Assessment of Covid-19 Pandemic Impacts on Construction Management: A Case of Local Government Unit-San Jose City, Nueva Ecija, Philippines

Clinfford O. Anasctacio[1], Kaye Ann G. Bernardino[1], Rick Donald S. Manzon[1], Lorinda E. Pascual[1], Noel T. Florencondia[1]

[1]*Graduate School, Master of Engineering Management, Nueva Ecija University Science and Technology, Cabanatuan City, Nueva Ecija Philippines.*

Corresponding Author: clinfford25anastacio@gmail.com

Abstract: The COVID-19 epidemic has had varied degrees of impact on business owners, developers, contractors, subcontractors, and supply chain providers. The nature of the repercussions and their scope are largely determined by the location of both the specific business and the underlying project. As a result of the suspension and, in some circumstances, the termination of partners or the entire project, there was a reduction in available commodities and manpower. Construction activity in several states and localities is in flux, depending on whether construction is classified as a necessary business. As a result of the COVID-19 crisis, construction industry participants now need to address both short and long-term commercial issues, as well as design project-by-project solutions in a new global and national context. The actual amount and complexity of the modifications required to manage the pandemic's problem are still unclear, and this study could be refined until vaccines or other treatments are widely available. These new realities have an impact on nearly every aspect of the construction process, including defaults, scheduling, coordination contracts, and project notification. The project can be paused, ended, and resumed. OSHA and Occupational Safety Compliance are two acronyms for the Occupational Safety and Health Administration. Material, subcontractor, and supply chain delays and consequences; human resource management Damage prevention or damage management; risk management and insurance. And, in the event of a health emergency, the LGU-San Jose City in Nueva Ecija's necessity for advice is strongly urged for efficient monitoring and oversight of the project. Contractors and project inspectors accomplish this by minimizing construction delays, finishing projects on time, and verifying that all workers are fit for work prior to performing relevant work under COVID-19, which contains a mechanism for assuring the company's survival and protection.

Key Words: — ***Construction Management, Project Operation, Pandemic Response.***

I. INTRODUCTION

Before COVID-19 Pandemic, the city established and developed many buildings like banks, schools, churches, commercial stalls, malls, and industrial buildings. The Local Government Unit of San Jose also implemented the “Build Build Build” program to see how progressive and develop by means of project implemented like constructing school in different barangay in San Jose city, Rehabilitation of Concrete Road in Rural place in the city to fast the transportation and communication were expedited, Construction of Potable water in Rural place for easy domestic use for drinking, washing, cleaning and preparing food and Rehabilitation of Slope protection to help stabilize the slope and can last a lifetime in protecting surrounding properties from damage and people from injury if they are maintained in a good and functional condition at all times especially in rural place.

Local Government Unit of San Jose City is the most affected in construction management during COVID19 pandemic. Owners, developers, contractors, subcontractors, and supply chain vendors have experienced varying degrees of effects as a result of the COVID19 pandemic. The nature of the influence and extent of the ramifications are in large part dependent upon the location of both the respective businesses and underlying projects. Construction is underway in some states and cities depending on whether the building is classified as a mandatory business.

As a result, this crisis required construction industry members to settle short-term and long-term business challenges and develop project-related solutions in a new global and domestic environment. The full extent and extent of the changes needed to address pandemic-related issues is still unknown, and this analysis could be further developed until vaccines or other therapies are introduced worldwide.

Manuscript revised December 11, 2021; accepted December 12, 2021. Date of publication December 13, 2021.

This paper available online at www.ijprse.com

ISSN (Online): 2582-7898; SJIF: 5.494

These new realities affect almost every aspect of the construction process, especially issues such as defaults, scheduling, coordination contracts and project status. Occupational Safety and Health Administration (OSHA) and Occupational Safety Compliance; Human resource management; material, subcontractor, and supply chain delays. Risk management and insurance; damage prevention or damage management and the proceedings. Careful decision-making in this new and unfamiliar environment suggests the use and consultation of people and teams with the required industry and legal experience. As pandemics are beginning to impact industry members, a proactive approach that requires sound and practical legal advice is essential for making cost-effective responses.

II. Method And Procedure

This study is descriptive research using qualitative type of research to determine the impact on construction management, a case of local government unit – San Jose City, Nueva Ecija, Philippines. According to Knufer & McLellan (ND) the term descriptive research refers to the type of research question, design, and data analysis that can be applied to a given topic.

The qualitative design using semi structured questionnaire in google type form was utilized for data collection. The researchers sought the impact of construction management, a case of local government units – San Jose City, Nueva Ecija, Philippines.

The participants of the study are the project inspectors, city engineer, and the city architect in the project implemented by the Local Government Unit of San Jose City, Nueva Ecija Philippines. A total of 29 participated in the data gathering of this research. The participants shared their expertise and experiences in order to provide essential data for this study. The survey was conducted through virtual meetings and questionnaires were distributed to the respondents electronically using Google Forms Application.

III. Results And Discussion

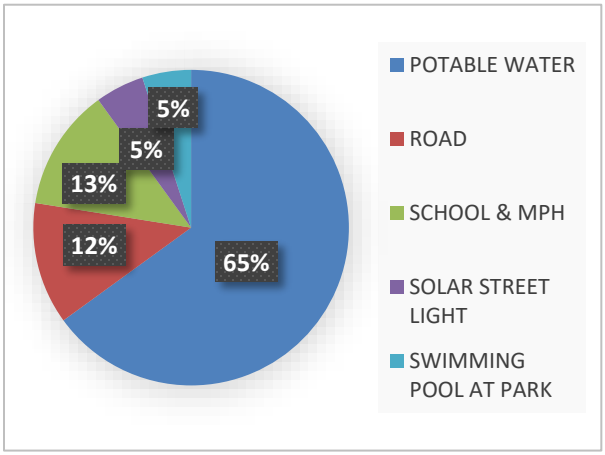
Based from the data gathered, *Table 1* shows that 40 total projects were implemented for the whole year 2019 in LGU-San Jose City wherein 26 projects were finished on time on the actual schedule, and 14 projects were delayed on the actual date completion. The 40 projects implemented by the Local Government Unit of San Jose City are construction of potable water system (26), rehabilitation and concreating of road (4), construction of school building (1), multipurpose hall (6), and rehabilitation and improvement of at nature park pool (2).

Table.1. List of FY 2019 Projects

LIST OF PROJECT FY 2019	
STARTED YEAR 2019 BEFORE COVID-19 OUTBREAK	
PROJECTS	NO. OF PROJECTS
Construction of Potable Water System	26
Rehabilitation & Concreting of Roads	5
Construction of School Building & Multi Purpose Hall	5
Construction of Octagon Post and Installation of LED Solar street light of Various Barangay	2
Rehabilitation of Swimming Pool at Nature Park	2
Note: 40 Projects; 26 projects finshed on time & 14 delayed	

Figure.1. shows the Distribution of projects for FY 2019 in which Potable Water System projects occupies 65% of project allocation followed by 13% in school building and multi-purpose halls projects, 12% in road construction and habilitation and 5% for solar street lights.

Fig.1. Project Distribution for FY 2019



On the other hand, Table 2 shows that 31 projects were implemented for the whole year 2020 in LGU-San Jose City, 14 projects were finished on time on the actual date, and 17 projects were delayed on the target date of completion.

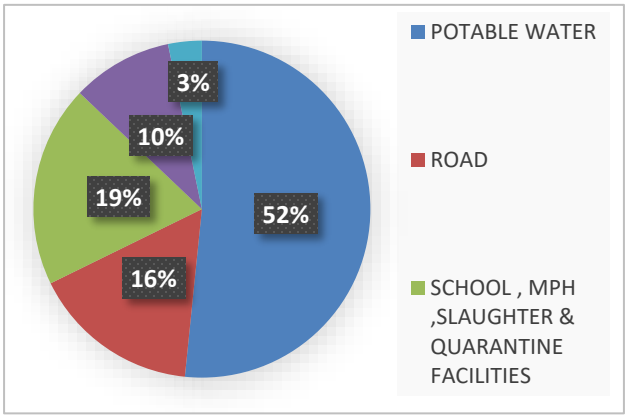
The 31 projects implemented by the Local Government Unit of San Jose City during this time are rehabilitation and concreating of road (5), construction of potable water system (16), construction of school building, multi-purpose hall, improvement of slaughter house and makeshift quarantine facilities (6), construction of slope protection, drainage system and perimeter fence (3), and improvement and nature park beautification (1).

Table.2. List of FY 2020 Projects

LIST OF PROJECT FY 2020	
STARTED YEAR 2020 COVID-19 OUTBREAK	
PROJECTS	NO. OF PROJECTS
Construction of Potable Water System	16
Rehabilitation & Concreting of Roads	5
Construction of School Building & Multi Purpose Hall,Slaughter house & makeshift quarantine facilities	6
Construction of Slope protection	3
Improvement & Beautification of Nature Park	1
Note: 31 Projects; 14 projects finshed on time & 17 delayed	

Figure.1. shows the Distribution of projects for FY 2020 in which Potable Water System projects occupies 52% of project allocation which decreased by 13% from the previous year, followed by 19% in school building and multi-purpose halls projects which increased by 6%, 16% in road construction which increased by 4%, 10% is allocated for slope protection and 3% for the beautification of park.

Fig.2. Project Distribution for FY 2020



The tables and figures above reveal that the Local Government of San Jose City still manages to allocate and implement project which will be beneficial to the community. Changes in the distribution of projects per year only shows that whatever the community needs will be addressed and accounted accordingly.

During the time of COVID-19, the country's economy has adversely changed as the pandemic changed the situation all over the world. Developing cities like the city of San Jose are also affected in every way, especially in construction industry. Based on the semi-structured questionnaire used, researchers came up with the following results reflected in Figures 3, 4 and 5.

Figure 3 shows that the respondents agreed that there are many causes of delay in project implementation during COVID 19. Manpower schedule, non-compliance of workers to health protocols and rapid increase on prices of construction materials have the highest percentage. Other causes of delay are: poor ventilation of workplaces, manpower health condition, limited site visitation, workforce shortage, compliance to quarantine protocol, affected prices of construction materials and delivery of construction materials because of the travel ban restrictions. The figure clearly shows that these causes have been experienced and observed by the respondents.

Fig.3. Causes of delay in project implementation

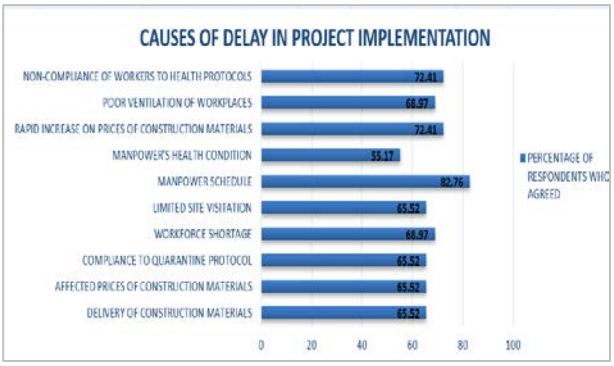


Figure.4. shows that the respondents agreed that there are changes brought by COVID 19 in the construction industry. Significant changes include: increased in prices of construction materials, increased risk on site and decrease in schedule of site visitation have the highest percentage. Other noted changes are decreased in manpower available on site and decreased in schedule of delivery of construction materials. The figure clearly shows that these changes are being experienced in the construction industry.

Fig.4. Changes brought by COVID 19 in the construction industry

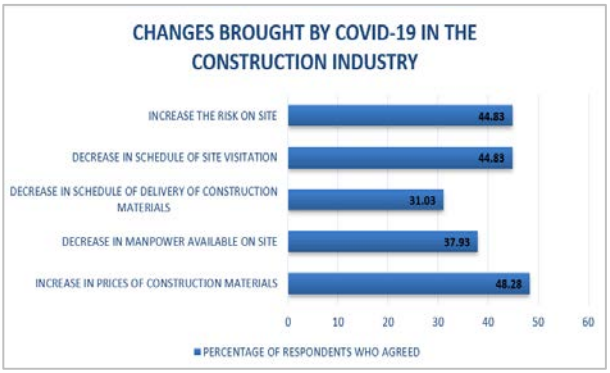
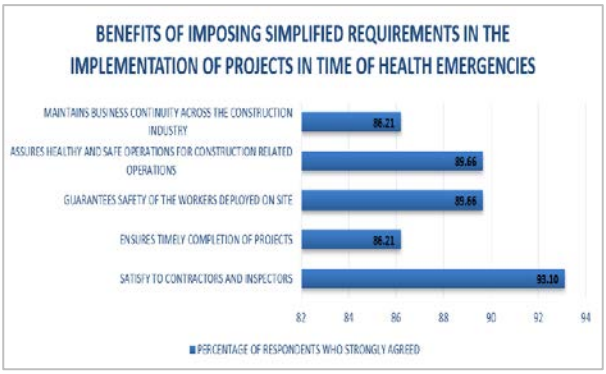


Figure 5 shows that the respondents strongly agreed that imposing simplified requirements in the implementation of projects in time of health emergencies is beneficial to the LGU, project engineers, inspectors, contractors, sub-contractors, developers and supply chain vendors. Respondents believe that the guidelines will satisfy contractors and inspectors, assures healthy and safe operations for construction related operations, guarantees safety of workers deployed on site, ensures timely

completion of projects and maintains business continuity across the construction industry.

Fig.5. Benefits of imposing simplified requirements in the implementation of projects in time of health emergencies



IV. Conclusion

This study assessed the impact of the COVID-19 pandemic on construction management of Local Government Unit of San Jose City, Nueva Ecija, Philippines. Based on the results of interview with the key players, it was concluded that construction management in LGU-San Jose City, Nueva Ecija was affected in the implementation of project due to the availability and delivery of materials causing delay in construction. Transport restrictions hindered project engineer to inspect the project that resulted to project schedule for inspection not followed and also led to total the decreased number of manpower working in the construction site. Price of the materials are 16% percent higher, and travel restrictions limited the delivery of construction materials.

It was also concluded that the necessity for guidelines to be imposed by LGU-San Jose City, Nueva Ecija in time of pandemic for proper supervision and monitoring of projects is highly recommended. This includes a system for contractors and project inspectors to avoid delays during construction period, assure the on-time completions of projects, that all workers are fit to work prior to deployment give set key principles and minimum requirement that define response, well and safe operations for construction related operations under COVID-19 and ensure the survival of business as well as the protection of employee.

References

[1]. Okolie, K.C. (2011). Performance Evaluation of Buildings in Educational Institutions: A Case of Universities in South-East Nigeria. Ph.D dissertation.

[2]. Alsharef, A., Banerjee, S., Uddin, S. M., Albert, A., & Jaselskis, E. (2021). Early impacts of the COVID-19 pandemic on the United States construction industry. International journal of environmental research and public health, 18(4), 1559.

[3]. Araya, F. (2021). Modeling the spread of COVID-19 on construction workers: An agent-based approach. Safety Science, 133, 105022.

[4]. Bailey, J., Bouchardie, N., & Madalena, I. (2020). COVID-19: The current impact on construction and engineering projects. White and Case Corona Virus Resource Center, White and Case LLP.

[5]. Chodorow-Reich, G., & Coglianese, J. (2021). Projecting unemployment durations: A factor-flows simulation approach with application to the COVID-19 recession. Journal of Public Economics, 197, 104398.

[6]. Impact of COVID-19 in the workplace: new health and safety measures. Achilles. (2021). Retrieved 8 December 2021.

[7]. Impact of COVID-19 on the construction sector. Ilo.org. (2021). Retrieved 8 November 2021.

[8]. Karimi, H., Taylor, T. R., Dadi, G. B., Goodrum, P. M., & Srinivasan, C. (2018). Impact of skilled labor availability on construction project cost performance. Journal of Construction Engineering and Management, 144(7), 04018057.

[9]. Katherine Vines, P. W., & Beech, N. (2020). The impact of COVID-19 on the safety of workers in the WA construction industry: navigating risk. KWM.

[10]. Kermanshachi, S., & Rouhanizadeh, B. (2019, June). Sensitivity analysis of construction schedule performance due to increased change orders and decreased labor productivity. In 7th CSCE International Construction Specialty Conference (ICSC) (pp. 12-15).

[11]. Pamidimukkala, A., & Kermanshachi, S. (2021). Impact of Covid-19 on field and office workforce in construction industry. Project Leadership and Society, 100018.

[12]. Pamidimukkala, A., Kermanshachi, S., & Jahan Nipa, T. (2021). Impacts of COVID-19 on Health and Safety of Workforce in Construction Industry. In International Conference on Transportation and Development 2021 (pp. 418-430).

[13]. Stiles, S., Golightly, D., & Ryan, B. (2021). Impact of COVID-19 on health and safety in the construction sector. Human Factors and Ergonomics in Manufacturing & Service Industries.

[14]. Zamani, S. H., Rahman, R. A., Fauzi, M. A., & Yusof, L. M. (2021, February). Effect of COVID-19 on building construction projects: Impact and response mechanisms. In IOP Conference Series: Earth and Environmental Science (Vol. 682, No. 1, p. 012049). IOP Publishing.