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The Potential Strategies for Mitigating the Effect of Pandemic of Construction Site Workers in Kano State, Nigeria

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Abstract

Construction project execution has faced a dramatic challenge during the pandemic period, especially in Kano metropolis. The aim of this paper is to investigate the potential strategies for mitigating the effect of pandemic and productivity in Kano state with a view to the recommend solution that can enhance the productivity of workers during pandemic in case of future occurrence. The study adopted quantitative design and purposive random sampling technique was used and software version 22 was used for data analysis and the results were presented in tables. The findings concluded that the most potential strategies for mitigating the effect of pandemic and productivity in Kano were using safety measures appropriate for COVID-19 pandemic, provision of personal protective equipment, government stability, investing to strengthen core public health infrastructure and coordinated response should be implemented were moderate potential strategies for mitigating the effect of COVID 19 pandemic. While risk transfer mechanisms, introducing online platform and rapidly extinguishing sparks that could lead to pandemics were low potential strategies for mitigating the effect of pandemic and productivity in Kano ranked. Construction companies should develop and implement site-specific safety protocols, including PPE provision, regular sanitation, and testing procedures, to mitigate the risk of

infection. The study recommended that construction companies should consider adopting flexible work hours, remote work options where possible, and transportation support to facilitate workers' access to and from construction sites while minimizing movement restrictions.

Keys: Potential, Strategy, Mitigating, Pandemic, Site, Workers

Introduction

The entire globe came to a standstill with the outbreak of a deadly disease of 'Corona Virus' popularly known as 'Covid-19' (Agarwal, Mohapatra, Sharma, Sharma, Bhatia & Mishra, 2020). Due to that, on January 11, 2020, the COVID-19 was recognised as a global pandemic by the World Health Organisation. Then, on 30th January 2020, the Emergency Committee of the World Health Organization (WHO) has declared the on-going COVID-19 outbreak to be a global Public Health Emergency of International Concern (PHEIC) which the PHEIC defined as an America (USA), Russia, United Kingdom, Brazil, Spain, Italy and China. However, tight measures have been implemented by the Nigerian government to prevent this pandemic from wide spreading. Like other countries, Nigeria has also implemented nationwide traffic restriction and stay at home order since 18th March 2020. The government has imposed restriction in term of movement control order (MCO) with a special standard operation procedure (SOP) and not a tight lockdown as China's. The construction industries and its site workers are also being affected. According to Mercy, November 2020, professional bodies such as Chartered Institute of Building (CIOB), Royal Institute of Surveyors (RICS), in an attempt to preserve construction businesses, are rolling out strategies to ensure smooth sailing and transition into new dispensation (Emmanuel & Baker, 2012).

The project to recovery is prepared by construction industry to reinvent measures for safeguarding construction site activities, which is solely carried out by construction site workers. Also, families of construction site workers to meet their daily spending or needs is challenging (Bhagat, Reshmi, Sahoo, Roy & Govil, 2020). Most of the multinational and indigenous construction site workers in Kano metropolis are severely affected by the covid-19 pandemic by staying at home. Some studies carried out examples include Harari (2020) also expressed that COVID-19 pandemic is the biggest crisis of the generation and it may take years to recover and action must be taken decisively to subsidize and plan new

strategies to avoid the travail of humankind. Another study by Ventegodt et al. (2020) found that the Indian real estate sector has been severely affected and declination has been considerably recorded. Helm (2020) also pointed out that the total lockdown caused by COVID-19 has severely curtailed economic activities. Therefore, none of the studies above has reported on potential strategies for mitigating the effect of pandemic and productivity. However, the construction industry with no exception have been severely affected by the COVID-19 pandemic and this paper exclusively will examine the potential strategies for mitigating the effect of pandemic and productivity in Kano state.

Literature

Concept of Covid – 19 Pandemic

The advent of COVID-19 has been the largest shock to the world economy since World War II. It has induced a large contraction in GDP that has been unusually synchronized across countries. But the shock has also had asymmetric effects across sectors of the economy, with those sectors that involve the most social contact in consumption bearing the brunt. Furthermore, the shock has necessitated a reorganization of production processes both in the near-term as an immediate response but also over the medium-term – that will have implications on productivity construction site works. The spread of COVID-19 and measures to contain it are therefore likely to have important implications for productivity building projects (Bloom, Bunn, Mizen, Smietanka & Thwaites, 2021).

This study presents an analysis of the impact of Covid-19 on productivity in a major construction project. A survey data from the Decision Maker Panel (DMP), a large and representative monthly panel survey of UK firms that was established in 2016. Whilst the DMP survey does not ask about productivity directly, panel members have been asked about the impact of COVID-19 on all of the main components of productivity, covering inputs, outputs and prices (Bloom et al., 2021). We take pre-COVID measures of firm-level productivity derived from company accounts data and project them forward using timelier and/or forward-looking data from the DMP on the impact of Covid-19 on these components. The study assesses the impact of COVID-19 on both measures of labour productivity and total factor productivity (TFP). Build our results up from the firm level and decompose the aggregate impacts into 'within-firm' and 'between-firm' effects (hereafter within and between effects) using the accounting framework of (Bloom, Bunn, Mizen, Smietanka & Thwaites, 2020). So, in contrast to other studies that must infer the impact of a shock on productivity from some natural temporal or unobserved cross-firm variation in exposure, the DMP data allows us to ask firms directly. These reported impacts account for much of the realised changes in the firm-level data.

The results suggest that COVID-19 will reduce TFP in the UK private sector, relative to what would otherwise have happened, by about 3% on average between 2020 Q2 and 2021 Q2, peaking at 5% in 2020. Businesses anticipate a large reduction in productivity within firms, partly because measures to contain Covid-19 are expected to increase intermediate costs (Rapaccini, Saccani, Kowalkowski, Paiola & Adrodegari, 2020). The negative within-firm effect is partially offset by a positive between effect as low productivity sectors, and the least productive firms among them, are disproportionately affected and consequently make a smaller contribution to the economy. The effects of Covid-19 on hourly labour productivity are estimated to be less negative than those on TFP. That is because hours worked are estimated to have dropped by around 40% in 2020 Q2, which is a larger fall than the input share weighted fall in capital (which dropped by 1% in 2020 Q2) and hours. Labour productivity per hour is estimated to have increased in 2020 Q2 as the large short-term between effects more than offset the impact of higher costs. To gauge the effects over the medium term, we use responses to survey questions asking about the expected impacts of COVID-19 in 2022. We estimate that the pandemic will reduce TFP by about 0.7% over the medium term, equivalent to about around one year of pre-pandemic UK productivity growth (De Lyon & Dhingra, 2021).

Productivity during COVID-19

Overall project progress i.e. whether, and to what extent, projects had fallen behind the pre-COVID-19 expected programme was inconstant. It was influenced by a range of factors including having fewer workers on site, difficulty getting materials, and specialist suppliers being closed due to lockdown. Some tasks took longer than usual due to the need for workers to maintain social distancing (Kuzemko, Bradshaw, Bridge, Goldthau, Jewell, Overland & Westphal, 2020). A range of mitigating measures were put in place. One project introduced a second shift to step up construction whilst still having fewer workers on site at any one time. Other tasks were rescheduled or carried out in different ways: one site used offsite manufacture to reduce the need for workers to be in close proximity, although this increased direct costs. Individual or gang productivity/effectiveness was considered to have improved to some extent on all five main sites: i.e. there was higher output per worker, even if total site output was reduced by having fewer workers (World Health Organization, 2020).

Workers' Productivity

Increase of productivity was calculated prior to mid-1906's, in the construction industry. Later, decline in productivity has remained of great concern issue in the construction industry all over the world. In 1968, the Construction Roundtable was

established due to concern about the increased cost of construction resulting from an increase in the inflation rate and a significant decline in construction productivity (Abdelaal, Emam & Farrell, 2016). Also in 1965, the United Nations Committee on Housing, Building, and Planning (UNC) published a significant manual concerning the effect of repetition on building operations and processes (Abdelaal, Farrell & Emam, 2014). The research discovered the necessity for a rise in productivity was perhaps more severe in the construction sector compared to any other sector. It was necessary to implement, as far as possible, industry-wide principles of production throughout the construction process. Though, it was known that careful adaptation would be required to implement the knowledge and experience gained in the manufacturing industry to the building construction industry (Abdelaal *et al*., 2016).

Past studies and research show the number of factors affecting productivity, there are still anonymous factors need to be further studied even in developed countries (Dalibi, 2016). A study by Amae (2020) stated that policies to rise productivity are not always similar in each country. Their study identified different factors affecting labor productivity and grouped them according to their characteristics such as, design, execution plan, material, equipment, labor, health and safety, supervision, working time, project factor, quality, leadership and coordination, organization, owner/consultant, and external factors.

Quelch and Boudreau (2016) Classified the productivity factors causing low productivity as industry-related factors, labor-related factors, and management-related factors. Industry-related factors, essentially, are the characteristics of the construction industry, such as the uniqueness of construction projects, varied locations, adverse and unpredictable weather, and seasonality. Labor-related factors include the union's influence, little potential for learning, and lack of motivation. Management-related factors usually refer to a lack of management for tools or techniques.

Blok, Wesselink, Studynka and Kemp (2015) classified the productivity factors into two categories: external factors the ones outside the control of the organization management and internal factors related to the productivity factors originating within the organization. From their viewpoint, the nature of the industry, usually the separation of design and construction functions, has affected construction productivity through delay in drawings, design changes, and following rework. Construction clients have sometimes been obstructions to construction productivity because of their lack of suitable knowledge about construction procedures. Moreover, being an outdoor industry, construction performance is extremely affected by weather conditions. In addition to the factors disused, health and safety regulations, and codes of practices are other external factors influencing task operations and productivity. In the internal category, management inadequacies could result in a waste of resources with

consequent losses in productivity; adoption of modern technology and training for the laborer would increase productivity (Blok et al., 2015).

Kisi, Mani, Rojas and Foster (2017) built an ideal to describe the factors affecting labor productivity. In the model, two groups of factors determine the productivity performance, work environment, and task to perform. Work-environment factors refer to how well a job is organized and accomplished. Work to be done, or work content, relates to work required to perform and includes physical components of work, specification requirements, and design details. Past study showed that task to be completed could affect the labor resources by as much as 15%, whereas work environment can affect labor requirements by an extra 25%. Based on this factor model, more detailed research was done. One study suggested that scheduled overtime always leads to efficiency losses because of the inability to deliver materials, tools, equipment, and information at an accelerated rate (Kisi *et al*., 2017).

Methodology

This paper adopted descriptive research design and the study approach considered most appropriate for this paper is quantitative as numerical data was collected and analysed. Survey research strategy with questionnaire as instrument of data collection was adopted in this paper. The study was conducted in Kano State. Consequently, the target respondents for this study were building professionals this includes Architects, Quantity Surveyors, Builders and civil engineers. The sample size for this research was 150, determined by Krejcie and Morgan's (1970) table of determining samples. The proportionate purposive sample random sampling techniques was adopted for this paper.

Results

Information of Respondents

The demographic information of the respondents was collected, the frequency and percentage analysis were carried out and the results presented to show the respondents 'demography.

Table 1: Demographic Data of the Respondents

S/N	Questions	Options	Frequency	Percentage
1	Professions	Architecture	44	32.4
		Builders	19	14
		Engineers	41	30.1
		Quantity Surveyors	32	23.5
		Total	136	100.0
2	Experience in the industry	0 - 5 Years	18	13.2

		6- 10 Years	24	17.6
		11 - 15 Years	36	26.5
		16 - 20 Years	28	20.6
		Above 20 Years	30	22.1
		Total	136	100.0
3	Type of organization	Client	35	25.7
		Contractor	27	19.9
		Consultant	74	54.4
		Total	136	100.0
4	Types of construction handled	Building Construction	69	50.7
		Civil Construction	16	11.8
		Both	51	37.5
		Total	136	100.0

Table 1 above shows the professions, experience in the industry, type of organization and types of construction handled. It shows that majority of the respondents were architecture which constitute 32.4%, while 14.0% were builders which are the minority. The table also indicate that that the respondents have an experience of 11 - 15 years in the construction industry with 26.5% of the responses respectively. Most of the respondents were consultants with 54.4% in the study area. Furthermore, it can be seen that most of the respondents were handling building construction projects which constitute 50.7% in the study area.

The potential strategies for mitigating the effect of pandemic and productivity in Kano state

Table 2: Potential strategies for mitigating the effect of pandemic and productivity in Kano

Potential strategies for mitigating the effect of pandemic	**Mean**	**Std. Deviation**	**Ranking**	**Level**
Using safety measures appropriate for covid-19 pandemic	3.15	.923	1	
Provision of personal protective equipment	3.15	1.088	2	
Government stability	3.04	1.138	3	
Investing to strengthen core public health infrastructure	3.00	.958	4	

Coordinated response should be implemented	2.88	.914	5	
Successful contingency planning	2.88	.784	6	2.58 Moderate
Increasing situational awareness	2.79	1.043	7	
Provision of treatment centre at construction site	2.72	1.245	8	
Risk transfer mechanisms	1.68	1.107	9	
Introducing online platform	1.62	1.149	10	
Rapidly extinguishing sparks that could lead to pandemics	1.56	1.140	11	

Table 2 shows that the results indicated that the most potential strategies for mitigating the effect of pandemic and productivity in Kano are using safety measures appropriate for covid-19 pandemic, provision of personal protective equipment, government stability, investing to strengthen core public health infrastructure and coordinated response should be implemented with mean value of 3.15, 3.15, 3.04, 3.00 and 2.88 ranked at 1st to 5th respectively. While risk transfer mechanisms, introducing online platform and rapidly extinguishing sparks that could lead to pandemics were low potential strategies for mitigating the effect of pandemic and productivity in Kano with mean score of 1.68, 1.62 and 1.56 ranked at 10th to 11th respectively. Therefore, the study agreed with the report conducted by World Health Organization (2020) implementing specific practices like social distancing, handwashing stations, temperature checks, and mask mandates significantly reduce transmission risk and protect workers' health. The study agreed with the report conducted by International Labour Organization. (2020) equipping workers with appropriate masks, gloves, and face shields minimizes exposure to the virus and fosters confidence in workplace safety. The study also agreed with the report conducted by Oxfam International. (2020) a stable political environment with clear public health policies and consistent enforcement provides predictability and promotes adherence to guidelines, ultimately protecting workers and mitigating pandemic impacts.

Conclusion and Recommendations

The findings concluded that the most potential strategies for mitigating the effect of pandemic and productivity in Kano were using safety measures appropriate for covid-19 pandemic, provision of personal protective equipment, government stability, investing to strengthen core public health infrastructure and coordinated response should be implemented were moderate potential strategies for mitigating the effect of covid 19 pandemic. While risk transfer mechanisms, introducing online platform and

rapidly extinguishing sparks that could lead to pandemics were low potential strategies for mitigating the effect of pandemic and productivity in Kano. The paper recommended that construction companies should foster open communication channels between workers and supervisors to address challenges, share best practices, and encourage innovative solutions. Collaborative work environments can enhance creativity and problem-solving. The paper recommended that construction companies should utilize construction management software, digital tools, and automation solutions to streamline processes, improve accuracy, and reduce errors. Technology can help maintain project timelines and consistency. The paper recommended that construction companies should implement detailed project plans and realistic schedules that break down tasks into manageable units and consider potential challenges. Pre-planning can minimize delays and improve overall project pace.

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