CIVED Journal of Civil Engineering and Vocational Education

EISSN: 2622-6774
Vol 12 No.1 March 2025
http://cived.ppj.unp.ac.id/index.php/CIVED

Evaluation Study of Risk Management Process in The Business Process National Road Implementation Center (BPJN) West Sumatra

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Received 13th January 2025; Revision 8th February 2025; Accepted 24th February 2025

ABSTRACT

This study evaluates the effectiveness of risk management implementation in national road infrastructure projects managed by the National Road Implementation Agency (BPJN) of West Sumatra, Indonesia. Employing an evaluative method that integrates qualitative and quantitative approaches, this research assesses risk management practices based on the guidelines set by the Ministry of Public Works and Housing. The study utilizes document reviews, structured interviews, and perception surveys involving at least 10 respondents, including Risk Owners, Risk Managers, and officials from the Risk Management Unit (UPR) responsible for planning, financial management, and technical operations. Findings indicate that while BPJN West Sumatra has effectively implemented several risk management aspects, deficiencies persist in risk monitoring and response strategies. Notably, the study highlights the urgent need for a structured risk monitoring system, more proactive mitigation strategies, enhanced stakeholder communication, and the integration of information technology. This research contributes to the existing literature by providing a comprehensive evaluation framework for risk management effectiveness in infrastructure projects, offering practical recommendations to improve risk management capacity and support the successful execution of national road infrastructure projects in West Sumatra.

Keywords: *Risk Management; Infrastructure Projects; National Roads.*

DOI: https://doi.org/10.24036/cived.v12i1.706

INTRODUCTION

Infrastructure development has become a central focus in the modern era, covering sectors such as energy systems, road transportation, buildings, telecommunications, and clean water networks. The success of these projects depends on effective implementation and risk management strategies. In West Sumatra, infrastructure development is a government priority to enhance regional economic growth, improve connectivity, and support sustainable development. However, road infrastructure projects are inherently exposed to various risks, including financial constraints, technical failures, and regulatory uncertainties, which can affect project productivity, performance, cost efficiency, and quality.

Despite extensive research on risk management in construction projects, studies focusing on its practical implementation within government agencies, particularly in Indonesia, remain limited. Prior studies primarily discuss general risk assessment frameworks or focus on private sector projects, leaving a gap in understanding how public institutions, such as the National Road Implementation Agency (BPJN) of West Sumatra, implement risk management practices. Moreover, previous research often emphasizes risk identification and classification but lacks a comprehensive evaluation of the effectiveness of risk mitigation strategies and monitoring mechanisms. This study addresses these gaps by examining the actual implementation of risk

management in BPJN West Sumatra, assessing its effectiveness, and identifying areas for improvement.

In response to these challenges, the Ministry of Public Works and Housing (PUPR) issued Circular Letter Number 04 of 2021, providing guidelines for risk management in infrastructure development. While these guidelines serve as a framework for public institutions, their actual implementation and impact on project outcomes require further investigation. This study aims to evaluate the effectiveness of risk management practices in BPJN West Sumatra by analyzing key processes such as risk identification, assessment, response, and monitoring. Specifically, this research seeks to answer the following questions: How effectively does BPJN West Sumatra implement risk management based on the guidelines set by the Ministry of PUPR?; What are the key challenges in risk monitoring and mitigation strategies within BPJN West Sumatra?; What improvements can be recommended to enhance risk management effectiveness in national road infrastructure projects?

By addressing these questions, this study contributes to the public sector risk management literature and provides practical recommendations to optimize risk mitigation efforts. Given the unique geographical and demographic characteristics of West Sumatra, understanding these challenges is essential to ensuring the long-term success of infrastructure development in the region. The findings are expected to benefit policymakers, project managers, and other stakeholders in improving risk management frameworks for future infrastructure projects.

METHOD

This study evaluates the effectiveness of risk management implementation at the National Road Implementation Agency (BPJN) of West Sumatra based on the guidelines established in Circular Letter No. 04/SE/M/2021 by the Ministry of Public Works and Housing (PUPR)[10]. The evaluation framework follows the guidelines from the Inspector General of PUPR (No. PW 0204-IJ/1686, December 30, 2022) regarding the assessment of risk management effectiveness.

The study employs a mixed-method approach, integrating both quantitative and qualitative methods. Document review, structured interviews, and perception surveys are conducted to ensure a comprehensive evaluation. Document review assesses the compliance of BPJN's risk management practices with regulatory guidelines, while interviews and surveys validate and supplement the document review findings.

The target population consists of BPJN West Sumatra employees directly involved in risk management processes. The sample is selected purposively, comprising Risk Owners, Risk Managers, and officials from the Risk Management Unit (UPR) responsible for planning, financial management, and technical operations. The minimum sample size is 10 respondents, in accordance with the PUPR Inspector General's evaluation guidelines. Additional respondents are included based on availability within the UPR unit.

This study utilizes both primary and secondary data sources collected between July 8, 2024, and July 24, 2024. Primary data is obtained through observation and literature review, which involves analyzing existing studies and regulatory guidelines on risk management in infrastructure projects. Additionally, interviews are conducted with key BPJN personnel to validate the findings from document reviews. Questionnaire surveys are distributed to selected respondents to further assess the effectiveness of risk management implementation.

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Meanwhile, secondary data consists of risk management documents collected from BPJN West Sumatra, including official reports, policy guidelines, and implementation records.

To ensure the reliability and validity of the research, two types of questionnaires are utilized: the Document Review Validation Questionnaire and the Perception Survey Questionnaire. The Document Review Validation Questionnaire is used during structured interviews to confirm the accuracy and completeness of document assessments. At the same time, the Perception Survey Questionnaire measures respondents' evaluations of risk management implementation. Validity testing uses a triangulation method, which compares document review findings with interview responses and survey results. Furthermore, the reliability test is conducted using Cronbach's Alpha to ensure the internal consistency of the questionnaire, confirming its reliability as an instrument for measuring risk management effectiveness.

Data analysis follows a weighted evaluation model, combining document review and perception survey results. In the document review analysis, each subcomponent is scored based on predefined criteria and weighted according to the Inspector General's guidelines. To enhance the accuracy of findings, structured interviews are conducted with relevant officials for validation. In the perception survey analysis, respondents' answers are averaged for each component, and scores are weighted based on the importance of each factor in risk management assessment. The final evaluation score is then computed using the following formula:

Final Score = (Document Review Score × 80 %) + (Survey Score × 20 %)

This weighted approach ensures a balanced assessment by prioritizing document-based compliance while incorporating respondents' perceptions.

The research workflow consists of several stages. First, a literature review is conducted to define the research background, objectives, and scope, as well as to examine relevant studies on risk management frameworks. Next, data collection is carried out through gathering risk management documents, conducting interviews for validation, and distributing perception surveys. In the data analysis phase, documents are evaluated based on regulatory guidelines, findings are validated through interviews, and risk management effectiveness scores are computed. Finally, the conclusion summarizes key findings and provides recommendations for improving risk management practices.

Table 1. List of Document Review Results Validation Interview Questions
Risk Management

It	Conformity to the Statement of Guidelines for the Evaluation of Risk Management Implementation		Answer		Note
			Yes	Not	
a	c		d	e	f
1	**Value of Consultation and Communication**				
	Is there a communication and consultation process ?				
	1	Is the Risk Management policy communicated to the UPR internal concerned?			
	2	Is there a risk profile and response plan preparation meeting? If the answer: Yes, proceed to the question 2.a and 2.b; No, proceed to question no. 3.			
	2.a	Is the meeting chaired by the Risk Owner/Manager ?			
	2.b	Was the meeting attended by all UPRs?			

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	3	Whether the extraction of risk information has involved UPR Officials as well as parties with knowledge and experience?			
	4	Are there regular meetings to discuss the realization of response and risk monitoring ? If the answer is Yes, continue to questions 4.a and 4.b.			
	4.a	Is the meeting chaired by the Risk Owner/Manager ?			
	4.b	Whether the meeting is attended by officials under him			
2	**Scope Formulation Value , Context, and Criteria**				
	Is there a context formulation process ?				
	1	Whether the scope and period of application have according to the provisions?			
	2	Whether all the objectives in the planning document , tasks and functions as well as the strategic initiatives of the UPR in the organizational structure and work procedures document have all been included in the context and have a definition same?			
	3	What is the structure of the UPR in the risk management commitment form with stipulations/appointments?			
	4	Whether stakeholder identification and its relationship with UPR is appropriate ?			
3	**Risk Identification Value**				
	Is there a Risk Identification process ?				
	1	Are all objectives/tasks/functions/strategic initiatives Have the risks been identified, at least 1 per context?			
	2	Does risk identification pay attention to the Objectives and Risks of higher level UPR and lower level UPR?			
	3	Whether the risk statement of the previous period has been identified as the risk of the current year, during Still relevant?			
	4	Whether the identification of the incident, causes, and impacts has referred to, among others, the Report on the Results of Internal Supervision/ Inspection of Law Enforcement Officials , the Loss Event Database (LED), opinions experts and/or comparative data ?			
	5	Is the minimum number of risk categories met?			
	6	Whether the statement of risk, cause, impact, and Risk categories have been formulated correctly?			
4	**Risk Analysis Value**				
	Is there a Risk Analysis process ?				
	1	Has the determination of LK, LD, LR been done for all risks?			
	2	Is the determination of LK/LD in accordance with the criteria?			
	3	Whether the LR determination and the amount of risk are in accordance with Risk analysis ?			

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	4	Does the determination of the amount of risk pay attention to the control system that has been implemented?			
	5	Does the preparation of risk maps pay attention to LK and LD?			
5	**Risk Evaluation Value**				
	Is there a risk evaluation process ?				
	1	Is the risk priority made in accordance with the stages of risk prioritization?			
	2	Whether the determination of the amount/level of risk responded to Late exactly?			
	3	Whether the risk response decision for risks that are above the risk tolerance line is in accordance with the authority or approval of the direct supervisor of the Risk Owner /UPR in It?			
6	**Risk Response Value**				
	1	Is there a Risk Response Process ?			
	2	Is the formulation of the control innovation in accordance with the chosen option?			
	3	Is the formulation of control innovation in accordance with Risk Response Criteria ?			
	4	Does the formulation of control innovations contain complete information?			
7	**Monitoring and Review Values**				
	Is there a monitoring and review process ?				
	1	Whether it is control innovation , risk level monitoring and review of new risks or problems that have not yet been identified at least every quarter?			
	2	Whether the monitoring of control innovations has contained the realization of time, monitoring results and Obstacles/ obstacles to implementation?			
	3	Has the realization of control innovations according to output targets been supported by evidence?			
	4	Whether the risk level monitoring list has included 1-year risk events, actual risk levels, variances The amount of risk and recommendations for monitoring results ?			
	5	Whether the review of new risks or unidentified issues has included the occurrence of new risks or unidentified issues in the risk profile ?			
	6	Is there any UKI verification of proposed new risks or issues that have not yet been identified?			
	Logging and reporting values				
	1	Is there a recording and reporting process?			

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8	2	Whether the Risk Management Implementation Report is signed by the UPR Leader and has included the Monitoring of Control Innovations , Review of Risks New and Risk Level Monitoring List ?			
	3	Is the Risk Management Implementation Report submitted no later than 30 days at the end of each reporting period (quarterly)?			
	4	Whether the quarterly Risk Management Implementation Report (including the New Risk Review Report) has been submitted to the UPR leadership above it, and with a copy to UKI and the Inspectorate General?			

Data Analysis
Data analysis is conducted in two stages:

a. Document Review Analysis:
   1) Assessing each subcomponent based on established criteria.
   2) Calculating the value of each subcomponent and multiplying it by the predetermined weight.
   3) Validating results through interviews with relevant officials.
b. Perception Survey Analysis:
   1) Calculating the average score of all respondents' answers for each component.
   2) Multiplying the average score by the predetermined weight.

The final evaluation score is calculated with the formula:
Final Score = (Document Review Score x 80%) + (Perception Survey Score x 20%)

Validity and Reliability
Research validity is ensured through triangulation of methods (document review, interviews, and surveys) and data sources (documents, key officials, and employees). The reliability of the survey instrument is tested using Cronbach's Alpha method.
Research Ethics

This research is conducted with attention to research ethics principles, including informed consent from respondents and maintaining personal data confidentiality. With this research method, it is expected to obtain a comprehensive and objective evaluation of the effectiveness of Risk Management implementation at BPJN West Sumatra.

RESULTS AND DISCUSSION

This study evaluates the implementation of risk management at the National Road Implementation Center (BPJN) of West Sumatra based on the Letter of the Inspector General of the Ministry of PUPR No. PW 0204-IJ/1686[11]. The evaluation was conducted through document analysis and perception surveys of 13 respondents consisting of officials and employees in the fields of planning, financial management, and technical areas.

a. Respondent Profile
   The research respondents have diverse work experience backgrounds, as shown in Table 2.

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No	Respondent	Position	Work Experience (Years)
1	Respondent 1	Monitoring and Evaluation Manager	6-10
2	Respondent 2	Head of Road and Bridge Construction Section	> 20
3	Respondent 3	Road and Bridge Engineering Expert, Intermediate Level	11-15
4	Respondent 4	Head of KPIJ	16-20
5	Respondent 5	PKJJ Expert, Intermediate Level	6-10
6	Respondent 6	Road and Bridge Engineering Expert, Entry Level	2-5
7	Respondent 7	Treasurer	> 20
8	Respondent 8	BPP (Assistant Expenditure Treasurer)	11-15
9	Respondent 9	Payment Order Signing Officer (PPSPM)	6-10
10	Respondent 10	Financial Manager	> 20
11	Respondent 11	Road and Bridge Administrator, Skilled Level	> 20
12	Respondent 12	Head of Preservation Section	11-15
13	Respondent 13	Head of BPJN	> 20

Table 2 shows that the majority of respondents (53.8%) have more than 20 years of work experience. This indicates that most respondents have a deep understanding of the work processes at BPJN West Sumatra. This diversity of work experience also provides a comprehensive perspective in evaluating the implementation of risk management.

b. Evaluation of Risk Management Documents

The evaluation of risk management documents was conducted based on eight main components.

1) BPJN West Sumatra shows excellent performance in several aspects, achieving the maximum score of 100 for the components of Formulating Scope of Context and Criteria, Risk Identification, Risk Analysis, Risk Evaluation, and Recording and Reporting. This indicates that BPJN has implemented procedures in accordance with the established guidelines for these aspects.
2) Communication and Consultation obtained a score of 75, indicating room for improvement in this aspect. Although already quite good, improvements in communication and consultation can help increase the overall effectiveness of risk management.
3) Risk Response received a score of 65, indicating a need to improve strategies and implementation in responding to identified risks. This may involve developing more comprehensive mitigation plans or increasing capacity in handling risks.
4) The aspect that needs the most attention is Monitoring and Review, with a score of only 15. This shows significant weaknesses in the ongoing monitoring process and evaluation of the effectiveness of applied risk management strategies.

c. Recapitulation of Document Review Scores

From the document evaluation, BPJN West Sumatra obtained a total subcomponent score of 83. After multiplying by the assessment weight of 80%, the weighted document review score obtained is 664. This result shows a fairly good level of effectiveness in the implementation of risk management, although there is still room for improvement, especially in the aspect of monitoring and review.

d. Perception Survey Results

The perception survey of 13 respondents resulted in an average score of 88 points. After multiplying by the assessment weight of 20%, the weighted survey score obtained is 176. This result indicates a high level of satisfaction among respondents regarding the implementation of risk management at BPJN West Sumatra.

Some important findings from the perception survey include:

1) The majority of respondents agree that BPJN has involved officials and implementing staff in risk assessment.
2) Respondents generally feel that risk evaluation has been carried out adequately.
3) There are indications that the use of information systems and technology in risk management still needs to be improved.

e. Final Assessment Recapitulation

Based on the combination of document review results and perception surveys, the final evaluation score for the implementation of risk management at BPJN West Sumatra is 840. This score places BPJN at level 4 on the scale of effectiveness in risk management implementation, indicating that the implementation of risk management is already at an effective level. The evaluation results show that BPJN West Sumatra has implemented risk management quite effectively, especially in aspects of context formulation, identification, analysis, and risk evaluation. However, there are several areas that need improvement:

f. Discussion

1) Monitoring and Review: The low score (15) indicates an urgent need to improve the ongoing monitoring and evaluation system. BPJN needs to develop more structured mechanisms to monitor the effectiveness of applied risk management strategies and conduct regular reviews.
2) Risk Response: With a score of 65, this aspect requires improvement in terms of formulation and implementation of risk mitigation strategies. BPJN needs to develop more innovative and effective approaches in responding to identified risks.
3) Communication and Consultation: Although the score is quite good (75), there is still room to improve the communication and consultation process in risk management. This may involve increasing the frequency and quality of communication between stakeholders, as well as developing more effective platforms for sharing risk-related information.
4) Technology Utilization: The results of the perception survey show the need to increase the use of information systems and technology in risk management. BPJN may consider investing in technological solutions that can help automate and integrate risk management processes.

The evaluation of risk management implementation at BPJN West Sumatra shows a fairly good level of effectiveness, with a final score of 840 placing it at level 4. However, there are several areas that need improvement, especially in aspects of monitoring and review, as well as risk response. To increase the effectiveness of risk management, BPJN West Sumatra needs to focus on developing a more structured monitoring system, improving risk response strategies, and optimizing the use of information technology in the risk management process. With improvements in these aspects, BPJN can enhance its ability to identify, evaluate, and manage risks more effectively, which will ultimately support the achievement of organizational goals in implementing national road infrastructure projects in West Sumatra.

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CONCLUSION

This study evaluates the effectiveness of risk management implementation at the National Road Implementation Center (BPJN) of West Sumatra based on the guidelines of SE Minister of PUPR No. 04 of 2021. The results show that BPJN West Sumatra has implemented risk management quite effectively, especially in aspects of scope formulation, identification, and risk analysis. However, some areas still require significant improvement, particularly in terms of monitoring and review, risk response, and communication and consultation. Although BPJN demonstrates good performance in risk recording and reporting, as well as risk evaluation, weaknesses in ongoing monitoring and risk mitigation strategies still need to be addressed. Improvements in these aspects will greatly assist BPJN West Sumatra in enhancing its ability to manage infrastructure project risks in the future, thus supporting the achievement of more effective and efficient development goals.

Recommendations:

1) Implement a more structured and comprehensive risk monitoring system, utilizing information technology to enable real-time monitoring and automated reporting.
2) Develop more effective and proactive risk response strategies, including detailed contingency plans for various potential risk scenarios.
3) Enhance communication and consultation among stakeholders by holding regular meetings and creating easily accessible information-sharing platforms.
4) Conduct regular training for BPJN staff on best practices in risk management, with a particular focus on areas requiring improvement.
5) Integrate risk management into all project stages, from planning to implementation and evaluation, to ensure a holistic approach.
6) Build a comprehensive risk database based on previous project experiences to aid future risk identification and analysis.
7) Implement a performance assessment system that includes risk management effectiveness as

REFERENCE

[1] B. R. Rustam, *Risk Management principles, applications, and research*. Salemba Four, 2017.
[2] E. R. Fisk, *Construction Project Administration*. Prentice Hall, 1997. [Online]. Available: https://books.google.co.id/books?id=fHAeAQAAIAAJ
[3] C. B. Chapman and Dale. F. Cooper, *Risk analysis: Testing some prejudices*, vol. 83. Elsevier Science Publishers, 1983.
[4] C. F. Gray and E. W. Larson, *Project Management: The Managerial Process*. McGraw-Hill/Irwin, 2006. [Online]. Available: https://books.google.co.id/books?id=g5MCPwAACAAJ
[5] P. Guide, *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*. Project Management Institute, 2008.
[6] H. Darmawi, *Risk Management*. Literary Earth, 2016. [Online]. Available: https://books.google.co.id/books?id=Nz1lEAAAQBAJ
[7] H. R. Kerzner, *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*. 2013.
[8] R. Flanagan and G. Norman, *Risk Management and Construction*. Wiley, 1993. [Online]. Available: https://books.google.co.id/books?id=CPMaX2dikTAC
[9] Yth, *SURAT EDARAN MENTERI PEKERJAAN UMUM DAN PERUMAHAN RAKYAT REPUBLIK INDONESIA*.

EISSN: 2622-6774
Vol 12 No.1 March 2025
http://cived.ppj.unp.ac.id/index.php/CIVED

[10] Indonesia, *Surat Edaran Menteri Pekerjaan Umum dan Perumahan Rakyat Nomor 04/SE/M/2021 Tahun 2021 tentang Pedoman Penerapan Manajemen Risiko di Kementerian Pekerjaan Umum dan Perumahan Rakyat*. Indonesia: Kementerian PUPR., 2021.

[11] Inspektur Jenderal Kementerian PUPR, *Pedoman Evaluasi Tingkat Efektivitas Penerapan Manajemen Risiko di Kementerian PUPR*. Indonesia: Surat Inspektur Jenderal Kementerian PUPR, 2022.