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Strategies towards Business Continuity for Construction Industry in Kenya during and after COVID-19 Pandemic

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Abstract

The onset of the novel COVID-19 pandemic declared by the World Health Organization (WHO) in 2019 has brought wide-ranging detrimental impacts on the construction industry. The industry has experienced delays in the delivery of materials, high cost of materials, suspension of activities, termination of contracts, and workforce implications among others. This array of impacts cannot be ignored by the construction industry stakeholders as they require prompt countermeasures. These repercussions necessitated the aim of this study which is to assess strategies for business continuity for the construction industry during and after the COVID-19 pandemic. This study was guided by three research questions: 1) What is the level of resilience of contractors' businesses during the pandemic? 2) What survival measures did contractors in Kenya consider to avert the impacts of the pandemic? 3) What recovery strategies can be adopted to enhance contractors' business in post COVID-19 environment and similar occurrences? A mixed-method cross-sectional research design was employed to collect both quantitative and qualitative information. An interview schedule that contained both open-ended and close-ended questions was used to collect data from 245 contractors in Kenya sampled using simple random sampling. Simple random sampling was used because the contractors were considered knowledgeable about the topic under study and therefore had an equal chance of selection to participate in the study. Descriptive statistics such as mean, standard deviation, and frequencies were used to interpret the findings from quantitative analysis, while qualitative data analysis was conducted using word frequency query and text search query. Further, the output was displayed using tables and charts. From the findings, it was ascertained that the level of resilience of contractors' businesses was very low during the pandemic. The highly rated survival measures were: redistribution of workloads, cross-training of employees, working in shifts, multiple sources of revenue, and automation of tasks. The study also established that post-COVID-19 recovery measures should include: risk assessment, preparation of action plans, accessibility to health insurance, and securing of inventory of materials. In addition, the study asserted that interest should also be directed towards innovation and creativity, resilience in decision-making, networking, flexibility and diversification, management, and improved access to resources and productivity. The paper's findings form an important background by uncovering vital evidence on COVID-19 survival and recovery measures.

Keywords

COVID-19 ([articles.aspx?searchcode=COVID-19&searchfield=keyword&page=1&skid=0](#)), Survival ([articles.aspx?searchcode=+Survival&searchfield=keyword&page=1&skid=0](#)), Recovery ([articles.aspx?searchcode=+Recovery&searchfield=keyword&page=1&skid=0](#)), Resilience ([articles.aspx?searchcode=+Resilience&searchfield=keyword&page=1&skid=0](#)), Construction Industry ([articles.aspx?searchcode=+Construction+Industry&searchfield=keyword&page=1&skid=0](#)), Contractors ([articles.aspx?searchcode=+Contractors&searchfield=keyword&page=1&skid=0](#))

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1. Introduction

Construction industries worldwide have an immense impact on country economies acting as a facilitator and a linkage to other sectors. This is especially true for developing countries that are dependent on the construction sector for sustainable development. Globally, the construction industry has a 15% share of GDP, and it is expected to grow further to US\$ 15,030 bn by 2025, an indication of its vital role in the global economy (Agyekum et al., 2022). In most countries, this sector has an impact of 5% to 7% of the country's GDP. It also accounts for an average global spending of USD 1.7 trillion globally (Alaloul et al., 2021). A well-functioning construction industry contributes to improved tourism, better living standards, increased money circulation, sustainable systems, and employment creation which are essential to national development. In 2019 in Kenya, the construction sector contributed 5.6% to the GDP and provided employment to approximately 222,000 citizens (Kenya National Bureau of Statistics, 2020). In 2020 despite the COVID-19 pandemic, the sector was the leading contributor to Kenya's economy. The Economic Survey 2021 reveals that the sector registered a growth of 11.8% providing employment to approximately 230,500 citizens (Kenya National Bureau of Statistics, 2021). This points to its impact to the country's growth and development.

Like many other industries such as Aviation, Tourism, and Hospitality, the onset of the COVID-19 pandemic had adverse effect on the construction industries globally. The construction industry has been subject to partial to full lockdown in most countries to curb the spread of the pandemic. This has been devastating more so for the construction industry which works on a "no work, no pay" basis (Construction COVID-19 Response Task Team, 2020). For wage earning laborers, this meant going for weeks or even months without a source of income. Apart from unemployment, the construction sector also suffered from delay in carrying out projects and disruption of construction supply chains. Following this, countries have come up with different interventions to mitigate the adverse effects brought on by the pandemic to the sector.

In Malaysia, some construction companies have developed their own computer applications to trace the movement of workers on sites, as workers are required to scan Quick Response (QR) codes when they enter any office. Apart from usual temperature checks, construction companies were able to examine workers for other symptoms, which were conducted periodically by doctors who are engaged by the contractors (Olanrewaju et al., 2021). In South Africa, well established construction firms made use of policies which include restricting site access, screening and ensuring the use of Personal Protective Equipment (PPE) and social distancing to mitigate the spread of the virus (Emuze, 2022). However, studies reveal that for proper continuation of business in the "new normal", there is need for companies to rethink and adopt a number of strategies. Some of these strategies include adopting digitization and technology, training employees on new technology and COVID-19 preventative measures, restructuring to improve and strengthen the supply chains, and redirecting capital and resources for construction to where they are most needed. In order to bounce back from the impacts of the pandemic, construction firms should adequately explore the survival and recovery mechanisms. This formed the aim of this study which is to assess strategies towards business continuity for the construction industry during and after the COVID-19 pandemic.

2. Literature Review

2.1. Construction Industry Resilience and Survival during COVID-19

Construction industry resilience is the ability of the industry to perform in the face of expected or unexpected disturbances, in this case the COVID-19 pandemic. Resilience can allow the industry to effectively develop situation-specific responses to the disruptive surprises that can potentially threaten survival, and ultimately engage in transformative activities to capitalize on these events (Chih et al., 2022). The easing of COVID-19 containment measures across the globe has led to construction activities returning to near normal, hence increasing the risk of exposure to the virus. This has necessitated the need to have measures in place to control the pandemic on construction sites. Many agencies such as World Health Organization (WHO), Occupational Safety and Health Administration (OSHA), have proposed a wide range of measures to act as a quick response to the changing mode of the pandemic. For instance, WHO classified into six categories, measures to control the pandemic in construction sites. The measures include: general guidelines, prevention measures (such as cleanings, frequent handwashing, promoting good respiratory hygiene), screening process before entering the site, preventative measures related to the use of transportation, measures before entering the house after a working day, procedure to follow in case of contagion, and stress management measures (PAHO/WHO, 2020). In regards to general guidelines, WHO recommended contractors to assign a focal point to implement and monitor prevention measures, restrict entry to all visitors, ensuring workers feeling unwell stay at home, holding briefings on COVID-19, temperature checks, ensuring social distance at the construction site among others (PAHO/WHO, 2020).

A study done by Agyekum et al. (2022) on construction companies contribution to the fight against the pandemic found that 18.75% of the respondents indicated increased education, 31.25% indicated provision of Personal Protective Equipment (PPEs) such as face shield, sanitizers, disinfectants, hand gloves, face masks, etc., 6.25% had adopted working in shifts, 25% indicated regular testing and adequate checks, 6.25% indicated the use of screening questionnaire and 12.50% indicated the isolation of workers who showed symptoms of sickness. These measures were categorized into two themes 1) increased education and provision of PPEs: According to the respondents, it was important to ensure that various measures are put in place on construction sites to help in the fight against the spread of the virus, and as part of their effort to continually educate their workers. Workers have also been supplied with PPEs. 2) Included regular testing and adequate checks—the respondents stated that they had put in place measures that provided regular and effective checks on entry and exit from the site.

A study done in Malaysia to evaluate measures to prevent the spread of COVID-19 on the construction sites, used Principal Component Analysis (PCA) to group the measures into four categories envisaged to facilitate systemic decision making and to interrupt the spread of the virus on sites hence increasing productivity. The measures were 1) hygiene and control 2) protective equipment and monitoring 3) awareness creation, and 4) use of incentives. In regards to hygiene and control, some of the means for combating the virus were social distancing, hand washing, wearing face masks among others (Olanrewaju et al., 2021). On the other hand, it was important to keep workers informed on the status of the virus and on the government guidelines and regulations on ways to reduce the spread of the virus on

construction sites (Olanrewaju et al., 2021) . In the short term then, some of the strategies adopted by construction businesses included: redistribution of tasks, automation of tasks, constant communication with all sub-contractors, establishing regular briefing meetings and collaborations with the stakeholders (Gamil & Alhagar, 2020) .

2.2. Post COVID-19 Recovery for Construction Industry

The safety guidelines enforced due to the COVID-19 pandemic has affected the construction sector, which is one of the highest labor-intensive industries. The construction industry stakeholders should not overlook these effects but instead formulate feasible solutions directed at post COVID-19 recovery. Construction leadership council in UK set three stage sustainable path towards recovery of construction sector from the pandemic. The three-pronged plan include restart, reset and reinvent. Restart phase constitutes: increase output, maximizing employment and minimizing disruption. Reset phase entail: drive demand, increase productivity, and strengthen capability in the supply chain. On the other hand, reinvent phase involves: transforming the industry, delivery of better value, collaboration and partnership (Walker, 2020) .

A study conducted by Ebekoziem, Aigbavboa, & Aigbedion (2021) on post COVID-19 recovery for achieving sustainable development goals, suggested that construction industry needs to improve on management efficiency. Furthermore, the construction companies need to accelerate rollout and adoption of digitalization technologies with government support. In addition, the study also suggested new skill building on new tools and technologies, and that the government should increase the budget on infrastructure facilities as part of feasible solution to drive post COVID-19 recovery strategy (Ebekoziem et al., 2021) . The sector is one of the major employers of labor and therefore skill building to close skill gaps in construction workforce and enhance advanced digital cognitive skills, multichannel mechanism supports, vertical integration, collaboration, optimization of construction costs and adjusting financing mechanisms, and strengthening scientific policy advice, are needed to revamp the sector (Ebekoziem et al., 2021) .

Proactive companies are finding creative solutions to deal with the issues brought about by the pandemic in the construction sector to their business in post COVID-19 recovery. As momentum continues to build in the industry, construction companies have engaged in new strategies to rally for long-term successes (Freeman, 2021) . The focus has been directed towards stabilizing and managing supply chain, adoption of new technologies, offsite and modular construction, as well as implementing pandemic-specific contract clauses to mitigate potential damages. Construction companies are protecting themselves through legal means, where contract terms addressing spikes in material costs, contract performance obligations and delay clauses, suspension and termination of works, allow construction business to operate safely to guard against continued disruption in the supply chain (Freeman, 2021) . The global construction industry has been showing signs of recovery since the beginning of 2021 and is projected to have a Compound Annual Growth Rate (CAGR) of 6.0% between 2020 and 2024 (DUBLIN, 2021) . The boost in construction activity post COVID-19 pandemic can be achieved through increased automation, government initiatives along with rising awareness on the pandemic issues (DUBLIN, 2021) . Recovery for construction companies depends on their ability to make reasonable estimates of future cashflows, adoption of data analytics in navigating the crisis, maintaining a fine balance between efficiency and redundancy when managing supply chain, and making sure project controls, risk management, and governance processes can handle all supply chain changes (PWC, 2021) .

In facing economic crisis, one of the most recommended principles of resilience is diversification. Here, the construction firms may diversify into new markets, countries or regions (Yu et al., 2020) . In assessing resilience level of civil infrastructure in New Zealand, Pascua & Chang-Richards (2018) addressed leadership and management, situation awareness, sensitivity to market, innovations, flexibility and diversification, robustness of networks and accessibility to resources, as key indicators of organizational resilience. Resilience of an organization is mainly indicated by strong leadership and management, competent staff, robust supply chain and partnership. In addition, improved training systems and standardized procedures for legislation compliance regarding a crisis also contribute significantly to the improved resilience of the construction sector (Pascua & Chang-Richards, 2018) .

One of the key issues in time of business disruption is maintaining or stabilizing the workforce. Stakeholders of the construction workforce include teams and individuals of a firm, contractors and suppliers outside, as well as collaborating partners (Nassereddine et al., 2021) . At its most effective, full involvement of workers creates a culture where relationships between employers and workers are based on collaboration, trust and joint problem solving. As is normal practice, workers should be involved in assessing workplace risks and the development and review of workplace health and safety policies in partnership with the employer. Employers and workers should always come together to resolve issues (UK Government, 2020) . The risk assessment should identify tasks and activities where work schedules may need to be adjusted to avoid excess numbers of workers on site at the same time, and assess whether some activities can be performed off site, for example through teleworking of managerial and administrative staff. It should also facilitate the safe management of external visitors to the site (delivery of materials, equipment, etc.) as well as identification of the operational changes required if workers or teams of workers have to quarantine (ILO, 2020) . Assessment of the hazards to which the workers may be exposed, evaluation the risk of exposure, and selection, implementation, and ensuring workers use controls to prevent exposure are also key (US Department of Labor, 2021) .

2.3. Gap in Literature

COVID-19 pandemic has had far reaching implications across sectors in various jurisdictions. Consequently, different entities have adopted varying context-specific strategies first to survive through the impacts, and secondly to ensure continuity during and after the pandemic. This scenario is reflected in most of the available literature for example Olanrewaju et al. (2021) reports on how construction stakeholders in Malaysia developed their own computer applications to trace the movement of workers on sites. On South Africa, Emuze (2022) reports that well established construction firms made use of policies which include restricting site access, screening and ensuring the use of Personal Protective Equipment (PPE) and social distancing to mitigate the spread of the virus. Further, Walker (2020) looks at recovery measures

adopted by the Construction leadership council in UK, especially as it relates to employers-worker relationship and risk assessment on sites. On a more global scale, entities such as World Health Organization (WHO), and Occupational Safety and Health Administration (OSHA), proposed a wide range of measures to act as a quick response to the changing mode of the pandemic, but which were intended to be adoptive PAHO/WHO (2020) and ILO (2020) , while others such as Freeman (2021) , DUBLIN (2021) , PWC (2021) give general commentaries on Business Continuity. As such, business continuity and resilience have been demonstrated as being context-specific. With this consideration, are there is no comprehensive study that carried out on the effects of COVID-19 on the construction industry of Kenya, especially with regard to continuity and resilience during and after the pandemic and other similar occurrences. This article therefore contributes to the ongoing global discourse by presenting the Kenyan Construction sector scenario.

3. Study Methodology

The study was aimed at assessing strategies towards business continuity for construction industry during and after COVID-19 pandemic. A cross-sectional survey design involving looking at data from a population at one specific time was employed to capture information on the impacts. COVID-19 pandemic brought far reaching implications in the construction industry. The effects have prompted the construction industry practitioners to rethink their operations during and after the COVID-19. The research questions were structured as:

- 1) What is the level of resilience of contractors' businesses during the pandemic?
- 2) What survival measures did contractors in Kenya consider to avert the impacts of the pandemic?
- 3) What recovery strategies can be adopted to enhance contractors' business in post COVID-19 environment and similar occurrences?

A mixed-method cross-sectional survey design was employed to collect data on resilience, survival and recovery measures adopted by contractors in dealing with effects of the pandemic in Kenya. Mixed-methods cross-sectional survey design was suitable in this study because it enabled deeper understanding of the phenomena being studied by providing quantitative and qualitative information within a specific period of time. Data collection was carried out in March 2021, a year after the onset of COVID-19 and when Kenya was experiencing the third wave of the pandemic. The study employed interview schedules containing open-ended questions and multiple-choice questions. A sample of question included: What are some of the coping measures adopted by your firm to improve your resilience against the pandemic? The open-ended questions were designed to give qualitative data while multiple choice questions resulted in quantitative data. The qualitative aspect of the study enabled the researchers to get in depth views and experience of the contractors about the topic under study rather than the researchers' assumptions. It helped get deep insights of the strategies towards business continuity rather than basing views on numbers generated quantitatively.

Face-to-face data collection was conducted on a sample of 300 contractors who were randomly selected from a pool of 912 contractors in Kenya. Simple random sampling, a probability sampling technique was applied because all contractors were assumed to have been affected by the pandemic, and therefore had equal chance of selection to participate in the study. The response rate was recorded at 82% after receiving 245 complete interview schedules, which met the threshold of 75% and above set by different researchers. The introductory section of the interview schedule collected data on the background information of the respondent, while the other parts were designed to answer the research questions. Quantitative data analysis was performed using descriptive statistics such as mean, standard deviation and frequencies, while qualitative data analysis was conducted using word frequency query and text search query. The output was presented using graphs, tables and figures.

4. Findings of the Study

4.1. Demographic Information

Majority (24.7%) of the respondents had between 4 - 7 years of experiences as contractors in the construction industry of Kenya. Furthermore, 23.0% of the respondents had 8 - 11 years of experience, while the minority (8.6%) of the respondents had between 16 - 19 years of experience as contractors in the construction industry of Kenya (Figure 1).

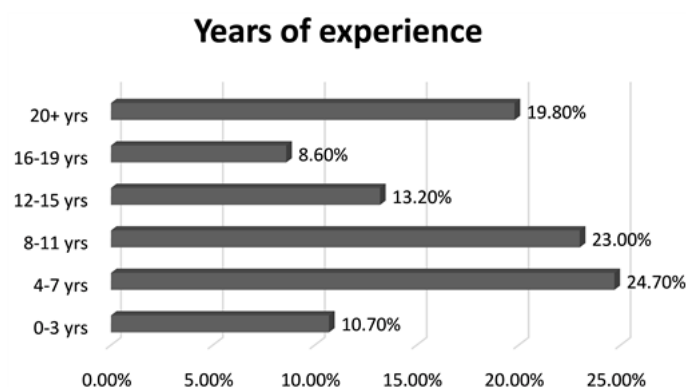


Figure 1. Respondents by years of experience. Source: Authors.

4.2. Business Resilience of Contractors

Resilience of contractors helps define the construction sector during the pandemic. Literature suggested 9 indicators that can be used to assess level of resilience of contractors during a pandemic. These indicators were presented to respondents to rate on a scale of 1 - 10 where the values greater than five indicated high resilience while values less than five were indication of low resilience.

Level of innovation and creativity was ranked highest with a mean value of 4.96. 38.78% of the contractors indicated low level of innovation and creativity, 21.63% indicated average while cumulatively 39.59% of the contractors indicated high level of innovation and creativity. Profitability during the pandemic had the lowest mean of 2.96 with 78.37% of contractors recording low profitability, 12.24% of the contractors recorded average profitability while 9.39% of contractors recorded high profitability (Table 1). The mean values of the indicators were all recorded at less than five, an indication of low level of resilience during the pandemic.

Indicators of Resilience	Resilience Level			Mean	Standard Deviation	Mean rank
	Low	Average	High			
1) Level of innovation and creativity during the pandemic	38.78%	21.63%	39.59%	4.96	2.45	1
2) Capacity to make key resilience building decision during the pandemic	40.00%	23.27%	36.73%	4.93	2.41	2
3) Strength of your network	42.46%	23.27%	34.27%	4.92	2.50	3
4) Flexibility and diversification	43.67%	24.90%	31.43%	4.70	2.52	4
5) Ability to engage/manage employees during the pandemic	43.68%	26.94%	29.38%	4.58	2.43	5
6) Accessibility to resources	58.78%	19.18%	22.04%	3.99	2.44	6
7) The extent of recovery from the pandemic	61.23%	17.55%	21.22%	3.94	2.10	7
8) Level of productivity during the pandemic	61.63%	19.59%	18.78%	3.93	2.13	8
9) Profitability of your business during the pandemic	78.36%	12.24%	9.40%	2.96	1.94	9

Table 1. Measures of business resilience.

Source: Authors.

4.3. Survival Measures

In order to ascertain the survival measures adopted by the contractors amid the pandemic, a list of measures was presented to contractors to state the survival strategies they had employed. The majority (76.33%) of the respondents had ensured honest and early communication to the employees. 60.82% had revised their working programs and ensured redistribution of workloads to employees. 58.37% of the contractors had trained their employees in different areas of specialization in order to enable them perform multiple duties. 51.43% of the contractors helped their employees realize their potentials by setting short term goals and enabling them to be part of innovative solution in curbing the spread of the virus. However, most of the contractors did not consider offering retention bonus to employees as a survival measure; this could be as a result of disruption in cashflow that had been experienced. On the other hand, automation of some tasks that are redundant was considered a long-term strategy, hence was only adopted by 23.27% of the contractors (Table 2).

Activities	N	percentage
1) Honest and early communication to the employees about the state of the business.	187	76.33%
2) Redistribution of workload	149	60.82%
3) Employees were cross-trained and able to perform multiple duties.	143	58.37%
4) Helping employees to set short term goals and being part of innovative solutions.	126	51.43%
5) Every team takes an audit of their work	99	40.41%
6) Adoption of remote working	74	30.20%
7) Automation of some tasks that are redundant	57	23.27%
8) Retention bonus were offered to employees	38	15.51%

Table 2. Survival measures.

Source: Authors.

In addition, creation of employees' welfare mostly to skilled and non-skilled workers, working in shifts, conducting online site meetings, and considering multiple sources of revenue, were other survival measures that the contractors had adopted in keeping their businesses afloat.

4.4. Recovery Measures

The new global environment that the COVID-19 pandemic has presented has made recovery strategies unavoidable. From the literature, 10 measures were identified that can lead to construction contractors' recovery from the pandemic. The measures identified were subjected to a rating scale of 1-10 to gauge the opinion of the contractors in terms of their adoptability. Measures that were rated above 5 were considered important and could be adopted, while measures that were rated below 5 were less important strategies. According to the findings, re-establishing work programs was highly ranked with a mean value of 6.90. Assessing risk by identifying areas of weakness was second in rank with a mean value of 6.82. However, establishing a work from home policy had lowest mean rank (4.04), meaning it was not an adoptable strategy. Contractors cited that construction works require workers to be present onsite as it would be very difficult to work from home (Table 3).

Measures	N	Mean	Std. Dev.	Mean rank
1) Re-establishing work programs	245	6.90	2.63	1
2) Assessing risk by identifying areas of weakness	245	6.82	2.69	2
3) Preparation of an action plan for each critical service for the business	245	6.61	2.73	3
4) Ensuring employees have access to health insurance	245	6.44	2.92	4
5) Planning your supply chain to minimize disruption	245	6.33	2.62	5
6) Securing an inventory of materials for business continuity	245	6.15	2.58	6
7) Assessing inventory and resource capacity	245	6.08	2.52	7
8) Adoption of automation of some tasks	245	5.8	3.19	8
9) Obtaining business interruption insurance	245	5.37	3.25	9
10) Establishing a work from home policy	245	4.04	3.08	10

Table 3. Recovery measures.

Source: Authors.

Qualitative data was generated from the open-ended question where contractors were asked to indicate measures that can enhance business continuity of contractors in the wake of COVID-19 pandemic. A range of feedbacks were given by the contractors, and the information were analyzed to inform this section's findings. A word frequency diagram was generated to illustrate most occurring words that majority of the respondents stated. This generated three main themes being 1) education and awareness, 2) financial measures, and 3) Ministry of Health (MoH) guidelines.

Theme 1 on education and awareness creation through training of construction industry practitioners on matters COVID-19 was stated by many respondents as one major step to address the impacts of the pandemic and hence a pathway to recovery (Figure 2). Theme 2 under financial measures presented measures such as the allocation of emergency funds, having multiple sources of revenue, prompt payment by clients, access to loans, provision of incentives by the government among others. Theme on Ministry of Health (MoH) guidelines emphasized the need to adhere to COVID-19 guidelines put by MoH. Some of the suggested measures under this theme included COVID-19 testing and temperature checks, wearing of face masks, social distancing, vaccination among others (Figure 2).

Being the most occurring word, a text search query for "training" was performed to highlight feedbacks that were recorded by the respondents. Most of the recommendations were on trainings related to employees in regards to the prevention of the pandemic and any future uncertainties (Figure 3).



Figure 2. Word frequency diagram. Source: Authors.

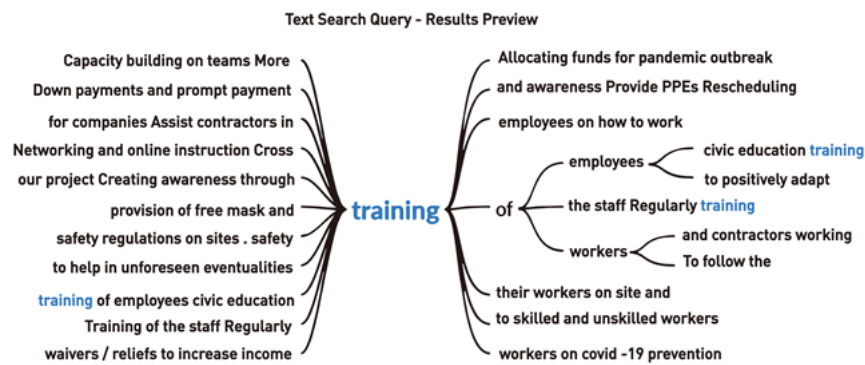


Figure 3. Text search query output. Source: Authors.

5. Discussion of the Findings

5.1. Business Resilience of Contractors

The resilience of construction industry is critical during the changing environment of COVID-19 pandemic and beyond. This paper assessed indicators of resilience identified from the literature, which forms part of this paper's discussion. The mean values of the indicators of resilience assessed were all recorded below the average, an indication of low level of resilience by the contractors during the pandemic. However, it is worth noting that despite the global construction sector being caught unaware by the pandemic, level of innovation and creativity with mean value 4.96, the capacity to make key decisions during the pandemic (4.93), the strength of contractor's network (4.92), the flexibility and diversification (4.70), and the ability to manage employees during the pandemic (4.58), were slightly below the average value of 5. In addition, the study findings showed low level of productivity and profitability, and low level of accessibility to resources during the pandemic. A separate study conducted on construction projects in UK yielded similar results; that some construction firms have experienced 35% loss of productivity from the COVID-19 pandemic (Sturm, 2021) . Stagnant productivity, low levels of digitization, and low profitability dogged the construction industry (Biörck & Sjödin, 2020) .

5.2. Survival Measures for the Construction Sector

The impact of COVID-19 in the construction sector has necessitated the need for the industry practitioners to consider survival measures to help the industry remain afloat. This paper findings outlined key measures that the contractors took to combat the effects of the pandemic. The highest ranked measure is honest and early communication to the employees (76.33%), followed by redistribution of workload (60.82%), cross training of employees (58.37%), and helping employees to set short term goals and being part of collaborative solutions (51.43%). These findings are in line with findings from a study conducted by Gamil & Alhagar (2020) that, some of the strategies adopted by construction businesses are redistribution of tasks, constant communication and briefings. On the other hand, Olanrewaju et al. (2021) asserts that measures to interrupt the spread of the virus can be categorized into hygiene, protective equipment and monitoring, awareness and incentives. In addition, this paper highlights that the creation of employee's welfare, working in shifts, conducting online site meetings, and having multiple sources of revenue as having been considered by many contractors. In terms of contributing to fight against the pandemic, 6.25% of the firms had adopted working in shifts (Agyekum et al., 2022) .

5.3. Recovery Measures for Construction Sector

Despite having survival measures put in place, these are just but short-term strategies. The construction industry needs to look beyond the COVID-19 pandemic and craft solution-oriented recovery strategies. This study presents wide array of measures that construction contractors consider to be vital in ensuring stability post COVID-19 pandemic. Reestablishing work programs was highly ranked measure with a mean value of 6.90. This is in line with global practices where leading engineers and contractors are using 4D and 5D simulation to replan projects and reoptimize schedules (Biörck & Sjödin, 2020) . The study further asserts that, there is need to assess risks by identifying areas of weaknesses. This is in line with practice where to better be able to adapt to the risk levels, construction work tasks should assess the risk of exposure, and select, implement, and ensure workers use controls to prevent exposures (US Department of Labor, 2021) . As a normal practice, workers should be involved in assessing workplace risks and the development and review of workplace health and safety policies (UK Government, 2020) . Conducting and documenting site-specific assessment of every individual at the risk of contracting COVID-19, and formulating risk control measures was also recommended in line with guideline of ILO (ILO, 2020) . This paper also ranks preparation of an action plan as the third post COVID-19 recovery measure. This is in line with the observation that Project Managers and Contractors need to adopt their existing risk action plans with necessary updates and revisions as required (Adhikari & Poudyal, 2020) . Ensuring employees have access to health insurance was ranked fourth.

Planning supply chain was ranked fifth by the respondents as a post COVID-19 recovery strategy. Globally, proactive companies were noted to have also engaged in new strategies to enhance long term successes with more focus being directed towards stabilizing and managing supply chains (Freeman, 2021) . Other measures noted include: securing inventory of materials, assessing inventory and resource capacity, adoption of automation of some tasks, and obtaining business interruption insurance.

Qualitative aspect of this paper provided a range of measures that have been deemed important for the construction industry. In the Word frequency query, awareness and training were found to be the most used word in regards to road map to COVID-19 recovery. Key training issues were directed towards the safety of employees. This finding is supported by a study done by Emuze (2022) that, there is need to rethink and adopt strategies such as training employees on new technology and COVID-19

preventive measures. Pascua & Chang-Richards (2018) asserts that improved training system and compliance procedures regarding a crisis significantly contribute to resilience of construction sector.

6. Conclusion and Recommendations

The present paper acts as a significant guide to the study of business continuity in the construction industry during and after the COVID-19 pandemic by uncovering the survival and recovery measures perceived by the construction contractors in Kenya as being effective in dealing with the pandemic. The results of this paper show that for the contractors to survive during the pandemic, they must demonstrate honest and early communication about the state of the business, ensure redistribution of workload, ensure employees are cross-trained to handle multiple tasks and be part of innovative solutions. Working in shifts, considering multiple sources of revenue and automation of some tasks are also crucial survival measures highlighted. On the other hand, the results show that, post COVID-19 recovery can be achieved by contractors demonstrating ability to re-establish work programs, undertake risk assessment, prepare action plans, ensure accessibility to health insurance and securing inventory of materials. To enhance the resilience of the industry, focus should be directed towards innovation and creativity, resilience decision making, networking, flexibility and diversification, management, accessibility to resources and productivity. Many of the proposed measures have been marked important by the contractors in Kenya, however, the question remains their capacity to adopt these measures. While the measures presented may not be exhaustive, it forms an important theoretical and empirical background by bringing vital evidence on the survival and recovery measures perceived by Kenyan construction contractors in effectively dealing with the pandemics and similar occurrences. The findings should act as a significant guide to the industry practitioners and policy makers when making decisions for the industry. The limitation of the research is related to the nature and amount of data analyzed which could not allow predictive analysis. Further studies should focus on more rigorous predictive analysis perspective to explore this phenomenon.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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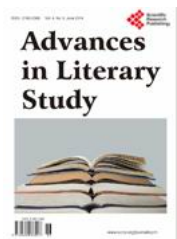
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