

COVID-19's Effect on a Hotel Construction: A Case Study

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Abstract: The COVID-19 pandemic has unprecedented impacts on different sectors around the globe. The effects observed in developing countries are even more severe. **Some projects stopped while many have cost and time overrun issues.** This paper conducted a case study on the COVID-19's effects on a hotel construction project in Nepal. The study reviewed the literature on COVID-19 and its impact on construction sectors and conducted a semi-structured interview with the project's personnel. The interview response was analysed and the contributing factors that impacted the project and its performance were identified. The paper found financial, operational, contractual, safety, and risk management issues in the hotel project. Overall, the project cost increased by 32% where the material cost increased by 35% and labor cost increased by 28%. This research discusses causes, measures, and provides a broad perspective of the problems, significant challenges, and opportunities associated with the effects of COVID-19 on the construction industry. The Owner as well as the Contractors incurred added costs because of COVID-19. The paper identified contributing factors and presented the challenges which could be used as opportunities to minimize unforeseen impacts of the pandemics in near future. The lesson learned from this case study was that the labor cost and materials cost could have been minimized if the Owner and the Contractor had established alternative resources such as using locally available labor, materials, and alternative suppliers.

Keywords: COVID-19, pandemic effect, semi-structured interview, cost analysis

INTRODUCTION

In the year 2020, the COVID-19 had been a major threat to billions of people worldwide. The COVID-19 has impacted almost every business for developed and developing countries [1]. Construction industries are no exception. Comparatively, the outbreak imposed more threat to developing countries like Nepal.

This paper is mainly focused on the assessment of the challenges faced by the hotel construction sector in Nepal. As shown in figure 1, the tourism number dropped significantly in Nepal in the year 2020 due to the COVID-19 pandemic. The hotel industry whose revenue is based on the number of tourist visits was highly impacted.

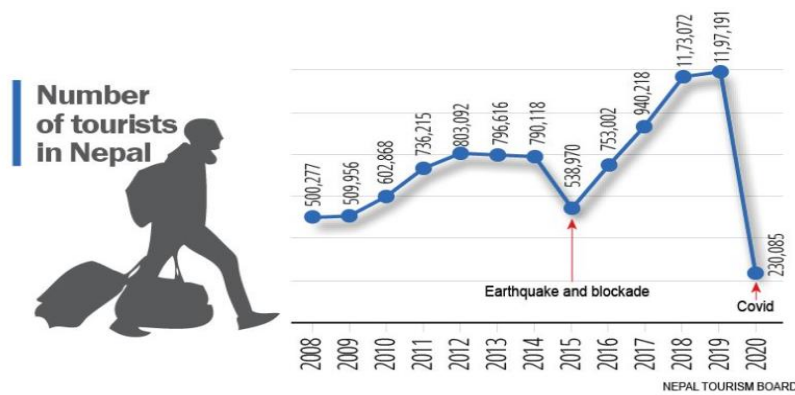


Figure 1. Nepal tourism statistics (Source: Nepal tourism board 2020)

In this case study, not only the Owner but also the Contractor has been affected due to COVID-19 and its subsequent lockdowns. The study identified the underlying problems and analysed their financial and operational impacts on the project performance. The study further established the strategies through the lesson learned to address those problems in the building or hotel construction industry in future. Thus, the research objective is to identify problems caused by COVID-19 in the building construction industry and mechanisms and hence, to reduce COVID-19 negative impacts on the project performance by using qualitative research methods through open interviews and useful data from the case study of the project. The findings in this study are to recognize the mistakes, observe effects, and document them to minimize the potential loss to the project eventually. Findings in this case study further help policymakers, academicians, researchers, and practitioners improve existing strategic plans and create new policies to cope with the circumstances caused by COVID-19 among building construction organizations.

LITERATURE REVIEW

In the year 2020 and 2021, COVID-19 pandemic closed many businesses and affected the economics worldwide. Many studies presented the impact of COVID-19 pandemic on construction. In the early stage of COVID-19 pandemic in 2020, a significant number of construction workers reportedly tested positive for COVID-19 [2, 3]. Pasco et al. [4] emphasized that the risk of COVID-19 infections among construction workers were about five time more likely to be hospitalized because of COVID-19 than workers in other industries. Reynolds [5] states that some of the construction company was allowed to open and continue its operation despite the shutdown due to the pandemic. However, the author stated that the company had to face many direct and indirect challenges due to worldwide pandemic. Similarly, Zamani [6] has identified the problems brought by the pandemic on the building construction industry and proposed mechanism to lessen the impacts.

There is limited research on the hotel construction specially developing countries like Nepal. Although some studies have addressed the pandemic in developing countries [7], they fall short in incorporating specific impacts due to COVID-19 during the implementation of construction of the hotel projects. That's why careful consideration and examination are required to ascertain the impacts in the case study. The author found there were major issues in operational and financial issues. In operation level, project delays, lack of workers, lack of materials, lack of safety measures were the major issues. In financial level, lack of budget, late payment, increased project cost and reduced turnover.

Besides, Assad and EI-adaway [8] highlighted valuable guidelines impacts and future research direction in constructions projects. Yet the results of Assad and EI-adaway [8] do not address the unique nature of the project as a case study. This paper fills the gap of identifying a comprehensive list of impacts based through qualitative and quantitative analysis in the hotel constructions in developing countries.

METHODOLOGY

The authors primarily focus on the qualitative and quantitative method to analyse the impacts of COVID-19 on the project through the case study on the Khwopa Hotel at Bhaktapur City, Nepal. The qualitative analysis was carried out through semi-structured interviews with all the personnel involved in, periodic site visits and related literature reviews. For qualitative analysis, the following interview questionnaire was established.

- What are the main construction factors that affect the project due to COVID-19?
- What was the impact of COVID-19 on the project timeline?
- Is the construction material available during COVID-19 lockdown?
- Are construction workers available during COVID-19 lockdown?
- Was there any late payment from the client or Contractor?
- How is your financial condition during COVID-19?
- What are the safety measures taken in the site during the pandemic?
- What factors should be considered to mitigate such risk in future?

Similarly, the quantitative analysis was done based on turnover, material cost, labour cost, tools and equipment cost of the project.

DATA COLLECTION

Based on the questionnaire mentioned in the methodology, the data was collected from research participants through semi-structured interviews. The interview was done on the site as well as in the office to collect as much information as possible for assessment and evaluation. The interviewee consisted of the Owner, Project manager, Project engineer, Supervisor, skilled workers, and interior designer. Similarly, primary data including drawings related to the project were collected from the project manager and analyzed.

RESULTS

This project was started on November 2018 with a completion date originally scheduled in November 2020. The contracted amount was US \$ 456,333 and it was a cost-plus contract. The area of the hotel is 8,276 sqft. Because of the COVID-19 effect, the project did not complete on time and is now anticipated to complete by December 2022.

Below is a summarized version of the respondent's perspective during the semi-structure interview.

Owner 's perspective:

The Owner said that since the tourism markets were booming and Visit Nepal 2020 was nearing, he decided to construct a sustainable hotel named Khwopa Hotel after years of research, market

study, and consultation regarding sustainability construction. He thought that targeting locals and maintaining Newari cultures could be one of the best sustainable hotels in Bhaktapur city. On the onset of COVID-19 pandemics in 2020, every business specially tourism was greatly impacted. He explained that could not allocate the budget as planned. Consequently, payment to Contractors and sub-Contractors was little bit delayed. Moreover, periodic lock downs caused material shortage and labor shortage. So, he decided to change from sustainable hotel construction to conventional hotel. The owner explained there was safety measures taken in the site such as distance working, alternative day of work and toolbox talks I should have good cash-flow backgrounds and need proper planning, budgeting, and forecasting of a project to reduce the risk in future.

Project manager’s perspective:

The project manager said that the project started with full zeal at the beginning phase of the project and was in schedule as planned but affected due to COVID-19. Most of the workers involved in the project were from Terai, which is about a day travel distance far from the project site. Workers were not willing to return to work for nearly 6 months because of frequent Lock downs from government or fear from getting infected. In addition, there was a shortage of materials because of the lockdowns. The turnover was low during mid of 2020 to 2021 as shown in Figure 2. The project could not progress as planned due to lack of workers and materials at the site. As the client has shifted from sustainable construction to conventional hotel construction, the project was delayed and overrun. The Project manager explained that payment was not smooth from the client and forced skilled and unskilled manpower and subcontractors leave the company because his company (Contractor) could not make payment in time. According to Project Manager, the impacts of pandemic could have been minimized if his company had well planned the resources in terms of manpower and labors. If more focus were given to local labors rather than distant worker from terai, the impact of delay could have minimized. “Well-planned budget and continues cash flow can mitigate the risks imposed by COVID-19 in future.”, the Project manager said.

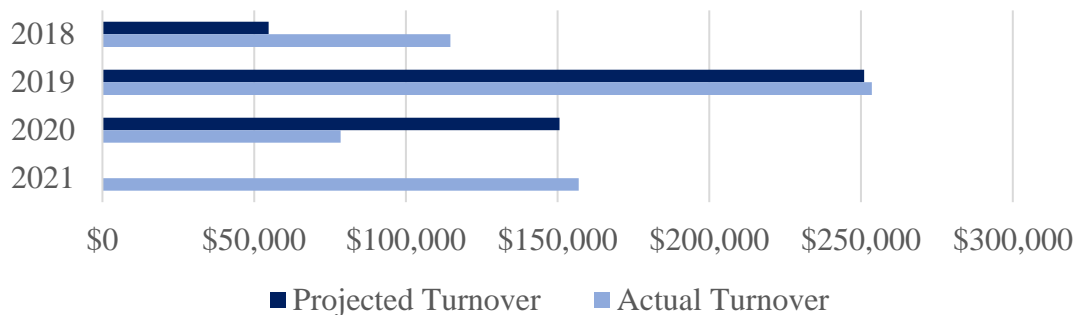


Figure 2. Hotel project turnover

Project Engineer’s perspective:

The Project Engineer explained that the project was closed for almost 8 months during pandemic, Due to lack of workers and material in the site, the project engineer said that he could not progress as planned. The project engineer recited that rework and dismantling were immense as the client converted the project from Sustainable hotel to conventional hotel. Many designs, materials, concepts, electrical and plumbing works had to be either replaced, changed, or modified.

Payment was due for a long time, monthly salary got delayed. Because the company told the project engineer to stay at home with unpaid leave, he left the job to sustain and take care of his family during COVID-19. The company failed to provide necessary safety measures to the workers and staffs. There were not proper safety rules and regulations maintained in the site.” He emphasized the necessity of proper planning, seriousness of the pandemic’s effect and proper financing on the project, which could, if well-planned, help reduce the COVID-19 related risk in the future.

Supervisor’s perspective:

According to the Supervisor, this project was very much impacted by COVID-19. The supervisor of the project informed that there were no workers at the construction site. During absence of the project engineer and the project manager at site, the supervisor stated that he had to make decision on his own on construction works. “The subcontractor could not work due to shortage of materials and payment was not done in time as well. Workers were facing too much problem because of the payment. Many workers were hired on an hourly basis, so when the pandemic happened, the project stopped, and those hourly workers had no work to do. As a result, many joined different companies.”, the supervisor said. Safety measures were taken very lightly and lately in the project, which further discouraged the workers to continue their work during the pandemic. He explained, “the health and safety priority play a vital role in the project performance specially in the pandemic. Besides, continuous supply of materials, in-time payment the worker and active involvement of the senior managers during the pandemic could motivate and encourage the workers at site.”

Skilled workers’ perspective:

The skilled workers who worked in the project told that they were highly affected due to the pandemic. They informed that they do not have saving and they used to get payment on weekly basis before COVID-19. Before the pandemic, the workers were satisfied with the payment, and they used to send money to their family. But during and after the pandemic, they had limited work and no overtime. The workers said that they finished their saving paying rent and food. Some of the workers lost their life due to COVID-19.

Interior designer’s perspective:

The interior designer was initially proud to be a part of the hotel project because it was the first sustainable hotel project in Bhaktapur city. But the COVID-19 affected the project. Since the client changed his mind and changed the design of sustainable hotel construction to regular conventional hotel due to lack of budget during the pandemic, the interior designer had to redesign most of the work such as selection of new materials, provision of different facility including electrical, plumbing and HVAC works.

DISCUSSION

The Owner invested a huge amount of money to build a sustainable hotel. But when COVID-19 forced the country to lock down for a longer period impacting every business running across the country, the Owner could not speed up the hotel construction in a sustainable way. Hence, many financial and operational issues lead to project delays and project cost overrun. According to the

hotel Owner and Table 1, the project performance could not meet because of lack of workers, materials, budget and hence caused considerable delays in the completion of the projects.

Similarly, according to the interview with the Project manager, the project was delayed in absence of labor, material, cash flow issue, and design changes during the pandemic. From Table 1, it can be concluded that not only had the construction worker in this project depend on workers outside Kathmandu valley but also materials outside the countries. In addition, the payment from the client was significantly delayed causing payroll problems to staff, subcontractors, and workers. The direct implications can be seen in the turnover of the Contractor for the year 2020 and 2021 (Figure 2). Table 2 shows an increase of 35% in the material cost used because of soaring price during lockdown, design change and rework as the Owner converted sustainable hotel construction to convectional hotel.

Table 2 shows that the tools and equipment cost raised to 26% due to idle of equipment and rental charge. Further, the labor cost increased by 28% as there was a shortage of construction works. In addition, the Owner paid for the idle hours claimed by the Contractor. Local workers were hired at a high price to complete the job. Overall, because of the continuous lockdown, the project cost increased by 32%. Since the project is cost-plus model, the Contractor did not have any effect on his profit margin, but the Owner suffered a huge budget crisis in this project.

Table 1. Summary of impacts based on the interview

Rank	Impacts	Owner	Project manager	Project engineer	Supervisors	Skill workers	Interior Designers
	<u>Operational impacts</u>						
1	Project delays	√	√	√	√	√	√
2	Lack of materials	√	√	√	√		√
3	Lack of workers	√	√	√	√		
4	Design change		√	√			√
5	Lack of safety measures			√	√		
6	Job loss			√		√	
7	Disruption in supply chain		√				
8	No skilled subcontractors		√				
	<u>Financial impacts</u>						
1	Late payments	√	√	√	√	√	
2	Lack of Budget	√	√				√
3	High project cost	√	√		√		
4	Reduced turnover		√	√			

Table 2. Actual vs estimated budget

Description	Estimated Budget	Actual Cost	Percentage Increase
Material cost	\$215,963	\$291,531	+35%
Tools and equipment	\$24,821	\$31,395	+26%
Labor cost	\$95,743	\$122,264	+28%
Total amount	\$456,333	\$603,679	+32%

LESSON LEARNED

If not prepared for unforeseen contingencies like COVID-19 and due to lack of provision of reserved funds, there could be cash flow problems that could affect not only the hotel Owner but also the associated firms like Contractors, Subcontractors, Vendors, and Design Consultants.

To mitigate the risks imposed by the pandemic, the lesson learned from this case study was that there would not be much problem if the local construction workers were hired so that they become readily available during the pandemic. In this study, the Contractor hired workers from outside the city at a cheaper rate to maximize their profit. Hence, hiring locally available labor could minimize the labor cost to some extent. Further, the design consultant should identify alternative materials, suppliers, or locally available resources and get approval from the Owner to lessen the disruption of the material. Moreover, if the Contractor had done proper planning on the purchase and storage of construction materials, the site work would not have faced the lack of insufficient materials the high price. So, the project could have been successful if the Owner had done proper budgeting, smooth cash flow, and proper planning.

From safety point of view, the project lacks proper Safety and Risk management strategy and its effective use in the site. For any project to be successful specially during pandemic like COVID-19, the Safety and Risk Management stands as a solid foundation for the project. So, the Owner, the Contractor and other associated construction firms should pay careful attention and consideration to alleviate the consequences of the pandemics on their project performance.

CONCLUSION

The study found that the COVID-19 pandemic affected the project in many terms such as financial, operational, contractual, safety, and risk management. Although the Owner envisioned building a hotel using sustainable materials, the project was hardly hit by the pandemic, and this caused the Owner to change from sustainable to conventional hotel construction. This resulted in many modifications in civil, plumbing, and electrical works, reworks, repairs, and dismantling works. As a result, the project cost increased by 32%. The pandemic affected payment to the Contractor, which subsequently affected payment to staff and vendors. Contractually, the nature of the project was a cost-plus model, which benefitted the Contractor but not the Owner. The increased project cost could have been minimized if the contract was different other than cost-plus model.

A few of the lessons learned from this case study were the labour cost and materials cost, that could have been minimized if the Owner and the Contractor had established alternative resources such as using locally available labor, materials, and alternative suppliers. The COVID-19 pandemic has also taught the Owner and Contractor to be more proactive when selecting the materials and workers. Improper planning of cash model, the pandemic has impacted the Owner than the Contractor resulting high cost of the project while not affecting the Contractor's profit margin. However, the Contractor could make profit as expected. Referring to Table 1, it can be concluded that the major problems or construction factors due to COVID-19 are lack of materials, lack of labor, lack of budget, lack of safety measures, poor implementation of Safety and Risk Management which caused substantial delays in project completion, late payment, increased project cost, reduced turnover causing both the Contractor and the Owner a great loss. The findings can be used to establish guidelines and strategies and provide the foundation for the practitioners to prepare for unseen contingencies like the COVID-19 pandemic. The limitation of this study is that the findings are based on a specific hotel project and the result may not be generalized.

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