

Post-Pandemic Factors Improving Performance in Building Projects of Sindh. A Contractor Perspective

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Abstract

Coronavirus highly damaged the construction industry globally including the construction industry of Pakistan. The coronavirus impacted the world economy as well as health sectors. The government decreased the construction budget for ongoing projects which affected the performance of projects and has a negative outcome for stakeholders, resulting in financial crises in the completion of projects. This research examines factors that could improve the performance of building projects in Sindh after the post-pandemic. This research used quantitative analysis through a questionnaire survey form, distributed to employees working with contractors and involved in building projects in Sindh Pakistan. Received data analyzed through the Average index method to identify factors were (1) Revising the project budget, (2) a safe working environment, (3) improving the e-communication system, (4) centralizing project data, (5) Timely payment, (6) Extension of time, and (7) Timely decision making. This finding helps construction stakeholders manage and improve building projects' performance after the post-pandemic situation.

Keywords

COVID-19, Building Projects, Project Performance, Project Challenges

1. Introduction

COVID-19 has the biggest challenge worldwide. Kalumbu Nsefu & Mishengu Mwanaumo, (2021) mentioned that COVID-19 has negative effects on project performance and reduced productivity for certain reasons. One important reason is employees were forced to stay away from each other and isolate themselves to avoid the spreading of infections. Sami Ur Rehman et al., (2022) informed that during COVID-19, the UAE construction industry faces several issues such as delays in revising schedules, disturbance of cashflow, delaying in permits, materials inspection and approvals, health and safety issues, shortage of material on site, and travel restriction that impact timely completion of projects. The UAE government and construction industry take initiatives such as providing support programs, digitalization of processes, implementing heavy fines, providing health facilities, and implementing new policies to reduce the impact of COVID-19 and improve the performance of projects. Khalef et al., (2022) mentioned that COVID-19 had a severe impact on the construction industry as well as other industries also. Shortage of materials, equipment, and human resources, and lack of project data negatively affect construction projects. The stakeholders should take early action on time and procure the materials timely to save from expected delays on projects. King et al., (2021) informed that Contractors were highly affected and faced several problems during the pandemic period. Contractors should improve existing strategies and policies to manage the performance of projects and contractors could better manage the problems. Nguyen et al., (2021) informed that during COVID-19, Vietnam's construction industry was highly affected and faced many challenges to completing the project on time and at cost. COVID-19 impact on multiple sectors as mentioned in Fig.1.

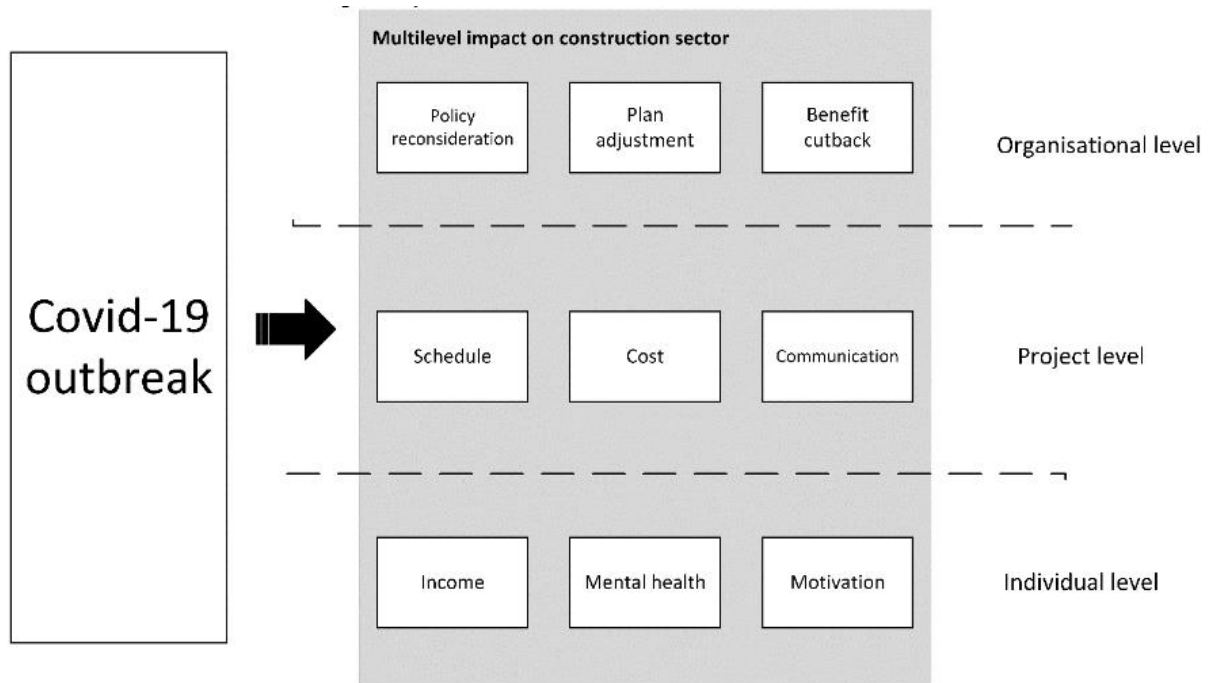


Fig. 1. Impact of COVID-19 on the construction sector (Nguyen et al., 2021)

Sohil et al., (2021) described that the overall world facing COVID-19 pandemic issues but those countries that have very low resources difficult to control it. During a small period, around 2.15 million people died across the world and 100 million were affected. The national command operation center (NCOC) of Pakistan identified that more than half a million suffered during the pandemic and eleven thousand were dead across the country Pakistan. For controlling that situation, the Government of Pakistan put a complete lockdown to control the spread of coronavirus as much as possible. Khan et al., (2022) mentioned that the COVID-19 Pandemic huge impact on the economy of Pakistan, and the construction sectors have been completely closed that affected and increase problems for employees/labor, especially for daily wagers. Increasing project time, re-mobilization of contractors, incomplete documents, and lack of e-communication channels were observed as major issues during the pandemic situation. The stakeholders should be equipped with the latest technology to manage and improve the performance of the projects even in a pandemic situation. According to Shaikh et al., (2021b), to acquire maximum effectiveness and efficiency, stakeholders should pay attention to rewards for high performance because the success and failure of workers depend upon the efficiency and effectiveness of the workforce at the workplace. Asghar et al., (2020) observed that COVID-19 hit Pakistan's economy and paralyzed around 5 lacs people in Pakistan. The government of Pakistan announced relief packages to compensate lower-class labor and provide foodstuff for lower-class families for survival. The government should initiate to make new policies and strategies and provide a safe working environment for the re-mobilizing of workers.

2. Literature Review

As research discussed, project performance issues have been commonly observed during the COVID-19 period. COVID-19 affected on world construction industry including the construction industry of Pakistan. Timilsina et al., (2021) mentioned that COVID-19 highly impacts the construction industry of Nepal. The government of Nepal had a reduced financial budget for the construction industry which highly affected the contractor's performance to complete the project on time. The government needs to build the mechanism and support the construction industry by revising of budget to manage and complete the projects on time. Once the issues have been taken on an early stage and discussed, the performance could be improved. Larasati et al., (2021) informed that during the COVID-19 period, contractors were mostly affected, and impacted cost performance as compared to other stakeholders. During the implementation of new procedures, contractors cover the extra cost implementing of health protocols. In that situation, the contractor faces financial problems to complete the remaining part of project in a short amount which affects the performance of the project. Stakeholders should revise the project budget to compensate the contractors that could

complete the remaining part of the project. Pamidimukkala & Kermanshachi, (2021) mentioned that COVID-19 highly impact site and office working team in the construction industry. During COVID-19, project performance could be improved by increasing the level of information, stakeholders must educate the project force regarding new COVID-19 guidelines and procedures and make sure to implement them during work and maintain and establish an effective communication system. Al Amri & Marey-Pérez, (2020) informed that the construction industry of Oman was highly affected by COVID-19. All the major projects were delayed in completion because of travel restrictions and the supply of materials was a major issue due to the closed of borders. The worst economic condition of the construction industry impacted employees and stakeholders suffered to manage the operating cost.

Performance of projects can be observed by the completion of projects on estimated time and cost. Memon et al., (2021) informed that for successful measurement of the performance of projects, cost and time factors are basic parameters. Currently, the Construction industry facing poor performance issues due for several reasons. The high price of equipment, inconsistency in material price affecting cost performance and contractor financial problems, and incomplete project data affect project time performance. For improving time and cost performance, stakeholders should communicate and mitigates the issues that could help them improve project performance. Memon et al., (2019) mentioned that for the success of any project, time and cost is a key principle for measuring performance. Poor performances have been observed in Pakistan's construction industry. Communication, shortage of skilled personnel, and obtaining permits from government authority was major issue faced by a construction project in Pakistan. Soomro et al., (2019) conducted a study to identify time factors that affected building construction projects in Pakistan. Lack of contractor experience, contractor financial problems, change in scope during construction, and shortage of labor was observed main cause of time overrun in building projects. Stakeholders should control these factors through proper communication between stakeholders. Shaikh et al., (2021a) illustrated those positive relations between supervisors and workers create a positive environment through that employees can share their ideas, develop their skills and face challenges. Abdul Momeet, et,al (2022) mentioned that health and safety and environmental factor one of the important issues to impact the performance of projects. The unavailability of skilled staff was a major issue faced by stakeholders. Proper training should be provided to the staff to increase the level of information. Akhund & Memon, (2016) identified time overrun factors that affected construction projects in Sindh Pakistan. Issues in quality of works, incomplete project information, delivery of material, lack of communication system, working relationship between stakeholders, make changes in design and scope was observed as a major cause of time overrun in construction projects in Sindh. The factors could be controlled through remedial measures and effective communication, improving working relationships between stakeholders, procuring material on time, and providing complete project information could reduce the impact of time overrun. Akram et al., (2017) identified cost overrun factors that affected construction projects in Pakistan. Inflation in prices, increased project cost, delay in decisions, changes in design, inadequate planning, and scheduling, frequent changes in scope, inaccurate estimation, payment problems, and shortage of skilled labor were major factors causing project cost overrun. Timely decisions and frequent communication between stakeholders could reduce the impact of cost overruns of construction projects in Pakistan. Sohu et al., (2018) mentioned that cost overrun was one major problem for building construction projects in Sindh Pakistan. Increasing material pricing, incomplete project information, payment problems, poor site management, timely decision-making, and incomplete project information were observed as major factors that cause the cost overrun in the building project in Sindh. Shaikh et al., (2018) informed that for achieving target metrics, stakeholders focused on payment factors and time management which are creating a positive effect on productivity and enhancing innovation and create and help in solving critical problems.

This study conducts a detailed literature review on the performance of building construction projects in Pakistan. From extensive literature, this research identified the factors that frequently affected building construction projects in Sindh. From identified factors, this research highlighted important factors by conducting a quantitative method that could be helpful for contractors' firms to manage building projects smoothly during any expected pandemic period.

3. Aims and Objectives

This research aims to identify important factors that could support improving performance in building projects in Sindh even in a pandemic situation. The identified factors gave direction to all building construction stakeholders to take an early action plan to reduce the impact of a pandemic on running projects.

4. Methodology

An extensive literature review has been conducted to identify factors that normally affected the performance of building construction projects. A quantitative approach was used for the collection of data from respondents. This research focuses on the contractor sector because, during COVID-19, this sector was highly affected. A questionnaire survey form was designed based on the contractor's perspective and chose the factors that most affected building construction projects. Questionnaire survey form was distributed among employees working with contractor firms in building projects in Sindh Pakistan. The purpose of the study is to approach and collect data from those employees who suffer and have experienced managing the performance of projects during the COVID-19 period. The employees requested to choose important factors that could be beneficial for the contractors' firms and the contractors could improve their performance by using chosen factors even during the pandemic period. Received questionnaires survey forms analyzed through the Average Index Method because the Average Index Method is very popular in analyzing data for research works. The result and suggestion could help the building contractors of Sindh to include factors in the contract clause that could be used in an expected pandemic situation to reduce the impact of COVID-19 on building projects in Sindh Pakistan. The methodology chart has provided in fig – 2.

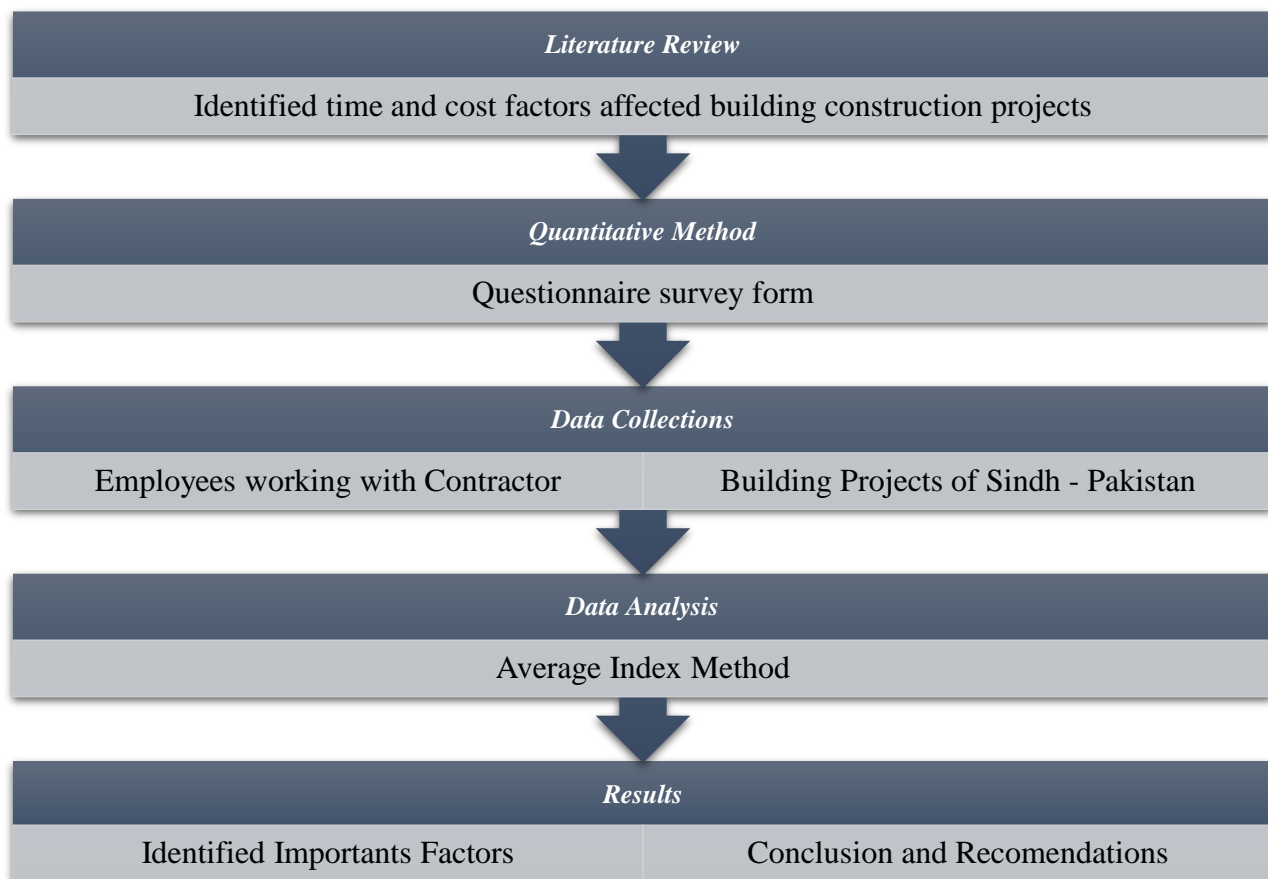


Fig. 2. Methodology Chart

5. Data Collection

A total of 110 questionnaire survey form has been sent to different employees working with different contractors' firm around building projects in Sindh. Mostly mega building projects are constructed in major cities of Sindh such as Karachi and Hyderabad. Ashraf et al., (2022) informed that Karachi city is the biggest city in Sindh -Pakistan and has around 16 million of population. Multiple mega projects are running in the city of Karachi to provide basic facilities for citizens. Out of 110 questionnaire survey forms, 93 questionnaire survey form has been received from the respondent; the majority was from building projects in Karachi Sindh. Received survey forms were analyzed through

the average index method. A five Likert scale was used as 1 = Not Important; 2 = Slightly Important; 3 = Moderately Important; 4 = Important; 5 = Highly Important. AI is calculated by using the following formula.

$$AI = \frac{\sum (1X1 + 2X2 + 3X3 + 4X4 + 5X5)}{\sum (X1 + X2 + X3 + X4 + X5)}$$

<p>Where, $\sum (X1 + X2 + X3 + X4 + X5)$ X1 = Number of respondents on a scale of 1 X2 = Number of respondents on a scale of 2 X3 = Number of respondents on a scale of 3 X4 = Number of respondents on a scale of 4 X5 = Number of respondents on a scale of 5</p>	<p>Evaluation ranges to assess Important levels, 1.00 < AI < 1.50: Not Important. 1.50 < AI < 2.50: Slightly Important 2.50 < AI < 3.50: Moderately Important 3.50 < AI < 4.50: Important 4.50 < AI < 5.00: High Important</p>
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6. Results and Discussion

A total of ninety-three questionnaire survey form has been received from different categories of employees having different years of experience. A questionnaire survey form was reviewed and analyzed to get the outcome of the research. Those factors having AI more than 3.5 has been considered for this research.

6.1 Respondent Year of Experience

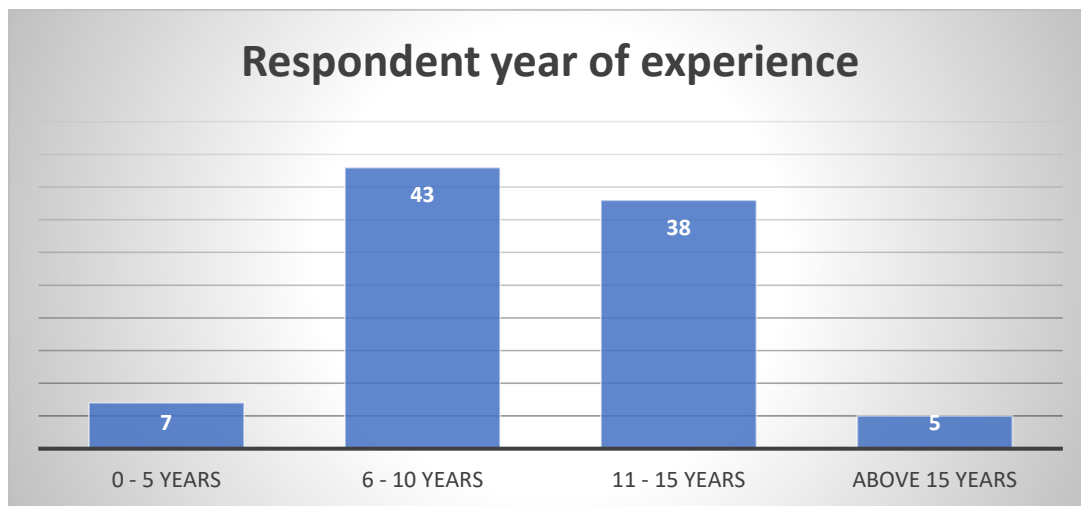


Fig. 3. Respondent year of experience

Figure 3 shows the respondents' total years of experience working in contractor firms. 7 respondents have working experience between 0 – 5 years, 43 respondents have working experiences between 6 – 10 years, 38 respondents have working experiences of 11 – 15 years, and 5 respondents have working experience of more than 15 years.

6.2 Factors Improving Performance of Building Project

Extensive literature identified seventeen important factors that affected the performance of building projects. Out of seventeen factors, most of the respondents choose seven factors that could help to improve the performance of building projects during the pandemic situation. Figure 4 shows seven important factors (1) Providing a safe environment, (2) Revising the project budget, (3) Centralizing project data, (4) E-Communication, (5) Timely payment, (6) Extension of time, and (7) Timely decision-making.

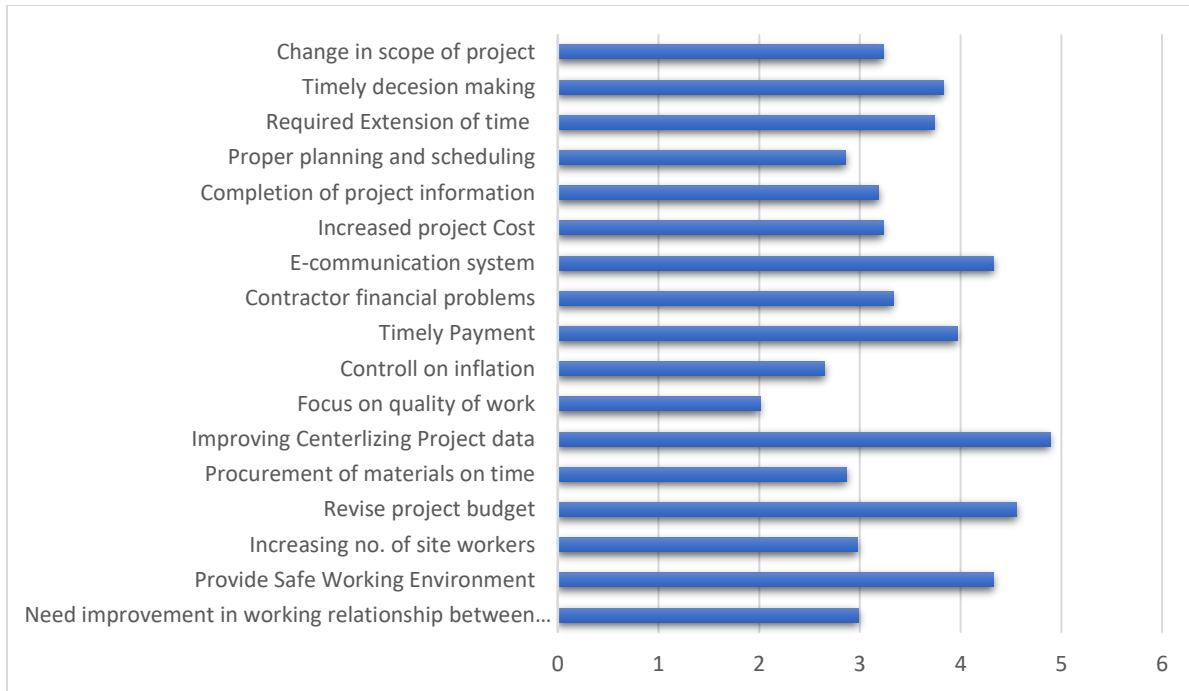


Fig. 4. Factors improving performance.

6.2.1 Provide a Safe Environment

A safe working environment was a top priority during the pandemic situation. Most employees prefer working remotely from home, and site management including the team could not perform and be stuck during the lockdown. After post-pandemic, the government and construction stakeholders decided to re-mobilization of work during the pandemic by implementing new policies and providing a safe working environment. Hussain et al., (2021) mentioned that construction stakeholders should design the plan and working procedures and implement them on projects. If the contractor provides a safe working environment, it could support employees to improve performance during working in the pandemic and the project could complete on time.

In addition, contractor firms should take precautionary measures on-site as well as office, by providing health and safety kits, working at a social distance, providing masks at the entrance of each door, providing hand sanitizing, and maintaining proper cleaning of offices and sites to smoothly completion of projects even in the pandemic period.

6.2.2 Revise Project Budget

Coronavirus highly damages Pakistan's economy. Pakistan's construction industry was on its way to improving and managing projects timely. But suddenly restrictions and implementation completed lockdown across the country; the Pakistan government deducted/reduce/cut the financial budget of construction that highly affected building projects in Sindh and resulting in all building projects have been frozen and delayed in completion. Larasati et al., (2021) informed that for re-mobilizing of contractors and projects, the client should revise the project budget to provide a safe zone for contractors to complete the remaining part of a project that was affected during the pandemic. Contractors mostly cover their budget for implementing health protocols at project sites. The responsibility of the government/client provides or revise the project budget that could support all contractor firms to the early completion of the project.

6.2.3 Centralizing Project Data

Centralizing data is one of the key elements of managing the information in any project. During the peak period of COVID-19, employees working remotely highly suffer from missing project data. Unexpected situation and complete lockdown during COVID-19, all employees were allowed work from home which affect performance. From the pandemic experience period, the contractor should upgrade, update, and centralize project data that every single employee could access remotely with implement data privacy rules and regulations. Khahro et al., (2020) mentioned that without centralized project data and information, a good project management activity will no longer exist. For managing the projects during the pandemic period if data is centralized it could support the improving performance of projects.

By centralizing project data, the performance of the project could be monitored, and contractors could take early steps to improve the timely completion of projects.

6.2.4 E – Communication

For the success of any project, communication is an important tool for the completion of the project on time. During COVID-19, communication was observed regarding sewer issues between employees and stakeholders. Lack of communication and tools affected contractor work and performance of building projects during a pandemic. Most contractor firms suffer during the pandemic by not properly communicating with clients and consultant team members regarding project progress. Pamidimukkala & Kermanshachi, (2021) informed that an important approach during a pandemic for site and office team workers should adopt proper communication through various tools. Most of the problems could be resolved through timely communication between stakeholders. Khahro et al., (2020) advised that several tools could be helpful during a pandemic for employees for managing the performance of projects, such as teams' meetings, emails, skype, zoom meetings, what's up, Imo, and facetime.

E-Communication could be suitable for employees working remotely managing the project's progress smoothly. Timely communication and resolving issues could improve the performance of projects even during the pandemic period. It's the responsibility of contractors upgrades the e-communication system, so every single employee could communicate frequently.

6.2.5 Timely Payment

Contractor firms mostly faced payments issues, and delays from the Client. Due to the economic crisis of COVID-19, construction stakeholders face a shortage of funds, especially contractors. Most funds have been used to control the spread of COVID-19. The client could not pay the contractor invoices timely which affects performance on projects. Timilsina et al., (2021) mentioned that late payment problems faced by contractors cause overrun costs of the projects. The client makes ensures timely payment to contractor firms to reduce the impact of cost overrun of projects.

6.2.6 Extension of Time (EOT)

COVID-19 highly impacted construction projects around the world including Pakistan building projects. During lockdowns and restrictions, building projects in Pakistan suffer increasing project costs and time. King et al., (2021) suggested that the client must provide an Extension of time to contractor firms, to complete the remaining parts of a project that affect and delay due to the lockdown. The revised schedule submitted by contractors mentioning a new finishing date due to a delay that is not the contractor's fault should be reviewed and approved by the Client and Consultant timely to support the contractor to finish the project smoothly.

6.2.7 Timely Decision Making

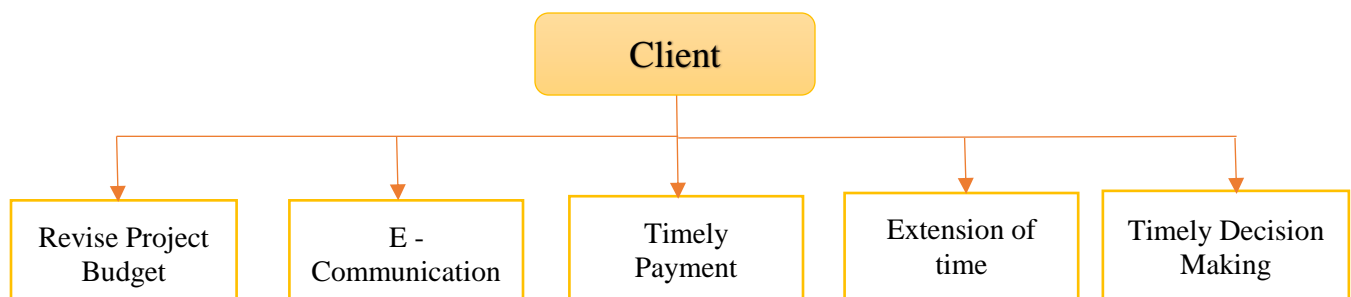
Timely decision-making is very important for the success of any construction project. In the construction industry, stakeholders must take early, jointly, and right decisions on time that could help in the completion of the project successfully. Taking wrong decisions could create several causes in terms of cost, time, and relationships between the stakeholders. During COVID-19, construction stakeholders were forced by the government to shut down their activities and were not able to take decisions, on how to manage the employees and the performance of projects. Shabbar et al., (2017) mentioned that making slow decisions from the Client affects the performance of projects. Dastyar et al., (2018) suggested that timely decision-making on different occasions of the project could improve the performance of projects.

7. Factors Related with Stakeholders

The identified factors from this research have relate with stakeholders mentioned and describe:

7.1 Factors Related with Client

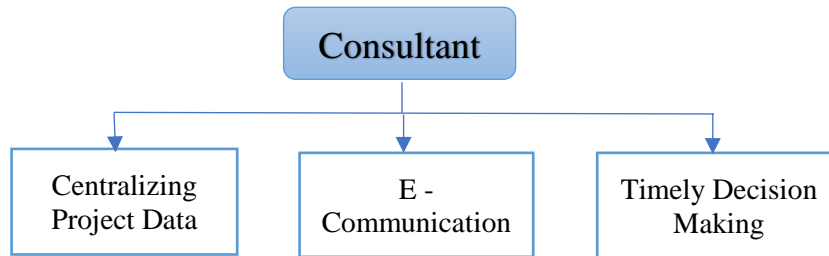
There were multiple factors related with client that client need to focus during pandemic could support the contractors to improve building project performance.



It has been suggested that during any expected pandemic situation, client should support the contractor to revise the project budget to manage the pandemic situation, provide extension of time to complete remaining part of project, and timely payment to contractors that could allow contractor to manage the project smoothly, contact all stakeholders through e – communication to be update about the project status, and support in timely decision-making to improve the performance of projects.

7.2 Factors Related with Consultant

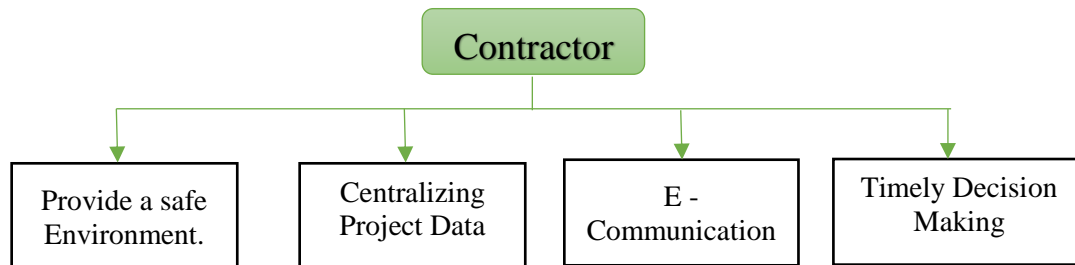
There were some factors related to consultant that consultant need to focus during pandemic could support the contractors to improve building project performance.



It has been suggested that during any expected pandemic situation, consultant should support the contractor to centralizing the project data that every one could have access remotely, contact with client and contractors through e – communication such as teams application, Zoom application, WhatsApp, and emails to easily exchange of information to discuss about the project progress, and provide support in timely decisions to improve the performance of projects.

7.3 Factors Related with Contractor

There were multiple factors related to contractor that contractor need to focus during pandemic could support the contractors to improve building project performance.



It has been suggested that during any expected pandemic situation, contractor should provide a safe working environment for all employees and workers that every employee should feel safe and secure during working in pandemic period, project data should be centralized and easily accessible for all employee to update the project progress accordingly, contractor should communicate with their employees, consultant and client through e-communication channels to be update about the project progress, and contractor should take timely decision to reduce the impact of pandemic during construction and it could improve the performance of projects.

8. Conclusion

Construction projects in Pakistan highly suffered during the pandemic especially building projects in Sindh. Construction stakeholders could not bear the burden of lockdown and closing of projects, and its impact on performance efficiency. During the reopening of construction projects, many contractors suffer re-mobilizing of building projects and face financial crises. This paper examines important factors that could be helpful for contractors

to carry out construction activities during a pandemic by implementing and including new factors in the contract clause; safe working environment, revising project budget, centralizing project data, e-communication, Timely payment, Extension of time, and Timely decision making. This paper advises contractors and clients who should include the above factors during signing the contract for managing the projects even during the expected pandemic period. Implementation of new policies and procedures could be helpful for a contractor to smoothly finish projects during a pandemic situation.

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