

Impact of Project Delays on Financial Losses on the Green Economy

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Abstract: The facility construction and land leasing projects often face various challenges that can cause delays, ultimately significantly impacting costs and financial losses. The study analyses the impact of project delays resulting in green economic losses that exceed the total initial investment cost. With a total investment of IDR 6,188,481,522, this project suffered significant losses, reaching IDR 8,095,928,364 due to various factors, including operational disruptions due to non-fulfilment of licensing documents, additional licensing items, and extension of work time. The method used is qualitative risk analysis. These findings emphasize the importance of effective project management, especially permit fulfilment and schedule planning, to minimize financial risks and ensure smooth project operations. This research provides important insights for project managers facing similar future challenges.

1 INTRODUCTION

The project under study involves the construction of facilities and land leases for 10 years, with a total investment cost of IDR 6,188,481,522 in a subsidiary of PT. Astra. However, this project experienced several delays that caused various financial losses, which amounted to Rp 8,095,928,364. This construction project allocates IDR 4,799,592,633 for the construction of facilities that are expected to support project operations. In addition, there is a cost of Rp 1,388,888,889 that has been allocated for land lease for 10 years, which is an important part of the project's operational sustainability. Delays in the processing of licensing documents have caused the assumption of operational losses for one year, with a total loss of Rp 7,775,130,384 include official trips, additional permits cost, overtime, and land. Overall, the losses caused by the delay of this project far exceeded the initial investment cost, with a total loss of Rp 8,095,928,364. These losses illustrate the importance of more effective project management, especially in terms of fulfilling the right licensing and scheduling documents so that the project can run as planned and minimize potential losses (Egwim et al., 2023; Elhusseiny et al., 2021; Fashina et al., 2021).


Project delays in the green economy can lead to increased operational costs and significant financial


losses due to delays in the implementation of green technologies and reduced economic benefits of energy efficiency. Additional costs for licensing, rent, and official travel as well as losses from suboptimal use of resources will exacerbate the financial impact. Therefore, effective time management in green economy projects is essential to minimize additional costs and ensure environmental and economic benefits are achieved (Monteiro et al., 2020; Montenegro et al., 2021; UNEP, 2010).

The objectives of this study are to identify the causes of project delays by researching and identifying the main factors that cause delays in facility construction and land lease projects, especially those related to the fulfilment of licensing documents. The analysis method used is a fishbone diagram so that it can be more in-depth and structured in analysing the delay in licensing development projects and their impact on costs and financial losses (Gartlehner et al., 2017).

2 LITERATURE REVIEW

The theories that support this study include; Project management includes the concept of planning, organizing, controlling, and supervising a project to

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achieve the goals that have been set (Divi & Kumar.P, 2017; Kumar et al., 2023). A focus on time, cost, and quality management is often key in identifying and reducing the risk of project delays (Moradi et al., 2020). Risk management is used to identify, analyse, and respond to risks that may occur during the implementation of a project (Alsaadi & Norhayatizakuan, 2021; Lin & Chen, 2021). This approach helps in understanding how uncertainty in the fulfilment of licensing documents and other external factors can lead to delays and financial losses (Shibani et al., 2022). Cost control is concerned with controlling costs in a project to ensure that project costs remain within the planned budget (Beste & Klakegg, 2022).

For project delay research, this theory helps in analysing how changes in timing and licensing requirements can affect budgets and cause cost overruns (Nusraningrum & Priyono, 2018). Decision theory is applied in decision-making processes related to project management, especially in situations of uncertainty and risk (Alsaadi & Norhayatizakuan, 2021; Lin & Chen, 2021; Sarmiento et al., 2017; Shibani et al., 2022). This concept supports the analysis of how decisions related to regulatory adjustments or permit fulfillment can affect project sustainability and overall costs.

Whereas organizational behavior describes how the behavior of individuals and groups within an organization can affect project performance (Colquitt, 2023). Managerial skills, team coordination, and effective communication are important elements that can impact project delays and cost additions (Aung et al., 2023). Finally, contingency understanding emphasizes the importance of flexibility and adaptability in project management (Demirkesen & Ozorhon, 2017; Herrera et al., 2020; Kumar et al., 2023; Lalmi et al., 2021; Nusraningrum et al., 2020; Wang & Chen, 2023). This relates to how the project must adapt to changing conditions, such as regulations or resource constraints, to minimize the negative impact on costs and schedules. By integrating these various theories, research can offer more comprehensive insights into the factors that contribute to project delays and how their impacts can be managed or reduced.

3 METHODS

The design of this research is qualitative, the object of research is one of the Branch Building Construction projects of PT. Astra which is carried out by a subsidiary located in Palembang experienced delays in the processing of building permits. Data

analysis using the fishbone method is used for cause-and-effect analysis (Gartlehner et al., 2017). Fishbone diagrams help identify various causes that may result in delays in exploring factors such as management, resources, processes, and externalities. This method allows a systematic approach to analysing complex problems by grouping potential causes into categories, such as man, methods, machines, and materials. The category groupings used in this cause-and-effect diagram were obtained from observations carried out on the project under study. By understanding the underlying causes of delays, more effective solutions can be developed to reduce the financial impact of delays by identifying areas that need improvement.

4 RESULT AND ANALYSIS

Data on the cost of work, and investment cases studied can be seen in the following table 1.

Table 1: Data on costs and investments in delays in obtaining building permits.

Description	Value (IDR)	Note
Construction and facility costs	4.799.592.633	
Land Lease	1.388.888.889	10 years rent
Total	6.188.481.522	

Table 1 expresses the total cost of the project, which includes cost of construction and facilities.

Table 2. Losses delays of building permits processing.

Description	Value (IDR)	Information
Operational	7.775.130.384	Assumption of loss of 1 year, if the location is closed due to non-fulfillment of licensing documents
Official Trips	16.000.000	Total Calculation of Official Trips Outside the Agenda
Addition of Licensing Items	155.000.000	There is an addition of permit management items due to regulatory adjustments and because the building has been erected first
Working time	10.909.091	Calculation of cost assumptions due to additional time spent in management for 1 year
Land Rental Cost	138.888.889	Assumption of loss of 1 year, if the location cannot be maximized
Total	8.095.928.364	

Table 2 outlines the various costs related to the project studied, namely operational losses, official trips, additional fees for permit management, overtime, and land rental.

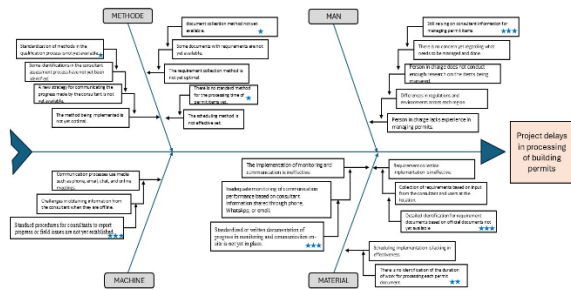


Figure 1: Project Delay Fish Bone Diagram.

Figure 1 identifies the various factors that cause project delays in the processing of building permits.

- 1. Man.** The person in charge did not conduct enough research regarding the item being managed. In addition, there is a lack of experience in managing permits, which hinders the efficient completion of permits. Differences in regulations and environments in each region lead to difficulties in the standards and procedures to be followed, which contributes to delays.
- 2. Method.** The requirements collection methods that are being implemented are not optimal, which leads to the necessary information not being collected effectively. The implementation of monitoring and communication is ineffective. Monitoring communication performance based on information from consultants shared via phone, WhatsApp, or email is also inadequate.
- 3. Machine.** The communication process uses media such as telephone, email, chat, and online meetings. However, there are challenges in getting information from consultants when they are not online, which slows down the process. The process of collecting information from consultants does not run optimally when communication occurs offline, resulting in delays in decision-making.
- 4. Material.** The implementation of requirements collection is ineffective, especially because requirements collection is based on input from consultants and users on site. In addition, the implementation of the schedule is less effective, which contributes to project delays.

Project delays usually require additional working time for the workforce, whether in the form of overtime or extending the term of the worker's contract. This will increase the overall cost of labor (Beste & Klakegg, 2022; Nusraningrum & Priyono, 2018; Sepasgozar et al., 2019). Delays in the project schedule can cause rental equipment to be maintained longer, or materials that have already been purchased may need to be stored longer, incurring storage costs and possible material damage. In some cases, delays may require reapplying for permits or adjusting existing permits, which will add to administrative costs (Beste & Klakegg, 2022). However, changes in regulations during the delay period may require changes or renewals of permits, which adds to the cost. If the delay violates the agreed licensing deadline or has an impact on the fulfilment of certain legal obligations, this may result in additional fines or penalties to be paid. Project delays in the green economy often led to spikes in additional costs, such as for licensing and operations, as well as reducing the economic benefits of implemented green technologies. Efficiency in project time management is key to reducing financial losses and ensuring that investments in green solutions can provide optimal returns (Al-Hamrani et al., 2021).

Delays can also lead to a loss of business opportunities or potential revenue generated from the use of completed projects. For example, a commercial building that is overly completed cannot be leased or used as planned, which reduces the revenue potential. In the case of long delays, the price of materials and other costs may increase over time, adding to the greater financial burden than budgeted. All of the above elements will contribute to an increase in the total cost of the project, which can over budget (Beste & Klakegg, 2022; Nusraningrum & Priyono, 2018). This can affect the overall profitability of the project. Delays that lead to increased costs can also damage investor or other stakeholder confidence, which can lead to long-term financial losses such as withdrawal of investments or difficulty obtaining funding for future projects. Thus, the delays in licensing identified through fishbone diagrams are not only a matter of time but also have a significant financial impact on the total cost of the project, as well as potentially causing long-term losses (Egwim et al., 2023; Elhusseiny et al., 2021).

To evaluate the effectiveness of project management in anticipating and dealing with delays, it is necessary to conduct a comprehensive analysis of project performance through key indicators such as completion time compared to the planned schedule, comparison of actual costs with the initial budget, and

the level of compliance with the risk planning that has been set (Divi & Kumar.P, 2017; Moradi et al., 2020). The use of methods such as variance analysis can help identify deviations from the plan, while project audits and post-project reviews can provide in-depth insights into areas that need improvement, particularly in risk management and cost control (Guinness & Heathcote, 2022; Nusraningrum & Priyono, 2018; Sarmiento et al., 2017). Project scheduling should be more flexible and scenario-based, with time buffers to anticipate possible delays and periodically revise schedules based on actual progress (Egwim et al., 2023; Fashina et al., 2021; Sepasgozar et al., 2019). To address the risks in this project, contingency planning involves ensuring completeness and compliance with licensing documents by allocating additional budgets and establishing proactive communication with authorities to avoid delays. To mitigate losses from land leases, negotiate flexible contracts monitor land use regularly, and prepare a reserve fund to cover losses if the location is not fully used.

5 CONCLUSIONS

The factors that cause project delays in processing building permits are weaknesses in human resource management, data collection, communication methods, use of tools and materials. Project delays in the green economy can significantly increase operational costs and financial losses, so efficient time management is essential to minimize negative impacts and maximize environmental and economic benefits. Implications in the processing of building permits is improving the skills and competencies of the project management team. The adoption of more advanced technologies for data collection and analysis, such as cloud-based project management systems or specialized software for permit management. Re-evaluate the use of tools and materials to ensure efficiency and reduce waste. Corrective action should be focused on identifying the specific causes of delays in each of the areas.

Further research on the role of human resource management, communication, and the use of technology in the efficiency of construction projects will opens up opportunities for the development of more effective and sustainable project management models.

The limitation of this research focuses on internal factors such as human resource management, data collection methods, and the use of tools and materials

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