

# Lesson from pandemic Covid-19 for sustainability construction in Indonesia

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# Lesson from Pandemic Covid-19 for Sustainability Construction in Indonesia

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**Abstract.** The Covid-19 pandemic, which has hit Indonesia for 1 year, has an impact on almost all sectors of life, including the construction sector. The existence of restrictions on human activity and gathering as well as all policies that arise such as budget refocusing has caused several construction projects to be delayed and several others cancelled. Until now the number of cases exposed to Covid-19 has reached more than 1 Million cases. Seeing the magnitude of the impact caused by the Covid-19 pandemic and the lack of studies in Indonesia related to this is the background for this research to find out how the impact of the Covid-19 pandemic is on construction projects in Indonesia. The finding of this study reveal that supply chain in project construction as one of the sector that has significant effect to Covid-19. The result of this study is one of few beginning endeavors to evaluate the impacts of the Covid-19 and to give the input in managing the transition for sustainability construction in Indonesia.

## INTRODUCTION

One year the Covid-19 pandemic has entered Indonesia, starting from the first confirmed case, namely on March 2, 2020 until 19 February 2021 the number of cases exposed to Covid-19 has reached 1.24 million cases with 33,638 dead victims [1]. Judging from the dangers caused by the Covid-19 pandemic as an effort to control its spread, the government has implemented a social restriction policy. One of them is the Large-Scale Social Restrictions (PSBB) policy which is regulated in Government Regulation No. 21/2020 refers to the acceleration of the handling of Covid-19 and Minister of Health Regulation No. 9 regarding PSBB Guidelines, large-scale social restrictions have been imposed.

The implementation of the PSBB is not only carried out in Jakarta but also in almost all major cities in Indonesia. The existence of the PSBB emphasizes the existence of activity restrictions that have an impact on almost all sectors, especially the economic and health sectors. Construction is also one of the sectors affected by the Covid-19 pandemic. Several infrastructure works were postponed or even canceled due to budget refocusing [2]. Refocusing has an impact on cutting changes and reallocating budgets for several work packages, the amount of the Ministry of PUPR's budget cut for handling Covid-19 is Rp. 44.5 trillion of the total Rp. 120 trillion or nearly 1/3 of the total budget [3]

The impact of work packages in the Kempupera environment due to the COVID-19 pandemic in 2020 is a total of 2,432 packages for consulting services, 896 packages for small qualifications, 885 packages for medium qualifications and 651 packages for large qualifications [2]. A special policy within the Ministry of Environment and Forestry is the SE Minister of PUPR (Menpupera) regarding the implementation of construction services in the new normal era.

In addition to having an impact at the pre-construction stage, the pandemic COVID-19 also has an impact on ongoing projects due to obstacles in the mobilization process and the availability of manpower, materials and equipment. Some projects even had to be stopped if they were in the red zone. In addition, there are additional costs due to increased HSE costs as part of efforts to keep Covid-19 from spreading in the project environment [3].

After being implemented and finally evaluated, now the PSBB is continued with a period of adaptation to new habits which are defined as changes in behavior to continue carrying out normal activities in the midst of a pandemic.

This period of adaptation to new habits can be defined as a new order that allows people to live side by side with COVID-19.

Seeing the magnitude of the impact caused by the Covid-19 pandemic in Indonesia and the lack of studies related to this is the background for this research to learn out how big the impact of the Covid-19 pandemic is on construction projects in Indonesia. Include what parts of the project life cycle have been most affected by the pandemic.

## METHOD

This research is using descriptive quantitative method. In this study, the goal was to assess the impact of the Covid-19 pandemic on construction projects in Indonesia.. Some previous research have studied related topic impact of Covid-19 in project construction as shown in Table 1.

TABLE 1. Previous Study

Aim	Result
To create a unused catastrophe recuperation show that can be utilized in circumstances such as COVID-19 widespread within the development industry	The affect amid and post COVID-19 have incredibly impacted the development phase. The reason of this consider was to create a fiasco recuperation show, so that a extend can run easily amid a emergency and not be disadvantageous by not attending-to the taking after things: prioritizing trade capacities; having a communication arrange (e.g. for representatives, clients, sellers, the open, and the media); having avoidance and moderation procedures; having an crisis reaction checklist; deciding the potential dangers, vulnerabilities, and dangers; backing up information occasionally, both online and off-site; conducting schedule tests of calamity conceivable outcomes; organizing for working off-site; and having insurance. [4]
To distinguish the factors leading to delays on development ventures in Kuwait amid Covid-19.	Acceleration and expansion of fabric costs as major causes of delay in Kuwait amid Covid-19[5]
To investigate the vital arranging to limit delay variables on development ventures in Kuwait amid Covid-19	Delays in development ventures can be limited with appropriate arranging, counting appropriate communication and coordination, and customary installments to temporary workers [6]
To examine the effect of COVID 19 on the development industry's survival	The foremost unmistakable impacts of COVID 19 are the suspension of ventures, work affect and work misfortune, time invade, fetched overwhelm, and financial suggestions. These findings shed light on the effects of sudden pandemics and raise awareness of their fundamental but not to be overlooked impacts [7]
To allow direction in development in construction safety practices for covid-19	Contruction safety practices for COVID-19 included in [8]: physical distancing, tasks, monitoring, schedulling, behavior, meetings, logistic control and site logistics, administration action and policies, employee education, engineering controls, sanitation and hygiene, and ppe
Examines and concludes the teaching of changed circumstance in a few normal purviews, and, by taking thought of law and fact, gives a few approaches and potential legitimate arrangements to bargain with that misfortune from a comparative law perspective.	The around the world spread of COVID-19, primarily through governments' anti-COVID-19 arrangement or law and subject to affect forced by person variables of ventures, brings approximately changed circumstances to development ventures within the world and alts the presupposed conditions for contractors' execution in development ventures to diverse extent. [9].
The Jordanian engineers' recognition on how they confronted this lockdown, the results they anticipate and how they see long haul of gracious designing and development industry.	Plan respectful engineers were able to work from domestic with sensible productivity whereas development location gracious engineers don't accept that after the lockdown is lifted the development specialists will follow to the social removing and to wearing basic individual defensive hardware.[10]

Aim	Result
Analyze COVID-19's impacts on build resource procurement with a view to opening up new prospects for development	A few challenges within the zone of demand and supply chain disturbance, unused approach issues, workers' uneasiness and survey of COVID-19 vs Constrain Majeure in standard shapes of the development contract. However, openings advanced within the field of present day acquirement arranging, the necessity for virtual working and special plan contemplations.[11]
PPPs within COVID-19 might be legally obligated and subject to conditions of force majeure.	The phenomenal scale and escalated of the current COVID-19 widespread is forcing the open and private segments to require a hard look at existing constrain majeure arrangements. Not as it were is the greatness overpowering, but the probability of potential PPP disappointments is unparalleled.[12].
to survey and confirm whether a temporary worker affected by COVID-19 suggestions can be relieved of such liquidated harms and can utilize legally binding Force Majeure or other forgivable disturbance and delay provisions to hunt for an expansion of time (EOT) and extra remuneration for such disturbances and delays.	COVID-19 related disturbance and delay implications may or may not be seen as passable reason to apply for an expansion of time beneath a development contract. It depends on the concrete contract provisions, on the particular impacts and circumstance the construction project is in. A "one COVID-19" contention fits for an all disturbance and delay reason for a temporary worker to relief from one or more legally binding commitments is a critical try and may reverse discharge to the contractor later on. [13]

Based on previous research, it can be seen that the project life cycle consists of at least 3 (three) stages, namely the pre-construction stage, the construction stage and the post-construction/maintenance stage. Each of the stages in the project life cycle has crucial parameters because it can affect the sustainability of a project. This study tries to describe how big the impact of the Covid-19 pandemic is on a project from each of these parameters.

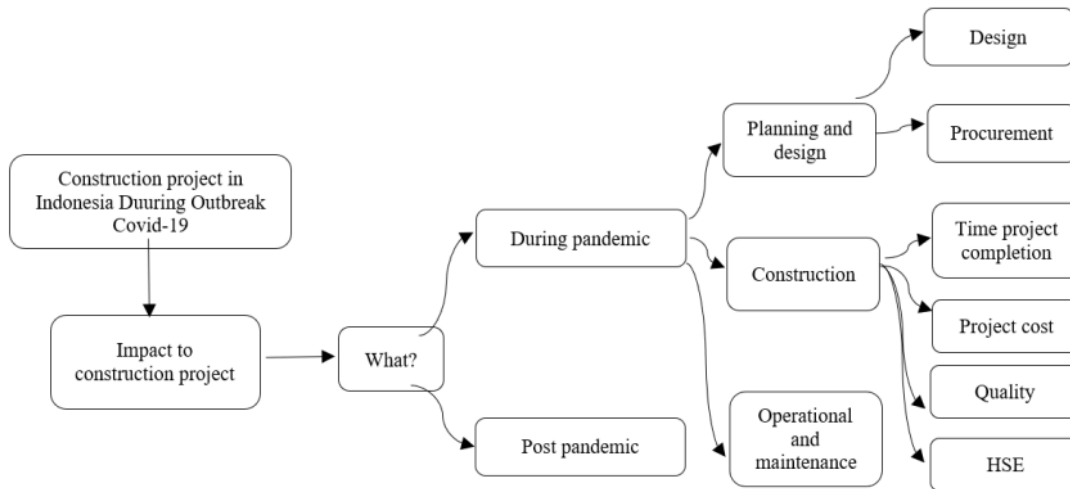


FIGURE 1. Mind map

This study will review the impact of the Covid-19 pandemic on construction projects in the pre-construction and construction stages. The basic thoughts and questions that underlie the decision in determining these parameters are as follows:

Then data of this study was carried out by distributing questionnaires to construction project stakeholders, namely owners, contractors and consultants, both planners and supervisors, to provide a perspective on the magnitude of the

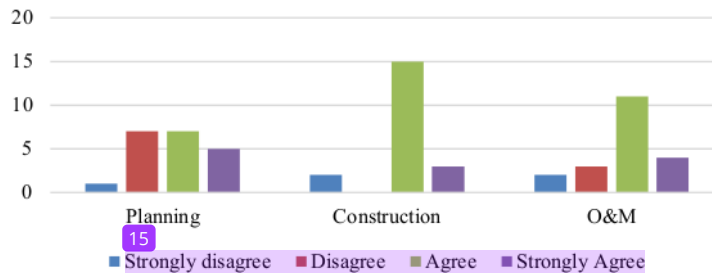
impact on construction projects from the COVID-19 pandemic in Indonesia. Through the questionnaire results, then it will be processed to see the impact caused by the Covid-19 pandemic on construction projects in Indonesia.

Collection the data was starting through questionnaire to 20 respondents were having 6-10 years experience in construction project i.e contractors, consultant and representative of PUPR ministry. Three parts comprise the questionnaire used to assess the impact of factors on the respondents: (1) General information of respondents (2) Project information (3) Factors that affect the respondents during pandemic Covid-19 in construction project in Indonesia. In part 3, The opinion was measured in a likert scale by four options. (1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree and likert scale used to asses how big the impact covid-19 to construction project is (1=low; 2=medium; 3=high; 4=extreme). The likert scale is usefull to digging the opinions of respondents towards factor in construction project that having impact during pandemic Covid-19 in Indonesia.

## RESULT AND DISCUSSION

The results of as given by the questionnaire to respondents, is shown in Figure 2 below:

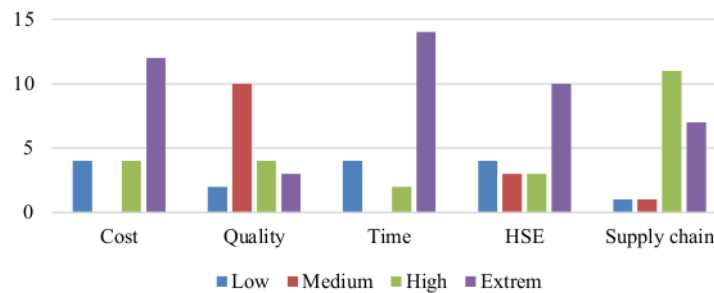
**Covid-19 Having Impact to Project Construction in Indonesia**



**FIGURE 2.** The Impact of Covid-19 in Life Cycle Project

From the data, shown that mostly respondents agreed Covid-19 having impact in every stage of life cycle project from planning through operational and maintenance. In planning stage in Indonesia, covid-19 has impact to project related to cutting and reallocating budget for [2], this policy has big impact to construction in Indonesia because mostly construction project were postponed or even canceled due to budget refocusing. Special policy release by Ministry of PUPR especially related to procurement during pandemic also shown Covid-19 has real impact to planning stage in construction project. From the data also shown that mostly respondent agreed, the biggest impact from Covid-19 was experienced in construction stage, as mentioned in figure 3 below.

**Impact Covid-19 to Construction Project in Indonesia**



**FIGURE 3.** Impact Covid-19 to Construction Project

The results finding mostly sector i.e. cost, time, HSE and supply chain in construction project are having impact to Covid-19. Figure 3 also shows, most respondents agree that Covid-19 has an extreme impact on project completion



time, project budgets and also has an impact on HSE on construction projects. From previous studies, Covid-19 also has a high impact because of the supply chain in project development. The impact of supply chain disruptions has other impacts on the project, namely cost overruns, time delays, limitations related to regulations at HSE during the pandemic and supply chain.

Effect of Covid-19, the global supply chain also has been disturbed, which makes a critical affect socially and financially. Whereas demand is approximately to extend as lockdown controls gotten to be less demanding, the degree to which it will return is hazy. Whereas the larger part of companies had anticipated the negative and extreme impact of the widespread, unfortunately possible effect of Covid-19 during outbreak on supply chain project was causing generation and conveyance deviations, tall coordination endeavors, and long deficiency periods, as involved by the late or deluding sending of adjustment activities.

Adaptating from Readymade Garment (RMG) industry supplychain, possible effect of Covid-19 during pandemic to supply chain in construction have been identified below [14]:

1. Lack of order due to cancellation
2. Lack of production
3. Lack of materials and workers
4. Unavailability of the worker caused by Covid-19 affected
5. Time delayed in delivery
6. Overabundance stock due to order cancellation or order decreased

One of strategic model to this supply chain problem during pandemic Covid-19 has been reveal by previous study below:

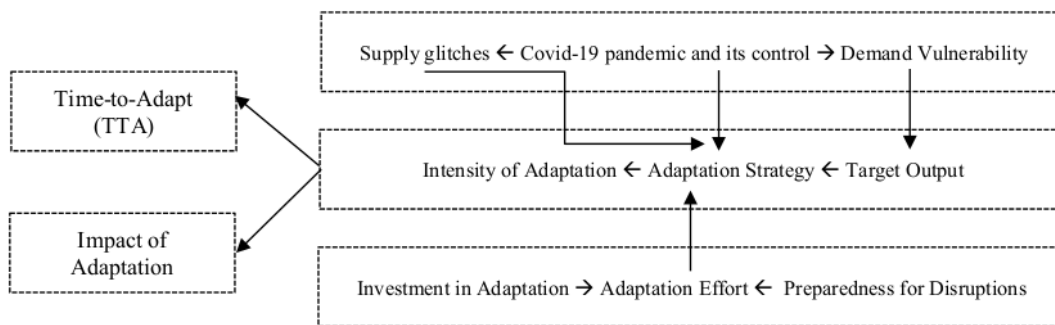


FIGURE 4. Strategic Model Adaptation to Supply Chain During Pandemic [15]

The world is within the midst of one of the foremost inclusive disruptive events in a few eras. Due to COVID-19 widespread, society was forced to put itself on pause for a long period. How we live and how goods are delivered and distributed will probably undergo huge changes in the near future. The course of the coronavirus flare-up will determine how we develop from this process, but that does not imply we are weak<sup>6</sup> shape sustainability transitions in the longer term. Furthermore, adaptating in supply chain project construction is needed to minimize the impact of Covid-19 to the project. One of the efforts that can be done is to cut the supply chain in construction projects, this will make the project more efficient, as well as an effort to adapt to the new normal of the construction project during the pandemic Covid-19.

A future pandemic can be sorted based on the position of the needs throughout an adaptation. Taking after the following highlights, a few noteworthy and striking techniques that are extremely important in influencing the impacts. Impact strategies are organized to play, down dispose of, or monitor the impact of known or obscure dangers. Organizations' managers need to hone high levels of recognition and collaboration to counter unexpected chance components and vulnerabilities related to them. In order to avert the impacts of such disturbance events, the best administrations and policymakers should identify systemsically feasible methodologies which are sensitive to their impacts.

## CONCLUSION

The pandemic Covid-19 has an impact on almost all sectors of life, including the construction sector. The existence of restrictions on human activity and gathering as well as all policies that arise such as budget refocusing has caused

several construction projects to be delayed and several others cancelled. In Indonesia, Covid-19 has affected to cost, time, HSE, supply chain and minor quality in project construction. Disruption in supply chain also having impact to the cost overrun and time delayed. Apart of adaptating in project construction supply chain, the finest organization and policymakers have to be recognize the centrality of systemically distinguishing conceivable strategies that are noteworthy and tricky towards the impacts of such unsettling influence events to managing the transition for sustainability construction in Indonesia.

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