

APPRAISAL OF DAILY PAYMENT METHODS ON THE PRODUCTIVITY OF ARTISANS ON NIGERIAN CONSTRUCTION SITES (A CASE STUDY OF SELECTED MASONS IN MINNA, NIGER STATE)

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ABSTRACT

Construction projects are capital intensive and navigating through the payment framework for resources especially manpower resources cannot be overemphasized. Delay in prompt payment as at when due can influence the productivity of workers on sites. This paper examines the effect of daily wages on the outputs of masons in the selected construction sites in Minna, Niger state. Three objectives were set for the study which are (i) to identify the types of payment methods for masons on construction sites; (ii) to determine the influence of daily wage on the output of masons working in substructural section of residential buildings and (iii) to determine the influence of daily wage on the outputs of masons working on the superstructural section of residential buildings. For the purpose of this study, a quantitative research approach was adopted to gather data whereby 15 ongoing residential buildings were purposively sampled and structured questionnaires were administered to 60 registered masons. Linear regression analysis was employed to determine the relationship that exists between the variables and the results of the findings indicate Coefficient of determination (R^2) 0.2% in substructure and 0.5% in superstructure. It was therefore concluded that daily pay to masons has no effect on the output in the area of study and that other factors such depth and height of work could be responsible for a weak relationship.

Keywords: Payment, Method, Delay, Productivity, Construction

INTRODUCTION

Construction projects are complex and often involve a range of stakeholders, including owners, designers, contractors, suppliers, and regulatory bodies because it is a crucial sector that plays a vital role in the economic growth and development of nations. However, the performance of construction projects in Nigeria has been a significant concern due to the numerous challenges facing the industry. Poor performance of construction projects has resulted in significant cost overruns, schedule delays and quality issues, leading to project failures, loss of revenue, and poor reputation. (Unegbua et al., 2023). One of the critical issues affecting the performance of construction projects in Nigeria is inadequate payment method which has resulted to loss of time, lack of coordination of resources, and lack of processes to achieve maximum productivity level.

Other issue that affects the successful delivery of construction projects in Nigeria is inadequate funding. The construction industry requires significant financial resources to deliver projects successfully. Inadequate funding, however, has been a significant challenge in the Nigerian construction industry, leading to underfunding of projects and delayed payments to contractors and suppliers and site operatives (Adeyinka et al., 2018). Osemenam et al. (2020) explained that the construction industry

faces a shortage of skilled labour. The industry requires a range of skilled professionals, including architects, engineers, quantity surveyors, and skilled tradespeople. However, the industry faces a shortage of skilled labour, leading to the use of unskilled and semi-skilled workers who may not have the required expertise to deliver projects successfully.

STATEMENT OF THE PROBLEM

The litigation arising from disputes on the inadequate and unfair daily wages has not only lead to project delay but has also lead to the reduction in the outputs of operatives on construction sites. Claims and counterclaims from the client, contractor and artisans as to the appropriate payment method vis a vis the work done on site have been the issue prevailing in most Nigerian construction sites. This paper intends to critically examine the daily wage and productivity of workers on site.

AIM

The aim of the paper is to determine the influence of daily wage on the outputs of masons working on residential buildings in Minna, Niger State in an attempt to advise construction stakeholders on the need for prompt and adequate payment to construction workers.

OBJECTIVES

The objectives of the study are (i) to identify the types of payment methods for artisans on construction sites;

(ii) to determine the influence of daily wage on the output of masons working in substructural section of residential buildings and

(iii) to determine the influence of daily wage on the outputs of masons working on the superstructural section of residential buildings

RESEARCH QUESTION

- (i) What is the actual daily wage for a gang of mason working in substructure?
- (ii) What is the actual daily wage for a gang of mason working in superstructure?
- (iii) What is the relationship between the output of a gang and daily wage?

LITREATURE REVIEW

Productivity is one of the most important factors affecting the overall performance of any organization, large or small. At the micro-level, improved productivity decreases unit costs and serves as an indicator of project performance. At the macro-level, improved productivity is a vital tool in countering inflationary effects and determining wage policies. Improved productivity is thus always counted among the basic means of solving economic problems. It is recognized that capital alone is an inadequate means of producing more wealth or for starting a business in developing countries (Makinde, 2018)

The building section of the construction industry is mainly concerned with the assembly of building materials which are supplied by the manufacturing sector and delivered to the site by the transportation sectors. To a large extent in Nigeria, many of the buildings construction works still rely heavily on manual labor in their assembly. According to Bake and Makinde (2021), Labour is the most significant and versatile resource in the building sector. A good number of people are employed in construction projects and the construction industry in Nigeria employs more than 800,000 people who are required to deliver the constructed facilities to the clients' on time, within budget and meeting specified standards

of quality. All these may be feasible only if the predetermined levels of labour productivity are known by stakeholders in advance. Labour productivity in the construction industry has become one of the most frequently discussed issues in general management.

Why timely payment is important?

In the publication by ServiceTitan (2025), projects are very capital intensive, and any delay in payment can throw them off course. Unfortunately, contractors may be forced to cut corners to compensate for cash shortfalls or halt the project when payments are delayed. In order to prevent this scenario, timely payment to contractor prevents cost increases. Contractors cannot pay suppliers and financial institutions when payments are late as this can lead to costly late payment penalty fees and interest charges. It also strains the relationship with vendors, who may impose stricter terms in subsequent contracts.

In addition, it strengthens relationships with subcontractors. Subcontractors who commit to delivering quality work are invaluable. So, it's vital to hold onto them by paying them promptly, which only happens when the general contractor gets paid on time. And also mitigates legal disputes, since timely payments prevent lawsuits from being filed. This protects the reputation of all parties and ensures the project is completed on time.

In their view, Okoye et al., (2022) prepared a guide to construction site managers towards selecting appropriate payment methods for different construction site operations by minimising issues arising from labour wage determination. This gives a clue to construction workmen leaders or gang leaders of different building trades on what and how their payments are to be made for a particular construction operation and guides construction policy maker in making appropriate labour laws for construction site operations.

Adamu (2026) explained that the average salary for a construction worker in Nigeria is NGN 73,414 – NGN 255,686. However, salaries can vary depending on the worker's experience, skills, and the type of project they are working on. The lowest salary in construction is typically paid to unskilled labourers. However, even unskilled laborers can earn a decent wage in Nigeria, with the average salary being NGN 73,414 – NGN 255,686.

Bake and Makinde (2021) highlighted two types of payment method which are (i) Time Payment whereby a definite sum is paid for a fixed period of time, that is, payments are paid at a fixed rate per hour, day, week; or other period, and each construction worker in a given category receives the same payment irrespective of differences in output while in piece payments, payments depend upon output, each construction worker is paid according to the quantity of work done, and irrespective of the time it takes. (ii) Piece rates, by which the pay of each worker is proportionate to his output, might be thought more satisfactory than time rates, especially from the point of view of the employer and the national economy and they also seem fair to the workers. However, they are not suitable for all kinds of construction work, and also the system is liable to abuse if applied deceitfully. Earnings are usually higher for construction workers on piece rates than for those on similar work paid on a time basis, and the danger of excessive speed is not great as the workers are not penalized if they fail to reach a given standard or target.

Wong (2024) opined that in the world of construction project management and financing, navigating the complexities of payment schedules is critical for maintaining a project's momentum and financial health. Two methods stand out in the industry: milestone payments and cost-to-complete (CTC). Each approach has its mechanisms, benefits and challenges, and significantly impact how contractors manage

resources and how clients control project costs. Milestone payments are structured around the achievement of predefined events or the completion of specific sections of work, rather than adhering to a traditional time-based schedule. This payment strategy ensures that contractors receive compensation upon reaching certain project benchmarks, known as "milestones". The allure of milestone payments lies in the straightforward premise: accelerate work progress to reach milestones promptly, and in turn, secure payments faster. In practice, this often leads to contractors deploying additional staff and resources, focusing intensely on achieving these milestones swiftly. The intent is to expedite work progress, thereby facilitating quicker payment cycles and improving cash flow. However, this focus on speed can sometimes compromise the quality of work or lead to resource strain if not managed carefully.

Cost-to-complete offers an approach that benefits from prudent financial planning, providing a detailed forecast of the total project costs and ongoing costs as the project progresses. When contracts are structured around CTC, payments can be scheduled monthly, based on the estimated length of the project. This contrasts with milestone payments, as the passage of time, rather than the achievement of work milestones, triggers payments. This setup offers a measure of predictability and regularity in cash flow for contractors, as payments continue as scheduled despite progress on the project. It necessitates a detailed understanding of project finances and requires ongoing cost assessments to ensure accuracy in forecasting the remaining work costs. A thorough understanding of payment models and methods enhances the ability to manage projects effectively, ensuring that financial goals align with project deliverables.

RESEARCH METHODOLOGY

For the purpose of this study, 15 residential buildings under construction were purposively sampled whereby 60 masons were randomly sampled in Minna metropolis. 60 structured questionnaires were administered with a return rate of 72% from the respondents. The questionnaire covers the profile such as age, educational qualification, year of experience and daily wage. Analysis of variance (ANOVA) and simple linear regression were employed to determine the relationship between the variables tested. Certain procedures were taken into considerations while taking records on sites. The operatives to be observed were not aware when taking note of the particular spot or point at which the work was started and the starting and finishing time is also taken. A physical measurement of the work output executed is then carried out using simple tools such as tapes. The observed output and finishing time are both recorded. The actual time taken was calculated by taking the difference between the starting and the finishing time and thus the observed time was recorded.

The average outputs of a gang of mason working on blockwork in the foundation of depth of 1m is 8.22m² for a daily pay of # 8375 per a mason and #3500 for each of the unskilled labourer. While working on a blockwork of 1.5m deep in the foundation, the actual wage paid per day is #8585.70 with the average output of 7.7m².

Table 1.0 Average Outputs for Blockwork Exceeding 225mm wide in the Substructure

DEPT H	MORNG TIME		AFTN PERIOD				TOTAL	AVG	AVG TOTAL OUTPUT	AVG. PROD PER HOUR
	AV.BL K	AVG TIME	AV.OUT P	AV BLK	AVG TIME	AV. OUTP				
	LAID		PRODT VT	LAID		PRODT VT				
metre	no	hr	m2/hr	no	hrs	m2/hr	AV.TI ME SPENT	WAGE/ DA #	M2	
1	39.88	1.72	2.36	42.25	1.69	2.55	3.613	8375.00	8.22	4.91
1.5	37.14	2.3	1.74	39.43	2.43	1.66	4.82	8585.70	7.7	3.4

Source: Researcher's Analysis (2025)

The total time spent in order to achieve the output of 8.22m² in blocklaying is 3.613hr per gang. This denotes that the time for mixing mortal, for placing blocks on courses and rest/relaxation accounts for the remainder of the time spent in a day. The outputs dropped as the depth of foundation increases from 1m to 1.5m.

In the same vein, Table 2.0 presents the average outputs for blockwork in wall exceeding 300mm wide in superstructure. The productivity level of a gang of mason dropped from 2.33m²/hr to 1.32m²/hr as the height of wall increases and scaffolds needed to be put in place to aid in blocklaying in the superstructure. The average wage per day for a mason rose from #8,500.00 to #9,042.00 as the height of work increases while that of unskilled labourer per day stood at #4,200.00. the average numbers of block laid within the time recorded in the Table 2.0 is 95.67 at the height of 1 meter above ground level whereas at the height of 2.5meters gives 77.71 blocks laid per day. Despite increase in wages of mason per day as the height of work increases, the output of masons shows no significant increase.

Table 2.0 The Average Outputs for Blockwork in Wall Exceeding 300mm wide in Superstructure

HEIG HT	MORNG PERIOD			AFTN PERIOD							
	AV.B LK LAID	AVG TIME	AV.OU TP PROD TVT	AV BLK LAID	AVG TIME	AV. OUTP PROD TVT	TOTA L AV.TI ME SPEN T	AVG DIST	AVG WAGE /DA	AVG TOTAL OUTPUT	AVG. PROD PER HOUR
metre	no	hr	m2/hr	no	hrs	m2/hr		metres	#	M2	
1	49	2.47	2.33	46.67	2.30	2.40	4.77	6.00	7500.00	9.57	4.73
1.5	42.67	3.06	1.75	46.67	2.28	1.98	5.34	6.33	8200.00	8.94	3.73
2	39.5	2.6	1.96	43.79	2.08	1.85	4.69	5.87	8325.00	8.33	3.81
2.5	37.21	3.08	1.32	40.5	2.53	1.27	5.61	6.00	9042.00	7.77	2.59

Source: Researcher's Analysis (2025)

The influence of wages mason per day on the output of the mason in substructure was analysed through linear regression analysis in Table 3.0. the result showed a weak relationship as Coefficient of determination (R²) indicated 0.2%. Hence, null hypothesis is accepted

Table 3.0 : Summary Of Regression Results For Blockwork In Substructure

Analysis NO	Variables			Observations							Inferences	
	X	Y	Type of Model	Regression Equation	R2 (%)	F cal	Ftab	P values	Strength of Relationship	Remark	Action On Hypothesis	
1	Wage/day blk in substr	output blk in subst	linear simple	Y=1.668+2.51x 10 ⁻⁵ X	0.2	0.059	4.18	0.81	Weak	NS	Accept Ho	

Source: Researcher's Analysis (2025)

NS=Not Significant

In addition, the relationship between the wages of masons per day and the output per day in the superstructure was analysed using linear regression equation below in Table 5.0. The R² value indicates 0.5% while the Probability value indicates 0.57. the two results showed that no significant relationship exists between the variables tested.

Table 5.0 Summary of Regression Results for Blockwork in Superstructure

Analysis NO	Variables			Observations							Inferences	
	X	Y	Type of Model	Regression Equation	R2 (%)	F cal	Ftab	P values	Strength of Relationship	Remark	Action On Hypothesis	
1	Wage/day in supestruc	output blkw in supe	linear simple	Y=1.376+3.89x10 ⁻⁵ X	0.5	0.327	4.00	0.57	Weak	NS	Accept Ho	

Source: Researcher's Analysis (2025)

CONCLUSION

This paper examines the influence of daily payment method on the productivity of masons working on residential buildings in both substructure and superstructure sections. The results of analyses indicate that no significant relationship exist between the productivity level of masons in the area of study. This could be attributed to other factors such as depth and height of location of work. The purchasing power of the wages being paid to workers and other motivational factors. It should be noted however, that building developers and contractors should devise another method of motivating artisans on site such paying a living wage to various categories of operatives and other incentives in order to increase productivity on sites.

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