

Legal and Financial Risk Management in Large-Scale Construction Projects

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Abstract

Construction projects involve many parties and experts such as builders, contractors, designers, and consultants, which causes project arrangements to be complicated with many risks and uncertainties, including legal and financial risks. Legal risks include aspects of contracts, permits, certificates, claims, lawsuits, and sanctions. Conflicts or disputes can arise due to legal risks, which can lead to cost overruns and delays in project schedules. The project manager must be able to mitigate these risks in order to achieve the project objectives. This study uses descriptive qualitative and descriptive analytical methods to provide a detailed description of the research problem. The results showed that the risks adversely affect the legal aspects of construction, time, cost, and quality of the project. Legal risks in construction projects can arise due to several reasons, namely problems with documents and contract articles, lawsuits from third parties, and problems in acquiring project land. Good risk management is required to improve project efficiency, and project performance is improved when the organization can create a high fit between risk exposure and risk management profile.

Keywords: Risk management, legal risk, financial risk and construction projects.

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1. INTRODUCTION

The construction sector plays an important role in the success and economy of the country through the development of government and private infrastructure. The successful implementation of a construction project is the key to achieving development goals, so effective construction management is essential to ensure the success of the project. On the other hand, risk management is an important aspect in the management of construction projects because of the potential for uncertainty at every stage from the beginning to the end of the project.

Construction projects involve a wide range of stakeholders and experts such as developers, contractors, designers and consultants, so the setup is complicated with many risks and uncertainties, including legal and financial risks. Legal risks include aspects of contracts, permits, certificates, claims, lawsuits, and sanctions. This risk can lead to violations, conflicts, disputes or legal

losses for all parties involved, such as clients, estimation consultants, contractors and suppliers. The project manager must identify the risks before the project begins. Once the risk has been identified, the next step is to identify strategies to mitigate the identified risk [1]. Proper risk management in construction projects has a significant impact on the achievement of project scope. Risk management involves active preparation for possible future events. Project risk management is very important because risk can affect the outcome of the project. This means that the better the risk management, the lower the risk faced by construction service providers [2].

Project risks can negatively impact project objectives such as schedule, cost/budget, and quality, as well as being an obstacle to project execution. Budget-related risks often result in cost overruns, incurring losses for contractors. Schedule risks delaying project completion, harming contractors and project owners.

¹Newton, P. *Managing a Project Risk: Project Skills* (1st ed.). Bookboon. 2016.

²Shibani, A., Hasan, D., Saaifan, J., Sabboubeh, H., Eltaip, M., Saidani, M., & Gherbal, N. *Financial risks*

management within the construction projects. 2022. *Journal of King Saud University-Engineering Sciences*.

Quality risks can lead to construction failure, also to the detriment of the contractor. In addition, construction projects often cause disputes due to the high value of the work and the vagueness of contractual aspects.

According to the Construction Services Act No. 1 of 2017, a construction contract is a full-fledged document regulating the legal relationship between service users and service providers in the implementation of construction work. Article 46 states that the contract must include the employment relationship between the two parties and be used to monitor the development of needs in accordance with the provisions of legislation. Construction disputes can be identified at the beginning of work, but are often ignored by the parties involved. In Indonesia, disputes often arise due to the vagueness of the contract, differences in contract interpretation, non-conformity of the type of contract with field conditions, contract limitations, obligations of both parties, still unclear and failed to verify the terms of the contract during the procurement procedure [3].

Construction industry players are now increasingly understanding the importance of paying attention to risk issues in the projects they handle. Errors in risk assessment and handling can have a negative impact, either directly or indirectly, on a construction project. This risk can lead to cost overruns and delays in project completion schedules. Therefore, effective risk management is necessary to avoid such adverse effects and ensure the achievement of project objectives. To avoid these risks, the project manager must be able to mitigate these risks so as not to have a fatal impact on the achievement of project objectives [4]. This means that the better the risk management, the lower the risk faced by construction service providers. Risks in the project can have a negative impact on the objectives of the project, ie. schedule, cost/budget and quality, and can be an obstacle to the implementation of the project. According to Hopkinson risk management is an activity that aims to respond to known risks. Meanwhile, The Project Management Institute articulates risk management by including measures related to planning, identification, response, as well as monitoring and controlling risk management. All of these steps should be kept up to date throughout the project cycle [5]. The purpose of risk management is to increase the likelihood of a positive impact of an event and reduce the negative impact of a project.

Planning for unforeseen events allows construction project management to be prepared to respond if the forecast comes true. To guarantee the

success of a project, a company must be able to manage it by identifying, minimizing and avoiding risks. Project managers must understand the benefits of risk management because project execution relies on planning, preparation, results, and evaluation to achieve strategic objectives. Planning for success risk management planning contributes to the success of a project by listing external and internal risks. The plan usually includes identified risks, their likelihood, impact, and proposed mitigation measures. Small risks usually have little or no impact on cost, schedule, or performance. Intermediate risks result in increased costs, schedule disruptions, or decreased performance. On the other hand, a high level of risk can result in significant cost increases, schedule disruptions, or serious performance problems. Establish effective communication with stakeholders to ensure the project runs smoothly, the project manager must communicate the plan to the project sponsor, stakeholders, and team members. These actions allow project stakeholders to set clear expectations so that the project can run smoothly as planned without major disruptions. The process of identifying, avoiding and resolving risks is essential to ensure that employees can respond effectively to emerging challenges. Project managers without a risk management strategy are more likely to face problems later on. In contrast, an effective risk management strategy allows a company to maximize profits while minimizing costs on those parts that do not generate a return on investment. With detailed analysis, leaders can prioritize sustainable work based on results, even when faced with obstacles. Be proactive, not reactive the project manager's risk management plan allows for proactive planning to anticipate risks that have yet to materialize. This initiative is certainly more beneficial than facing danger without proper preparation. The project team can take identified risks and turn them into specific steps to mitigate risks. These steps can then be translated into a larger plan. Thus, it is important to pay attention to the risks that may arise both legal risk and financial risk.

2. METHOD OF RESEARCH

This study uses a descriptive qualitative approach that aims to provide a detailed and systematic description of the problem under study. The Data used in this study consists of primary data that is the results of observation and secondary data, secondary data sources in this study come from letters or reports, legislation, books and journals related this method helps in understanding and outlining in depth the various aspects associated with risk in construction projects.

³Ilma, D. A. U., Fitriyanti, F., Ma'arif, F., Baldah, N., & Utoyo, B. State of the Art construction contract disputes in Indonesia. *Inertia: information and exposure of Civil Engineering and architectural research results*, 16(2), 158-170. 2020.

⁴Sirpilla, A. F., Ferrada, X., Howard, R., Rubio, L. Manajemen Risiko dalam Proyek Konstruksi: Pendekatan Berbasis Pengetahuan. *Procedia-Jadi Ilmu Sosial dan Perilaku* 119 (2014) 653-662. 2014

⁵Hopkinson, R. Risk Management, Concept and Application. New York: Mc-Graw Hill. 2011.

3. RESEARCH RESULT AND DISCUSSION

Risk management is an activity that compensates for uncertainties in project management through a proactive approach, aimed at achieving project efficiency. This approach reduces unforeseen events and helps to understand the consequences of negative events. The ability to identify risks at all levels of project management improves project performance. Risk management includes the management of risks before or during a project, which can reduce costs, delays, pressures, and uncertainties, as well as ensuring the project meets certain specifications. Risk mitigation activities include acceptance, avoidance, reduction, and transfer of risk. Risk management is a decision that takes into account the potential of the project, with risk analysis helping to achieve the project objectives. Risk management can be applied during project contract negotiations and throughout the duration of the work.

The risk management process includes four process steps, namely:

- a. Risk identification: analyze the project to identify the source of risk.
- b. Impact assessment: Assessing the impact of a risk event and how to handle it.
- c. Risk Response development: developing loss mitigation options and emergency plans.
- d. Risk Response Management: improving risk strategies, monitoring new risks, and making changes to plans and management [6].

Risk management should concentrate on critical factors that affect project risk during the project:

- a. Relationship and continuity of the division of labor structure.
- b. Accuracy in key management and event tracking.
- c. Success of control procedures.
- d. System change control.

a. Project Risk

The researchers looked at different project risk definitions from different perspectives. Risk is the possibility of something going wrong during a project. Hillson defines risk management as a management method to achieve alignment between uncertain conditions to minimize threats and maximize opportunities when projects focus on achieving goals [7]. According to Edward and Bowen risk analysis is the systematic evaluation of decision variables that are subject to risk and uncertainty. The purpose of the risk analysis process is to identify possible project errors, to establish limits on assumptions regarding uncertainty; measure the potential impact of risky project results [8]. Risk management as a systematic approach to achieving

alignment by deliberate consideration of context and goal setting; identifying and analyzing risks and influencing risks in decision-making; monitoring and assessing risk responses. According to a Guide to the Project Management Body of Knowledge in Ward project risk management is defined as a part of project management with four process components, namely risk identification, risk quantification, Risk Response development, and risk management. Risk refers to the possibility of losing or obtaining economic or financial benefits, physical damage, delayed uncertainty related to activities aimed at achieving goals (Chapman and Cooper, Dey, 2002).

There are many risks associated with construction projects, but not all risks should be anticipated and considered before starting a project because it takes a long time. Therefore, parties involved in a construction project must prioritize significant risks that affect the outcome of the project.

b. Legal Risks

Risks that arise due to the absence of supporting legislation and weak ties are called legal risks, such as incomplete agreements/non-performance of contracts. There are problems in the implementation of construction contracts in the field: unclear content of contract documents, misunderstandings between users and service providers, the selection of the wrong type of contract, and plans that are not in accordance with the field. against conditions. In addition, it was clarified that according to Article 1 Paragraph (8) of the Construction Services Law of 2017, a construction contract is a complete document that regulates the legal relationship between service users and service providers at the time of construction. Article 46, on the other hand, states that the construction contract must mention the employment relationship between the service user and the service provider. The form can be used to monitor the development of needs and implemented in accordance with the provisions of legislation.

The contract is part of the Civil Code, so the terms of the contract/agreement are in the Civil Code. According to Article 1313 of the Civil Code, a contract is an act by which one or more persons bind themselves to one or more other persons. This construction contract is a contractual assignment because it is related to the provisions of Article 1233 of the Civil Code, according to which there are 2 (two) sources of assignment. Definition of construction contract by Salim H.S. is a contract known as the implementation of both the state and private parties in the implementation of house construction (Salim, 2013). On the other hand, Article 8 of the Construction Services Law Number 2 of 2017

⁶F. Gray, Clifford dan W. Larson, Erik. Manajemen Proyek : Proses Manajerial. Yogyakarta: Andi. 2006.

⁷Hillson, D. Using a risk breakdown structure in project management. Research Paper, 85-97. 2003.

⁸Edwards, P.J and P.A Bowen. Risk and risk management in construction: a review and future directions for research. Engineering Construction and Architectur Management, 6, 4, 339-349. 1998.

explains that a construction contract is a complete document that regulates the legal relationship between service users and service providers in the provision of construction services.

Regarding the construction contract, a construction dispute, also called a construction dispute, is a dispute that arises in connection with the execution of a construction services business between the parties

mentioned in the construction contract [9]. Legal risks in construction projects can arise due to various reasons, such as problems with contract documents and their articles, lawsuits from third parties, and problems in acquiring project land. The occurrence of risks in construction projects can have an impact on all parties, whether owners, contractors, consultants or stakeholders or the community. The potential risks associated with a construction contract are as follows:

Chart 1.1: Legal Risks of Construction Projects

Sources of risk	Risk Components	Indicators (Risk items)
Legal	Contract issues and their articles	Contractual / contract is not legally valid; contract with articles that do not benefit the project party; incomplete, unclear, ambiguity propyek articles; changes in the type, conditions, or regulations of the contract.
	Lawsuits	Legal claims from third parties at the time of execution; risk of part of the employment contract that has been handed over; legal/unofficial seizure of the project by the authorities/ government
	Licensing and land acquisition	Licensing and access are difficult and the process of land acquisition by the owner longer and incur costs beyond estimates.

c. Financial Risk

Financial risk refers to the potential loss of revenue and profits that may occur if the project fails. If the deadlines or budget of the project are not met, the result can be a large financial loss. Risks affecting an organization's financial performance are risk events

resulting from fluctuations in exchange rates, interest rates, including credit, liquidity, and market risks. Financial risk factors include inflation and interest rates, exchange rate fluctuations, cost overruns [10]. In addition, some of the factors that can lead to project failures and losses are the following:

Sources of risk	Risk Components	Indicators (Risk items)
Eksternal	Changes in government policies/regulations	Increase in fuel prices, changes in government regulations such as taxes, employment, devaluation and poor political climate in the country.
	<i>Acts of God dan natural hazard</i>	Floods, earthquakes, hurricanes, volcanic eruptions, tsunamis, lightning, landslides, erosion, excessive river levels, adverse weather conditions, low water levels and plane crashes.
	The economic condition of the country is not good	The weakening of the exchange rate, changes in interest rates on loans, rising prices for local materials, machine rental, labor wages.
	Problems in the provision of resources	Difficulty obtaining materials and equipment, changes in interest rates on loans, rising material prices, equipment rental, labor wages.
	Less supportive owner	The owner's project financing is unstable, insufficient, the owner is less involved in the project, the owner's payment is delayed, the owner's bureaucracy is complicated, the owner's demands to speed up the project; unilateral termination by the owner; the delay in launching the project due to the owner's fault; and the owner terminates the project.
	Poor condition of the company / branch	Weekly distribution of money from affiliates to underperforming projects, weak support from the company's management, poor political conditions in the Company, bankruptcy of the company, separation of the company from DRM members, changes in affiliate policy.
	Unexpected retribution	Unexpected costs/expenses such as excavation, irrigation, access roads and other unavoidable matters; and subcontractor price claims

⁹Nazarkhan Yasin. Familiar With Construction Claims & Construction Dispute Resolution. Jakarta: Gramedia Pustaka Utama. 2013.

Building Construction Project : Case Study - PT. Perusahaan Gas Negara Indonesia. The Tenth East Asia-Pacific Conference on Structural Engineering and Construction. 2006.

¹⁰Firmansyah, Bayu Aditya, Alin Veronika and Bambang T. Risk Analysis In Feasibility Study Of

Sources of risk	Risk Components	Indicators (Risk items)
Internal	Poor financial condition of the project	Miscalculation of project costs; consequential losses due to material/work defects; and overtime and express shipping costs.
	Poor project execution conditions	Project execution evaluation errors; and the project did not start as planned.
	K3	Occupational accidents, occupational deaths, dangerous/infectious diseases and poisoning due to physical projects.
	HR condition of the project is not good	Removal of key staff/senior staff/no role; poorly educated workforce; low labour productivity; strikes and riots; labour disputes; delay in seeing the problem through; delay in resolving the problem.
	Dishonesty, dishonesty, dishonesty	Disclosing project secrets to internal parties that harm the project; damage/loss of important documents, images, files, letters; and staff dishonesty, which harms the project financially.
	Risks due to third parties	Cross liability (losses incurred by subcontractors); third party losses (disability/death/material) due to work accidents; and the cost of disposal of debris belonging to third parties by the project
	Damage to equipment, property, physical projects	Risks to property that belongs to the project or is under its responsibility; damage to project construction equipment, low productivity of equipment/machinery; transportation of insured property; fire, explosion, damage to crops, forests, art objects, and culture
	Non-fulfillment of technical specifications	Quality control by the owner/consultant is poorly coordinated; rework due to substandard quality of work; lifetime risks; risks in testing mechanical and electrical components; as a result of defective work; lack/shortage of skilled labor; disadvantaged agricultural workers; and consequences of faulty materials.
	Technical aspects of the project that have changed from the owner	Changes in the concept of the building / building of the owner; minor changes to the project before construction; minor changes to the existing structure; differences in interpretation; technical changes made by the owner; volume of construction work; working drawings are not clear; one-time works are not clearly detailed, thereby increasing their value.
	Technological problems of construction methods	Different site conditions such as soil/rock/excavation conditions that exceed expectations; damage to drainage systems; cassettes/tunnels unable to withstand currents; unstable natural river banks; soil subsidence, contraction, expansion (in embankments); vibration, movement or weakening of soil carrying capacity (in embankments) ; to cast failures in rock or soft soil; cracks and leaks; damage to underground networks.
Actual physical condition problems encountered in the field	Varied site conditions such as soil/rock/excavation conditions exceeding expectations; damage to drainage systems; cassettes/tunnels unable to withstand flow; unstable natural river banks; soil subsidence, shrinkage, expansion (in embankments); vibration, movement or weakening of soil carrying capacity (in embankments); cast failures in rock or soft soil; cracks and leaks; damage to underground networks.	

d. Risk Analysis

Risk assessment is a process of identification and evaluation. According to Godfrey, a systematically applied risk analysis can help identify, assess and classify risks by clearly focusing the main risks, clarifying the limits of damage, minimizing potential losses in the worst case, managing project uncertainties, clarifying and strengthening roles of any person / institution involved in risk management [11].

Once the risks arising from these activities have been identified, actions are taken to reduce the resulting risks. This action is called Risk Reduction. The problem of risk mitigation that can be done by risk management contains risk, namely the act of accepting risk/maintaining, because the impact of adverse events can still be accepted as much as possible, the impact of these events can be reduced by applying risk mitigation, although these actions can still have residual risk. which should be revisited. Or it could be by transferring the risk to a third party for a fee, for example to an insurance

¹¹ Candace Yuliana. Contract risk management for construction projects. Journal Of Civil Engineering / Volume 11, No.1-2017 ISSN 1978-5658.

company. However, the last step that should be taken to reduce the risk is to avoid the risk itself if the impact of the risk is unacceptable [¹²].

e. Risk Response Planning

Risk management planning is the activity of developing alternatives and determining actions to increase profit opportunities and reduce the risk of loss of project objectives. The results of this step are compiled in the form of an updated list of risks and their components:

- a. Identify the risk and its description, the scope of the project affected, its causes and how the risk affects the project objectives,
- b. The owner of the risk and the person responsible for the implementation.
- c. Results of qualitative and quantitative risk analysis process, including project risk priority list and project feasibility analysis,
- d. Design of the received response,
- e. Specific actions to implement the selected response plan,
- f. Symptoms and warning signs of risk events,
- g. Preparation of the budget and timing of the activities necessary for the implementation of the selected response plan,
- h. Uncertainty of time and budget resource plans with respect to risk tolerance of interest groups,
- i. Reverse planning (reaction), used as a reaction to existing risks,
- j. The remaining risk is the risk that can only arise after planning,
- k. That arise directly as a result of risk management measures,
- l. Provision of unforeseen costs in the calculation as the basis of a qualitative analysis of the limit value of the project and the organization.

f. Project Performance

The objective of the implemented project is to identify constraints in the project schedule, cost and project performance (in terms of project scope and quality). When we want to manage a project, we definitely think between performance and schedule and cost and budget. The goal of project management is often information to measure project performance, which provides opportunities for more effective remedial action. The concept of project efficiency includes product and process efficiency. Product performance refers to the success of the system developed in the project, while process performance refers to the successful development of the project itself (for example, completing the project on time within the specified

budget). Project performance measurement is an important part of the project management or project management process and should be taken seriously.

In general, the effectiveness of the project can be seen from the implementation of an effective and successful project. on time according to schedule or according to budgeted costs. Project performance measurement is a very important aspect of a project because many factors can affect the success or failure of a project or the uncertainty of a project. The industry / organization must be able to determine the effectiveness of the project implemented, in other words, know exactly the criteria for the success of the project. Most organizations have so far emphasized project efficiency in terms of Project Time and cost. In addition, it highlights changes in contract time and contract costs, often referred to as time and cost increases, which appear as a positive or negative percentage of the specified contract terms. For example, if the growth in time and cost of a project is negative, then it is generally a useful and successful project. This can happen because the owner or project manager decides to reduce the scope of work, or the project is completed before the end of the schedule/before the deadline which means a negative time extension and increased costs.

Thomas stated that project success or project performance can be viewed from the point of view of project variability in line with lean manufacturing principles [¹³]. Workflow variability during the design process interferes with efficiency. Therefore, projects should focus on workflow variations to improve project efficiency. This workflow variability is related to capacity flexibility strategies (workforce and factory) to respond effectively. The main principle is to reduce waste-related activities in the process in order to make improvements in the context of added value. These principles include several things, such as:

- a. Goal: reduce project cycle time.
- b. Why: because speeding up production / process will increase yield.
- c. How to achieve: improve the reliability of process flow, reduce wasteful operations, and simplify operations.

Risk management is an approach to risk, namely by understanding, identifying and evaluating project risks. Then consider what will be done in terms of impact and the possibility of transferring risk to other parties or reducing existing risks. Risk management is a set of risk-related activities, ie. Risk Planning, Assessment, processing and monitoring (Kerzner, 2001) [¹⁴].

¹² Flanagan, R. Managing Risk For Anuncertain Future A Project Management perspective. London: School of Construction Management and Engineering The University of Reading UK. 2012.

¹³Thomas, R et al., Reducing variability to improve performance a lean construction principle. Journal of

Construction Engineering and management, 144-154. 2002.

¹⁴Kerzner, H. Project Management. Seventh Edition. John Wiley & Sons, Inc.,New York. 2001.

4. CONCLUSION

In any construction project, it is very important to implement risk management to avoid the cost, quality and schedule of the project. Risk management is an approach to risk, namely by understanding, identifying and evaluating project risks. Then consider what will be done in terms of impact and the possibility of transferring risk to other parties or reducing existing risks.

Legal risks in construction projects can arise due to several reasons, such as problems with documents and contract articles, lawsuits from third parties, and problems in acquiring project land. The occurrence of risks in construction projects can have an impact on all parties, whether owners, contractors, consultants or stakeholders or the community.

Construction project risks always have a negative impact on project objectives, construction projects are high-risk business fields, risks in projects are things that if realized can negatively affect project objectives, namely schedules, costs and technical data. Risks can lead to stalled and delayed projects, as well as cost overruns. The risk of causing negative changes to aspects of the project such as construction law, estimated time, estimated cost and project quality. Therefore, good risk management is necessary to achieve project efficiency. Project performance improves when organizations can create a high fit between risk exposure and risk management profiles. When project performance is measured based on the cost gap criterion, high-risk projects require a higher profile of internal integration and formal planning than low-risk projects. On the other hand, if project performance is measured by system quality, high-risk projects require greater user involvement. Project performance is a direct result of the activities of the people involved in the project (those who carry out project risk management practices), which is why it is necessary to integrate the perspectives and priorities of the various parties, so that the project performance criteria can be achieved. compromise work is recognized and well managed.

To minimize the risks that arise, construction project parties should view risk management as an integral part of overall project management. Risk management includes the steps involved in risk management planning, identification, response, and Project Monitoring and control. All of these steps should be kept up to date throughout the project cycle. The purpose of risk management is to increase the likelihood of a positive impact of an event and reduce the adverse impact of a project.

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