

## **Risk Management in Loan Programming of Public Works Infrastructure Construction (Lesson Learned of Indonesia Tourism Development Project)**

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### **Keywords**

risk management, last planner system, loan program

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### **Abstract**

Loan programs serve as an alternative funding source for public infrastructure development in Indonesia, yet they often face significant delays due to complex organizational structures, readiness criteria, procurement procedures, and technical challenges. This study aims to formulate risk management recommendations for loan-funded public works infrastructure projects by drawing lessons from the Indonesia Tourism Development Project (ITDP), implemented from 2018–2024. The research adopts a qualitative case study approach using the Last Planner System (LPS) framework, which includes Master Schedule, Phase Planning, Modified Lookahead Planning, and Weekly Work Planning. Data were collected from CPMU, PMU, and PIU progress reports, operational manuals, audit records, and lender evaluation documents. The findings reveal that combining planning and construction within the same loan period is a primary source of delay, as the formulation of the Integrated Tourism Master Plan consumed nearly half of the project timeline. Other critical issues include land availability, procurement document mismatches, technical adjustments during construction, and institutional gaps in asset handover to local governments. The study concludes that loan programs should separate planning from construction phases, prioritize subprojects based on societal impact, ensure readiness criteria are fulfilled before commencement, and establish early stakeholder collaboration. These LPS-based recommendations provide a structured approach for future loan managers to anticipate and mitigate implementation delays.

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## **INTRODUCTION**

The global infrastructure financing gap has emerged as one of the most pressing economic challenges of the twenty-first century, with profound implications for sustainable development worldwide. According to the *Global Infrastructure Outlook* by the World Bank Group, the world faces a staggering cumulative infrastructure investment shortfall of approximately USD 11 trillion between 2025 and 2040. This deficit spans critical sectors, including transportation, energy, water supply, sanitation, and digital connectivity, affecting both developed and developing nations. The gap is particularly acute in low- and middle-income countries, where the annual financing need reaches around USD 1.5 trillion, equivalent to approximately 4.5 percent of their combined GDP. Furthermore, the human dimension of this shortfall is stark: 666 million people remain without access to electricity, 2.1 billion lack safe drinking water, 3.4 billion lack adequate sanitation facilities, and 2.6 billion people remain digitally unconnected. These statistics underscore the urgency of mobilizing effective financing mechanisms for infrastructure development (Ferreira et al., 2023).

In response to this global challenge, loan programs have become an increasingly vital alternative funding source for public infrastructure development. International financial institutions, multilateral development banks, and bilateral lenders have stepped in to fill the void left by constrained public budgets. The World Bank, through its Country Partnership Frameworks, actively promotes sustainable economic development by providing loan facilities tailored to national priorities. Similarly, commercial banks play a pivotal role in infrastructure financing, often acting as the primary capital channel in countries where capital markets remain underdeveloped. However, this reliance on loan-based financing creates a paradox: while loans enable infrastructure development, they also expose borrowing nations and implementing agencies to significant credit and implementation risks. Empirical evidence from Tanzania demonstrates that mismanagement of borrowed funds, inadequate technical capacity, and deficiencies in procurement management frequently lead to substandard work, project delays, and cost overruns, ultimately contributing to rising public debt and a moderate-to-high risk of debt distress (Buitrago-Mora et al., 2024).

The specific issue of infrastructure project delays in loan-funded public works has reached critical proportions across multiple countries, demanding immediate academic and practical attention. In India, for instance, nearly 580 national highway projects with a total value of approximately Rs 3.9 lakh crore (USD 4.7 billion) are currently facing delays, while an additional 200 projects worth Rs 1.6 lakh crore have yet to commence despite being bid out months ago. The primary causes identified include land acquisition hurdles (accounting for 28 percent of cases), contractor-related issues (19 percent), and pending statutory clearances, such as forest and environmental approvals (13 percent). Similarly, South Africa has witnessed a contracting pipeline of infrastructure projects, with more than 500 projects canceled nationally in 2024 alone and an average of 22 percent of projects either postponed or canceled between January and May 2025. Municipalities, which hold nearly 26 percent of the government's infrastructure budget, continue to underspend by billions, while tender activity in civil and general building works has fallen by 33 percent nationally. These figures indicate that construction delays are not isolated incidents but rather systemic problems rooted in planning, coordination, and risk management deficiencies (Orya & Calahorra-Jiménez, 2025).

Previous research from reputable databases such as Google Scholar and Scopus has identified various strategies to mitigate delays in construction projects, with the Last Planner System (LPS) emerging as a particularly promising lean construction tool. A study published in *Results in Engineering* (Volume 22, June 2024), involving 50 building project managers and two residential projects, found that implementing BIM and lean tools, especially LPS and collaborative meetings, strongly influences the mitigation of delay factors such as errors and deficiencies in design documents, inefficient project planning and scheduling, and poor communication and coordination with designers. The study specifically identified that the 4D construction planning and 4D construction analysis and optimization capabilities of BIM, combined with LPS's look-ahead planning and weekly work planning, significantly reduce schedule deviations (Amoah et al., 2024). Similarly, research published in the *SSRG International Journal of Civil Engineering* (Volume 10, Issue 4, 2023) demonstrated, through a pilot plan in a tracks-and-greenways project in Lima, that LPS implementation resulted in an 8 percent decrease in project delays relative to the initial deadline, a 22 percent increase in the percentage of completed plans, and a 5 percent reduction in stoppages due to rework (Quiroz et

al., 2023). These findings confirm the effectiveness of lean construction philosophy and LPS as a powerful methodology for production planning and control in construction projects (Power et al., 2024).

However, despite these promising findings, a significant research gap exists regarding the application of LPS specifically to loan-funded public works infrastructure projects within developing-country contexts. Most existing LPS research focuses on private or commercial construction projects, where funding mechanisms are relatively straightforward and organizational structures are leaner. Loan-funded public works projects are fundamentally different: they involve complex multilayered organizational structures (Central Program Management Unit, Program Management Unit, and Project Implementation Unit), stringent lender requirements, compliance with both national and international procurement regulations, and extensive documentation, such as Environmental and Social Management Frameworks and Project Operational Manuals. Furthermore, loan programs are characterized by specific implementation periods, defined targets and indicators, and eligibility restrictions on subprojects. The integration of planning and construction phases within the same loan period, as observed in the *Indonesia Tourism Development Project (ITDP)* from 2018 to 2024, introduces unique risks that have not been systematically addressed in existing LPS literature. The current research therefore lacks a framework that adapts LPS to the distinctive institutional and financial constraints of loan-based public infrastructure programming (Omotayo et al., 2024).

The urgency of addressing this research gap cannot be overstated, given the simultaneous pressures of accelerating infrastructure delivery, managing public debt sustainability, and meeting sustainable development goals. As public budgets in many countries face rising debt and interest burdens, demographic challenges, and the additional demands of climate change adaptation and digital transformation, loan programs will inevitably play an even larger role in infrastructure financing. However, without effective risk management frameworks tailored to these programs, the cycle of delays, cost overruns, and suboptimal outcomes will continue, undermining development impact and exacerbating debt distress (Osei-Kyei & Chan, 2023). The World Bank itself recognizes that public budgets and multilateral support are insufficient to eliminate poverty on a livable planet, emphasizing that partnership and efficient implementation are essential. Moreover, banks financing these projects face significant risks, including credit concentration, liquidity mismatches, and pressure on equity capital when loans underperform or projects are delayed. Therefore, developing and validating risk management strategies specifically for loan-funded public works is not merely an academic exercise but a practical necessity for financial and development institutions worldwide.

The novelty of this research lies in its application of the Last Planner System as an integrative risk management framework for loan-based public infrastructure projects, using the *Indonesia Tourism Development Project* as an empirical case study. Unlike previous studies that apply LPS to individual construction sites or private developments, this research extends LPS across three organizational levels of loan program management: Master Schedule (CPMU level), Phase Planning (PMU level), and Modified Look-ahead and Weekly Work Planning (PIU level). The research systematically identifies how each LPS component addresses specific delay factors characteristic of loan programs, including document preparation and lender approval processes, subproject selection based on readiness criteria, procurement

harmonization between national and lender regulations, land acquisition delays, coordination conflicts between concurrent construction works, technical adjustments due to design-actual discrepancies, and asset handover procedures to local governments. Furthermore, this research contributes to the limited body of knowledge on tourism infrastructure development financing, a sector with unique multisectoral coordination challenges involving planning, public works, tourism, and investment ministries, as evidenced by the ITDP's structure.

The primary purpose of this research is to formulate actionable risk management recommendations for loan program managers and stakeholders involved in public works infrastructure construction, based on documented lessons learned from the ITDP implementation period from 2018 to 2024. By employing the LPS framework, this research seeks to bridge the gap between theoretical lean construction principles and the practical realities of loan-funded development projects. The research contributes to both academic knowledge and professional practice in several ways. First, it provides structured documentation of delay factors specific to loan programs, categorized by LPS planning levels, which can serve as a diagnostic checklist for future projects. Second, it offers empirically grounded recommendations for each critical aspect of loan implementation, from master schedule design to weekly work monitoring. Third, it demonstrates how LPS can be modified to accommodate the hierarchical decision-making and compliance requirements inherent in loan programs, thus expanding the applicability of lean construction theory to development finance contexts.

The specific objectives of this research are: (1) to identify and categorize the critical delay factors encountered during the ITDP loan program implementation from 2018 to 2024, based on data collected from CPMU, PMU, and PIU monitoring and evaluation activities; (2) to map these delay factors onto the four levels of the Last Planner System—Master Schedule, Phase Planning, Modified Look-ahead Planning, and Weekly Work Planning—to create a structured risk management framework; (3) to formulate targeted recommendations for each critical aspect, including document preparation, subproject selection, procurement procedures, land availability, coordination between related construction works, technical issue mitigation, handover sequences, and audit follow-up; (4) to analyze the institutional and procedural lessons learned from ITDP as documented in Project Completion Reports, Implementation Completion Reports, and Independent Evaluation Group reviews; and (5) to propose a modified LPS-based planning approach that loan managers can adopt to anticipate and mitigate potential delays before they occur.

The benefits of this research extend to multiple stakeholder groups across the infrastructure development and financing ecosystem. For loan program managers and implementing agencies (CPMU, PMU, and PIU), this research provides a practical, step-by-step framework for planning and monitoring loan-funded construction projects, potentially reducing the frequency and severity of delays that currently plague such programs. For lending institutions, including multilateral development banks such as the World Bank, the findings offer insights into how borrower-side planning practices can be strengthened to improve loan performance and disbursement rates, thereby reducing credit and reputational risks. For national governments, particularly in developing countries such as Indonesia, the recommendations can inform policy reforms related to the separation of planning and construction phases in loan programs, the preparation of readiness criteria before loan effectiveness, and the establishment

of early stakeholder collaboration mechanisms with local governments for asset handover. Ultimately, for the intended beneficiaries of infrastructure projects—the millions of people currently lacking access to electricity, clean water, sanitation, roads, and digital connectivity—this research contributes to the timely delivery of the infrastructure that underpins quality of life, economic opportunity, and sustainable development.

## **METHOD**

This study adopted a qualitative, retrospective case study research type, as it aims to extract and formulate risk management recommendations based on the documented experience of a single, complex loan-funded infrastructure project—the Indonesia Tourism Development Project (ITDP), implemented from 2018 to 2024. The research is exploratory and applied in nature, focusing on lessons learned rather than hypothesis testing (Yin, 2018; Lapinski et al., 2021). The data population comprises all documentation, reports, and institutional knowledge related to ITDP’s public works infrastructure component under the authority of the Ministry of Public Works. The data sample includes specifically selected project documents: the Environmental and Social Management Framework (ESMF), Project Operational Manual (POM), Integrated Tourism Master Plan (ITMP), procurement records, audit reports, and progress monitoring reports from the Central Program Management Unit (CPMU), Program Management Unit (PMU), and Project Implementation Unit (PIU). The sampling technique was purposive sampling, as only documents and experiences directly relevant to loan implementation delays, readiness criteria, and planning-construction interfaces were selected to ensure relevance to the Last Planner System (LPS) framework (Creswell & Creswell, 2018).

The research instrument is a document analysis guide and a thematic coding sheet developed based on the four LPS levels: Master Schedule, Phase Planning, Modified Lookahead Planning, and Weekly Work Planning. Validity was ensured through content validity, where the instrument items were derived directly from the Lean Construction Institute’s LPS workbook and cross-checked with ITDP’s operational manuals. Reliability was established through inter-coder agreement, where two researchers independently coded 20% of the sampled documents, achieving a consistency level above 85%. Data collection technique employed documentary review and secondary data analysis, compiling information from internal ITDP progress reports, CPMU meeting minutes, audit follow-up records, and lender reports (World Bank’s Implementation Completion Report and Independent Evaluation Group review). The procedure involved four steps: (1) collecting all relevant ITDP documents from 2018–2024, (2) mapping each identified risk or delay to the corresponding LPS planning level, (3) formulating recommendations based on observed gaps, and (4) validating findings against the Project Completion Report and IEG review.

Software used for data management and analysis included Microsoft Excel for organizing coded themes and NVivo 14 for qualitative thematic analysis to identify recurring delay factors across subprojects (Clarke & Braun, 2022). The data analysis technique employed thematic content analysis and pattern matching, where delays from ITDP implementation (e.g., land acquisition, procurement mismatches, technical issues) were matched against LPS planning functions to formulate targeted recommendations. Additionally, cross-case synthesis was implicitly used by comparing multiple subproject experiences within ITDP to identify common risk patterns. The analysis resulted in the structured presentation of findings in Tables 1–4, each

corresponding to one LPS planning level, with critical aspects, ITDP implementation notes, and recommendations.

## RESULTS AND DISCUSSION

### Master Schedule

#### Functions

Master schedule provides overall information of the loan program that covers start and end period of loan effective period, detail subprojects planned by related responsible stakeholders, and documents required for the implementation of the loan program. The master schedule is approved on the level of CPMU.

**Table 1 Master Schedule of LPS on Loan Program**

No.	Aspects and Notes
1.	<p><b>Critical Aspect:</b> Document Preparation of Loan Implementation</p> <p><b>ITDP Implementation:</b> Formulation of Environmental and Social Management Framework (ESMF) and Project Operational Manual (POM) as basic reference for technical guidelines</p> <p><b>Recommendation:</b> Intensive coordination and collaboration should be well developed between loan managers and lender to ensure approval document process is effective and efficient</p>
2.	<p><b>Critical Aspect:</b> Planning and Construction Phase of the Loan Program</p> <p><b>ITDP Implementation:</b> Formulation of ITMP as planning document basis consumed several years of implementation period</p> <p><b>Recommendation:</b> Loan implementation should focus on construction phase</p>
3.	<p><b>Critical Aspect:</b> Subproject Selection of the Loan Program</p> <p><b>ITDP Implementation:</b> Some changes of subproject implementation had been made to due to readiness of the construction criteria</p> <p><b>Recommendation:</b> Subproject selection should consider the readiness criteria and achievement towards targeted outcome</p>
4.	<p><b>Critical Aspect:</b> Procurement and Construction Aspect</p> <p><b>ITDP Implementation:</b> Procurement and construction period are affected by delay of planning document formulation</p> <p><b>Recommendation:</b> Preparation of subproject should be well finalized to ensure there would be no delay of construction</p>

Source: Authors' analysis based on ITDP implementation experience (2018–2024) and Last Planner System (LPS) framework.

#### Required Documents of Loan Implementation

ITDP formulates several required documents such as Environmental and Social Management Framework (ESMF), Project Operational Manual (POM) which consist of General Guidelines and Program Manual Guidelines. Approval of those documents is given from the World Bank as lender since the documents are derived from the manual of the lender.

Loan managers should develop intensive coordination and communication both within the project team as well as to external of related stakeholder to ensure shared perspective towards

reference documents. Such an approach would give more efficient process for the approved documents by the lender (Kim, 2023).

### **Planning document as a reference for construction**

ITDP puts tourism aspect as leading sector to accelerate economic growth. This approach requires integrated programs across multiple sectors. Therefore, in the beginning of the loan period ITDP focusses of development of Integrated Tourism Master Plan (ITMP). On the other hand, the formulation of ITMP consumes almost half period of the loan program. As a result, in terms of loan disbursement the performance is not effective.

It is highly recommended that loan program does not encompass both planning and construction within the same period of loan program. Referring to ITDP experience, the planning process has significant impact to the readiness of the subproject's construction period. Therefore, the loan program should focus exclusively on construction while the planning aspects are undertaken through a separate program prior loan's effective period.

### **Subproject selection for construction**

Selection of subproject for construction is undertaken once the planning aspect has been completed. In fact, however, some practical adjustment towards subproject selection is required due to readiness of the required requirements such as land availability and technical design document. As a result, some subprojects are taken out and replaced with other subproject meet all the requirements.

Subproject selection plays an important role to achieve the targeted outcome. Therefore, meeting the required criteria such as land availability as well as technical document becomes essential follow-up action. The recommended approach is to conduct subproject selection first, followed by the preparation of the readiness criteria.

### **Procurement process and construction period**

Procurement and construction period on the level of master schedule are observed in general way to ensure that those activities are completed within the loan's effective period. In the case of ITDP implementation, due to delay of planning documents as well as technical preparation of readiness criteria, the construction period needs an additional time of 1 years. Consequently, the loan was extended from December 2023 to December 2024.

Procurement and construction activities should be planned carefully within the loan effective period. This requires preparation of readiness criteria as well as procurement procedure should be completed prior the commencement of the construction. It is recommended to ensure that procurement process and construction would not lead to the loan extension period.

### **Phase Planning**

#### **Functions**

Phase planning describes milestones of the program which was provided in yearly plan. The phase planning is approved in the level of PMU.

**Table 2 Phase Planning of LPS on Loan Program**

<b>No.</b>	<b>Aspects and Notes</b>
1.	<b>Critical Aspect:</b> Subproject Preparation for Construction <b>ITDP Implementation:</b> Fulfillment of the readiness criteria requires 6 months until 2 years of preparation

	<b>Recommendation:</b> Prioritize the subproject that brings significant impact to the society then the readiness criteria would be followed up
2.	<b>Critical Aspect:</b> Procurement Procedure <b>ITDP Implementation:</b> Reference document of procurement is harmonized document between national procurement regulation and World Bank procurement document <b>Recommendation:</b> Selection of Pokja with specific knowledge of loan procurement procedure
3.	<b>Critical Aspect:</b> Construction Period <b>ITDP Implementation:</b> High potential of adjustment due to difference between technical design document and actual situation <b>Recommendation:</b> Intensive monitoring should be done to ensure the construction would bring positive impact to the society
4.	<b>Critical Aspect:</b> Handover Procedure <b>ITDP Implementation:</b> Structural problem regarding to institutional aspect of local government for asset operators <b>Recommendation:</b> collaborate with the related stakeholder since the subproject commencement

Source: Authors' analysis based on ITDP implementation experience (2018–2024) and Last Planner System (LPS) framework.

### Subproject Preparation for Construction

Subproject preparation on the phase planning focusses on establishing necessary readiness criteria. Referring to ITDP implementation, the fulfillment of the readiness criteria requires 6 months until 2 years of preparation including land acquisition, formulation of detail engineering design and completion of social and environmental documents. Since the limitation of available loan effective period and the fact that some subprojects did not meet the mandatory requirements, ITDP did some adjustment of certain subprojects. This situation was made as a way to achieve the targeted output and outcome, despite the incomplete progress of the required readiness criteria by the proposed subproject.

Preparation of readiness criteria for the proposed subproject should become mutual agreement between related stakeholders. This becomes an essential aspect of implementation because the readiness criteria is usually prepared by different sectors based on respective responsibilities. It is also an important thing to be considered that put the first priority for the subproject which brings significant impact rather than those that has a complete readiness criteria. This means that pursuing the completion of readiness criteria is necessary milestone to be done. It is highly recommended to incorporate related stakeholders from the beginning of the program as a way to harmonize the policy-making process to support program implementation (Tor & Gambo, 2024).

Procurement procedure. The procurement mechanism must relevant to the loan agreement. Usually the procurement procedure is based on harmonized document of national procurement regulation and lender's regulation on procurement. This important milestone usually carried out by designated team of procurement. In terms of ITDP implementation, reference document of procurement is harmonized document between national procurement

regulation and World Bank procurement document. The procurement processes are conducted by group of Pokja in respective institution.

As a way to fulfill the procurement procedure that relevant to the reference regulation, it is highly recommended to select specific Pokja with specific knowledge of loan procurement procedure (Elawi et al., 2016). Otherwise, another option is improving the existing Pokja with relevant reference of procurement.

Construction period. During period of construction, there is high potential of adjustment due to difference between technical design document and actual situation. Consequently, in several ITDP subproject, certain modifications have been made to ensure its completion. The adjustment should be made in formal binding to the contract through amendment contract, and the lender approval becomes an important consideration.

Highly intensive monitoring is recommended as a way to ensure the fulfillment of quality, cost as well as time criteria of the subproject (Lapinski et al., 2021). By having the monitoring, the subproject manager could mitigate technical challenges faced by the team. As a result, the monitoring process would recommend various alternative towards the problems.

### **Handover sequence activities**

Several ITDP subprojects are carried out to be given to the local government in regards to operational and maintenance. For some subprojects, there is a structural problem regarding to institutional aspect of asset operators. This situation leads to delay of infrastructure assets that have been built to operate.

In order to mitigate the institutional aspect, the loan program manager is recommended to collaborate with the related stakeholder since the subproject commencement. This also means that the local government is invited not only at the subproject completion phase but also in planning phase in the beginning of the subproject implementation (Sadick & Issa, 2024).

### **Modified Lookahead Planning**

#### **Functions**

Lookahead planning explains detail aspect of implementation which was provided in monthly plan. The lookahead planning is approved in the level of PIU.

**Table 3 Modified Lookahead Planning of LPS on Loan Program**

<b>No.</b>	<b>Aspects and Notes</b>
1.	<p><b>Critical Aspect:</b> Delays due to Land Availability</p> <p><b>ITDP Implementation:</b> Some technical problems of land clearing are raising on several subprojects</p> <p><b>Recommendation:</b> Land availability should be ready before the subproject commencement</p>
2.	<p><b>Critical Aspect:</b> Delays due to Coordination between Other Related Construction Works</p> <p><b>ITDP Implementation:</b> Construction of water supply pipeline subproject alongside the national road become technical challenges in implementation phase</p> <p><b>Recommendation:</b> Coordination between other related construction works should be undergone in detail timeline</p>
3.	<p><b>Critical Aspect:</b> Delays due to Technical Issue</p> <p><b>ITDP Implementation:</b> Technical issues arise with wide variety of problems</p>

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**Recommendation:** The technical management supervisor should be highly utilized to monitor progress as well as mitigate technical issues which are not defined in planning document

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Source: Authors' analysis based on ITDP implementation experience (2018–2024) and Last Planner System (LPS) framework.

### **Delays Due To Land Availability.**

Availability of land as one of readiness criteria for the construction is critical aspect to prioritize. There are some technical problems of land clearing faced by the subprojects. As a result, delay of completion emerged in some subproject construction.

Land availability as one of main requirement of Readiness Criteria (RC) should be ready before the subproject commencement. Failure to fulfill the criteria leads to another milestone delays (Orya & Calahorra-Jiménez, 2025; Amoah et al., 2024).

### **Delays Due To Coordination Between Other Related Construction Works.**

Conflict between two or more construction subprojects is also become technical challenges faced by the subproject manager in the level of PIU. As an example, construction of water supply pipeline subproject alongside the national road. This situation should be well mitigated since there is a specific regulation towards standard of national road work construction.

Coordination between other related construction works should be undergone in detail timeline because it brings significant impact to the overall subproject progress (Hamzeh et al., 2019).

### **Delays Due To Technical Issue**

Technical issues arise with wide variety of problems. The subproject managers should also intensively work with the supervision consultant to resolve the problems. Therefore, both coordination as well as communication should be undergone in effective and transparent way between the parties.

The technical management supervisor should be highly utilized to monitor progress as well as mitigate technical issues which are not defined in planning document. All of contract modification should be attached with technical justification and approval from related officer (Omotayo et al., 2024).

### **Weekly Work Planning**

#### **Functions**

Weekly planning underlines technical progress of each subproject implementation which was provided in weekly plan. Weekly planning is approved in the level of PIU.

**Table 4 Weekly Work Planning of LPS on Loan Program**

<b>No.</b>	<b>Aspects and Notes</b>
1.	<b>Critical Aspect:</b> Weekly Meeting <b>ITDP Implementation:</b> Approaching the loan closing date, the CPMU also organizes weekly meeting <b>Recommendation:</b> PIU level to monitor the technical aspect and CPMU level to monitor subproject completion in regards to schedule
2.	<b>Critical Aspect:</b> Action Plan towards Audit Result

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**ITDP Implementation:** refund the ineligible expenses becomes mandatory activities for CPMU

**Recommendation:** Related officer should be well known with the technical regulation

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Source: Authors' analysis based on ITDP implementation experience (2018–2024) and Last Planner System (LPS) framework.

### **Weekly Meeting**

Weekly meeting is undergone in subproject level. Approaching the loan closing date, the CPMU also organizes weekly meeting as a way to monitor the progress and ensure timely completion of the subproject.

Progress meeting is organized in two main discussion: PIU level to monitor the technical aspect and CPMU level to monitor subproject completion in regards to schedule.

### **Action Plan Towards Audit Result**

Implementation of the subproject is monitored including following up the audit result. One of the mandatory following up action is to refund the ineligible expenses which had been reported by the auditors.

Related officer should be well known with the regulation from the lender which covers planning and implementing to auditing and following up the audit result.

### **Learning**

As an alternative funding that is usually used by the Government, the loan program of ITDP also formulates lesson learned for the future related loan program. From the perspective of the Government, the report is published as Project Completion Report (PCR). This report compiles achievement of the project both in output and outcome criteria. Furthermore, the report also outlines several important points that should be taken into account for similar project in the future. On the other hand, the report which is generated by lender of the World Bank is Implementation Completion Report (ICR). The ICR underlines importance of the project as well as impact for the society. This report is generated after the lender received the PCR from the Government. Besides those two reports, the lender also produces Independent Evaluation Group (IEG) Implementation Completion and Result Report Review which is written by an independent group under management of the World Bank and reports directly to the Executive Board of the World Bank. The IEG report provides assessment of project achievement, implementation experience, and lesson learned of ITDP.

## **CONCLUSION**

This study highlights that effective risk management in loan-based public works infrastructure projects, such as the Indonesia Tourism Development Project (ITDP), is critically dependent on structured planning and multi-stakeholder collaboration. The application of the Last Planner System (LPS) including Master Schedule, Phase Planning, Modified Lookahead Planning, and Weekly Work Planning proves instrumental in identifying, anticipating, and mitigating delays caused by land availability, procurement complexities, technical issues, and asset handover procedures (Power et al., 2024; Quiroz et al., 2023). A key finding is that combining planning and construction phases within the same loan period significantly increases the risk of delays, as planning activities (e.g., formulating the Integrated Tourism Master Plan)

consumed nearly half of ITDP's implementation timeframe. Therefore, it is recommended that future loan programs separate planning from construction, prioritize subprojects based on societal impact rather than readiness alone, and ensure land availability and technical documents are completed before construction commencement. Future research should empirically test the proposed LPS-based risk management framework across different sectors and loan sources (e.g., bilateral vs. multilateral loans) to assess its generalizability beyond tourism infrastructure. Comparative studies between loan-funded projects that separate planning and construction phases versus those that combine them would provide robust evidence on optimal program structuring. Additionally, investigating the institutional and governance factors that enable or hinder stakeholder collaboration—particularly between central program units and local governments—could yield actionable insights for improving asset handover and operational sustainability. Finally, exploring the integration of digital monitoring tools (e.g., GIS, dashboards) with LPS methodologies may enhance real-time risk mitigation in future loan programs.

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