

Cross Sector Risk Management Analysis on Public-Private Partnership, Case Study Drinking Water Supply System (SPAM) Jatiluhur I

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ABSTRACT

This research aim to analyzes cross-sector risk management based on ISO 31000 in the Jatiluhur I SPAM PPP project. Using qualitative methods, data was collected through interviews and focus group discussions. The results showed that the principle of risk management needs to adopt collaborative as an addition, which show intergation, coordination, synergy and synchronization for all entities involved to achieve national development goals. Emphasizing functions and responsibilities of 3 lines in the design of the risk management framework. Risk assesment was conducted and there were 20 risks identified: 1 strategic, 11 operational, 3 policy and 5 financial risks. This research contributes significantly to the integration and effectiveness of national project risk management.

INTRODUCTION

Clean water is a primary and basic need for humans that must receive attention from the government. Therefore, one of the government's duties as stated in the minimum service standards is to be able to meet the basic needs of the community, which includes providing minimum community clean water services. The availability of drinking water infrastructure is an important requirement for people's lives. The availability of drinking water is also closely related to improving the quality of life of the community and the environment (Amelia, 2022). Access to proper drinking water in 2022 reached 91.05% nationally (Badan Pusat Statistik, 2023). In line with the important role and function of drinking water for the community, a drinking water supply system (SPAM) is urgently needed. The Ministry of Public Works and Public Housing (KemenPUPR) is currently building Jatiluhur I SPAM, which uses raw water from the Jatiluhur Dam in West Java Province. Jatiluhur I SPAM consists of upstream and downstream systems. The upstream system is implemented with a scope of activities that includes the construction of intakes, transmission pipes, water treatment plants (IPA), and the main distribution network to the offtake point. This SPAM has a Water Treatment Plant (IPA) located in Cibebet and Bekasi, West Java. The construction of the downstream system of Jatiluhur I SPAM continues piping from the offtake point, which includes the construction of reservoirs, distribution network pipes to service units in the form of house connections that will become the domain of local government obligations.

Infrastructure development is inseparable from various challenges, one of which is funding. To answer the challenges in building and managing infrastructure, a collective effort is needed from various stakeholders consisting of government agencies and business entities (Santoso, Siswanti, Hidayat, Isa, & Marfatah, 2022). The government has developed an alternative funding scheme called Public Private Partnership (PPP) to meet the needs of infrastructure development. The PPP scheme is a cooperation scheme between the government and business entities to provide infrastructure and / or services for the public interest and refers to specifications previously set by the government, which partly or entirely uses business entity resources (Daliman, Herman, & Purwanti, 2021). Infrastructure development with the PPP scheme is based on an agreement between the government and a business entity that takes into account the risk sharing between the two parties. Through the PPP scheme, the government can save the infrastructure development budget at the beginning and can allocate it for other needs. Jatiluhur I SPAM is one of the National Strategic Projects where the financing uses the PPP scheme for the provision of drinking water infrastructure. SPAM projects with PPP schemes have unique characteristics because they involve various stakeholders from across sectors. Not only does it involve the central and local governments, but also private business entities, financial institutions, and the community. This complexity creates its own challenges in coordinating and aligning the interests of each party.

Despite having great potential to accelerate the provision of access to drinking water, the implementation of SPAM projects with PPP often faces obstacles in achieving the targets that have been set. One of the main factors affecting this is the complexity of the stakeholders involved. Different priorities, bureaucratic procedures, and interests of each party can cause delays in decision-making and project implementation.

The success of a PPP project will not be separated from its risk management capacity given the many factors in managing risks that need to be developed comprehensively and implemented effectively to build a strong foundation in the implementation of Private-Public Partnership projects (Suntantiningrum & Utami, 2019).

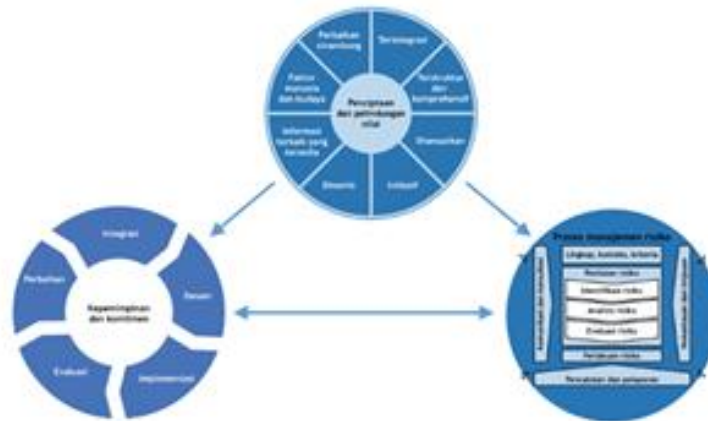
The pre-survey conducted by the interview process with the Ministerial Expert Staff for Maritime Economy at the Ministry of Economy and Culture Marves stated that the state has the aspiration to realize an independent, advanced, just and prosperous Indonesian society through the acceleration of national development in various fields in accordance with national development planning, but it cannot be denied that the achievement of national development has challenges both from within and from outside. The complexity of national development requires a comprehensive and integrated risk management approach between sectors. This requires coordination and synergy in handling risks at the national level. Awareness of this urgency has prompted the government to make regulations through Presidential Regulation (Perpres) number 39 of 2023 concerning National Development Risk Management (MRPN) as a foundation and legal protection in the process of integrating the implementation of risk management across sectors. The regulation aims to build a systematic framework to identify, analyze, and mitigate various cross-sectoral risks in an integrated manner. With this holistic approach, it is expected that national resilience in the face of various challenges and uncertainties can be improved, so that the sustainability of national development is more secure.

Currently, risk management in SPAM infrastructure projects is still carried out in a sylo manner where each actor carries out its own risk management process. This is certainly not in line with the principles and framework of risk management, namely integration, which in the PPP scheme involves cross-sectoral. Cross-sectoral risk management involves many stakeholders, so an integrated and harmonized cross-sectoral National Development Risk Management (MRPN) is needed. MRPN is needed to accommodate the characteristics of national development, namely: National development must involve cross ministries, institutions, regions, and business entities, Its success is highly influenced by the collective delivery quality of the entities involved, The creation of shared risks that must be managed together and Neglect of risk from one party will threaten the success of collective development

THEORETICAL REVIEW

Risk Management

Risk is a danger, result or consequence that can occur from an ongoing process (Nugroho & Sutawidjaya, 2022). According to SBC Warburg in (Hairul, 2020), (2020), risk management is a set of policies, procedures used by organizations to manage, track, and control potential risks. By implementing risk management, an organization is expected to minimize risks and overcome challenges. Risk management is a discipline that developed in response to the uncertainty inherent in every organizational activity. Its theoretical foundation is rooted in the understanding that risk, if properly managed, can not only minimize losses but can also be a source of opportunities. The theory emphasizes the importance of a systematic approach in identifying, analyzing, and responding to risks that may affect the achievement of organizational objectives. ISO 31000 is an international standard for risk management issued by The International Organization for Standardization, is a guideline designed to assist all types of organizations in managing the various risks that may arise from their activities. ISO 31000 offers basic principles that form the basis for implementing risk management, providing a framework designed to be integrated into the organization's management structure and processes, so that risk management becomes an integral part of the organization's overall operations and a structured and systematic risk management process (Pramuditha & Santoso, 2022). The ISO



31000 architecture consists of three interconnected elements namely principles, frameworks and risk management processes shown in the following figure :

Fig.1 Risk Management Architecture ISO 31000

Principles

There are eight principles of risk management: integrated; structured and comprehensive; customized; inclusive; dynamic; best available information; human and cultural factors; and continuous improvement. The goal of value creation and protection in risk management is supported by these eight principles.

Framework

A risk management framework is defined as a set of components that provide a foundation for designing, implementing, evaluating, and improving

in an integrated manner based on strong leadership and commitment. The six elements of the risk management framework are essentially a PDCA cycle that surrounds the elements of leadership and commitment with the added element of integration between the elements of improvement and design. The cycle begins with leadership and commitment from the organization's top management and oversight bodies. This is followed by integration with other systems within the organization. The results of integration are then realized in a risk management framework design which is then implemented into the risk management process. Finally, an assessment and evaluation is carried out to determine the effectiveness of the implementation of the risk management process and the results are used as recommendations for continuous improvement and improvement.

Process

The implementation element of the risk management framework is carried out by the risk management process. The three core stages of setting scope, context and criteria; risk assessment and risk treatment and the three umbrella stages of communication and consultation; monitoring and review; and recording and reporting form the six stages of the process. Stakeholders communicate and consult before starting the process. Next, the establishment of the scope, context, and standards used for risk assessment and treatment results in the products of the risk management process, such as the risk register. The outputs of the process are monitored and reviewed, to be recorded and reported

Public-Private Partnership

There Financing public sector projects is vital to build good infrastructure and public services. The participation of the private sector in fulfilling part of the infrastructure funding is a bridge contribution in infrastructure development through the PPP scheme (Suhendra, 2017). In PPP, the relationship between parties usually involves a long-term agreement and usually involves a concession agreement. Responsibilities and risks are shared fairly between each of the involved parties involved in the project. In addition, the relationship between stakeholders is complex (Aqsa & Nugroho, 2023). These projects are initiated, designed and supervised by the government, as the main entity within the public sector. Financing can come from various sources, such as the government budget, loans from international financial institutions, or working with private companies through a public-private partnership model.

Public-Private Partnership (PPP) is cooperation between the government and Business Entities in the Provision of Infrastructure for the public interest by referring to specifications previously set which partly or entirely uses the resources of the Business Entity by paying attention to risk sharing between the parties (Kementrian Keuangan, 2023). PPP is an implementation model of cross-sector partnerships, namely cooperative relationships between the public sector and business entities to build infrastructure for the benefit of society.

Conceptual Framework

Conceptual framework is a line of thinking that applies various conceptual models regarding how theory relates to factors that have been identified as problems in research topics in a systematic arrangement (Sugiyono, 2013). In research, the framework helps researchers establish the focus of the study, identify relevant research questions, and determine appropriate analytical methods and techniques. The framework not only clarifies the direction of the research but also provides a coherent structure for systematically documenting the process and results of the study.

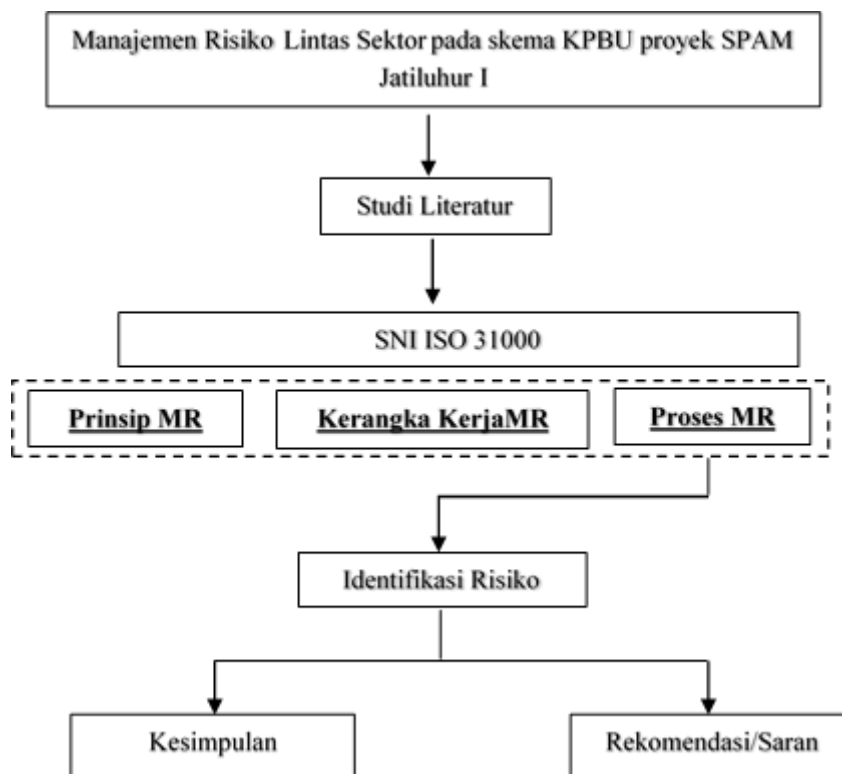


Fig.2 Conceptual Framework

METHODOLOGY

This research uses a qualitative approach to identify cross-sector risk management elements based on ISO 31000. The qualitative approach was chosen because it allowed the researcher to gain an in-depth understanding of the complex and dynamic issues related to risk management in the context of this project. Qualitative methods allow for a detailed exploration of how risk management principles, frameworks and processes are applied and integrated by the various entities involved.

Primary data collection was conducted through in-depth interviews and focus group discussions with key informants. In-depth interviews were conducted with the aim of exploring informants' views, experiences and understanding of existing risk management practices as well as challenges and needs for cross-sector integration. Key informants were selected based on their

roles and responsibilities in the implementation of national development risk management across sectors.

Focus group discussions were conducted to deepen the findings from the interviews and gain a broader perspective and consensus on key risk management elements. FGDs also enabled collaborative identification of how best to integrate risk management across sectors within the existing framework. The FGD process involved multiple sessions with different groups to ensure comprehensive representation of the various entities involved in the project.

Data were analyzed by identifying key themes from the interview and FGD transcripts. The analysis process involved systematically coding the data to uncover relevant elements of risk management principles, frameworks and processes. The findings of this study were then used to develop recommendations that can be implemented to improve the integration of risk management across sectors in SPAM PPP projects.

RESULTS

Based on interviews with key informants and focus groups discussion conducted supported by secondary data, several findings were obtained on the implementation of cross-sector risk management.

Policy Objectives Setting

National strategic programs involving various stakeholders should be cascading (vertically aligned) to strategic targets and key performance indicators so that each stakeholder has a contribution in achieving national development targets. From several stakeholders involved in the SPAM PPP project, only KemenPUPR has key performance indicators (KRI) that refer to the strategic development program.

Complexity of the Entities Involved

With the complexity of entities involved in cross-sector projects, it is necessary to affirm the roles and responsibilities of the first, second and third lines as a governance design in risk management.

Competency Improvement of Risk Management

Improving the competence of risk management providers, including risk owners, risk management committees, and risk management supervisors, is essential to ensure effective and integrated risk management in the organization. Lack of understanding of the risk analysis methodology may hinder the organizer's ability to comprehensively identify and evaluate risks in Public Private Partnership (PPP) projects for Drinking Water Supply Systems (SPAM).

Cross Sector Risk Assessment

The cross-sectoral risk assessment process in the Public Private Partnership (PPP) project for the Drinking Water Supply System (SPAM) faced several significant obstacles, namely

1. Unclear determination of the scope of risk assessment causes uncertainty in identifying and evaluating risks
2. Each of the entities involved in this project often implemented risk management organizing policies according to their own internal contexts
3. Access to data and information related to projects or activities as material for monitoring key risk indicators is very limited. This limitation hinders the ability to monitor and evaluate risks accurately and timely.
4. Each entity has different standards and benchmarks in assessing risk, leading to discrepancies in risk assessment results and interpretation

In the cross-sector risk assessment conducted, 1 Strategic Risk, 11 Operational Risks, 3 Policy Risks, and 5 Financial Risks were identified.

DISCUSSION

In the preparation of risk management based on ISO 31000, it is necessary to have principles as a foundation in risk management and should be considered when preparing risk management frameworks and processes. National strategic programs involving various stakeholders should be cascading (vertically aligned) to strategic goals and key performance indicators so that each stakeholder has a contribution in achieving national development targets. Currently, of the several stakeholders involved in the SPAM PPP project, only Ministry Public Work and Housing has key performance indicators that refer to the strategic development program.

Public-private partnership (PPP) for building the construction of SPAM Jatiluhur I involves various parties with different interests and perspectives. Therefore, in cross-sector risk management, the role of collaboration is quite important in identifying, assessing, and managing risks effectively. As stated in Presidential Regulation no. 39 of 2023 article 5 on the Principles of National Development Risk Management (MRPN) which adopts the Indonesian National Standard ISO 31000: 2018 with additional collaborative elements.

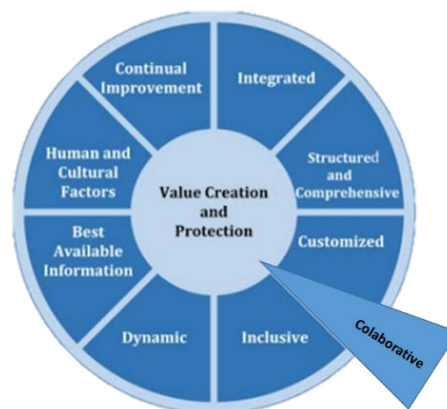


Fig 3. Cross Sector Risk Management Principles

Stakeholder mapping is a crucial step in applying collaborative principles to cross-sector risk management. This process involves identifying and analyzing the various parties that have an interest in or could be affected by decisions and

actions in risk management. By conducting stakeholder mapping, organizations can better understand the complexity of relationships and interests that exist among the various sectors involved.

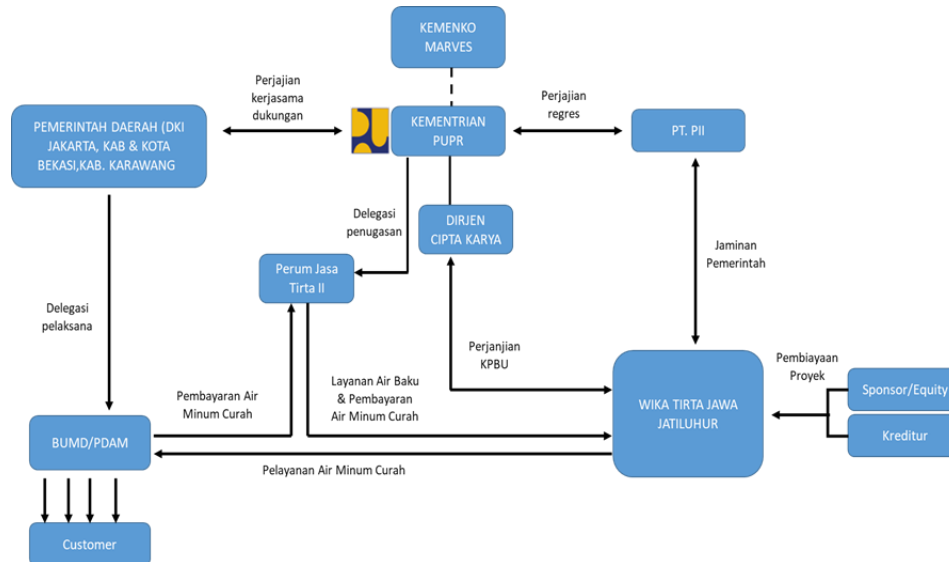


Fig 4. Stakeholder mapping

A risk management framework is essentially a PDCA cycle surrounding Leadership and Commitment with the addition of Integration between Improvement and Planning. An effective framework is essential to ensure structured guidance in managing risks holistically across sectors. A comprehensive risk management framework includes various elements and structures that enable organizations to manage risk effectively and efficiently. One of the fundamental concepts in this framework is the breakdown structure. Breakdown structures, such as Risk Breakdown Structure (RBS) or Work Breakdown Structure (WBS), break down large tasks or risks into smaller, manageable parts. This not only helps in the identification and assessment of risks, but also ensures that every aspect of risk is managed at the most appropriate level. In a risk management framework, this means ensuring that every level of the organization understands their roles and responsibilities in managing risk. This assertion includes the first line, second line, and third line, each with different but complementary roles in the overall risk management process. Roles and responsibilities of the first, second and third lines on Cross-Sector National Development Risk Management. According to the Expert Staff of the Ministry Coordinating for Maritime and Investment Affairs who acts as the MRPN Implementation Team, currently, cross-sector risk management in Indonesia still focuses on processes without paying attention to the three main interrelated components of risk management, namely principles, frameworks and processes. In fact, these three components must be integrated synergistically to achieve optimal risk management effectiveness. By taking the concept of Three Lines of Defense, which is a framework used to manage risk and ensure internal

control in an organization. This model can be applied in the context of cross-sector risk management to improve coordination and effectiveness.

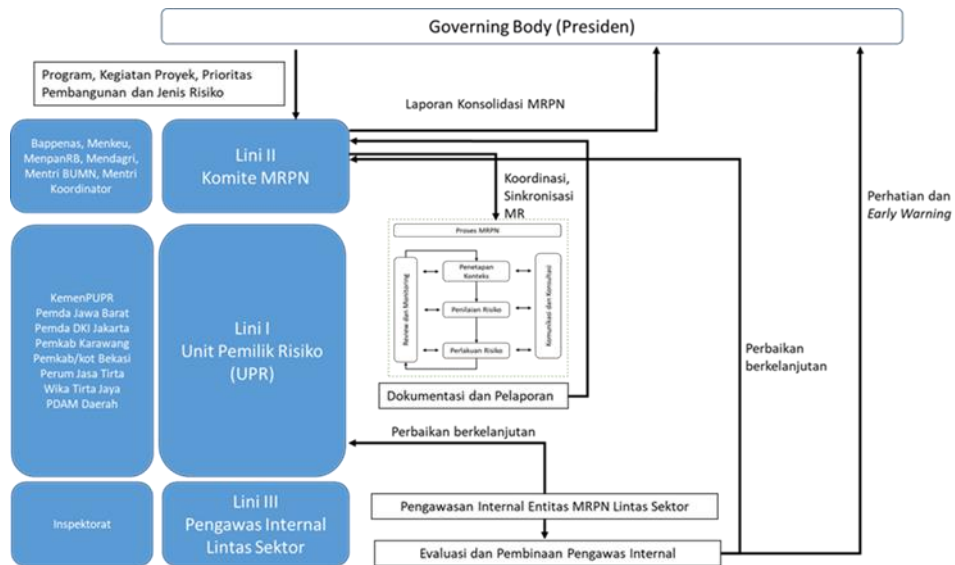


Fig.5 Three Line Defense Model in Cross-Sector Risk Management Framework

Determining the scope and context of a PPP project is a critical stage that requires careful and comprehensive consideration. This process involves identifying project boundaries, specific objectives, as well as an in-depth understanding of the environment in which the project will be implemented. In the context of a PPP involving multiple stakeholders, the scope should include the interests and expectations of the public, private, and affected communities. Integration of scope and context with national development goals is a crucial aspect of PPP projects. It ensures that the investments and efforts made in the project contribute directly to the achievement of development goals. This integration process involves aligning project objectives with national priorities. The results of the cross-sector risk management process reflect the collaborative efforts made to identify, assess, and manage risks that have the potential to affect various sectors simultaneously. From the results of risk identification, found 1 Strategic Risk, 11 Operational Risks, 3 Policy Risks, and 5 Financial Risks were identified. The results of the identification of strategic risks that indicate the non-achievement of national development targets reveal the various factors that cause failure and their broad implications. This identification provides a basis for in-depth evaluation and improvement in development strategies.

The following is the identification of risks in the Jatiluhur I SPAM PPP project with a top down approach :

No	Kategori	Jenis Risiko	Deskripsi
Risiko			
R1	Risiko Startegis	Tidak tercapainya	Tujuan atau target –target yang

pembangunan infrastruktur dituangkan dalam RPJMN tidak
 sistem penyediaan air tercapai karena *cascading* sasaran
 minum tidak *in-line* indikator kinerja utama
 stakeholder

The following is the identification of risks in the Jatiluhur I SPAM PPP project with a bottom up approach:

No	Kategori	Jenis Risiko	Deskripsi
		Risiko	
R2	Risiko Operasional	Pembebasan lahan tidak bisa dilakukan/ hanya sebagian	Kegagalan menjalankan proyek karena terhambat pengadaan lahan
R3	Risiko Operasional	Terlambatnya penyelesaian konstruksi	Kontraktor gagal melaksanakan kewajiban menyelesaikan tugasnya sesuai dengan ketentuan
R4	Risiko Operasional	Penurunan kuantitas air baku	Kuantitas air baku tidak mencukupi akibat cuaca, pengelolaan sungai dan hal-hal di luar kendali Badan Usaha
R5	Risiko Operasional	Adanya kebocoran jaringan	Terjadi kebocoran /kontaminasi dalam jaringan distribusi
R6	Risiko Operasional	Pengadaan material	Keterlambatan dalam pengadaan material atau peralatan Khusus
R7	Risiko Operasional	Cacat konstruksi	Terdapat cacat dalam hasil pekerjaan konstruksi mengakibatkan proyek tidak dapat berfungsi sesuai dengan tujuannya
R8	Risiko Operasional	Kesehatan dan keselamatan kerja	Permasalahan kesehatan dan keselamatan kerja yang terjadi selama masa konstruksi yang

			mengakibatkan biaya tambahan dan/atau keterlambatan
R9	Risiko Operasional	Kekurangan tenaga terampil	Kekurangan tenaga spesialis atau tenaga terampil yang menyebabkan biaya tambahan dan/atau keterlambatan
R10	Risiko Operasional	Dampak lingkungan	Pekerjaan konstruksi memiliki dampak buruk terhadap lingkungan yang tidak terduga, mengakibatkan biaya tambahan dan/atau keterlambatan
R11	Risiko Operasional	Kesalahan desain	Progress konstruksi menunjukkan adanya kesalahan desain sehingga mengakibatkan biaya tak terduga
R12	Risiko Operasional	Gagal/terlambatnya perolehan perizinan	Terjadinya keterlambatan otoritas perizinan menerbitkan izin, yang mengakibatkan keterlambatan dan/atau kenaikan biaya lainnya
R13	Risiko Kebijakan	Ekspropriasi	Pengambilalihan atau nasionalisasi asset tanpa kompensasi yang memadai
R14	Risiko Kebijakan	Perubahan regulasi (dan pajak) yang diskriminatif dan spesifik (discriminatory or specific change in law)	Perubahan regulasi (termasuk kebijakan pajak) oleh otoritas terkait (pusat dan daerah) yang bersifat diskriminatif terhadap proyek atau hanya diterapkan kepada seluruh proyek KPBU
R15	Risiko	Perubahan regulasi (dan	Perubahan regulasi yang berlaku

	Kebijakan	pajak) yang umum (general change in law)	umum di Indonesia
R16	Risiko Financial	Kegagalan pemenuhan pembiayaan	<ul style="list-style-type: none"> • Badan Usaha gagal untuk menutup pembiayaan karena kondisi pasar; • Adanya delay konstruksi sehingga harus membiayai dari ekuitas, meningkatkan risiko investor
R17	Risiko Financial	Risiko struktur finansial	Struktur modal yang tidak optimal mengakibatkan inefisiensi
R18	Risiko Financial	Premi asuransi	Kenaikan tingkat premi terhadap estimasi awal
R19	Risiko Financial	Penurunan permintaan	Adanya penurunan permintaan volume sehingga menurunkan pendapatan penjualan air
R20	Risiko Financial	Penyesuaian tarif secara periodic terhambat	Adanya keterlambatan pada saat penyesuaian tarif menjadikan berkurangnya revenue yang diterima

CONCLUSIONS AND RECOMMENDATIONS

This research identifies several key elements in cross-sector risk management in the Public Private Partnership (PPP) scheme for the Jatiluhur regional Water Supply System (SPAM) project. The main findings are related to risk management principles, risk management frameworks, and risk assessment processes that require special attention to achieve greater effectiveness.

1. Risk Management Principles

Cross-sector risk management principles adopt the Indonesian national standard ISO 31000 with 8 principles and 1 additional principle, namely collaborative. The collaborative approach is reflected in the determination of national development goals, where each entity has a contribution to the

achievement of common goals. The mapping of actors is a step in the formulation of strategies to achieve national development goals. This ensures that each stakeholder understands their roles and responsibilities and how their contribution supports the collective goal.

2. Risk Management Framework

The risk management framework identified in this study is an integrated Plan-Do-Check-Act (PDCA) cycle, supported by leadership and commitment from the top management level in the implementation of risk management. The Three Lines of Defense model is applied as an effective framework for managing risk and ensuring internal control within the organization. This model is particularly relevant in the context of cross-sector risk management as it can improve the coordination and effectiveness of risk management across different sectors, avoiding redundancies and silos.

3. Risk Management Process

An integrated risk management process is an important element in this study, but there are still some weaknesses that need to be improved. The unclear scope of risk assessment is a major obstacle, resulting in unclear risk identification and evaluation processes. In addition, the application of risk management that is still siloed according to the internal context of each entity hampers the effectiveness of cross-sector coordination. To overcome this weakness, a more concerted effort is needed to define a clear scope and encourage a more collaborative application of risk management. In the risk assessment process, 1 Strategic Risk (Macro), 11 Operational Risks, 3 Policy Risks, and 5 Financial Risks were identified.

Based on the research findings regarding cross-sector risk management in the Public Private Partnership (PPP) scheme for the Drinking Water Supply System (SPAM), several suggestions and recommendations can be given to improve the effectiveness and efficiency of risk management.

1. Conduct stakeholder mapping to identify the roles and responsibilities of each entity in the project. This mapping will assist in determining each party's specific contribution to the achievement of project objectives and national development goals.
2. Cascading of goals is done clearly to show how each entity contributes to the overall goal. This should include measurable metrics to quantify contribution and achievement.
3. Improve coordination between entities through the establishment of a cross-sector working team focused on risk management. This team should have representation from all key entities and be responsible for ensuring synergy in risk management.
4. Increase risk management capacity through workshops, seminars and online courses that focus on the latest methods and tools in risk management. Ensure that organizers have access to the necessary resources and knowledge to properly manage risk.
5. Standardize risk appetite across sectors so that risk evaluation criteria can be used consistently by all stakeholders. This will assist in ensuring

that risk assessments are conducted objectively and are comparable between different entities.

FURTHER STUDY

Research on cross-sector risk management in the Public Private Partnership (PPP) scheme for the Jatiluhur regional Water Supply System (SPAM) project has several limitations including the scope of data used, which may not cover all perspectives of stakeholders involved in the project, this research is limited to descriptive analysis without using quantitative methods to measure the level of risk or the effectiveness of mitigation strategies. In addition, limited access to sensitive or confidential data from business entities and the government also affected the depth of the analysis. So for further research, the authors recommend involving more stakeholders from different levels and sectors in data collection, including in-depth interviews and surveys to get a more diverse and thorough perspective, combining qualitative and quantitative methods to get a more comprehensive picture of cross sector risk management. Quantitative methods can assist in measuring risk levels and the effectiveness of mitigation strategies more objectively. and Improve access to sensitive or confidential data by working more closely with businesses and governments, perhaps through confidentiality agreements or joint research.

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REFERENCES

- Aisyah, A. P., & Dahlia, L. (2022). Enterprise Risk Management Berdasarkan ISO 31000 dalam Pengukuran Risiko Operasional pada Klinik Spesialis Esti. *Jurnal AKuntansi dan Manajemen*, 12(2), 78 - 90. doi:10.36406
- Alijoyo, A., & Fisabilillah, A. M. (2021). Risk Management Implementation in Public Sector Organizations: A Case Study of Indonesia. *Ornizational Culture : An International Journal*, 22(1), 1-23. doi:10.18848/2327-8013
- Amelia, E. B. (2022). Faktor-Faktor Kritis Penentu Kesuksesan Kerja Sama Pemerintah dengan Badan Usaha (KPBU) Sektor Air Minum. *Jurnal Litbang : Media Informasi Penelitian, Pengembangan dan IPTEK*, 19(1), 57-72. Retrieved from <http://ejurnal-litbang.patikab.go.id>
- Aqsa, Q., & Nugroho, B. Y. (2023). A Literature Review : Cross-Sector Collaboration Arrangements to Deliver Public Services and Goods. *Technium Social Science Journal*, 1 - 10.

- Badan Pusat Statistik. (2023). Produk - Tabel Statistik : Persentase Rumah Tangga menurut Provinsi dan Sumber Air Minum Layak. Retrieved from Badan Pusat Statistik: <https://www.bps.go.id/id/statistics-table/2/ODQ1IzI=/persentase-rumah-tangga-menurut-provinsi-dan-sumber-air-minum-layak--persen-.html>
- Badan Standardisasi Nasional. (2018). Manajemen Risiko Berbasis SNI ISO 31000. Jakarta: Badan Standardisasi Nasional.
- Daliman, Herman, & Purwanti, O. (2021). Analisis Penilaian Risiko Program Kerjasama Pemerintah Badan Usaha (KPBU) pada Infrastruktur Jalan Tol. *RekaRacana: Jurnal Teknik Sipil*, 7(1), 22-31. doi:10.26760/rekaracana
- Hairul. (2020). Manajemen Risiko. Yogyakarta: Deepublish.
- Jiang, W., Yang, Q., Jiang, J., Martek, I., & Gao, F. (2022). Operational Risk Management of Public-Private Partnership Infrastructure Projects: A Bibliometric Literature Review. *Buildings*, 1-19. doi:10.3390/buildings12111905
- Jokar, E., Aminnejad, B., & Lork, A. (2021). Assessing and Prioritizing Risks in Public-Private Partnership (PPP) Projects Using the Integration of Fuzzy Multi-Criteria Decision-Making Methods. *Operation Research Perspective*, 1-20. doi:10.1016/j.orp.2021.100190
- Kementrian Keuangan. (2023). Kerjasama Pemerintah Dengan Badan Usaha. Retrieved from Kementrian Keuangan: <https://kpbu.kemenkeu.go.id/read/1192-1553/umum/kajian-opini-publik/infrastruktur-air-minum-untuk-masyarakat-indonesia>
- Kominis, G., Dadau, A., Favotto, A., & Gunn, D. (2022). Risk governance through public sector interactive control systems: The intricacies of turning immeasurable uncertainties into manageable risks. *Public Money & Management*, 379-387. doi:10.1080/09540962.2021.1965729
- Lima, S., Brochado, A., & Marques, R. (2021). A paradigm shift in risk management in public-private partnership arrangements. *Water Policy*, 23(6), 1344-1358. doi:10.2166/wp.2021.106
- Mazher, K. M., Chan, A. P., Choudry, R. M., Zahoor, H., Edwards, D. J., Ghaithan, A. M., . . . Aziz, M. (2022). Identifying Measures of Effective Risk Management for Public-Private Partnership Infrastructure Projects in Developing Countries. *Sustainability*, 1-19. doi:10.3390/su142114149

- Nguyen, P. T., Likhitruangslip, V., & Onishi, M. (2020). Success Factors for Public-Private Partnership Infrastructure Projects in Vietnam. *International Journal on Advance Science Engineering Information Technology*, 10(2), 858-865.
- Nugroho, R. E., & Sutawidjaya, A. H. (2022). *Strategi Operasi & Proses Manajemen*. Bengkulu: Lembaga Pengkajian dan Pengembangan Sumber Daya.
- Pramuditha, K. B., & Santoso, S. (2022). ANALYSIS OF FUEL OIL SUPPLY CHAIN RISK MANAGEMENT AT JATINEGARA LOCOMOTIVE DEPO. *Rekayasa Mesin*, 13(1), 141-151. doi:10.21776/ub.jrm.2022.013.01.15
- Rahardjo, M. (2018). *Paradigma interpretif*. Malang: UIN Malang.
- Rivai, Y., Masduki, A., & Marsono, B. D. (2006). Evaluasi Sistem Distribusi dan Rencana Peningkatan Pelayanan Air Bersih PDAM Gorontalo. *SMARTek*, 126 - 134.
- Santoso, S., & dkk. (2024). *Konsepsi dan Telaah Implementasi Manajemen Risiko Pembangunan Nasional Lintas Sektor*. Jakarta: Kemetrian Koordinator Bidang Kemaritiman dan Investasi Republik Indonesia.
- Santoso, S., Siswanti, I., Hidayat, R. N., Isa, S. M., & Marfatah, M. R. (2022). The Readiness of the Measuring Model of Infrastructure Provisioning Under Sharia PPP Financing Scheme Using the IRL & TRL Approach. *IQTISHOUDUNA : Jurnal Ekonomi Islam*, 11(2), 139-154. doi:10.54471
- Sari, F. E., Rahmadani, N., Putri, N., & Hasanah, W. (2023). Penerapan Manajemen Risiko Pada PT. Mayora Indah Tbk Dengan Metode ISO 31000:2018. *Jurnal Manajemen Bisnis Syariah*, 39-47.
- Sesmiwati, Utama, W. P., & Peli, M. (2022). IDENTIFIKASI RISIKO PADA PROYEK WASTE TO ENERGY MELALUI KERJASAMA PEMERINTAH DENGAN BADAN USAHA DI SUMATERA BARAT. *Rekayasa Sipil*, 16(2), 119-126.
- Setiajatnika, E., Gunadi, T., & Nugraha, H. (2023). Skema Kerjasama Pemerintah Dengan Badan Usaha (KPBU) Dalam Penyediaan Infrastruktur Alat Penerangan Jalan (APJ). *COOPETITION Jurnal Ilmiah Manajemen*, 317-322.

- Sugiyono. (2013). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Suhendra, M. (2017). PENYEDIAAN INFRASTRUKTUR DENGAN SKEMA KERJASAMA PEMERINTAH DAN BADAN USAHA (PUBLIC-PRIVATE PARTNERSHIP) DI INDONESIA. *Jurnal Manajemen Keuangan Publik*, 1(1), 41-46. doi:10.31092/jmkp.v1i1.97
- Suntantiningrum, K. H., & Utami, S. R. (2019). Strategi Mitigasi Risiko Proyek KPBU Pembangunan SPAM Regional: Studi Kasus SPAM Regional Wosusokas Provinsi Jawa Tengah. *Prosiding Seminar Unimus*, 2, 462-470. Retrieved from <http://prosiding.unimus.ac.id>
- Susilo, L. J., & Kaho, V. R. (2018). *Manajemen Risiko : Panduan Untuk Risk Leader dan Risk Practitioner*. Jakarta: Grasindo.
- Sutantiningrum, K. H., & Utami, S. R. (2019). Analisis Risiko Proyek KPBU SPAM Regional Wosusokas Provinsi Jawa Tengah - Perspektif Pemerintah. *Jurnal Presipitasi*, 16(3), 186-195.
- Valipour, A., Yahaya, N., Noor, N. M., Valipour, I., & Tamosaitiene, J. (2019). A SWARA-COPRAS APPROACH TO THE ALLOCATION OF RISK IN WATER AND SEWERAGE PUBLIC-PRIVATE PARTNERSHIP PROJECTS IN MALAYSIA. *International Journal of Strategic Property Management*, 23(4), 269-283. doi:10.3846/ljspm.2019.8066
- Zambrano, D. J., & Villanueva, E. (2021). Risk management. A case study of a Colombian public sector company. *Cuadernos de Contabilidad*, 22, 1-18. doi:10.11144/Javeriana.cc22.rmcs