession effects). They also demonstrate that, even after adjusting for historical profitability, businesses that staff and educate employees more effectively beat rivals during all pre- and post-recessionary times.

Onyeche and Edeke (2016) conducted research in Port Harcourt, Rivers State, Nigeria, to investigate the effects of contract employment on work productivity. Utilizing a four-point Likert scale questionnaire, the study used a survey research approach. 399 respondents from the Nigeria Agip Oil Company, MTN Nigeria, and United Bank for Africa (UBA) in Port Harcourt were chosen using a multi-stage sampling approach for the data collection. Simple percentages were used in a descriptive analysis of the data gathered. According to the study's conclusions, worker demographics (gender, age, educational attainment, job experience, and number of children) have a significant impact on maintaining contract staffing and work productivity. Finally, an organization's propensity to maximize profit at the expense of the workers job security is one of the key drivers of contract staffing. Other reasons for choosing contract employment include the workers level of income in combination with a lucrative job offer. Therefore, it was suggested that trade unions take the initiative to work with the government to develop policies that will lessen the suffering of workers by guaranteeing that each employee has the right to assemble freely and associate with other people to form or belong to any existing trade union for the protection of their interests.

Mohamed *et al*. (2017) carried out research on "Exploring the influence of human resource management practices on labour productivity in Libyan national oil companies" to look at how human resource management practices affect labour productivity inside the Libyan National Oil Corporation. Structural equation modelling was employed to do the research in a hypothetical deductive manner. This study included a cross-sectional survey of three leading Libyan national oil corporations with 339 respondents. The findings showed that on-the-job training and decentralized decision-making had a favourable and substantial association with labour productivity. In contrast, it was discovered that in the Libyan environment, employee motivation and staff selection were

not relevant. The findings revealed that the oil and gas industry need to concentrate on the key elements of HRM in order to increase long-term productivity and turnover. The significance of staff selection and motivation as HRM practices is at odds with past research's findings that these factors are essential for labour productivity. Therefore, more research and exploration of these links are required. The study honours the growing consensus among academics that better organizational human resource practices may increase labour productivity and achieve organizational objectives. Two key aspects of modern HR policies have a considerable impact on labour productivity. The empirical assessments of HRM practices and labour productivity that have already been done benefit from this study.

Lisi and Malo (2017) research study titled "The Impact of Temporary Employment on Productivity," state that the usage of temporary contracts (TE) may have a negative impact on productivity, according to recent publications in the economic literature. There are a number of reasons, nevertheless, to think that the effects of TE could not be uniform across industries. The authors of this paper investigate the effect of TE on productivity growth and, in particular, determine if it varies according on the degree of talent in various industries. The data set is an industry-level panel of European nations that enables sectorial division based on degree of competence. The findings demonstrate that TE hinders productivity development, although it does so more severely in skilled industries. While a ten-percentage point rise in the share of TE would result in a reduction in labour productivity growth of 1–1.5% in skilled sectors, it would result in a reduction of 0.5-0.8% in unskilled sectors. This conclusion is impervious to the sample makeup, various skill intensity indices, and productivity metrics. The policy ramifications of this finding for labour market regulation are also discussed by the researchers.

# CHAPTER THREE

## 3.0 RESEARCH METHODOLOGY

### 3.1 Research Design

According to Harris (2019), research design is a process through which researchers select and implement methods to collect data and answer research questions. The precise research issue being examined and the kind of data being gathered should be taken into account while designing the study. The most important part of any research design is ensuring that it is valid and reliable. Reliability relates to whether or not results can be duplicated across studies using comparable methodologies, whereas validity refers to whether or not a research measures what it purports to measure. Both validity and reliability are essential for conducting high quality research.

When planning and conducting research, it is important to consider the design and methodology. The design of a study defines the plan or structure for how the research will be conducted. The methodology defines the specific methods or procedures that will be used in order to collect data (Sileyew, 2019). There are many different types of designs and methodologies that can be used, and it is important to choose those that are most appropriate for the question being asked and the type of data that needs to be collected. For example, if you want to understand people's opinions on a topic, surveys would likely be more effective than experiments (Sileyew, 2019).

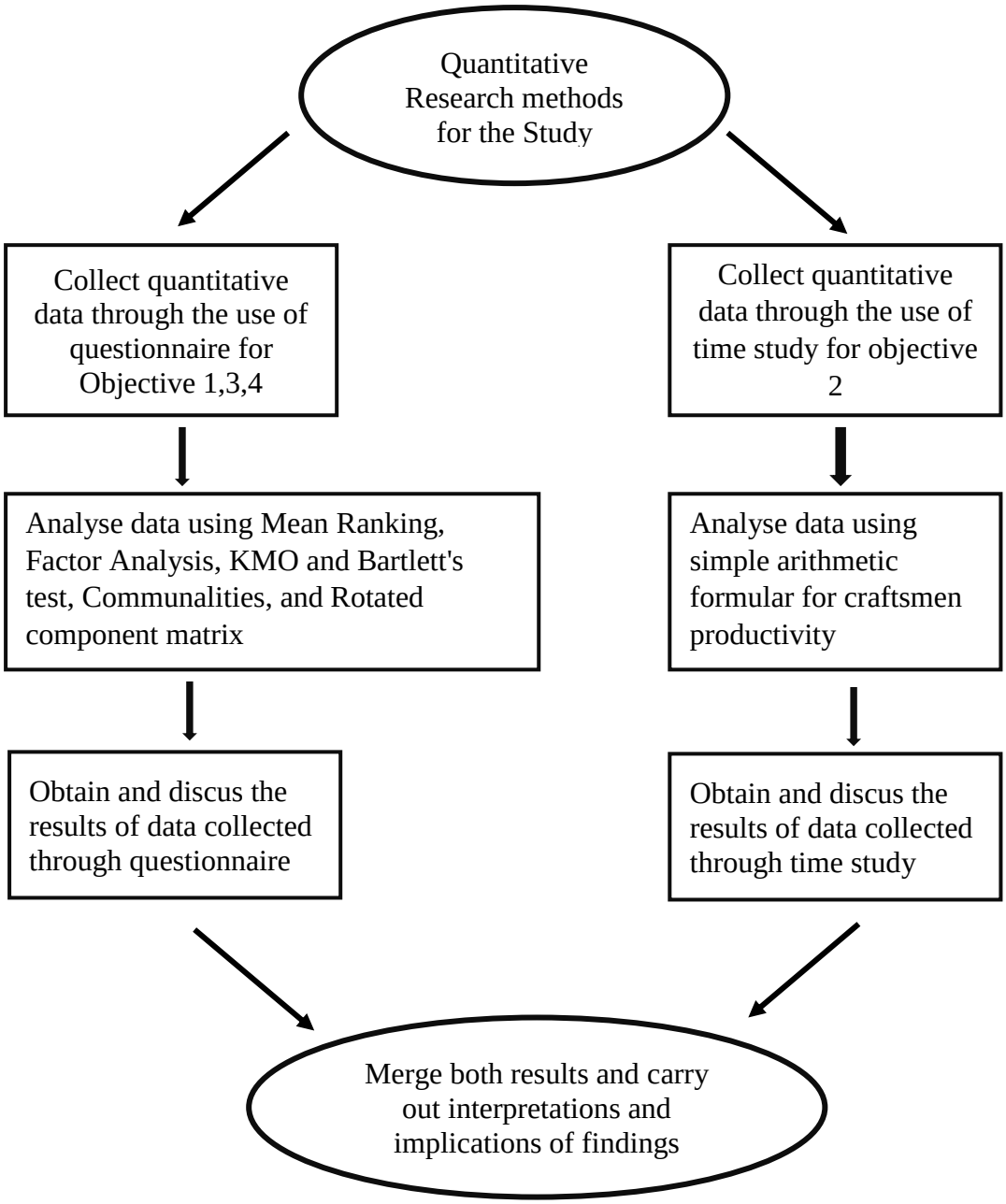


**Figure 3.1: Research design of the study**

**Source:** Researcher, 2022. Adapted from Sileyew (2019).

Considering the views of Harris (2019) and Sileyew (2019) Figure 3.1 will serve as the research design for this thesis showing the process through which the researchers select and implement methods to collect data and answer research questions through the use of survey method which is considered to be most appropriate for this research.

## 3.2 Research Methodology

There are many types of research methodology that can be used in order to investigate a given topic. The three most common types of research methodology are qualitative, quantitative, and mixed-methods. Each type of research has its own strengths and weaknesses, and so it is important to choose the right type of research for your specific project (Mishra & Alok, 2022).

### 3.2.1 Quantitative methodology

Quantitative methodology is a method used to collect and analyse data that can be measured. This type of research is often used in the social sciences, but can also be applied to other disciplines such as marketing or business. Quantitative research usually involves conducting surveys or experiments with large numbers of people in order to gather reliable data (Fellows & Liu, 2021)

There are several advantages to using quantitative methods of research. First, this type of research can provide a great deal of information about a large group of people very quickly and efficiently. Second, quantitative data is usually easier to analyse and interpret than qualitative data (such as interviews or open-ended survey responses). Finally, quantitative methods are often more objective than qualitative methods, which means they may be less biased overall (Keshk *et al.*, 2018).

However, there are certain drawbacks to quantitative research as well. The fact that it might be challenging to quantify intricate ideas or occurrences with precision using merely numerical data is a significant drawback. Additionally, quantitative studies often do not allow for much depth or nuance in the answers given by participants; this can make it hard to understand why people behave the way they do based on the results of these studies alone (Keshk *et al.*, 2018).

### 3.2.2 Qualitative methodology

Qualitative methodology is a type of scientific inquiry that focuses on the observation and interpretation of people's behaviours, experiences, and emotions. This type of research is often used to study social phenomena, such as how families interact or what factors influence people's opinions about a particular issue (Chivanga & Monyai, 2021). In qualitative research, a variety of techniques can be employed to gather data, such as participant observation, focus groups, interviews, and document analysis. Each method has its own strengths and weaknesses, so researchers must carefully choose the most appropriate method for their specific project (Chivanga & Monyai, 2021).

It's critical to examine data once it has been gathered using one or more qualitative methodologies in order to spot trends and themes. This analysis can be conducted using various approaches, such as coding (assigning numerical values to certain characteristics) or thematic analysis (identifying common themes across different pieces of data). Qualitative research is an important tool for understanding complex social phenomena; however, it does have some limitations compared to other types of scientific inquiry. For example, because qualitative studies often involve small numbers of participants, they may not be representative of a larger population (Ngozwana, 2018).

### 3.2.3 Mixed-methods methodology

The phrase "mixed methods methodology" describes the employment of many research methodologies to explore a topic. This type of research is often used in the social sciences, as it allows for a more comprehensive understanding of complex issues. Mixed methods research typically involves collecting data through both qualitative and quantitative means, and then analysing and interpreting this data using a variety of methods (Vebrianto *et al.,* 2020).

There are several advantages to using mixed methods research. First, by using multiple data sources, researchers can triangulate their findings and get a more complete picture of what is going on. Second, mixed methods allow for different types of analysis, which can provide complementary insights into the same issue. Finally, mixed methods tend to be more efficient than single-method approaches because they make better use of resources and allow researchers to collect multiple types of data at the same time (Matović & Ovesni, 2021).

Despite these advantages, there are also some challenges associated with mixed methods research. One challenge is that it can be difficult to integrate results from different data sources; another challenge is that not all researchers have expertise in both qualitative and quantitative methodologies (and thus may need assistance from those who do), due to the fact that single-method studies involve less time and effort than mixed method research (Vebrianto *et al.*, 2020).

After a detail study of the literature (Mishra & Alok, 2022, Fellows & Liu, 2021, Keshk, *et al.,* 2018, Chivanga & Monyai, 2021, Ngozwana, 2018, Matović & Ovesni, 2021; Vebrianto *et al.,* 2020). The researcher adopted the quantitative methodology of research which is the most appropriate for this study considering the pros and cons of the three most common research methodology.

## 3.3 Data Collection Technique

Quantitative data was collected for this study. This comprises of data gotten through the use of structured questionnaires and the use of time study. This was administered to POP workers and tilers on building construction sites in Abuja.

### 3.3.1 Research population

For the purpose of this study, only registered building constructions firms with ongoing project in the Federal Capital Territory was used. The population of the study comprised

of POP workers and tilers of the two most common staffing methods. This is done to provide a fair representation and viewpoint on the impact of staffing methods on Abuja's construction labour productivity.

### 3.3.2 Population sampling

Sampling methods aid in the selection of population components. In this study, a purposive sampling strategy was utilized to choose the various sites. The research relies on the factors they select for the sample population while using the non-probability sampling technique known as "purposeful sampling," also referred to as "subjective sampling." Every step of the sampling technique in this case is determined by the researcher's judgment and comprehension of the situation (Creswell, 2014). This type of sampling techniques is used because the stage of work as at the time of visitation to the site matters if the craftsmen working at the time of visitation is outside those considered in this study, and if a construction company is registered yet without an ongoing project within Abuja it will be of no value to this study, hence the purposive sampling technique was adopted for the study. The sites that were chosen allow us to determine each craftsman's actual production potential while they were working in typical and convenient circumstances, either as permanent employees or contract employees.

### 3.3.3 Sample frame

A sample frame offers quantitative data for population parameter estimate using sampled observation. When conducting research, it is important to have a clear and concise frame in order to focus your work and ensure that your findings are relevant. A sample frame can be extremely helpful in this regard, as it provides a template for you to follow as you collect data and evidence.

An effective sample frame will help you to identify the key issues and problems that you want to address in your research. It will also provide guidance on what type of data and evidence you need to collect in order to support your claims. Without a well-defined frame, it can be easy to become side tracked or lost in the details of your research project (Saluja & Modi, 2021).

A total of 30 building construction sites owned by registered construction companies with an ongoing building project in FCT Abuja was used. The 30 sites were selected using purposive sampling methods. It was restricted to 30 considering the time frame of this research work. This population comprises of both skilled and unskilled workers of POP and tilers made up of permanent and contract staff inclusive of professional on site supervising those workers. Questionnaires were administered to the 30 sites and 10 out of the 30 sites were used for time study for Pop workers and tillers.

### 3.3.4 Sample size

It's crucial to take the sample size into account while performing any kind of study. This is the estimated total number of participants in the study. A study's sample size should be carefully examined because it might significantly affect the findings. When choosing an adequate sample size, a number of things should be taken into consideration. The first is the type of data that will be collected. If qualitative data is being collected, then a smaller sample size may be sufficient as this type of data can provide rich detail. However, a larger sample size may be required if quantitative data is being collected in order to produce results that can be trusted (Andrade, 2020).

The sample size determination formula created by was used to determine the size of the sample of respondents for the questionnaire survey that was intended (Yamen, 2013). The formula is:

$$n = \frac{N}{1+N(e)^2}$$ Equation (3.1)

Where n is the sample size, N the target population, and E the level of accuracy or sampling error all of which are 5% refer to the total number of POP workers and Tilers (both skilled and unskilled) and professionals across all of the sites visited. 979 which was the total number of workers in the range of this study in the 30 sites served as the target population. The minimum sample size for this investigation, according to this formula, was 284. A total of 300 questionnaires were distributed, and 284 of them were fully completed and returned, constituting the sample size.

### 3.4 Data Collection

According to Taherdoost (2021), Data may be gathered in a variety of methods for research objectives. Surveys, interviews, focus groups, and observation are the most popular techniques. People are questioned about their thoughts or experiences in surveys, a sort of data collecting. They can be done online, over the phone, or in person. Another method of gathering data is doing one-on-one interviews with subjects to learn about their perspectives or experiences.

Focus groups involve small groups of people discussing a topic together. Observation is when researchers watch people interact in their natural environment without intervening (Taherdoost, 2021). Data for this study was collected on site using the Time Study Observation and structured questionnaire which is considered to be most suitable for this type of research (Taherdoost, 2021).

### 3.4.1 Data collected through time study observation

The following tools are used: a stopwatch, a plane sheet, a pencil, an eraser, clipboards, and a ruler.

Time: The researcher begins work at the site when it opens (7:30 am) and ends when it shuts (3:30 pm), or eight (8) working hours, depending on when the location is visited. In order to see well and to minimize interruptions while doing the study on location, the researcher finds a comfortable spot to sit a little distance from the subject of observation. The following information is included in the used paper:

i. Type of work done
ii. Rating based on observation
iii. The start time for each type of work done
iv. The ending time for each type of work done
v. The observed time
vi. The idle time and total area of work covered
vii. The actual time Attar et al. (2012)

When a job is interrupted, the duration of the interruption is noted as idle time. At the end of the day's work, the total amount of idle time is removed from the overall amount of time spent to give us the real amount of time used for that specific activity. By beginning the stop clock as soon as work begins, the observation process starts and is then continued. When work is interrupted, it was ensured that the length of the interruption was precisely documented. This procedure was repeated for different gangs of POP workers and Tilers on 10 selected sites having both contract and permanent staff on site for 14 days on each site.

### 3.4.2 Data collected through questionnaire

The type of questionnaire used in this research is a structured questionnaire. A total number of 300 Questionnaires were administered to professionals, POP workers and tilers on site which comprises of both skilled and unskilled for which 284 was dully filled and returned representing the sample size. For the ones given to the craftsmen who are unlearned, the questions were read out orally to them and the boxes applicable to them ticked considering their levels of education and inability to read and comprehend properly what is being writing. The researcher clarified any questions that they didn't understand for their own benefit. Professionals, knowledgeable skilled workers, and unskilled workers were given a questionnaire with an introduction on the cover page. Because they were knowledgeable, they were able to answer the questions as they applied to them and, in some cases, the researcher was required to explain things to them so that the researcher could obtain the most accurate data possible.

The questionnaire is made up of four sections A, B, C. D, as seen in appendix A. The section A gives the respondent profile, section B show the Staffing methods, Section C shows the factors affecting productivity on the site, why section D, shows the strategies for effective staffing methods for improved productivity.

## 3.5 Data Analysis

The two forms of data collected for this study was analysed separately using the craftsmen productivity methods and the relative important index.

### 3.5.1 Analysis of data collected through time study observations

To determine the actual time and the performance of the craftsmen, the data gathered through time study observations of the productivity of several craftspeople on site was analysed. The following equations were employed:

$$\text{Craftsmen Productivity} = \frac{\text{Work-hours}}{\text{Unit of work Done by Craftsmen}} \quad \text{----------(9)}$$

Actual time used = total observed time – idle time. The total observed time is the time laps for official working hours of the day which is relative to each company depending on the agreement entered with the workers which in most cases is 8am to 5pm for private organizations. This amount to a total of 9 hours which represent the observed time. The idle time on the other hand is the time of which the worker is either on brake or not working maybe because of distraction or paying attention to instructions or jesting. The work hour is represented by the actual time used.

Unit of work done is measured in $m^2$ or $m^3$ depending the nature of work done. This is done at the close of the day when the workers might have completed their work for the day and clean their tools. All those values are then inputted in to the formular to determine the craftsmen productivity for the day.

### 3.5.2. Analysis of data collected through questionnaire

The data collected through questionnaire was analysed using a simple important index (ordinary measurement scale) which is ranking of rating data than normally uses integers in ascending or descending order for analysing data by ordinary scale and the use of soft ware's such SPSS and Microsoft excel to arrive at the percentage rating of these factors affecting craftsmen productivity on site, the types of staffing methods and the strategies for effective staffing methods by adopting the mean ranking and factor analysis method. In carrying out this analysis, various construct under objectives 1, 3 and 4 will be analysed by subjecting them to reliability test, the mean ranking and factor analysis. The factor analysis is carried out through the use of KMO and Bartlett's Test, communalities, rotated component matrix and total variance explained

# CHAPTER FOUR

## 4.0 RESULTS AND DISCUSSION

### 4.1 General Demographics of Respondents

This shows the analysis of the various demography of the respondent ranging from the Age group, gender, profession, qualification, years of experience, professional training, experience in organization, size of firm and the position of respondent.

**Table 4.1. General demographics of respondents**

| General Demographics | Variables | Frequency | Percentage (%) |
|---|---|---|---|
| **Age Group** | 15-20 years | 2 | 0.70 |
| | 21-30 years | 100 | 35.21 |
| | 31-40 years | 62 | 21.83 |
| | 31-40 years | 64 | 22.54 |
| | 41-50 years | 52 | 18.31 |
| | 51-60 years | 4 | 1.41 |
| | **Total** | **284** | **100** |
| **Gender** | Male | 226 | 79.58 |
| | Female | 58 | 20.42 |
| | **Total** | **284** | **100.00** |
| **Profession** | Professional | 128 | 45.07 |
| | Skilled Labour | 112 | 39.44 |
| | Unskilled Labour | 44 | 15.49 |
| | **Total** | **284** | **100.00** |
| **Qualification** | Bachelor Degree | 90 | 31.69 |
| | Doctorate Degree | 14 | 4.93 |
| | Higher National Diploma | 78 | 27.46 |
| | Master Degree | 48 | 16.90 |
| | National Diploma | 14 | 4.93 |
| | O Level Certificate | 34 | 11.97 |
| | Primary Certificate | 6 | 2.11 |
| | **Total** | **284** | 100.00 |
| **Years of Experience** | 0-5 years | 102 | 35.92 |
| | 11-20 years | 66 | 23.24 |
| | 21-30 years | 10 | 3.52 |
| | 6-10 years | 106 | 37.32 |
| | **Total** | **284** | **100.00** |
| **Professional Training** | Every three years | 8 | 2.82 |
| | Every two years | 16 | 5.63 |

| | | | |
|---|---|---|---|
| | Only when the need arises | 186 | 65.49 |
| | Yearly | 74 | 26.06 |
| | **Total** | **284** | **100.00** |
| **Experience in Organization** | 0-5 years | 174 | 61.27 |
| | 11-20 years | 28 | 9.86 |
| | 6-10 years | 82 | 28.87 |
| | **Total** | **284** | **100.00** |
| **Size of Firm** | Large (250 above) | 64 | 22.54 |
| | Medium (50-249) | 114 | 40.14 |
| | Small (10-49) | 106 | 37.32 |
| | **Total** | **284** | **100.00** |
| **Position of Respondent** | Architect | 24 | 8.45 |
| | Builder | 38 | 13.38 |
| | POP Worker Foremen | 14 | 4.93 |
| | Civil Engineer | 30 | 10.56 |
| | Tiler Foremen | 18 | 6.34 |
| | General Manager | 8 | 2.82 |
| | Labour | 42 | 14.79 |
| | POP worker | 38 | 13.38 |
| | Project Manager | 18 | 6.34 |
| | Site Manager | 6 | 2.11 |
| | Site Supervisor | 2 | 0.70 |
| | Structural Engineer | 2 | 0.70 |
| | Surveyor | 2 | 0.70 |
| | Tiller | 42 | 14.79 |
| | **Total** | **284** | **100.00** |

**Source:** Researcher's Analysis 2022

From Table 4.1 one can observed that several professionals and non-professionals participated in this survey and there all have different positions in their respective organizations ranging Builder with about 38 people, followed by civil engineer with about 30 people, and the least of the categories of responded are the site supervisor, structural engineer and surveyor having 2 each. It can be observed from above that the construction site is made up of multiple professions with so many titles and positions, ranging from professionals to non-professionals. At the course of the study, it was also discovered that there were supervisors on site who are not professional in any of the professions in the

construction industry but they were there overseeing the activities of the site by the virtue of their relationship with the owner of the contract. The table also shows that those between of 21 to 30 years are more prominent in this survey with a total respondent number of 100 making 35.21% of the total number of respondent while the least category is those in the rage of 15 – 20 years accounting for 0.70% and those in the rage of 51-60 years accounting for 1.41% of the entire population of the respondent. This shows that the construction industry is made up of those who are still very strong and energetic and there is little or no case of child abuse involved at the course of carrying out this study, since the youngest respondent was 19 years old. In terms of gender the industry is dominated with the male gender with about 226 respondent accounting for 79.58% while the female made up the remaining 20.42%. The professionals were the highest respondent with 128 respondent accounting for 45.07% followed by the skilled labour with 39.44% and the least being the unskilled labour with 15.49%. This shows that the research cuts across different categories of people on site to ensure an unbiased response. Bachelor Degree holders account for 31.69% of the total respondent followed by Higher National Diploma with 27.46% while the least in terms of academic qualification is Primary certificate accounting for 2.11%, this shows that most of the workers involved in this research has undergo one form of academic training or the other. This implies that there was no complete illiterate encountered at the course of this research that could not read and write at least their name. With respect to years of experience it was observed that 106 respondents making up 37.32 % had work experience in their relevant field within the rage of 6-10 years, this was followed closely by those within 0-5 years of experience accounting for 35.92% of the total respondent. The least was those with experience of 21-30 years with 3.52%. Considering the frequency of training undergo by the workers on site it was observed that 65.49 only undergo training on when need arise why 2.82%

undergo training every three years. This shows that much attention should be given to training and retraining of workers on site. Though most of the workers have had good experiences in their areas but majority of them have only had 0-5 years' experience in their present working place accounting for about 62.27%, why those who have stayed in a particular company for about 11-20 years shows the least percentage of 9.86. The size of firm used majorly for this study comprises of both the small, medium and large firm, with medium firm having the highest percentage of 40.14, followed by small firms with 37.32% why the large firms were the least with 22.54%. this shows that though the medium and large firm have the highest percentage rating the large firms were also covered which help to give a more unbiased judgement in terms of the size of firm which this survey cuts across in the Federal Capital Territory Abuja.

## 4.2 Staffing Method(s) Used by Selected Organizations

This section seeks to identify the various staffing methods available in the construction industry which will be subject to survey and then analysed with the aim of identifying the most common staffing methods in the building construction industry in Abuja.

### 4.2.1 Reliability Test for Staffing methods

Cronbach's alpha reliability coefficient typically falls between 0 and 1, claim George and Mallery (2003). The coefficient, however, truly has no lower bound. The internal consistency of the scale's items is inversely correlated with how near Cronbach's alpha coefficient is to 1.0. Additionally, they suggest that ≥ 9 = Excellent, ≥ 8 = Good, ≥ 7 = Acceptable, ≥ 6 = Questionable, ≥ 5 = Poor, and ≤ 5 = Unacceptable" be used as guidelines.

**Table 4.2. Reliability test for staffing methods**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| 0.738 | 0.728 | 10 |

**Source:** Researcher's Analysis 2022

Given a Cronbach's value of 0.738 as seen in table 4.2 considering the value is more than 0.7 and the reliability statistics are based on a standardized item of 0.728 indicating the reliability statistics are deemed to acceptable based on guidelines set by (George & Mallery, 2003).

### 4.2.2. Mean Ranking for Staffing Methods

This displays the average value for each recognized staffing methods as used by the selected organizations. It also shows the standard deviation (SD), Test value (t), ranking (R), and the significant value (Sig).

**Table 4.3: Mean ranking for staffing methods**

| S/N | Staffing methods used by the org. | Mean | SD | Test Value = 3.5 | | | R |
|---|---|---|---|---|---|---|---|
| | | | | t | df | Sig. (2-tailed) | |
| B2 | Permanent staff | 4.176 | 0.860 | 13.251 | 283 | 0.000* | 1 |
| B1 | Contract staff | 4.162 | 0.794 | 14.045 | 283 | 0.000* | 2 |
| B3 | Internship staff | 3.458 | 1.497 | -.4760 | 283 | 0.635* | 3 |
| B4 | Casual staff | 3.275 | 1.392 | -2.728 | 283 | 0.007* | 4 |
| B8 | Freelance staff | 2.437 | 1.305 | -13.733 | 283 | 0.000* | 5 |
| B6 | Part-time staff | 2.254 | 1.099 | -19.115 | 283 | 0.000* | 6 |
| B5 | Fixed-term staff | 2.120 | 1.374 | -16.935 | 283 | 0.000* | 7 |
| B7 | Executive staff | 2.085 | 1.012 | -23.566 | 283 | 0.000* | 8 |
| B9 | At-will staff | 1.507 | 0.903 | -37.176 | 283 | 0.000* | 9 |
| B10 | Non-compete and confidentiality staff | 1.430 | 0.924 | -37.763 | 283 | 0.000* | 10 |

**Source:** Researcher's Analysis 2022

The respondents were provided with different types of staffing methods available in the construction industry and were instructed to grade them based on their degree of

understanding and experience of how common such staffing methods are being used in the construction industry in Abuja, using the scale: 1= very rare, 2 = rare, 3 uncommon, 4= common, 5= very common. The result on Table 4.3 revealed that permanent staff with (MS=4.176) was ranked 1st followed by contract staff with (MS=4.167) to be ranked 2nd. The least of the staffing methods used in Abuja from the survey shows At-will-staff with (MS=1.507) to be ranked 9 among the ten identified staffing methods why non-compete and confidential staff with (MS = 1.430) was ranked 10th.

Having the test value to be 3.5, this implies that only three staffing methods with 4.2, 4.2, and 3.5 representing, permanent staff, contract staff, and internship staff respectively are well represented in the construction industry in Abuja. This shows that for every site visited there is either one, two or all the three types of staffing methods present. One can therefore say the most common staffing methods in Abuja out of the ten types used for this survey is 3, which, are permanent staff, contract staff and internship staff but for the purpose of this study the first two staffing methods only will be used.

## 4.3 Productivity of Contract Staff and Permanent Staff Craftsmen on Site

### 4.3.1 Productivity study of POP activity for permanent and contract staff

Table 4.4 to table 4.8 shows the daily record of the productivity of POP workers with a gang size of two, and working with less design under a normal working condition for both contract and permanent staff on each project site. For the purpose of this research considering the time frame of the program only five building sites having both contract and permanent staff on site was used for the time study.

**Table 4.4 POP Activity Project 1**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 2.35 | 13.65 | 12.96 | 1.235 | 12.80 | 1.066 | 0.907 |
| 2 | 2 | 16 | 2.45 | 13.55 | 12.96 | 1.235 | 12.80 | 1.059 | 0.907 |
| 3 | 2 | 16 | 2.20 | 13.80 | 12.96 | 1.235 | 19.78 | 0.698 | 0.907 |
| 4 | 2 | 16 | 2.78 | 13.22 | 12.96 | 1.235 | 10.80 | 1.224 | 0.907 |
| 5 | 2 | 16 | 2.60 | 13.40 | 12.96 | 1.235 | 9.00 | 1.489 | 0.907 |
| 6 | 2 | 16 | 3.40 | 12.60 | 12.96 | 1.235 | 8.84 | 1.425 | 0.907 |
| 7 | 2 | 16 | 2.75 | 13.25 | 12.96 | 1.235 | 13.50 | 0.981 | 0.907 |
| 8 | 2 | 16 | 2.11 | 13.89 | 12.96 | 1.235 | 13.00 | 1.068 | 0.907 |
| 9 | 2 | 16 | 2.96 | 13.04 | 12.96 | 1.235 | 17.80 | 0.733 | 0.907 |
| 10 | 2 | 16 | 2.44 | 13.56 | 12.96 | 1.235 | 12.10 | 1.121 | 0.907 |
| 11 | 2 | 16 | 2.21 | 13.79 | 12.96 | 1.235 | 10.34 | 1.334 | 0.907 |
| 12 | 2 | 16 | 3.29 | 12.71 | 12.96 | 1.235 | 11.85 | 1.073 | 0.907 |
| **Mean** | | | | | **12.96** | **1.235** | **12.72** | **1.106** | **0.907** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 0.78 | 15.22 | 12.96 | 1.235 | 21.00 | 0.725 | 0.762 |
| 2 | 2 | 16 | 1.40 | 14.60 | 12.96 | 1.235 | 14.85 | 0.983 | 0.762 |
| 3 | 2 | 16 | 2.10 | 13.90 | 12.96 | 1.235 | 15.12 | 0.919 | 0.762 |
| 4 | 2 | 16 | 0.89 | 15.11 | 12.96 | 1.235 | 14.40 | 1.049 | 0.762 |
| 5 | 2 | 16 | 2.10 | 13.90 | 12.96 | 1.235 | 20.92 | 0.664 | 0.762 |
| 6 | 2 | 16 | 1.36 | 14.64 | 12.96 | 1.235 | 15.48 | 0.946 | 0.762 |
| 7 | 2 | 16 | 0.98 | 15.02 | 12.96 | 1.235 | 19.13 | 0.785 | 0.762 |
| 8 | 2 | 16 | 0.84 | 15.16 | 12.96 | 1.235 | 12.96 | 1.170 | 0.762 |
| 9 | 2 | 16 | 1.63 | 14.37 | 12.96 | 1.235 | 16.20 | 0.887 | 0.762 |
| 10 | 2 | 16 | 1.04 | 14.96 | 12.96 | 1.235 | 10.10 | 1.481 | 0.762 |
| 11 | 2 | 16 | 1.01 | 14.99 | 12.96 | 1.235 | 19.98 | 0.750 | 0.762 |
| 12 | 2 | 16 | 1.27 | 14.73 | 12.96 | 1.235 | 12.41 | 1.187 | 0.762 |
| **Mean** | | | | | **12.96** | **1.235** | **16.05** | **0.962** | **0.762** |

**Source:** Field study (2022)

**Table 4.5 POP Activity Project 2**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| **Permanent Staff** | | | | | | | | | |
| 1 | 2 | 16 | 2.10 | 13.90 | 12.96 | 1.235 | 12.36 | 1.125 | 0.874 |
| 2 | 2 | 16 | 2.43 | 13.57 | 12.96 | 1.235 | 13.45 | 1.009 | 0.874 |
| 3 | 2 | 16 | 1.90 | 14.10 | 12.96 | 1.235 | 18.92 | 0.745 | 0.874 |
| 4 | 2 | 16 | 2.54 | 13.46 | 12.96 | 1.235 | 12.34 | 1.091 | 0.874 |
| 5 | 2 | 16 | 2.32 | 13.68 | 12.96 | 1.235 | 9.21 | 1.485 | 0.874 |
| 6 | 2 | 16 | 3.52 | 12.48 | 12.96 | 1.235 | 9.45 | 1.321 | 0.874 |
| 7 | 2 | 16 | 1.88 | 14.12 | 12.96 | 1.235 | 12.67 | 1.114 | 0.874 |
| 8 | 2 | 16 | 2.31 | 13.69 | 12.96 | 1.235 | 14.87 | 0.921 | 0.874 |
| 9 | 2 | 16 | 2.54 | 13.46 | 12.96 | 1.235 | 16.98 | 0.793 | 0.874 |
| 10 | 2 | 16 | 2.10 | 13.90 | 12.96 | 1.235 | 15.43 | 0.901 | 0.874 |
| 11 | 2 | 16 | 1.79 | 14.21 | 12.96 | 1.235 | 10.74 | 1.323 | 0.874 |
| 12 | 2 | 16 | 2.98 | 13.02 | 12.96 | 1.235 | 9.84 | 1.323 | 0.874 |
| **Mean** | | | | | **12.96** | **1.235** | **13.02** | **1.096** | **0.874** |
| **Contract Staff** | | | | | | | | | |
| 1 | 2 | 16 | 0.98 | 15.02 | 12.96 | 1.235 | 18.40 | 0.816 | 0.757 |
| 2 | 2 | 16 | 1.23 | 14.77 | 12.96 | 1.235 | 15.65 | 0.944 | 0.757 |
| 3 | 2 | 16 | 1.87 | 14.13 | 12.96 | 1.235 | 14.12 | 1.001 | 0.757 |
| 4 | 2 | 16 | 1.64 | 14.36 | 12.96 | 1.235 | 16.40 | 0.876 | 0.757 |
| 5 | 2 | 16 | 2.87 | 13.13 | 12.96 | 1.235 | 19.92 | 0.659 | 0.757 |
| 6 | 2 | 16 | 1.11 | 14.89 | 12.96 | 1.235 | 16.37 | 0.910 | 0.757 |
| 7 | 2 | 16 | 1.08 | 14.92 | 12.96 | 1.235 | 20.16 | 0.740 | 0.757 |
| 8 | 2 | 16 | 1.37 | 14.63 | 12.96 | 1.235 | 13.06 | 1.120 | 0.757 |
| 9 | 2 | 16 | 1.10 | 14.90 | 12.96 | 1.235 | 17.24 | 0.864 | 0.757 |
| 10 | 2 | 16 | 0.94 | 15.06 | 12.96 | 1.235 | 12.10 | 1.245 | 0.757 |
| 11 | 2 | 16 | 1.21 | 14.79 | 12.96 | 1.235 | 20.90 | 0.708 | 0.757 |
| 12 | 2 | 16 | 0.65 | 15.35 | 12.96 | 1.235 | 13.32 | 1.152 | 0.757 |
| **Mean** | | | | | **12.96** | **1.235** | **16.47** | **0.920** | **0.757** |

**Source:** Field study (2022)

**Table 4.6 POP Activity Project 3**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| **Permanent Staff** | | | | | | | | | |
| 1 | 2 | 16 | 1.96 | 14.04 | 12.96 | 1.235 | 13.36 | 1.051 | 0.837 |
| 2 | 2 | 16 | 2.10 | 13.90 | 12.96 | 1.235 | 14.12 | 0.984 | 0.837 |
| 3 | 2 | 16 | 2.43 | 13.57 | 12.96 | 1.235 | 15.64 | 0.868 | 0.837 |
| 4 | 2 | 16 | 2.61 | 13.39 | 12.96 | 1.235 | 14.67 | 0.913 | 0.837 |
| 5 | 2 | 16 | 1.45 | 14.55 | 12.96 | 1.235 | 10.43 | 1.395 | 0.837 |
| 6 | 2 | 16 | 2.93 | 13.07 | 12.96 | 1.235 | 11.04 | 1.184 | 0.837 |
| 7 | 2 | 16 | 2.22 | 13.78 | 12.96 | 1.235 | 14.33 | 0.962 | 0.837 |
| 8 | 2 | 16 | 2.45 | 13.55 | 12.96 | 1.235 | 15.57 | 0.870 | 0.837 |
| 9 | 2 | 16 | 1.89 | 14.11 | 12.96 | 1.235 | 17.98 | 0.785 | 0.837 |
| 10 | 2 | 16 | 2.33 | 13.67 | 12.96 | 1.235 | 10.43 | 1.311 | 0.837 |
| 11 | 2 | 16 | 3.10 | 12.90 | 12.96 | 1.235 | 18.30 | 0.705 | 0.837 |
| 12 | 2 | 16 | 2.11 | 13.89 | 12.96 | 1.235 | 10.32 | 1.346 | 0.837 |
| **Mean** | | | | | **12.96** | **1.235** | **13.85** | **1.031** | **0.837** |
| **Contract Staff** | | | | | | | | | |
| 1 | 2 | 16 | 1.32 | 14.68 | 12.96 | 1.235 | 17.80 | 0.825 | 0.769 |
| 2 | 2 | 16 | 1.43 | 14.57 | 12.96 | 1.235 | 16.54 | 0.881 | 0.769 |
| 3 | 2 | 16 | 1.90 | 14.10 | 12.96 | 1.235 | 15.00 | 0.940 | 0.769 |
| 4 | 2 | 16 | 0.98 | 15.02 | 12.96 | 1.235 | 14.54 | 1.033 | 0.769 |
| 5 | 2 | 16 | 1.95 | 14.05 | 12.96 | 1.235 | 20.21 | 0.695 | 0.769 |
| 6 | 2 | 16 | 2.54 | 13.46 | 12.96 | 1.235 | 15.78 | 0.853 | 0.769 |
| 7 | 2 | 16 | 1.45 | 14.55 | 12.96 | 1.235 | 21.45 | 0.678 | 0.769 |
| 8 | 2 | 16 | 0.45 | 15.55 | 12.96 | 1.235 | 14.44 | 1.077 | 0.769 |
| 9 | 2 | 16 | 0.87 | 15.13 | 12.96 | 1.235 | 19.10 | 0.792 | 0.769 |
| 10 | 2 | 16 | 1.42 | 14.58 | 12.96 | 1.235 | 14.32 | 1.018 | 0.769 |
| 11 | 2 | 16 | 2.67 | 13.33 | 12.96 | 1.235 | 12.45 | 1.071 | 0.769 |
| 12 | 2 | 16 | 1.34 | 14.66 | 12.96 | 1.235 | 17.12 | 0.856 | 0.769 |
| **Mean** | | | | | **12.96** | **1.235** | **16.56** | **0.893** | **0.769** |

**Source:** Field study (2022)

**Table 4.7 POP Activity Project 4**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 2.61 | 13.39 | 12.96 | 1.235 | 12.98 | 1.032 | 0.915 |
| 2 | 2 | 16 | 2.44 | 13.56 | 12.96 | 1.235 | 13.45 | 1.008 | 0.915 |
| 3 | 2 | 16 | 1.99 | 14.01 | 12.96 | 1.235 | 14.65 | 0.956 | 0.915 |
| 4 | 2 | 16 | 2.87 | 13.13 | 12.96 | 1.235 | 12.45 | 1.055 | 0.915 |
| 5 | 2 | 16 | 2.64 | 13.36 | 12.96 | 1.235 | 11.84 | 1.128 | 0.915 |
| 6 | 2 | 16 | 3.60 | 12.40 | 12.96 | 1.235 | 14.55 | 0.852 | 0.915 |
| 7 | 2 | 16 | 2.66 | 13.34 | 12.96 | 1.235 | 12.54 | 1.064 | 0.915 |
| 8 | 2 | 16 | 2.64 | 13.36 | 12.96 | 1.235 | 14.63 | 0.913 | 0.915 |
| 9 | 2 | 16 | 3.06 | 12.94 | 12.96 | 1.235 | 15.32 | 0.845 | 0.915 |
| 10 | 2 | 16 | 2.44 | 13.56 | 12.96 | 1.235 | 11.43 | 1.186 | 0.915 |
| 11 | 2 | 16 | 3.46 | 12.54 | 12.96 | 1.235 | 9.44 | 1.328 | 0.915 |
| 12 | 2 | 16 | 2.55 | 13.45 | 12.96 | 1.235 | 8.34 | 1.613 | 0.915 |
| **Mean** | | | | | **12.96** | **1.235** | **12.64** | **1.082** | **0.915** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 2.21 | 13.79 | 12.96 | 1.235 | 16.50 | 0.836 | 0.793 |
| 2 | 2 | 16 | 2.10 | 13.90 | 12.96 | 1.235 | 15.44 | 0.900 | 0.793 |
| 3 | 2 | 16 | 2.43 | 13.57 | 12.96 | 1.235 | 14.54 | 0.933 | 0.793 |
| 4 | 2 | 16 | 2.63 | 13.37 | 12.96 | 1.235 | 13.89 | 0.963 | 0.793 |
| 5 | 2 | 16 | 1.87 | 14.13 | 12.96 | 1.235 | 18.56 | 0.761 | 0.793 |
| 6 | 2 | 16 | 3.06 | 12.94 | 12.96 | 1.235 | 13.67 | 0.947 | 0.793 |
| 7 | 2 | 16 | 2.45 | 13.55 | 12.96 | 1.235 | 17.45 | 0.777 | 0.793 |
| 8 | 2 | 16 | 1.34 | 14.66 | 12.96 | 1.235 | 12.69 | 1.155 | 0.793 |
| 9 | 2 | 16 | 1.21 | 14.79 | 12.96 | 1.235 | 16.66 | 0.888 | 0.793 |
| 10 | 2 | 16 | 0.98 | 15.02 | 12.96 | 1.235 | 13.20 | 1.138 | 0.793 |
| 11 | 2 | 16 | 2.98 | 13.02 | 12.96 | 1.235 | 12.66 | 1.028 | 0.793 |
| 12 | 2 | 16 | 2.65 | 13.35 | 12.96 | 1.235 | 19.00 | 0.703 | 0.793 |
| **Mean** | | | | | **12.96** | **1.235** | **15.36** | **0.919** | **0.793** |

**Source:** Field study (2022)

**Table 4.8 POP Activity Project 5**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 3.15 | 12.85 | 12.96 | 1.235 | 12.00 | 1.071 | 1.068 |
| 2 | 2 | 16 | 2.65 | 13.35 | 12.96 | 1.235 | 11.66 | 1.145 | 1.068 |
| 3 | 2 | 16 | 2.44 | 13.56 | 12.96 | 1.235 | 13.55 | 1.001 | 1.068 |
| 4 | 2 | 16 | 2.89 | 13.11 | 12.96 | 1.235 | 9.76 | 1.343 | 1.068 |
| 5 | 2 | 16 | 2.76 | 13.24 | 12.96 | 1.235 | 9.00 | 1.471 | 1.068 |
| 6 | 2 | 16 | 3.89 | 12.11 | 12.96 | 1.235 | 8.12 | 1.491 | 1.068 |
| 7 | 2 | 16 | 2.56 | 13.44 | 12.96 | 1.235 | 12.56 | 1.070 | 1.068 |
| 8 | 2 | 16 | 2.44 | 13.56 | 12.96 | 1.235 | 12.44 | 1.090 | 1.068 |
| 9 | 2 | 16 | 3.45 | 12.55 | 12.96 | 1.235 | 11.31 | 1.110 | 1.068 |
| 10 | 2 | 16 | 3.10 | 12.90 | 12.96 | 1.235 | 10.39 | 1.242 | 1.068 |
| 11 | 2 | 16 | 2.67 | 13.33 | 12.96 | 1.235 | 9.09 | 1.466 | 1.068 |
| 12 | 2 | 16 | 3.77 | 12.23 | 12.96 | 1.235 | 10.32 | 1.185 | 1.068 |
| **Mean** | | | | | **12.96** | **1.235** | **10.85** | **1.224** | **1.068** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 1.21 | 14.79 | 12.96 | 1.235 | 18.00 | 0.822 | 0.762 |
| 2 | 2 | 16 | 1.65 | 14.35 | 12.96 | 1.235 | 13.55 | 1.059 | 0.762 |
| 3 | 2 | 16 | 2.75 | 13.25 | 12.96 | 1.235 | 14.46 | 0.916 | 0.762 |
| 4 | 2 | 16 | 1.66 | 14.34 | 12.96 | 1.235 | 12.77 | 1.123 | 0.762 |
| 5 | 2 | 16 | 2.78 | 13.22 | 12.96 | 1.235 | 17.65 | 0.749 | 0.762 |
| 6 | 2 | 16 | 1.90 | 14.10 | 12.96 | 1.235 | 14.66 | 0.962 | 0.762 |
| 7 | 2 | 16 | 1.56 | 14.44 | 12.96 | 1.235 | 16.45 | 0.878 | 0.762 |
| 8 | 2 | 16 | 1.11 | 14.89 | 12.96 | 1.235 | 11.00 | 1.354 | 0.762 |
| 9 | 2 | 16 | 2.56 | 13.44 | 12.96 | 1.235 | 14.09 | 0.954 | 0.762 |
| 10 | 2 | 16 | 1.98 | 14.02 | 12.96 | 1.235 | 9.65 | 1.453 | 0.762 |
| 11 | 2 | 16 | 2.00 | 14.00 | 12.96 | 1.235 | 17.21 | 0.813 | 0.762 |
| 12 | 2 | 16 | 2.56 | 13.44 | 12.96 | 1.235 | 10.21 | 1.316 | 0.762 |
| **Mean** | | | | | **12.96** | **1.235** | **14.14** | **1.033** | **0.762** |

**Source:** Field study (2022)

### 4.3.1. Productivity study of Tiling activity for permanent and contract staff

Table 4.9 to table 4.13 shows the daily record of the productivity of tilers with a gang size of two, and working under a normal working condition for both contract and permanent

staff on each project site. For the purpose of this research considering the time frame of the program only five building sites having both contract and permanent staff on site was used for the time study.

**Table 4.9 Tiling Activity Project 1**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 2.66 | 13.34 | 14.44 | 1.108 | 12.80 | 1.042 | 0.919 |
| 2 | 2 | 16 | 2.34 | 13.66 | 14.44 | 1.108 | 13.12 | 1.041 | 0.919 |
| 3 | 2 | 16 | 2.32 | 13.68 | 14.44 | 1.108 | 14.45 | 0.947 | 0.919 |
| 4 | 2 | 16 | 2.09 | 13.91 | 14.44 | 1.108 | 12.00 | 1.159 | 0.919 |
| 5 | 2 | 16 | 2.79 | 13.21 | 14.44 | 1.108 | 14.44 | 0.915 | 0.919 |
| 6 | 2 | 16 | 3.10 | 12.90 | 14.44 | 1.108 | 13.23 | 0.975 | 0.919 |
| 7 | 2 | 16 | 2.65 | 13.35 | 14.44 | 1.108 | 12.00 | 1.113 | 0.919 |
| 8 | 2 | 16 | 2.94 | 13.06 | 14.44 | 1.108 | 14.00 | 0.933 | 0.919 |
| 9 | 2 | 16 | 3.30 | 12.70 | 14.44 | 1.108 | 15.40 | 0.825 | 0.919 |
| 10 | 2 | 16 | 3.45 | 12.55 | 14.44 | 1.108 | 12.43 | 1.010 | 0.919 |
| 11 | 2 | 16 | 3.12 | 12.88 | 14.44 | 1.108 | 11.34 | 1.136 | 0.919 |
| 12 | 2 | 16 | 2.11 | 13.89 | 14.44 | 1.108 | 13.67 | 1.016 | 0.919 |
| **Mean** | | | | | **14.44** | **1.108** | **13.24** | **1.009** | **0.919** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 1.33 | 14.67 | 14.44 | 1.108 | 23.00 | 0.638 | 0.714 |
| 2 | 2 | 16 | 1.55 | 14.45 | 14.44 | 1.108 | 16.21 | 0.891 | 0.714 |
| 3 | 2 | 16 | 2.65 | 13.35 | 14.44 | 1.108 | 14.98 | 0.891 | 0.714 |
| 4 | 2 | 16 | 1.43 | 14.57 | 14.44 | 1.108 | 16.23 | 0.898 | 0.714 |
| 5 | 2 | 16 | 2.33 | 13.67 | 14.44 | 1.108 | 21.65 | 0.631 | 0.714 |
| 6 | 2 | 16 | 1.65 | 14.35 | 14.44 | 1.108 | 16.87 | 0.851 | 0.714 |
| 7 | 2 | 16 | 1.12 | 14.88 | 14.44 | 1.108 | 20.00 | 0.744 | 0.714 |
| 8 | 2 | 16 | 2.21 | 13.79 | 14.44 | 1.108 | 13.86 | 0.995 | 0.714 |
| 9 | 2 | 16 | 0.98 | 15.02 | 14.44 | 1.108 | 17.04 | 0.881 | 0.714 |
| 10 | 2 | 16 | 1.09 | 14.91 | 14.44 | 1.108 | 12.34 | 1.208 | 0.714 |
| 11 | 2 | 16 | 2.56 | 13.44 | 14.44 | 1.108 | 18.98 | 0.708 | 0.714 |
| 12 | 2 | 16 | 1.00 | 15.00 | 14.44 | 1.108 | 14.48 | 1.036 | 0.714 |
| **Mean** | | | | | **14.44** | **1.108** | **17.14** | **0.864** | **0.714** |

**Source:** Field study (2022)

**Table 4.10 Tiling Activity Project 2**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 3.61 | 12.39 | 14.44 | 1.108 | 11.21 | 1.105 | 0.910 |
| 2 | 2 | 16 | 2.64 | 13.36 | 14.44 | 1.108 | 12.65 | 1.056 | 0.910 |
| 3 | 2 | 16 | 2.44 | 13.56 | 14.44 | 1.108 | 12.00 | 1.130 | 0.910 |
| 4 | 2 | 16 | 2.12 | 13.88 | 14.44 | 1.108 | 14.48 | 0.959 | 0.910 |
| 5 | 2 | 16 | 3.01 | 12.99 | 14.44 | 1.108 | 14.89 | 0.872 | 0.910 |
| 6 | 2 | 16 | 3.46 | 12.54 | 14.44 | 1.108 | 12.40 | 1.011 | 0.910 |
| 7 | 2 | 16 | 2.78 | 13.22 | 14.44 | 1.108 | 10.00 | 1.322 | 0.910 |
| 8 | 2 | 16 | 2.99 | 13.01 | 14.44 | 1.108 | 14.00 | 0.929 | 0.910 |
| 9 | 2 | 16 | 3.46 | 12.54 | 14.44 | 1.108 | 16.12 | 0.778 | 0.910 |
| 10 | 2 | 16 | 3.23 | 12.77 | 14.44 | 1.108 | 12.32 | 1.037 | 0.910 |
| 11 | 2 | 16 | 3.43 | 12.57 | 14.44 | 1.108 | 10.45 | 1.203 | 0.910 |
| 12 | 2 | 16 | 2.47 | 13.53 | 14.44 | 1.108 | 12.66 | 1.069 | 0.910 |
| **Mean** | | | | | **14.44** | **1.108** | **12.77** | **1.039** | **0.910** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 0.95 | 15.05 | 14.44 | 1.108 | 15.60 | 0.965 | 0.734 |
| 2 | 2 | 16 | 1.20 | 14.80 | 14.44 | 1.108 | 14.00 | 1.057 | 0.734 |
| 3 | 2 | 16 | 1.33 | 14.67 | 14.44 | 1.108 | 12.34 | 1.189 | 0.734 |
| 4 | 2 | 16 | 1.10 | 14.90 | 14.44 | 1.108 | 18.54 | 0.804 | 0.734 |
| 5 | 2 | 16 | 1.89 | 14.11 | 14.44 | 1.108 | 24.56 | 0.575 | 0.734 |
| 6 | 2 | 16 | 1.98 | 14.02 | 14.44 | 1.108 | 15.34 | 0.914 | 0.734 |
| 7 | 2 | 16 | 0.98 | 15.02 | 14.44 | 1.108 | 21.01 | 0.715 | 0.734 |
| 8 | 2 | 16 | 1.77 | 14.23 | 14.44 | 1.108 | 14.00 | 1.016 | 0.734 |
| 9 | 2 | 16 | 1.02 | 14.98 | 14.44 | 1.108 | 16.98 | 0.882 | 0.734 |
| 10 | 2 | 16 | 0.98 | 15.02 | 14.44 | 1.108 | 14.20 | 1.058 | 0.734 |
| 11 | 2 | 16 | 2.13 | 13.87 | 14.44 | 1.108 | 20.00 | 0.694 | 0.734 |
| 12 | 2 | 16 | 1.09 | 14.91 | 14.44 | 1.108 | 15.00 | 0.994 | 0.734 |
| **Mean** | | | | | **14.44** | **1.108** | **16.80** | **0.905** | **0.734** |

**Source:** Field study (2022)

**Table 4.11 Tiling Activity Project 3**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 4.01 | 11.99 | 14.44 | 1.108 | 9.60 | 1.249 | 0.999 |
| 2 | 2 | 16 | 3.11 | 12.89 | 14.44 | 1.108 | 10.22 | 1.261 | 0.999 |
| 3 | 2 | 16 | 2.21 | 13.79 | 14.44 | 1.108 | 12.00 | 1.149 | 0.999 |
| 4 | 2 | 16 | 2.63 | 13.37 | 14.44 | 1.108 | 13.60 | 0.983 | 0.999 |
| 5 | 2 | 16 | 2.98 | 13.02 | 14.44 | 1.108 | 14.00 | 0.930 | 0.999 |
| 6 | 2 | 16 | 3.56 | 12.44 | 14.44 | 1.108 | 11.80 | 1.054 | 0.999 |
| 7 | 2 | 16 | 3.32 | 12.68 | 14.44 | 1.108 | 9.00 | 1.409 | 0.999 |
| 8 | 2 | 16 | 2.90 | 13.10 | 14.44 | 1.108 | 12.00 | 1.092 | 0.999 |
| 9 | 2 | 16 | 3.78 | 12.22 | 14.44 | 1.108 | 13.00 | 0.940 | 0.999 |
| 10 | 2 | 16 | 3.23 | 12.77 | 14.44 | 1.108 | 10.92 | 1.169 | 0.999 |
| 11 | 2 | 16 | 4.06 | 11.94 | 14.44 | 1.108 | 9.10 | 1.312 | 0.999 |
| 12 | 2 | 16 | 3.34 | 12.66 | 14.44 | 1.108 | 10.54 | 1.201 | 0.999 |
| **Mean** | | | | | **14.44** | **1.108** | **11.32** | **1.146** | **0.999** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 1.10 | 14.90 | 14.44 | 1.108 | 16.80 | 0.887 | 0.689 |
| 2 | 2 | 16 | 0.88 | 15.12 | 14.44 | 1.108 | 15.00 | 1.008 | 0.689 |
| 3 | 2 | 16 | 0.60 | 15.40 | 14.44 | 1.108 | 12.00 | 1.283 | 0.689 |
| 4 | 2 | 16 | 1.33 | 14.67 | 14.44 | 1.108 | 19.45 | 0.754 | 0.689 |
| 5 | 2 | 16 | 1.92 | 14.08 | 14.44 | 1.108 | 26.00 | 0.542 | 0.689 |
| 6 | 2 | 16 | 0.66 | 15.34 | 14.44 | 1.108 | 16.43 | 0.934 | 0.689 |
| 7 | 2 | 16 | 0.89 | 15.11 | 14.44 | 1.108 | 22.40 | 0.675 | 0.689 |
| 8 | 2 | 16 | 0.73 | 15.27 | 14.44 | 1.108 | 15.32 | 0.997 | 0.689 |
| 9 | 2 | 16 | 1.20 | 14.80 | 14.44 | 1.108 | 18.20 | 0.813 | 0.689 |
| 10 | 2 | 16 | 1.11 | 14.89 | 14.44 | 1.108 | 14.00 | 1.064 | 0.689 |
| 11 | 2 | 16 | 1.40 | 14.60 | 14.44 | 1.108 | 22.12 | 0.660 | 0.689 |
| 12 | 2 | 16 | 0.98 | 15.02 | 14.44 | 1.108 | 16.89 | 0.889 | 0.689 |
| **Mean** | | | | | **14.44** | **1.108** | **17.88** | **0.875** | **0.689** |

**Source:** Field study (2022)

**Table 4.12 Tiling Activity Project 4**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Permanent Staff** | | | | |
| 1 | 2 | 16 | 3.12 | 12.88 | 14.44 | 1.108 | 10.32 | 1.248 | 0.806 |
| 2 | 2 | 16 | 3.00 | 13.00 | 14.44 | 1.108 | 12.00 | 1.083 | 0.806 |
| 3 | 2 | 16 | 1.90 | 14.10 | 14.44 | 1.108 | 14.21 | 0.992 | 0.806 |
| 4 | 2 | 16 | 2.80 | 13.20 | 14.44 | 1.108 | 13.90 | 0.950 | 0.806 |
| 5 | 2 | 16 | 2.68 | 13.32 | 14.44 | 1.108 | 12.56 | 1.061 | 0.806 |
| 6 | 2 | 16 | 2.66 | 13.34 | 14.44 | 1.108 | 18.90 | 0.706 | 0.806 |
| 7 | 2 | 16 | 2.90 | 13.10 | 14.44 | 1.108 | 16.00 | 0.819 | 0.806 |
| 8 | 2 | 16 | 3.10 | 12.90 | 14.44 | 1.108 | 13.22 | 0.976 | 0.806 |
| 9 | 2 | 16 | 3.58 | 12.42 | 14.44 | 1.108 | 12.80 | 0.970 | 0.806 |
| 10 | 2 | 16 | 3.10 | 12.90 | 14.44 | 1.108 | 15.87 | 0.813 | 0.806 |
| 11 | 2 | 16 | 3.88 | 12.12 | 14.44 | 1.108 | 16.32 | 0.743 | 0.806 |
| 12 | 2 | 16 | 3.62 | 12.38 | 14.44 | 1.108 | 8.62 | 1.436 | 0.806 |
| **Mean** | | | | | **14.44** | **1.108** | **13.73** | **0.983** | **0.806** |
| | | | | | **Contract Staff** | | | | |
| 1 | 2 | 16 | 1.30 | 14.70 | 14.44 | 1.108 | 17.00 | 0.865 | 0.698 |
| 2 | 2 | 16 | 1.24 | 14.76 | 14.44 | 1.108 | 14.20 | 1.039 | 0.698 |
| 3 | 2 | 16 | 1.02 | 14.98 | 14.44 | 1.108 | 10.21 | 1.467 | 0.698 |
| 4 | 2 | 16 | 1.44 | 14.56 | 14.44 | 1.108 | 18.00 | 0.809 | 0.698 |
| 5 | 2 | 16 | 2.04 | 13.96 | 14.44 | 1.108 | 24.20 | 0.577 | 0.698 |
| 6 | 2 | 16 | 0.98 | 15.02 | 14.44 | 1.108 | 14.00 | 1.073 | 0.698 |
| 7 | 2 | 16 | 1.19 | 14.81 | 14.44 | 1.108 | 20.31 | 0.729 | 0.698 |
| 8 | 2 | 16 | 1.21 | 14.79 | 14.44 | 1.108 | 14.90 | 0.993 | 0.698 |
| 9 | 2 | 16 | 1.42 | 14.58 | 14.44 | 1.108 | 20.30 | 0.718 | 0.698 |
| 10 | 2 | 16 | 0.99 | 15.01 | 14.44 | 1.108 | 15.03 | 0.999 | 0.698 |
| 11 | 2 | 16 | 1.56 | 14.44 | 14.44 | 1.108 | 21.98 | 0.657 | 0.698 |
| 12 | 2 | 16 | 1.05 | 14.95 | 14.44 | 1.108 | 18.00 | 0.831 | 0.698 |
| **Mean** | | | | | **14.44** | **1.108** | **17.34** | **0.896** | **0.698** |

**Source:** Field study (2022)

**Table 4.13 Tiling Activity Project 5**

| Day | Gang size | Total W/h (hrs) | Idle time (hrs) | Prod. time (hrs) | Expected output ($m^2$) | Expected daily prod. ($hr/m^2$) | Actual daily output ($m^2$) | Actual daily prod.($hr/m^2$) | Base line prod. ($hr/m^2$) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Permanent Staff** | | | | | |
| 1 | 2 | 16 | 2.45 | 13.55 | 14.44 | 1.108 | 11.00 | 1.232 | 0.897 |
| 2 | 2 | 16 | 2.68 | 13.32 | 14.44 | 1.108 | 14.20 | 0.938 | 0.897 |
| 3 | 2 | 16 | 2.90 | 13.10 | 14.44 | 1.108 | 13.12 | 0.998 | 0.897 |
| 4 | 2 | 16 | 3.00 | 13.00 | 14.44 | 1.108 | 12.04 | 1.080 | 0.897 |
| 5 | 2 | 16 | 3.10 | 12.90 | 14.44 | 1.108 | 13.00 | 0.992 | 0.897 |
| 6 | 2 | 16 | 2.54 | 13.46 | 14.44 | 1.108 | 13.12 | 1.026 | 0.897 |
| 7 | 2 | 16 | 3.30 | 12.70 | 14.44 | 1.108 | 15.64 | 0.812 | 0.897 |
| 8 | 2 | 16 | 2.87 | 13.13 | 14.44 | 1.108 | 14.32 | 0.917 | 0.897 |
| 9 | 2 | 16 | 2.95 | 13.05 | 14.44 | 1.108 | 10.23 | 1.276 | 0.897 |
| 10 | 2 | 16 | 2.67 | 13.33 | 14.44 | 1.108 | 14.14 | 0.943 | 0.897 |
| 11 | 2 | 16 | 2.89 | 13.11 | 14.44 | 1.108 | 15.00 | 0.874 | 0.897 |
| 12 | 2 | 16 | 3.61 | 12.39 | 14.44 | 1.108 | 9.00 | 1.377 | 0.897 |
| **Mean** | | | | | **14.44** | **1.108** | **12.90** | **1.039** | **0.897** |
| | | | | **Contract Staff** | | | | | |
| 1 | 2 | 16 | 0.90 | 15.10 | 14.44 | 1.108 | 18.00 | 0.839 | 0.696 |
| 2 | 2 | 16 | 0.89 | 15.11 | 14.44 | 1.108 | 15.44 | 0.979 | 0.696 |
| 3 | 2 | 16 | 1.04 | 14.96 | 14.44 | 1.108 | 14.44 | 1.036 | 0.696 |
| 4 | 2 | 16 | 1.62 | 14.38 | 14.44 | 1.108 | 19.00 | 0.757 | 0.696 |
| 5 | 2 | 16 | 0.98 | 15.02 | 14.44 | 1.108 | 23.21 | 0.647 | 0.696 |
| 6 | 2 | 16 | 2.30 | 13.70 | 14.44 | 1.108 | 16.00 | 0.856 | 0.696 |
| 7 | 2 | 16 | 1.10 | 14.90 | 14.44 | 1.108 | 21.00 | 0.710 | 0.696 |
| 8 | 2 | 16 | 2.00 | 14.00 | 14.44 | 1.108 | 15.00 | 0.933 | 0.696 |
| 9 | 2 | 16 | 1.20 | 14.80 | 14.44 | 1.108 | 19.80 | 0.747 | 0.696 |
| 10 | 2 | 16 | 1.56 | 14.44 | 14.44 | 1.108 | 16.20 | 0.891 | 0.696 |
| 11 | 2 | 16 | 2.98 | 13.02 | 14.44 | 1.108 | 21.00 | 0.620 | 0.696 |
| 12 | 2 | 16 | 0.94 | 15.06 | 14.44 | 1.108 | 19.04 | 0.791 | 0.696 |
| **Mean** | | | | | **14.44** | **1.108** | **18.18** | **0.817** | **0.696** |

**Source:** Field study (2022)

**Table 4.14 Summary result for labour productivity of POP Activity and Tiling Activity**

**POP Activity**

| | Permanent staff | | Contract staff | |
|---|---|---|---|---|
| **Project no.** | **Expected productivity (hrs/m$^2$)** | **Actual productivity (hrs/m$^2$)** | **Expected productivity (hrs/m$^2$)** | **Actual productivity (hrs/m$^2$)** |
| 1. | 1.235 | 1.106 | 1.235 | 0.961 |
| 2. | 1.235 | 1.096 | 1.235 | 0.920 |
| 3. | 1.235 | 1.031 | 1.235 | 0.893 |
| 4. | 1.235 | 1.082 | 1.235 | 0.919 |
| 5. | 1.235 | 1.224 | 1.235 | 1.033 |
| **Mean value** | | **1.108** | | **0.945** |

**Tiling activity**

| | Permanent staff | | Contract staff | |
|---|---|---|---|---|
| **Project no.** | **Expected productivity (hrs/m$^2$)** | **Actual productivity (hrs/m$^2$)** | **Expected productivity (hrs/m$^2$)** | **Actual productivity (hrs/m$^2$)** |
| 1. | 1.108 | 1.009 | 1.108 | 0.864 |
| 2. | 1.108 | 1.039 | 1.108 | 0.905 |
| 3. | 1.108 | 1.146 | 1.108 | 0.875 |
| 4. | 1.108 | 0.983 | 1.108 | 0.896 |
| 5. | 1.108 | 1.039 | 1.108 | 0.817 |
| **Mean value** | | **1.043** | | **0.871** |

**Source:** Field study (2022)

Table 4.14 shows the summary of the Labour productivity study carried out using the Time study for POP activity and Tiling activity which were either contract or permanent staff. This study was carried out on 5 building sites having both contract and permanent staff on site working on either Tiling or POP work. Table 4.14 shows the expected mean productivity from each project and the actual mean productivity. It can be observed from table 4.14 that there is no consistency in the daily productivity of either contract or permanent staff of both the Tilers and POP works and this can be caused by so many

human factors and atmospheric factors such as; less idle time, the particular work load being assigned for the craft man to do for which he has the liberty to live after the work has been completed and duly inspected without having to wait for the official closing time, the psychological state of the craft man, the zeal to work on such day, weather conditions and many other factors which are being considered further at the course of this research.

The mean productivity of the permanent staff POP workers is 1.108hrs/$m^2$ why that of the contract staff POP workers is 0.945hrs/$m^2$, this shows that the permanent staff of POP workers takes 1.108hrs to complete one square meter of POP work why the contract staff takes 0.945hrs to complete the same areas of work, implying that the average productivity of the contract staff is better than that of the permanent staff since it takes the contract staff less time to complete the same square meter of the work.

From table 4.14, The mean productivity of the permanent staff Tiler is 1.043hrs/$m^2$ why that of the contract staff Tiler is 0.871hrs/$m^2$, this shows that the permanent staff Tiler takes 1.043hrs to complete one square meter of Tiling work why the contract staff takes 0.871hrs to complete the same areas of work, implying that the average productivity of the contract staff is better than that of the permanent staff since it takes the contract staff less time to complete the same square meter of the work. It can also be seen from table 4.14 that the mean productivity of both the Tiling and POP activity is less than the expected productivity implying that the both productivity is ok in comparison to what is expected of such gang within Abuja.

## 4.4. Factors Affecting the Labour Productivity of Contract and Permanent (C&P) Staff on Site

This study's portion aims to pinpoint and analyse the variables influencing the efficiency of both C&P staff members on the job site. The selected variables are being submitted to several analyses, including factor analysis, mean ranking, and reliability testing. The KMO and Bartlett's Test, communalities, rotated component matrix, and total variance explained are taken into account while doing the factor analysis.

### 4.4.1 Reliability test for factors affecting labour productivity of C&P staff on site

**Table 4.15 Reliability statistics for factors affecting labour productivity of C&P staff on site**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .918 | .920 | 25 |

**Source:** Researcher's Analysis 2022

Cronbach's alpha reliability coefficient typically falls between 0 and 1, claim George and Mallery (2003). The coefficient, however, truly has no lower bound. The internal consistency of the scale's items is inversely correlated with how near Cronbach's alpha coefficient is to 1.0. Additionally, they suggest that ≥9 = Excellent, ≥8 = Good, ≥7 = Acceptable, ≥6 = Questionable, ≥5 = Poor, and ≤5 = Unacceptable" be used as guidelines.

From Table 4.15 there is a Cronbach's value of 0.918, and a Cronbach's Alpha Based on standardized Item of 0.920, therefore comparing with the guidelines provided by George and Mallery (2003), the reliability statistics is said to be excellent since the value is greater than 0.9.

### 4.4.2 Mean Ranking of Factors Affecting Labour Productivity C&P staff on Site

**Table 4.16 Mean ranking for factors affecting labour productivity C&P staff on site**

| S/N | Factors Affecting Labour Productivity on Site | Mean | Std. Deviation | Test Value = 3.5 | | | R |
|---|---|---|---|---|---|---|---|
| | | | | t | df | Sig. (2-tailed) | |
| C19 | Wages | 3.923 | 1.090 | 6.532 | 283 | .000* | 1 |
| C18 | Absenteeism | 3.775 | 1.331 | 3.477 | 283 | .001 | 2 |
| C20 | Incentives | 3.775 | 1.105 | 4.188 | 283 | .000* | 3 |
| C4 | Reassignment of manpower | 3.732 | 1.096 | 3.575 | 283 | .000* | 4 |
| C14 | Work force size | 3.718 | 1.118 | 3.292 | 283 | .001 | 5 |
| C15 | Design requirements | 3.711 | 1.168 | 3.047 | 283 | .003 | 6 |
| C1 | Overcrowding | 3.704 | 1.263 | 2.726 | 283 | .007 | 7 |
| C5 | Site conditions and organization | 3.683 | 1.118 | 2.761 | 283 | .006 | 8 |
| C9 | Poor supervision Communication | 3.662 | 1.365 | 1.999 | 283 | .047 | 9 |
| C3 | Engineering errors and omissions | 3.577 | 1.515 | .862 | 283 | .389 | 10 |
| C6 | Methods and equipment | 3.577 | 1.079 | 1.210 | 283 | .227 | 11 |
| C2 | Change orders | 3.528 | 1.132 | .419 | 283 | .675 | 12 |
| C10 | Management control | 3.444 | 1.233 | -.770 | 283 | .442 | 13 |
| C11 | Coordination | 3.444 | 1.180 | -.805 | 283 | .422 | 14 |
| C12 | Planning and scheduling | 3.444 | 1.168 | -.813 | 283 | .417 | 15 |
| C7 | Materials and tools availability | 3.408 | 1.335 | -1.155 | 283 | .249 | 16 |
| C16 | Quality of craftsmanship | 3.366 | 1.143 | -1.972 | 283 | .050 | 17 |
| C23 | Availability of skilled labour | 3.366 | 1.255 | -1.796 | 283 | .074 | 18 |
| C17 | Quality assurance and control | 3.331 | 1.181 | -2.411 | 283 | .017 | 19 |
| C21 | Fatigue | 3.331 | 1.181 | -2.411 | 283 | .017 | 20 |
| C22 | Morale and attitude | 3.246 | 1.184 | -3.608 | 283 | .000* | 21 |
| C24 | Adverse weather | 3.127 | 1.146 | -5.490 | 283 | .000* | 22 |
| C8 | Unbalanced crew or crew size | 3.113 | 1.172 | -5.572 | 283 | .000* | 23 |
| C13 | Project size | 3.099 | 1.185 | -5.710 | 283 | .000* | 24 |
| C25 | Population differences | 3.021 | 1.033 | -7.814 | 283 | .000* | 25 |

**Source:** Researcher's Analysis 2022

In The Federal Capital Territory of Abuja, the researcher requested the respondents to rank numerous variables impacting labour productivity on site based on their knowledge of these factors and their degree of comprehension of how severely they affect the

productivity of both professionals and artisans there. using the scale: 1= minor, 2 = moderate, 3= neutral, 4= severe, 5= very severe. Table 4.16's outcome shows that wages with (MS=3.923) was ranked 1st followed by absenteeism with (MS=3.775) to be ranked 2nd. The least of the factors affecting the productivity of professionals and craftsmen on site in Abuja from the survey shows project size with (MS=3.099) to be ranked 24th among the 25 factors used in the survey why population differences with (MS = 3.021) was ranked 25th. Having the test value to be 3.5, we can observe from Table 4.16 that there are 12 prevailing factors in every of the sites visited in Abuja at the course of the study which include the following: Wages, Absenteeism, Incentives, Reassignment of manpower, Work force size, Design requirements, Overcrowding, Site conditions and organization, Poor supervision Communication, Engineering errors and omissions, Methods and equipment and Change orders all stated in order of the priority using the mean value from Table 4.16, ranging from wages as 1st to change order as 12th.

### 4.4.3. Factor Analysis on Factors Affecting Labour Productivity C&P staff on Site

Factor analysis (FA) was used to analyse the factors impacting labour productivity on a construction site in Abuja after the descriptive analysis and the results that follow. Finding out whether the relevant variables are suitable for factor analysis and are factorable is the first stage in the process. The sample size of 284 and variable count of 25 are sufficient for factor analysis and are thus regarded as good. According to the information from the reports given by the following researchers (Pallant, 2016; Tabachnick & Fidell, 2007; Mundfrom *et al*., 2005; Hair *et al*., 1998). Another method of assessing the factorability of data for factors analysis is to look at the results of the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy. A Bartlett's test of sphericity with a p-value (or sig.) of less than 0.05 is the ideal, while a KMO value

between 0.5 and 0.7 is deemed appropriate. A KMO value lower than 0.5 is considered inadequate for factor analysis. The variables concerned exhibit predictable correlations when certain requirements are satisfied.

**Table 4.17 KMO and Bartlett's test for factors affecting labour productivity C&P staff on site**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .855 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 5515.126 |
| | df | 300 |
| | Sig. | 0.000 |

**Source:** Researcher's Analysis 2022

From Table 4.17 the KMO value is .855 this shows that the data is adequate. It also has a significant value of 0.000 which shows that it is ideal, considering the two conditions being meet it is obvious that the variables involved in determining the factors affecting labour productivity of workers on site in construction industry in Abuja have a patterned relationship.

**Table 4.18 Communalities for factors affecting labour productivity C&P staff on site**

| | Initial | Extraction |
|---|---|---|
| C1 | 1.000 | .676 |
| C2 | 1.000 | .716 |
| C3 | 1.000 | .768 |
| C4 | 1.000 | .759 |
| C5 | 1.000 | .609 |
| C6 | 1.000 | .628 |
| C7 | 1.000 | .803 |
| C8 | 1.000 | .709 |
| C9 | 1.000 | .693 |
| C10 | 1.000 | .606 |
| C11 | 1.000 | .734 |
| C12 | 1.000 | .730 |
| C13 | 1.000 | .668 |
| C14 | 1.000 | .743 |
| C15 | 1.000 | .713 |
| C16 | 1.000 | .793 |
| C17 | 1.000 | .828 |
| C18 | 1.000 | .526 |
| C19 | 1.000 | .767 |
| C20 | 1.000 | .810 |
| C21 | 1.000 | .774 |
| C22 | 1.000 | .731 |
| C23 | 1.000 | .717 |
| C24 | 1.000 | .626 |
| C25 | 1.000 | .728 |

Extraction Method: Principal Component Analysis.

**Source:** Researcher's Analysis 2022

Following KMO and Bartlett's criteria, communal values should also be taken into account. According to Preacher and MacCallum (2002), model error is minimal and the number of predicted components is quite modest when the communalities are high. It was said that regardless of the sample size utilized, a communality value of 0.6 and above indicates that variables are eligible for factor analysis. The average communality of the

variables related to site-specific factors influencing labour productivity is 0.7 as shown in Table 4.18. The variables can therefore be used in a factor analysis.

**Table 4.19: Rotated component matrix[a] for factors affecting labour productivity of C&P staff on site**

| Component | Component | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| C14 | .842 | | | | |
| C11 | .789 | | | | |
| C12 | .776 | | | | |
| C10 | .722 | | | | |
| C15 | .701 | | | | |
| C6 | .669 | | | | |
| C4 | .623 | | .599 | | |
| C20 | .589 | | | .575 | |
| C5 | .558 | | | | |
| C17 | | .879 | | | |
| C7 | | .859 | | | |
| C16 | | .807 | | | |
| C13 | | .676 | | | |
| C23 | | .658 | | | |
| C8 | | .652 | | | |
| C2 | | | .801 | | |
| C1 | | | .779 | | |
| C3 | | | .743 | | |
| C9 | | | .657 | | |
| C18 | | | .538 | | |
| C21 | | | | .816 | |
| C24 | | | | .672 | |
| C22 | | | | .654 | |
| C25 | | | | | .651 |
| C19 | | | | | .647 |

**Source:** Researcher's Analysis 2022

The loadings of the twenty-five retrieved components are displayed in Table 4.19. The factors are more severe the bigger the absolute value of the burden. In component 1, as well as simultaneously in components 2, 3, 4, and 5, the researcher collected 284 replies. Since there are no gaps (empty spaces) in the table, no loadings were suppressed since there are no loadings that are smaller than 0.5. This suggests that the rotated component matrix provides the basis for taking into account all elements.

**Table 4.20 Total Variance Explained for Factors Affecting Labour Productivity C&P staff on Site**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 8.812 | 35.248 | 35.248 | 8.812 | 35.248 | 35.248 | 5.343 | 21.373 | 21.373 |
| 2 | 4.475 | 17.901 | 53.149 | 4.475 | 17.901 | 53.149 | 4.552 | 18.209 | 39.582 |
| 3 | 2.296 | 9.184 | 62.333 | 2.296 | 9.184 | 62.333 | 3.544 | 14.175 | 53.757 |
| 4 | 1.247 | 4.987 | 67.320 | 1.247 | 4.987 | 67.320 | 2.768 | 11.072 | 64.828 |
| 5 | 1.026 | 4.103 | 71.423 | 1.026 | 4.103 | 71.423 | 1.649 | 6.595 | 71.423 |
| 6 | .932 | 3.728 | 75.152 | | | | | | |
| 7 | .815 | 3.260 | 78.411 | | | | | | |
| 8 | .675 | 2.700 | 81.112 | | | | | | |
| 9 | .554 | 2.215 | 83.327 | | | | | | |
| 10 | .533 | 2.133 | 85.460 | | | | | | |
| 11 | .444 | 1.775 | 87.235 | | | | | | |
| 12 | .404 | 1.618 | 88.852 | | | | | | |
| 13 | .386 | 1.544 | 90.397 | | | | | | |
| 14 | .342 | 1.366 | 91.763 | | | | | | |
| 15 | .315 | 1.258 | 93.022 | | | | | | |
| 16 | .271 | 1.083 | 94.104 | | | | | | |
| 17 | .252 | 1.006 | 95.111 | | | | | | |
| 18 | .218 | .873 | 95.984 | | | | | | |
| 19 | .200 | .802 | 96.786 | | | | | | |
| 20 | .186 | .746 | 97.532 | | | | | | |
| 21 | .161 | .642 | 98.174 | | | | | | |
| 22 | .145 | .578 | 98.752 | | | | | | |
| 23 | .121 | .484 | 99.236 | | | | | | |
| 24 | .114 | .455 | 99.691 | | | | | | |
| 25 | .077 | .309 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

**Source:** Researcher's Analysis 2022

The number of components that were recovered and whose sum should match the total number of items exposed to factor analysis is what is really represented by eigenvalue. The list of factors that may be extracted from the analysis is shown next, along with each factor's eigenvalues. Initial Eigen Values, Extracted Sums of Squared Loadings, and Rotation of Sums of Squared Loadings are the three sub-sections of the Eigenvalue table.

We are solely interested in Initial Eigenvalues and Extracted Sums of Squared Loadings for analysis and interpretation reasons. As the presence of eigenvalues with a value

greater than one is a condition for determining the number of components or factors specified by chosen variables. Table 4.20 herein shows that for 1st component the value is 8.812 > 1, 2nd component is 4.475 > 1, 3rd component is 2.296 > 1, $4^{th}$ component is 1.427 > 1, $5^{th}$ component 1.026 > 1 and $6^{th}$ component is 0.932 < 1. Thus, the stated 25 variables represent five components. Further, the extracted sum of squared holding % of variance depicts that the first factor accounts for 35.248% of the variance features from the stated observations, the second 17.901%, the third 9.184%, the fourth 4.987%, and the fifth 4.103% as seen in Table 4.20, Thus, 5 components are effective enough in representing all the characteristics or components highlighted by the stated 25 variables.

## 4.5 Strategies for Effective Staffing Methods for Improved Productivity

This section aims to identify and analyse the strategies that the industry can use for an effective staffing method that will result in improved productivity after identifying the staffing methods that are currently available in the building construction industry, conducting a productivity study of the two most popular staffing methods, and identifying/analysing the factors affecting the productivity of those two most common staffing methods is expedient. The strategies identified are being subjected to several analysis such as the reliability test, the mean ranking and factor analysis. The factor analysis is carried out by using the KMO and Bartlett's Test, communalities, rotated component matrix and total variance explained. The identified strategies were gotten from preliminary studies of professionals and craftsmen on site and other professionals within the building construction industry such as the academia.

### 4.5.1. Reliability test of strategies for effective staffing methods for improved productivity.

**Table 4.21: Reliability statistics of strategies for effective staffing methods for improved productivity**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| 0.864 | 0.864 | 15 |

**Source:** Researcher's Analysis 2022

Cronbach's alpha reliability coefficient typically falls between 0 and 1, claim George and Mallery (2003). The coefficient, however, truly has no lower bound. The internal consistency of the scale's items is inversely correlated with how near Cronbach's alpha coefficient is to 1.0. Additionally, they suggest that ≥9 = Excellent, ≥8 = Good, ≥7 = Acceptable, ≥6 = Questionable, ≥5 = Poor, and ≤5 = Unacceptable" be used as guidelines.

From Table 4.21 there is a Cronbach's value of 0.864, and a Cronbach's Alpha Based on standardized Item of 0.864, therefore comparing with the rules of thumb giving by George and Mallery (2003), the reliability statistics is said to be good since the value is greater than 0.9.

### 4.5.2. Mean Ranking of Strategies for Effective Staffing Methods

The respondents were provided 15 strategies for effective staffing methods gotten from preliminary studies and interactions with professional in the field. They had to grade them based on their knowledge, expertise, and the degree to which their company had adopted those techniques. Using the scale: 1= very low, 2 = low, 3= moderate, 4= high, 5= very high. The result on table 4.22 revealed that 'good knowledge of available staffing methods' with (MS=4.176) was ranked 1$^{st}$ followed by 'enforcement of government policies' with (MS=4.099) to be ranked 2$^{nd}$. The least of the strategies being adopted by construction firms in Abuja shows 'enhance workers welfare' with (MS=3.099) to be ranked 14$^{th}$ why, 'ensuring workers are pensionable' with (MS = 3.246) was ranked 25$^{th}$.

Having the test value to be 3.5, we can observe from table 4.22 that 13 strategies seem to have been adopted by the organizations involved in this study why two has not being widely adopted by the various organizations involved in this survey.

**Table 4.22 Mean ranking of strategies for effective staffing methods**

| S/N | STRATEGIES | Mean | SD | Test Value = 3.5 | | | R |
|---|---|---|---|---|---|---|---|
| | | | | t | df | Sig. (2-tailed) | |
| D2 | Good knowledge of available staffing methods | 4.176 | 0.800 | 14.238 | 283 | .000 | 1 |
| D1 | Enforcement of government policies | 4.099 | 0.884 | 11.409 | 283 | .000 | 2 |
| D4 | Good knowledge of laws binding staff employments and retention | 4.077 | 0.890 | 10.931 | 283 | .000 | 3 |
| D11 | Good management system | 4.028 | 0.823 | 10.813 | 283 | .000 | 4 |
| D5 | Encourage staff training | 3.979 | 0.766 | 10.541 | 283 | .000 | 5 |
| D13 | Government policies | 3.930 | 1.041 | 6.955 | 283 | .000 | 6 |
| D12 | Good working environment | 3.768 | 1.113 | 4.051 | 283 | .000 | 7 |
| D14 | Encourage good working relationship | 3.768 | 0.926 | 4.870 | 283 | .000 | 8 |
| D3 | Encouraging staff retention | 3.754 | 0.851 | 5.023 | 283 | .000 | 9 |
| D8 | Detail knowledge of size of project | 3.754 | 0.907 | 4.711 | 283 | .000 | 10 |
| D15 | Encourage training and re training of staffs | 3.704 | 1.062 | 3.241 | 283 | .001 | 11 |
| D10 | Project requirements | 3.606 | 1.076 | 1.654 | 283 | .099 | 12 |
| D9 | Detail knowledge of duration of projects | 3.563 | 1.046 | 1.021 | 283 | .308 | 13 |
| D7 | Enhance workers welfare | 3.486 | 1.163 | -.204 | 283 | .838 | 14 |
| D6 | Ensuring workers are pensionable | 3.246 | 1.447 | -2.952 | 283 | .003 | 15 |

**Source:** Researcher's Analysis 2022

### 4.5.3. Factor Analysis of Strategies for Effective Staffing Methods for Improved Productivity.

Factor analysis (FA) was used to analyse the factors impacting labour productivity on a construction site in Abuja after the descriptive analysis and the results that follow. Finding out whether the relevant variables are suitable for factor analysis and are factorable is the first stage in the process. The sample size of 284 and variable count of 25 are sufficient

for factor analysis and are thus regarded as good. According to the information from the reports given by the following researchers (Pallant, 2016; Tabachnick & Fidell, 2007; Mundfrom *et al*., 2005; Hair *et al*., 1998). Another method of assessing the factorability of data for factors analysis is to look at the results of the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy. A Bartlett's test of sphericity with a p-value (or sig.) of less than 0.05 is the ideal, while a KMO value between 0.5 and 0.7 is deemed appropriate. A KMO value lower than 0.5 is considered inadequate for factor analysis. The variables concerned exhibit predictable correlations when certain requirements are satisfied.

**Table 4.23: KMO and Bartlett's Test of strategies for effective staffing methods for improved productivity**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .806 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2417.898 |
| | df | 105 |
| | Sig. | 0.000 |

**Source:** Researcher's Analysis 2022

From Table 4.23 the KMO value is .806 this shows that the data is adequate. It also has a significant value of 0.000 which shows that it is ideal, considering the two conditions being meet it is obvious that the variables involved in determining the level of adoption of the stated strategies for effective staffing methods for improved productivity of workers on site in construction industry in Abuja have a patterned relationship.

**Table 4.24: Communalities of strategies for effective staffing methods for improved productivity**

| Component | Initial | Extraction |
|---|---|---|
| D1 | 1.000 | .767 |
| D2 | 1.000 | .842 |
| D3 | 1.000 | .763 |
| D4 | 1.000 | .774 |
| D5 | 1.000 | .673 |
| D6 | 1.000 | .766 |
| D7 | 1.000 | .729 |
| D8 | 1.000 | .626 |
| D9 | 1.000 | .686 |
| D10 | 1.000 | .647 |
| D11 | 1.000 | .644 |
| D12 | 1.000 | .706 |
| D13 | 1.000 | .766 |
| D14 | 1.000 | .656 |
| D15 | 1.000 | .578 |

Extraction Method: Principal Component Analysis.

**Source:** Researcher's Analysis 2022

Following KMO and Bartlett's criteria, communal values should also be taken into account. According to Preacher and MacCallum (2002), model error is minimal and the number of predicted components is quite modest when the communalities are high. It was said that regardless of the sample size utilized, a communality value of 0.6 and above indicates that variables are eligible for factor analysis. The average communality of the variables related to site-specific factors influencing labour productivity is 0.708 (Table 4.24). The variables can therefore be used in a factor analysis.

**Table 4.25: Rotated Component Matrix[a] of strategies for effective staffing methods for improved productivity**

| Component | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| D6 | .863 | | | |
| D7 | .837 | | | |
| D10 | .786 | | | |
| D12 | .786 | | | |
| D9 | .767 | | | |
| D8 | .729 | | | |
| D3 | .633 | .597 | | |
| D14 | .622 | | .519 | |
| D2 | | .807 | | |
| D4 | | .804 | | |
| D5 | | .625 | | |
| D11 | | | .723 | |
| D15 | | | .683 | |
| D1 | | | | .803 |
| D13 | | | | .723 |

**Source:** Researcher's Analysis 2022

The loadings of the fifteen extracted strategies are displayed in Table 4.25. The amount of adoption of the techniques increases with the absolute loading value. In component 1, as well as simultaneously in components 2, 3, and 4, the researcher collected 284 replies. Since there are no gaps (empty spaces) in the table, no loadings were suppressed since there are no loadings that are smaller than 0.5. This suggests that the rotated component matrix provides the basis for taking into account all elements.

**Table 4.26: Total Variance Explained for strategies for effective staffing methods**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 5.697 | 37.981 | 37.981 | 5.697 | 37.981 | 37.981 | 4.936 | 32.909 | 32.909 |
| 2 | 2.682 | 17.880 | 55.860 | 2.682 | 17.880 | 55.860 | 2.270 | 15.135 | 48.044 |
| 3 | 1.215 | 8.100 | 63.961 | 1.215 | 8.100 | 63.961 | 1.890 | 12.603 | 60.647 |
| 4 | 1.029 | 6.860 | 70.821 | 1.029 | 6.860 | 70.821 | 1.526 | 10.174 | 70.821 |
| 5 | 0.740 | 4.935 | 75.755 | | | | | | |
| 6 | 0.650 | 4.332 | 80.087 | | | | | | |
| 7 | 0.567 | 3.778 | 83.865 | | | | | | |
| 8 | 0.535 | 3.566 | 87.432 | | | | | | |
| 9 | 0.422 | 2.814 | 90.246 | | | | | | |
| 10 | 0.364 | 2.424 | 92.671 | | | | | | |
| 11 | 0.321 | 2.139 | 94.810 | | | | | | |
| 12 | 0.272 | 1.815 | 96.624 | | | | | | |
| 13 | 0.229 | 1.523 | 98.148 | | | | | | |
| 14 | 0.154 | 1.029 | 99.176 | | | | | | |
| 15 | 0.124 | .824 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

**Source:** Researcher's Analysis 2022

The number of components that were recovered and whose sum should match the total number of items exposed to factor analysis is what is really represented by eigenvalue. The list of factors that may be extracted from the analysis is shown next, along with each factor's eigenvalues. Initial Eigen Values, Extracted Sums of Squared Loadings, and Rotation of Sums of Squared Loadings are the three sub-sections of the Eigenvalue table.

Initial Eigenvalues and Extracted Sums of Squared Loadings for analysis and interpretation reasons are the major required results. As the presence of eigenvalues with a value greater than one is a condition for determining the number of components or factors specified by chosen variables. According to table 4.26 in this document, the values for the first component are 5.697 > 1, the second component is 2.682 > 1, the third component is 1.215 > 1, the fourth component is 1.029 > 1, and the fifth component is

0.740 1. The 15 variables listed above so correspond to four components. Additionally, the extracted sum of squared holding% of variance shows that the first component accounts for 37.981%, the second 17.880%, the third 8.100%, and the fourth 6.860% of the variance characteristics from the given observations. This is shown in table 4.26. Therefore, 5 components are sufficient to accurately reflect all of the traits or components that the aforementioned 15 variables have drawn attention to.

## 4.6 Summary of Findings

The goal of this study was to assess how staffing practices affected Abuja's construction industry's labour productivity. The results of this study are summarized in the following sentences for each objective.

**Objective one:** Identify the staffing method(s) used by selected organizations.

Two very common staffing methods were identified in the construction industry in Abuja which are; permanent staff and contract staff with the mean value of 4.176 and 4.162 respectively. Followed closely to these is the internship staff with the mean value of 3.458. The very rear staffing methods identified were At-will-staff and non-compete/confidentiality staff with the mean value of 1.507 and 1.430 respectively.

**Objective two:** Measure the craftsmen productivity of POP workers and Tilers of the two most common staffing methods.

The mean productivity value for permanent staff POP activity is 1.108hrs/$m^2$ why that of the contract staff for POP activity is 0.945hrs/$m^2$. The mean productivity value for permanent staff of Tiling activity is 1.043hrs/$m^2$ why that of the contract staff Tiling activity is 0.871hrs/$m^2$.

**Objective three:** Identify the factors affecting the labour productivity of the two staffing methods considered.

With a mean test value of 3.5 and above, twelve out of twenty-five elements were shown to have a significant impact on the labour productivity of both contract and permanent employees on site. Wages, absenteeism, incentives, reassignment of personnel, work force size, design requirements, congestion, site conditions and organization, and inadequate supervision are some of these variables. mistakes and omissions in engineering, poor communication Using the mean value from table 4.37, the methods, equipment, and change orders are all listed in order of priority, from wages at the top to change orders at the bottom.

**Objective four:** Develop a strategy for effective staffing methods for improved productivity.

Using the test value of 3.5, thirteen strategies for effective staffing methods out of the fifteen identified strategies have been adopted effectively by the construction industry in Abuja. Those strategies include: good knowledge of available staffing methods, Enforcement of government policies, good knowledge of laws binding staff employments and retention, good management system, encourage staff training, Government policies, good working environment, encourage good working relationship, encouraging staff retention, detail knowledge of size of project, encourage training and re-training of staffs, project requirements, detail knowledge of duration of projects. The other two not well adopted are: enhance workers welfare, ensuring workers are pensionable.

# CHAPTER FIVE

## 5.0 CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

The study's objective was to assess the impact of staffing methods on Abuja's construction industry's labour productivity in order to create solutions for efficient staffing practices. The most popular staffing strategies in Abuja's construction sector were found to be contract and permanent employment. The study revealed that the productivity of contract staffs is better than that of permanent staff both for the Pop workers and Tilers under study.

Twelve main factors were identified as the common and prevailing factors affecting the productivity of workers on site inclusive of professionals and craftsmen on site be it permanent or contract staffs. Those factors are: Wages, Absenteeism, Incentives, Reassignment of manpower, Work force size, Design requirements, Overcrowding, Site conditions and organization, Poor supervision Communication, Engineering errors and omissions, Methods and equipment and Change orders.

Thirteen strategies were identified to have been well adopted by the construction industry which are: good knowledge of available staffing methods, Enforcement of government policies, good knowledge of laws binding staff employments and retention, good management system, encourage staff training, Government policies, good working environment, encourage good working relationship, encouraging staff retention, detail knowledge of size of project, encourage training and re-training of staffs, project requirements, detail knowledge of duration of projects.

Two of the strategies which were not properly adopted by the construction industry are; enhance workers welfare, ensuring workers are pensionable. It is obvious to note that the strategies given less attention by the construction industry bother most on the welfare of

the workers, therefore failure to really look into this could really affect the productivity of the workers on site, since every worker are majorly motivated by their welfare and the fact that there has job security. The productivity of workers on the job site will increase significantly if those two tactics are also well executed, making it even better than it is now.

## 5.2 Recommendations

According to the research's conclusions, the following actions are advised:

i. Contract staff productivity are higher and are recommended considering all other conditions are met and its aim is not just for exploitation.

ii. Proper attention must be giving to these three main factors (Wages, Absenteeism and Incentives) at the planning stages to reduce its effect on the productivity of workers on site since they have the highest rating in the factors affecting the productivity of workers on site.

iii. Proper attention must be giving to the following strategies (enhance workers welfare and ensuring workers are pensionable) too if one must make the right chose of staffing methods. Since there both bothers on the welfare and security of the worker's job.

## 5.3 Contribution to Knowledge

The survey was able to clearly identify the various staffing strategies used in the construction business, with permanent employees and contract workers being the most popular. It also highlighted the main causes of low worker productivity on the job, which, when correctly addressed, will raise worker productivity. The study was also able to develop some strategies for effective staffing methods which has being appropriately tested through the survey. It shows that a proper implementation of those strategies will help the construction industries to determine the best staffing methods for various

construction works in other to ensure the best productivity. The study's findings will also be important to academics since they may be used as a reference in studies on construction management.

## 5.4 Suggestion for Further Study

The research was limited to the study of the influence of staffing methods on construction labour productivity with emphases on the building industry and Abuja city specific. Thus, further studies can be carried out in the following areas:

i. Other crafts aside the Tiling and POP work can be used as a focus of the study to determine the influence of staffing methods on their productivity.

ii. The construction industry at large can be look into instead of just a fraction of the industry since the focus of this study was on building sector of the industry only.

iii. Similar studies can be carried out in other metropolitan cities such as Lagos and Port Harcourt since this study was limited to FCT Abuja alone due to time constrain.

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**APPENDIX**

# FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

**DEPARTMENT OF BUILDING**
**MAIN CAMPUS GIDAN-KWANO, MINNA, NIGER STATE.**

Department of Building,
School of Environmental Technology,
Federal University of Technology,
P.M.B. 65,
Minna, Niger State.
27th January, 2022

**Dear Respondent,**

**Influence of Staffing Methods on Construction Labour Productivity in FCT-ABUJA**

My name is **AGADA, Daniel Ichekani,** a Master Student in Construction Management**,** Department of Building, School of Environmental Technology, Federal University of Technology Minna, Niger State. I am conducting research on ***''Influence of Staffing Methods on Construction Labour Productivity in FCT-Abuja''.***
Please note that all information provided will only be used for academic purposes. Your participation in filling of questionnaire will be helpful.

If you have questions or observations at any time about the survey or procedures, please contact me or my supervisor using the contact details below.

Thank you very much for your support.

**AGADA, Daniel Ichekani**
Phone: 08069749287
e-mail: agadaid@gmail.com

**Dr. C. U. Ayegba**
Project Supervisor. Phone:08034083586
email: calistus.ayegba@futminna.edu.ng

**PART A: RESPONDENT PROFILES**

**A1.** Position of Respondent in Organization……...

**A2.** Age of respondent (**Please tick as appropriate**)

☐15-20 years ☐21-30 years ☐31-40 years ☐41-50 years
☐51-60 years ☐60 years and above

**A3.** Gender of respondent (**Please tick as appropriate**)

☐ Male ☐ Female

**A4.** Profession of the respondent (**Please tick as appropriate**)

☐Professional ☐Skilled Labour ☐Operator/Driver ☐Unskilled Labour

**A5**. Educational qualification of respondent (**Please tick as appropriate**)

☐ Doctorate Degree ☐Master Degree ☐Bachelor Degree
☐ Higher National Diploma ☐ National Diploma ☐ O Lever Certificate
☐ Primary Certificate

**A6.** Years of experience (**Please tick as appropriate**)

☐0-5 years ☐6-10 years ☐11-20 years ☐21-30 years
☐31-40 years ☐41-50 years ☐50 years and above

**A7.** Do you undergo any professional/special training? If yes how frequent are such training organized? If no please ignore.

☐Yearly ☐Every two years ☐Every three years ☐Only when the need arises

**B8.** For how long have you being working in this organization?

☐0-5 years ☐6-10 years ☐11-20 years ☐21-30 years
☐31-40 years ☐41-50 years ☐50 years and above

**B9.** Size of firm **(please tick as appropriate)**

☐Small (10-49) Medium (50-249) Large (250 Above)

**PART B: STAFFING METHOD(S) USED BY THE ORGANIZATION**

Please tick appropriately the level of usage of the underlisted staffing methods in your organization.

*5 = Very Common, 4 = Common, 3 = Uncommon, 2 = Rare and 1 = Very Rare.*

| S/N | Staffing Methods | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 1 | Permanent staff | | | | | |
| 2 | Contract staff | | | | | |
| 3 | Internship staff | | | | | |
| 4 | Casual staff | | | | | |
| 5 | Freelance staff | | | | | |
| 6 | Part-time staff | | | | | |
| 7 | Fixed-term staff | | | | | |
| 8 | Executive staff | | | | | |
| 9 | At-will staff | | | | | |
| 10 | Non-compete and confidentiality staff | | | | | |

**If there are any other staffing method(s) please identify and rank appropriately**

| | Staffing Methods | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| | | | | | | |
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| | | | | | | |
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**PART C. FACTORS AFFECTING LABOUR PRODUCTIVITY ON SITE**

To what extend do the under listed factors affects your productivity on site? Please tick appropriately.

*5 = Very Severe, 4 = Severe, 3 = Neutral, 2 = Moderate and 1 = Minor.*

| S/N | FACTORS | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 1 | Overcrowding | | | | | |
| 2 | Change orders | | | | | |
| 3 | Engineering errors and omissions | | | | | |
| 4 | Reassignment of manpower | | | | | |
| 5 | Site conditions and organization | | | | | |
| 6 | Methods and equipment | | | | | |
| 7 | Materials and tools availability | | | | | |
| 8 | Unbalanced crew or crew size | | | | | |
| 9 | Poor supervision Communication | | | | | |
| 10 | Management control | | | | | |
| 11 | Coordination | | | | | |
| 12 | Planning and scheduling | | | | | |
| 13 | Project size | | | | | |
| 14 | Work force size | | | | | |
| 15 | Design requirements | | | | | |
| 16 | Quality of craftsmanship | | | | | |
| 17 | Quality assurance and control | | | | | |
| 18 | Absenteeism | | | | | |
| 19 | Wages | | | | | |
| 20 | Incentives | | | | | |
| 21 | Fatigue | | | | | |
| 22 | Morale and attitude | | | | | |
| 23 | Availability of skilled labour | | | | | |
| 24 | Adverse weather | | | | | |
| 25 | Population differences | | | | | |

**PART D: STRATEGIES FOR EFFECTIVE STAFFING METHODS FOR IMPROVE PRODUCTIVITY.**

Please tick appropriately the level of adoption of the following strategies by your organization for effective staffing methods.

*5 = Very High, 4 = High, 3 = Moderate, 2 = Low and 1 = Very low.*

| S/N | Strategies | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 1 | Enforcement of government policies | | | | | |
| 2 | Good knowledge of available staffing methods | | | | | |
| 3 | Encouraging staff retention | | | | | |
| 4 | Good knowledge of laws binding staff employments and retention | | | | | |
| 5 | Encourage staff training | | | | | |
| 6 | Ensuring workers are pensionable | | | | | |
| 7 | Enhance workers welfare | | | | | |
| 8 | Detail knowledge of size of project | | | | | |
| 9 | Detail knowledge of duration of projects | | | | | |
| 10 | Project requirements | | | | | |
| 11 | Good management system | | | | | |
| 12 | Good working environment | | | | | |
| 13 | Government policies | | | | | |
| 14 | Encourage good working relationship | | | | | |
| 15 | Encourage training and re training of staffs | | | | | |
| **If there are any other strategy(ies) please identify and rank appropriately** | | | | | | |
| | **Strategies** | **5** | **4** | **3** | **2** | **1** |
| | | | | | | |
| | | | | | | |
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| | | | | | | |

**TIME STUDY SHEET**

**Type of staff:** …….

**Number of workers per gang:** Craftsmen…… Labour …….

| Activity | Rating |
|---|---|
| Type of work done | |
| Rating based on observation | |
| Start time: | |
| End time: | |
| Observed time: | |
| Idle time: | |
| Actual time: | |
| Area of work done: | |

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**TIME STUDY SHEET**

**Type of staff:** …….

**Number of workers per gang:** Craftsmen…… Labour …….

| Activity | Rating |
|---|---|
| Type of work done | |
| Rating based on observation | |
| Start time: | |
| End time: | |
| Observed time: | |
| Idle time: | |
| Actual time: | |
| Area of work done: | |