IDRiM (2026) 16 (2) ISSN: 2185-8322
DOI10.5595/001c.166552

Journal of Integrated Disaster Risk Management

Regular Article

A Disaster Preparedness Checklist in Construction Project Planning

Seng Hansen[1*]

Received: 28/06/2025 / Accepted: 26/04/2026 / Published online: 18/08/2026

Abstract This study examines the potential for developing a disaster preparedness checklist that can be utilized in construction planning to improve project resilience. To that end, a comprehensive literature study was conducted on various publications related to disaster risk management in the construction industry. This study maps the extent to which disaster risk checklists are available, how they are used, and what gaps still exist in their application. Furthermore, this study develops a disaster preparedness checklist that can be used in construction project planning. It covers aspects of design, location, infrastructure, team readiness, project recovery protocol, and external coordination. The proposed checklist was further reviewed and validated by expert respondents. This study has two main benefits. For academics, the results of this study can be the basis for developing a more structured and applicable disaster risk evaluation framework in the construction context. Meanwhile, for practitioners, the findings of this study can serve as an initial guide for compiling or adapting a disaster risk checklist appropriate to the project type and geographic location. Ultimately, this effort is expected to increase the resilience of the construction sector in the face of disaster threats and to contribute to sustainable infrastructure development.

Keywords: checklist, construction, disaster, planning, preparedness, risk

1. INTRODUCTION

Construction project planning is a crucial process that determines the success of a project in terms of cost, quality, and time (Liang & O'brien, 2016; Zwikael & Globerson, 2006). In practice, this planning not only includes technical and financial aspects, but must also consider various risks that can disrupt the smooth running of the project (Akinradewo et al., 2019). One type of risk with significant potential to undermine project sustainability is natural disasters,

[1] Civil Engineering, President University, Indonesia
* Corresponding author email: seng.hansen@president.ac.id

DOI10.5595/001c.166552

such as earthquakes, floods, landslides, and strong winds. These disasters not only affect the results of the project but can also threaten worker safety, disrupt the supply chain, and significantly increase unexpected costs. Globally, the increasing frequency and intensity of disasters related to climate change have underscored the urgency of integrating a disaster risk management approach into the construction sector. Organizations such as the United Nations Office for Disaster Risk Reduction (UNDRR) have encouraged the application of resilient infrastructure principles from the early stages of planning. However, field implementation is still limited, especially in the form of practical tools or guides such as checklists that can be used systematically by construction project planners and managers.

In Indonesia, one of the world's most disaster-prone countries, this challenge is becoming increasingly relevant. With its geographical location at the meeting point of three tectonic plates and a tropical climate prone to extreme weather, construction projects in Indonesia are at high risk of disaster disruption (Zulfiar & Jayady, 2018). However, most construction companies in Indonesia have not consistently implemented a documented and standardized disaster risk management approach. This indicates a significant gap between the need for disaster risk mitigation and the construction industry's preparedness to anticipate these risks.

Disaster preparedness is an effort to anticipate the possibility of a disaster, whether natural or human-caused (Pastrana-Huguet et al., 2025). Essentially, preparedness means having sufficient plans, knowledge, and resources to minimize the impact when a disaster occurs. This includes simple steps such as evacuation drills, providing emergency routes, and implementing risk monitoring technology (Sensin & Gokmenoglu, 2024).

In the context of construction projects, disaster preparedness is crucial because projects often involve large numbers of workers, heavy equipment, and high-risk activities (Vishnu et al., 2024). For example, projects must consider the potential for earthquakes, floods, fires, or even major work accidents. By implementing a disaster preparedness system, such as risk analysis from the planning stage, developing emergency SOPs (standard operating procedures), and regular worker training, workforce safety and project continuity can be better assured (Edjossan-Sossou et al., 2020).

One simple yet effective instrument for identifying and managing risks is a disaster risk checklist. The checklist allows the project team to systematically verify various aspects of disaster vulnerability and preparedness, including at the planning, design, and implementation stages (Asian Development Bank (ADB), 2017). However, based on an initial review of international standard documents such as the Project Management Body of Knowledge (PMBOK), ISO 21500:2021 on project management guidelines, and ISO 31000:2018 on risk management, no checklist guidelines have been found that specifically address disaster risk in the construction context.

The absence of a standardized checklist has resulted in a diversity of approaches in the field, with each company developing its own disaster risk assessment tool, if it is done at all (Heagele, 2016). This has the potential to lead to inconsistencies in risk assessment, weaknesses in documentation, and difficulties in post-disaster audit or evaluation processes. In addition,

DOI10.5595/001c.166552

limited access to technical knowledge and a lack of human resource training are also inhibiting factors in the implementation of effective disaster risk assessment practices in the context of construction project planning.

Based on this background, this study aims to identify the availability and use of disaster risk checklists in construction project planning, assess gaps in the literature and field practices, and provide initial recommendations for developing a more systematic and context-specific checklist framework, particularly for disaster-prone areas such as Indonesia. With a literature-based approach, this research is expected to provide a strong basis for developing guidelines that can be widely adopted by the construction industry.

2. RISK AND DISASTER MANAGEMENT IN CONSTRUCTION PROJECTS

Risk management is a systematic approach to identifying, analyzing, evaluating, and controlling risks that have the potential to disrupt the achievement of project objectives (Damayanti, 2023). In the context of construction projects, risks can come from various sources, such as cost uncertainty, time delays, design errors, to external factors such as natural disasters (Diputera et al., 2024). According to the PMBOK Guide, project risk management consists of several stages, namely risk management planning, risk identification, risk assessment, risk response planning, and risk monitoring and controlling (Project Management Institute (PMI), 2021). Although this approach has been widely used in construction projects, the focus on natural disaster risks is still often overlooked, especially in the early stages of project planning.

Disaster management in construction is part of risk management that specifically addresses threats from natural and non-natural events, such as earthquakes, floods, fires, extreme winds, and pandemics (Shahriar & Roy, 2024). Disaster management is a systematic and comprehensive effort to deal with all disaster events quickly, precisely, and accurately to minimize the victims and losses caused (Danil, 2021). In practice, disaster management includes mitigation, preparedness, response, and recovery actions (PPPSDAK, 2017). However, the literature shows that integration between project risk management and disaster management remains minimal, both in terms of frameworks and implementation tools in the field. This leaves many construction projects unprepared for disasters, resulting in major losses or even failure to complete when a disaster strikes.

Various studies show that traditional risk management approaches are not responsive enough to the complexity and uncertainty caused by disasters. For example, Amaratunga et al. (2017) emphasize the importance of mainstreaming disaster risk reduction (DRR) throughout the construction project cycle, from planning to operation. One of the tools in this process is the use of a disaster risk checklist (Arumsari, 2017), which can serve as a practical guide to ensure that important aspects related to disaster preparedness have been checked and implemented.

In international standard documents such as ISO 31000:2018 (risk management) and ISO 21500:2021 (project, programme and portfolio management), the general principles of risk management are well stated. However, these standards remain generic and do not specifically address disaster risk assessment in construction projects, especially at the planning stage. The same thing happens in the PMBOK Guide, which discusses more technical and business risks, and does not provide a specific template or checklist for disaster risk. This indicates a gap between theory and practical needs, especially in the context of construction projects in disaster-prone areas such as Indonesia.

In Indonesia, the literature on disaster risk management in construction remains limited. Most studies emphasize the emergency response or post-disaster reconstruction aspects, rather than preventive measures in the project planning stage. For example, in his research, Fathonah (2025) analyzed the application of natural disaster risk management in the Yogyakarta-Bawen Section I toll road construction project which focused more on the impact of disasters on project implementation. Likewise, Toyfur et al. (2017) studied the selection of earthquake disaster risk assessment models for national roads in Indonesia. Meanwhile, Umboh et al. (2021) conducted a modeling of construction project risk management in Minahasa Regency.

These previous studies focus on emergency response or post-disaster aspects, without providing a disaster risk checklist that can serve as a practical tool for construction project planning. In fact, the integration of disaster risk management from the early stages can minimize infrastructure damage and economic losses, and accelerate the recovery process (Nakoe & Lalu, 2022). Therefore, further studies are needed to develop or adapt tools such as disaster risk checklists that are appropriate to local geographic, social, and technical capacity conditions such as in Indonesia. Considering the findings above, it is increasingly clear that developing a structured, easily implemented disaster risk management approach for construction projects remains an urgent need. This study will fill this gap by systematically reviewing relevant literature and formulating initial recommendations for the development of a more applicable and standardized disaster risk checklist, especially for use by construction practitioners in disaster-prone areas.

3. METHODS

This study uses a Systematic Literature Review (SLR) approach to systematically identify, evaluate, and analyze relevant literature on the use of disaster risk checklists in construction project management. SLR was chosen because it can provide a comprehensive understanding of current conditions and the best practices applied in both global and local contexts. This method is carried out in stages and in a structured manner to ensure objectivity and replicability in the data collection and analysis process (Hansen, 2024).

The first stage in this SLR is the identification of research questions, namely: what is the availability of disaster risk checklists in construction project management practices, and what is the form and content of the checklist as reflected in project standards and previous literature. Based on these questions, the inclusion/exclusion criteria for articles were prepared. The inclusion criteria for the selected articles were (1) scientific publications, international standard documents, and technical reports from relevant institutions, (2) published within the last 15 years, and (3) directly discussing the topic of disaster risk, construction project management, or risk assessment instruments.

The next step is the literature search and selection process carried out using Harzing's Publish or Perish software, with the source databases being Scopus and Google Scholar (only articles). The keywords used are "disaster", "construction", and "checklist" for Scopus search and "disaster risk", "construction project", and "checklist" for Google Scholar search. From the initial search results, all articles found will be selected based on title, abstract, and completeness of content. Figures 1 and 2 present the results of the search process, both through the Scopus and Google Scholar databases, while Table 1 displays the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram of the search results.

Scopus was chosen because it is one of the largest and most comprehensive bibliographic databases covering highly reputable journals across disciplines, including engineering, construction, and disaster risk management. Several bibliometric studies have shown that Scopus and Web of Science have significant overlap in coverage, particularly for scientific journals in the natural sciences and engineering (Pranckutė, 2021; Stahlschmidt & Stephen, 2022). For example, content analysis of articles shows that a large proportion of documents indexed in Scopus also appear in Web of Science, illustrating significant content convergence between the two large databases (Stahlschmidt & Stephen, 2022). Furthermore, Scopus generally covers a larger number of journals, including those also indexed by WoS (Pranckutė, 2021; Wang & Waltman, 2016). Google Scholar is used in a complementary manner to access interdisciplinary literature, early-access articles, and conference proceedings relevant to the practice context that are not always indexed exclusively in commercial databases. Therefore, the combination of Scopus and Google Scholar in this study provides a comprehensive and adequate literature base.

In addition to articles obtained from the Scopus and Google Scholar (GS) databases, other publications related to disaster risk management and assessment in construction projects, both in the form of international standard documents and technical reports from relevant institutions, were also included, namely PMBOK, ISO 21500, ISO 31000, UNDRR, ADB, IDB, IFRC, and UNISDR. All publications that met the criteria were then thoroughly reviewed and categorized based on the type of document (standard, scientific journal, technical report) and the area of implementation (global, regional, Indonesia). Data collected from selected literature will be analyzed qualitatively and descriptively to identify key themes, the checklist model used, and deficiencies or gaps in its implementation. The content analysis technique is used to group findings by document type, risk covered, geographic location, objectives, key findings, and potential gaps. Furthermore, the analysis results are used to compile a synthesis of findings and to provide initial recommendations for developing a more standardized and applicable disaster risk checklist framework in Indonesia.

IDRiM (2026) 16 (2) **ISSN: 2185-8322**
DOI10.5595/001c.166552

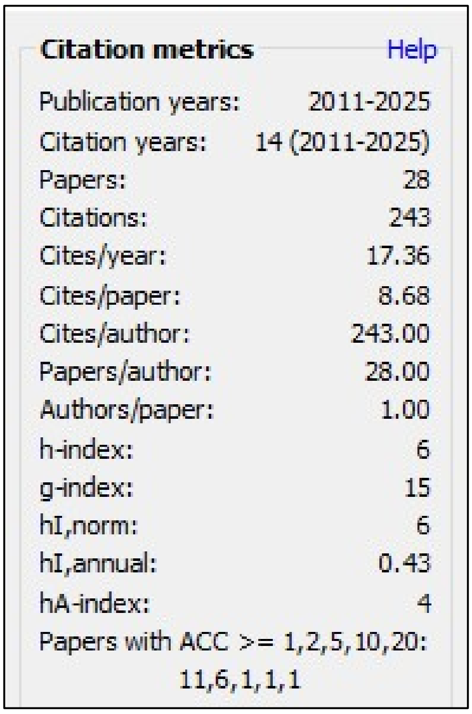

Figure 1. Metrics of Scopus search

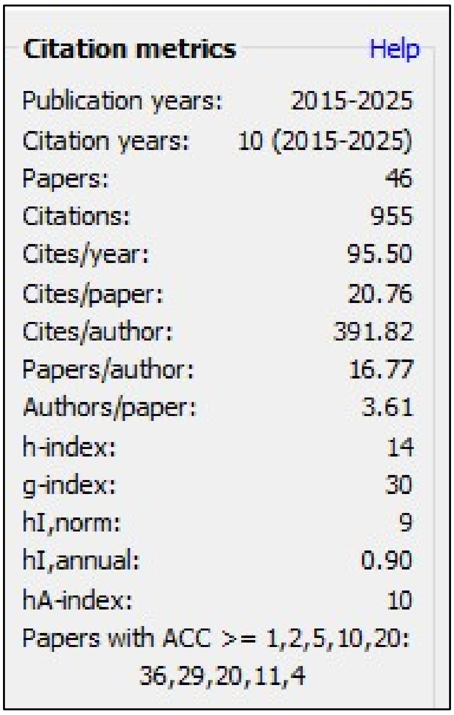

Figure 2. Metrics of Google Scholar search

Table 1. PRISMA for this study

Stages	**No. of articles**		**Notes**
	Scopus	**GS**	
Identification	28	46	Articles were found through databases: Scopus and Google Scholar
Preliminary selection	8	8	Articles were screened based on title and abstract (irrelevant ones were filtered out)
Full text examination	4	5	Articles that were available in a full version and met the inclusion criteria
Included articles	4	5	Articles that were relevant and used in the analysis

As part of an effort to ensure that the developed disaster preparedness checklist is not only based on literature but also relevant and applicable in practice, this study conducted external expert validation through a structured questionnaire survey. This validation involved respondents who met the criteria for experts or practitioners, namely: (1) having direct experience or relevant expertise, (2) working in the planning, risk management, or implementation of construction projects, and (3) having at least ten years of work experience. The survey was conducted between January 2 and 13, 2026. Table 2 presents the profiles of the expert respondents who reviewed and validated this checklist.

The main objectives of this questionnaire were to: (1) ensure that each indicator in the checklist is relevant to construction project planning practices, (2) assess the clarity and measurability of each checklist item, and (3) gather expert input regarding the completeness of the indicators and their potential application in the field. Thus, this validation process served to test the checklist's suitability to the actual needs of practitioners and experts in the fields of construction and disaster risk management.

The disaster preparedness checklist is intended for project managers or planning teams to use to assess a project's resilience to disaster risks during the planning stage. Respondents were asked to rate each indicator on three aspects: relevance, clarity, and feasibility of implementation in the context of construction project planning. Respondents were asked to rate each indicator on a scale of 1–4, where 1 indicates irrelevant/unclear/not applicable and 4 indicates very relevant/very clear/easily applicable. In addition to the numerical rating, respondents were also given the opportunity to add comments, suggestions, or proposed improvements to the indicators being assessed.

The checklist's acceptability analysis was conducted by calculating the average score for each indicator across the three assessment aspects (relevance, clarity, and implementability/applicability). An indicator was considered acceptable if its average score across all aspects was above 2.5 (threshold value). This validation stage was used to refine the developed checklist. This approach was used to ensure that the resulting checklist had a strong practical basis and was suitable for use in construction project planning.

Table 2. Expert respondents' profile

Code	Profile
Expert 1	Expert 1 is a practitioner with over 15 years of experience in the construction industry. He works at the Ministry of Public Works and Public Housing, Directorate General of Highways, as the First Expert in Road and Bridge Management. He frequently handles road reservation projects.
Expert 2	Expert 2 is a practitioner with over 10 years of experience. She serves as a project manager for a multinational company that frequently works in Timor Leste.
Expert 3	Expert 3 is an academic from a university in Jakarta. Prior to becoming an academic, he had over 20 years of practical experience in the construction industry, working on numerous high-rise and residential building projects.
Expert 4	Expert 4 is an academic and practitioner with over 15 years of work experience. Although currently affiliated with a university in West Java, he remains active as a consultant on various construction projects.

4. RESULTS

4.1 Result of Systematic Literature Review

This study identified 9 articles from the Scopus and Google Scholar databases, plus 8 publications from other relevant institutions, for a total of 17 publications that were analyzed. Table 3 summarizes the SLR results of this study. In the context of construction project planning, disaster preparedness is a crucial aspect that is increasingly receiving attention in academic literature. Based on the results of the review of the 17 documents analyzed, it appears that awareness of the importance of disaster risk management is quite widespread, but has not been fully translated into structured practices, such as specific checklists, that can be used directly during the construction project planning stage. Of all the studies analyzed, only a small number have compiled relevant checklist instruments, while most others remain conceptual or focus on the macro level, such as cities and national policies. The study by Kim et al. (2022) is the only one that explicitly compiles a building risk assessment checklist, consisting of three main categories: consequences, threats, and vulnerabilities. Although this is a step forward, this study does not integrate the checklist into the early stages of project planning, such as the design phase or feasibility study. This indicates a significant implementation gap, namely the absence of a mechanism to systematically adopt the checklist in construction projects from the early stages.

Meanwhile, Pham et al. (2019) highlighted the weak integration of building maintenance aspects in design and construction documentation, which ultimately increases vulnerability to disasters. They noted that the lack of as-built documentation and attention to maintenance at the beginning of the project were major deficiencies in the construction system in Australia. However, this study did not produce a specific checklist, so the conclusions presented are normative rather than operational.

In the category of international standards, UNDRR (2021) through the Disaster Resilience Scorecard for Cities document presents a very comprehensive approach. This resilience score comprises 117 indicators across 10 main elements, including organizing for resilience, using risk scenarios, and post-disaster recovery. However, this approach is considered too broad and requires a lot of time and resources so it is not suitable for direct application at the construction project level. In addition, the focus is more on city governance than on technical projects.

Similarly, Asian Development Bank (ADB) (2017) and Barandiarán et al. (2019) provide more relevant practical guidance for infrastructure projects. ADB, for example, provides a simple yet applicable field-based question-based checklist, focusing on identifying natural hazards, exposures, and community vulnerabilities. This checklist is designed for use by project officers and consultants during the project preparation phase. Barandiarán et al. (2019) from IDB adds more structured technical guidance through the risk assessment phases, complemented by a classification checklist and narrative analysis.

On the other hand, a study by International Federation of Red Cross and Red Crescent Societies (IFRC) (2019) developed a ten-point checklist that focuses on the legal and policy framework for disaster preparedness. This checklist highlights issues such as contingency planning, risk financing, and institutional arrangements. While important for national policy and legislative reform, this approach is too macro and does not address the technical operational aspects required at the construction project level.

Other studies, such as those by Kamari & Ham (2021) and Febriansyah et al. (2020), contribute to the general understanding of risk but do not produce an explicit checklist. Kamari & Ham (2021), for example, developed a visual detection method for potential flying debris due to cyclones at construction sites, but this study is still limited to the technological framework and has not yet reached the stage of developing a standardized preparedness tool.

Table 3. Summary of SLR

No	Authors (Year)	Publication Title	Document Type	Geographical Context	Risk Focus	Objectives	Key Findings	Gaps
1	Pham et al. (2019)	Role of Maintenance in Reducing Building Vulnerability to Extreme Events	Conference paper	Australia	Multi disasters	To assess contribution of maintenance toward reducing building vulnerability to extreme weather events such as high wind, wild fire and flood	Lack of consideration for maintenance during the design phase and lack of proper as-built documentation at completion of construction are the two main deficiencies of the Australian building system	No checklist provided
2	Kamari & Ham (2021)	Semantic Detection of Potential Wind-borne Debris in Construction Jobsites: Digital Twining for Hurricane Preparedness and Jobsite Safety	Conference paper	United States	Hurricanes	To develop a vision-based technique to identify and analyze the potential wind-borne debris in construction jobsites	The convenience of visual data collection and the advantages of the machine vision-based frameworks enable rapid scene understanding	No checklist provided
3	Kim et al. (2022)	Development of a Risk Assessment Model against Disasters in High-rise Buildings and Results of a Building Simulation Analysis	Journal paper	South Korea	Multi disasters	To assess a building's risk against disaster, tentatively named the Korean Integrated Disaster Evaluation Simulator (K-IDES)	[1] This study established a classification system for the evaluation of risk elements in Korean high-rise buildings. [2] There is a building risk assessment checklist available which is divided into 3 main categories, namely consequence, threats, dan vulnerability.	Disaster risk checklists have not focused on preventive efforts and have not been integrated into the project planning stage
4	Febriansyah et al. (2020)	Rapid Assessment of Buildings Affected by Earthquake: Case Study in Pidie Jaya, Aceh, Indonesia	Journal paper	Indonesia	Earthquake	To find the pattern of the level of damage to buildings due to the earthquake in Aceh	The earthquake that occurred resulted in almost all buildings with modern structures suffered minor damage	No checklist provided
5	Khodabakhshian et al. (2023)	Deterministic and Probabilistic Risk Management Approaches in Construction Projects: A Systematic Literature Review and Comparative Analysis	Journal paper	Global	General risks	To investigate and comparatively analyze the main deterministic and probabilistic methods applied to construction RM in respect of scope, primary applications, advantages, disadvantages, limitations, and proven accuracy	The findings established recommendations for optimum AI-based frameworks for different management levels—enterprise, project, and operational—for large or small data sets	No checklist provided
6	Kok et al. (2023)	Preparedness for contingencies: a systematic	Journal paper	Global	Multi disasters	To investigate factors that contribute to project	The results of a comparative analysis reveal four prominent	No checklist provided

		review of the factors that influence the crisis resilience of project managers				managers' crisis resilience through a systematic review of the literature and bibliometric analysis using VOXviewer	factors for enhancing crisis resilience: 1. leadership; 2. interpersonal skill; 3. agility; 4. risk management and vulnerability	
7	Zhao (2024)	Construction risk management research: intellectual structure and emerging themes	Journal paper	Global	General risks	To undertake a holistic review of global construction risk management (CRM) research published between 2000 and 2021 and identify the intellectual structure and emerging themes of the CRM research	The CRM knowledge domain consists of the key themes relating to CRM steps, RM in construction projects with specified characteristics, RM in international construction and management of particular risk categories	No checklist provided
8	Afkhamiaghda et al. (2021)	Factors affecting the post-disaster temporary housing construction	Journal paper	Global	Multi disasters	To study the factors affecting the building process of temporary housings	The top three factors affecting the post-disaster temporary housing construction are the community characteristics, environmental impact, and affordability	No checklist provided
9	UNISDR (2015)	UNISDR Working Papers on Public Investment Planning and Financing Strategy for Disaster Risk Reduction: Review of Seychelles	Technical paper	Seychelles	Multi disasters	To explore the financial aspects of disaster risk management policy in Seychelles	[1] Budgets need to be linked to a specific hazard (in this case tropical cyclones and earthquakes) to be meaningful. [2] The government needs to develop investment and financing strategies to address both extensive (small scale but high frequency) and intensive (low frequency but high impact)	Checklist to conduct a risk-sensitive budget review
10	Project Management Institute (PMI) (2021)	A Guide to the Project Management Body of Knowledge (PMBOK Guide) Seventh Edition and the Standard for Project Management	International standard	Global	General risks	To promote proactive, continuous risk identification and response as part of adaptive project environments	[1] Risk is embedded in the Principles and domains of project management. [2] Encourages customizing risk management based on project size, complexity, and environment (including disasters and crises). [3] Views risk as part of a larger system — not isolated — with dynamic interactions.	No specific disaster risk checklist provided, however it leaves room for organizations to develop custom tools for disaster risk identification, analysis, and response planning, especially in projects exposed to natural hazards or critical infrastructure

11	International Organization for Standardization (ISO) (2021)	ISO 21500:2021: Project, Programme and Portfolio Management – Context and Concepts	International standard	Global	General risks	To provide high-level guidance on project management concepts and processes to improve project performance and alignment with organizational strategy	It provides high-level guidance on project management, emphasizing the integration of risk management as a core component for achieving project objectives	No disaster risk checklist provided
12	International Organization for Standardization (ISO) (2018)	ISO 31000:2018: Risk Management – Guidelines	International standard	Global	General risks	To provide principles and a framework for effective risk management applicable to any organization, helping improve decision-making, resilience, and governance	It offers a comprehensive framework for managing all types of risk, highlighting principles like risk context, evaluation, and treatment	No disaster risk checklist provided
13	UNDRR (2021)	Disaster Resilience Scorecard for Cities: Detailed Level Assessment	International standard	Global	Multi disasters	To support cities in developing resilience action plans, guiding investment priorities, and tracking progress	[1] The Scorecard serves as a comprehensive checklist, structured around the "Ten Essentials for Making Cities Resilient", including organize for resilience, identify and use risk scenarios, and strengthen financial capacity. [2] The checklist contains 117 detailed indicators.	[1] Not suitable for individual projects. [2] The detailed assessment can take 1–4 months, requiring significant coordination and data.
14	Asian Development Bank (ADB) (2017)	Disaster Risk Assessment for Project Preparation: A Practical Guide	International standard	Asian region	Multi disasters	To support the application of this principle by providing ADB project officers sufficient technical advice to plan and oversee disaster risk assessments	[1] It outlines a systematic approach to assess natural hazards, exposure, and vulnerability using both qualitative and quantitative methods. [2] Disaster risk should be assessed early and thoroughly to inform risk-reduction design decisions, especially in infrastructure projects in hazard-prone areas.	[1] The guide includes checklists in its appendices: Lead questions focused on natural hazards and exposure (appendix 3) and Lead questions focused on community vulnerability (appendix 4). [2] While simple, these checklists are designed to guide project officers and consultants in conducting focused and efficient disaster risk assessments.
15	Barandiarán et al. (2019)	Disaster and Climate Change Risk Assessment Methodology for IDB	Technical paper	Latin America and Caribbean (LAC) region	Multi disasters	To provide a technical and operational framework for assessing disaster and	It provides structured checklists and guiding questions throughout the	[1] The checklist and accompanying methodology are technically dense and

		Projects: A Technical Reference Document for IDB Project Teams				climate change risks in IDB-financed projects	methodology, particularly in: Step 1 and Step 2 (Screening and classification checklists); Step 3 and Step 4 (Narrative and qualitative risk assessment guides)	multi-layered, requiring substantial expertise. [2] Steps 3 and 4 rely on qualitative inputs (e.g., expert workshops, narratives), which may be subjective or lack quantitative validation.
16	International Federation of Red Cross and Red Crescent Societies (IFRC) (2019)	The Checklist on Law and Disaster Preparedness and Response	International standard	Global	Multi disasters	To identify legal gaps and strengthen national legal frameworks for disaster preparedness and response	[1] It includes a 10-point checklist focusing on critical legislative issues such as: institutional frameworks, risk financing, and contingency planning. [2] Each section includes sub-questions and suggested legal/policy areas to review.	[1] The checklist is broad and general, which may limit its direct applicability. [2] It does not offer quantitative evaluation tools which could hinder decision-making. [3] While strong on legislative review, the checklist does not thoroughly address operational challenges on the project level.
17	UNISDR (2017)	National Disaster Risk Assessment: Hazards Specific Risk Assessment	International standard	Global	Multi disasters	To provide methodological guidance for hazard-specific risk assessments that inform national disaster risk reduction strategies	Although not formatted as a single unified checklist, the document provides structured modules for each hazard (e.g., earthquake, tsunami, flood), with key data inputs, tools, methods, and considerations for risk assessment	[1] There is no unified, consolidated checklist across all hazards. [2] Probabilistic approaches and modeling tools require advanced expertise and resources. [3] It does not include criteria to prioritize risks or actions.

Furthermore, a systematic study by Khodabakhshian et al. (2023) and Zhao (2024) enrich the discussion on risk management in construction, including deterministic and probabilistic methods, and the global knowledge structure related to project risk management. However, neither of them explicitly discusses disaster preparedness, nor do they develop a preparedness checklist at the project planning stage.

One common issue across all these reviews is the lack of integration of disaster risk into the planning phase of construction projects. Risk is often considered as part of the implementation or operational phase, rather than as a basic component in planning. In fact, aspects such as site selection, structural design, material selection, and construction schedule are highly influenced by local hazards and vulnerabilities. Another issue found is the high technical level of some existing approaches. The UNDRR and IDB methodologies, although comprehensive, require technical capacity that is not always available in all projects, especially in small- and mediumsized projects in developing countries. This is a challenge for consultants or project teams who need concise, practical, and easy-to-apply guidance.

Thus, there is an urgent need to develop a disaster preparedness checklist specifically for construction projects, to be incorporated into the planning stage. The checklist should be comprehensive yet straightforward, applicable to a wide range of project stakeholders, and able to bridge the macro approach (policy and urban planning) with the micro needs (tactical and operational in the field). Early integration, use of local risk data, and community and stakeholder engagement from early planning are key principles that should be adopted. In addition, the development of such standards can encourage greater awareness and capacity among construction human resources to deal with disasters, in line with the principles of sustainable development and infrastructure resilience.

4.2 Development of Disaster Preparedness Checklist

The synthesis results of the Systematic Literature Review show that although many studies highlight the importance of disaster risk management in construction projects, only a few explicitly provide a checklist that can be used directly. However, the information contained in these studies provides a strong basis for formulating a more operational and context-specific checklist, especially across six main areas: design and engineering mitigation; site security and accessibility; supporting infrastructure and physical protection; team readiness and coordination; project recovery protocol; and external coordination and supporting documents. Table 4 presents the recommended Disaster Preparedness Checklist that can be used in the implementation phase of a construction project, with a focus on identifying and mitigating natural disaster risks.

The 'Design and Engineering Mitigation' area was provided based on the finding that many studies emphasize the importance of technical mitigation efforts from the early stages of a project, but they have not been systematically integrated into the planning process. Kim et al. (2022) have developed a building risk assessment checklist, but have not linked it to early project phases such as design and feasibility studies. Meanwhile, Pham et al. (2019) showed that insufficient attention to maintenance and technical documentation from the design stage increases a building's vulnerability to disasters. These findings emphasise the need for indicators that explicitly guide technical and engineering mitigation from the beginning of project planning.

The 'Site Security and Accessibility' area was developed to address risks that arise at the project site level, which are often overlooked in macro policy approaches. A study by Kamari & Ham (2021) highlighted specific dangers at construction sites, including the potential for wind-borne debris that can compromise safety and exacerbate disaster impacts. Furthermore, the ADB (2017) and Barandiarán et al. (2019) guidelines also emphasize the importance of identifying hazards, exposures, and site accessibility from the project preparation stage. However, the literature has not yet formulated this into a simple checklist that focuses on project site security and access.

The ‘Supporting Infrastructure and Physical Protection’ area is based on the finding that project resilience is determined not only by the main building, but also by supporting infrastructure and physical protection. UNDRR (2021) and UNISDR (2017), through their Disaster Resilience Scorecard, emphasize the importance of support systems, utilities, and physical protection as part of resilience, albeit within a city or national context. At the project level, these aspects have not yet been translated into practical indicators, requiring specific formulation within a construction planning checklist.

The ‘Team Readiness and Coordination’ area is based on literature highlighting the roles of human resources and team readiness in crisis response. Kok et al. (2023) demonstrated that project manager resilience is significantly influenced by leadership, interpersonal skills, and risk management capabilities. However, these studies do not yet provide a practical tool for systematically assessing project team readiness. Therefore, this area is designed to bridge behavioral and organizational aspects into indicators that can be used during the planning stage.

The ‘Project Recovery Protocol’ area emerged in response to the finding that many risk frameworks emphasize prevention but under-emphasize project recovery preparedness after a disaster. UNDRR (2021) and IFRC (2019) emphasize the importance of contingency and recovery planning, but their focus remains policy- and institutional-based. Afkhamiaghda et al. (2021) also demonstrate that recovery factors are crucial to the success of post-disaster development. However, there is no checklist specifically addressing recovery planning at the construction project level from the initial phase.

Finally, the ‘External Coordination and Supporting Documents’ area was developed based on the finding that external coordination and the readiness of supporting documents are crucial but often fragmented elements. IFRC (2019) highlights weaknesses in legal and institutional aspects, while standards such as PMI (2021), ISO 21500, and ISO 31000 emphasize risk integration within the project management system, yet do not provide specific tools. The absence of operational indicators at the project level highlights the need for a dedicated area that combines coordination with external stakeholders and the readiness of supporting documents. Therefore, the six key areas in this checklist were developed in direct response to the gap between the conceptual framework and practical needs at the project level, and they adapt key findings and gaps identified in the literature. This structure is intended to provide a more focused, operational, and applicable tool for construction project planning in the context of disaster preparedness.

The disaster risk checklist prepared for the construction project implementation phase is a systematic tool to identify, evaluate, and control the potential impacts of natural disasters on construction activities. The checklist consists of six areas based on their direct relevance to the vulnerability of construction projects in disaster-prone areas such as Indonesia.

In total, there are 30 indicators, so that the interpretation can be divided into three interpretations based on the total score obtained (assessed from the number of 'Yes' responses). The first interpretation is low preparedness with a score range of 0-14, which indicates a high-risk project for disaster resilience so that redesign or supplementary planning is highly recommended before the project is actually executed. The second interpretation is moderate preparedness with a score range of 15-22, which indicates that some indicators have been met but there are still other risks that need to be mitigated by the project team. While the third interpretation is high preparedness with a score range of 23-30, which indicates a well-prepared project with risk-informed planning.

Table 4. Disaster preparedness checklist – construction project planning phase

No	Indicators	Yes	No	Notes
Design and Engineering Mitigation				
1	Is disaster risk considered in design criteria and material selection?			
2	Are local and international building codes for disaster resilience applied?			
3	Have engineering simulations (e.g., flood, seismic) been conducted?			
4	Are critical systems (power, water, data) designed with redundancy and protection?			
5	Are passive design strategies for disaster mitigation (e.g., floodable spaces, natural ventilation) incorporated into the early design phase of the construction project?			
Site Security and Accessibility				
6	Has a hazard mapping been conducted for the project location?			
7	Are emergency evacuation routes available and clearly marked?			
8	Does the project site have alternative access if the main route is cut off due to a disaster?			
9	Does the work area have a site risk assessment (e.g., earthquake/landslide/flood prone)?			
10	Are historical disaster data used in site selection and design planning?			
Supporting Infrastructure and Physical Protection				
11	Are all critical assets (utilities, structural components) mapped and analyzed for exposure?			
12	Have temporary protections for buildings or structures been prepared (e.g., flood barriers)?			
13	Is the drainage system in the work area adequate to prevent flooding?			
14	Are heavy equipment and materials stored in areas safe from disaster risks?			
15	Are structural monitoring systems (e.g., sensors) considered for early warning?			
Team Readiness and Coordination				
16	Is there a maintenance plan that includes disaster readiness measures?			
17	Has the disaster response focused on human coordination and safety?			
18	Have all workers received disaster emergency response training?			
19	Is there an emergency communication system (e.g., HT radio, evacuation numbers)?			
20	Are there routine procedures for disaster evacuation simulations?			
Project Recovery Protocol				
21	Are responsibilities clearly assigned for disaster response roles?			
22	Is there a maintained muster area/emergency assembly point?			
23	Is there a protocol for stopping work in the event of a disaster early warning?			
24	Is there a contingency plan in place in case the project must be temporarily halted?			
25	Is there a plan for the post-disaster recovery of materials and assets?			
External Coordination and Supporting Documents				
26	Is there a documented scenario-based risk assessment combining hazard, exposure, and vulnerability?			
27	Have social factors (poverty, accessibility, disability) been considered in vulnerability analysis?			
28	Is the project connected to the local disaster early warning system (BMKG, BNPB, etc.)?			
29	Are written emergency procedure documents available at the project site?			
30	Is there a designated disaster risk manager in the project team?			
	TOTAL			

DOI10.5595/001c.166552

Using this checklist is simple but requires commitment from the project manager and field team. Each point on the checklist is evaluated periodically, ideally before the start of daily or weekly construction activities. The person in charge of risk on the project must record whether each item has been met (yes), not met (no), and include information if necessary. The results of this checklist are then used to determine quick corrective actions, such as installing evacuation signs, relocating materials from vulnerable zones, or retraining evacuation procedures for workers.

This checklist can also be integrated with the occupational health and safety (OHS) management system, so that it does not stand alone, but becomes part of a holistic project management approach. In this way, the disaster risk aspect is not considered as an uncontrollable external issue, but as part of internal control that can be predicted and responded to. The positive implication is that the entire project team is increasingly aware of potential hazards and their readiness to deal with emergency situations. In addition to being a routine evaluation tool, this checklist can be used when there is a significant change in the project environment, for example, due to extreme weather, a small earthquake, or an early warning from disaster authorities. In such situations, the use of the checklist helps the project make quick decisions: whether activities are temporarily stopped, certain areas must be evacuated, or additional mitigation measures are needed. This reduces the possibility of asset loss, work accidents, or project delays due to unpreparedness.

4.3 Checklist Validation

The results of the validation with external experts are shown in Table 5. Of the 30 indicators in the previous disaster preparedness checklist, nine were found to be invalid (with an overall score below 2.5) and therefore eliminated from the final checklist (Table 6). These nine indicators are indicators 15, 18, 20, 24, 25, 26, 27, 28, and 30. These invalid indicators generally relate to aspects of disaster preparedness that are beyond the direct control of construction project management or outside the planning stage. For example, indicators associated with the use of structural monitoring systems for early warning (indicator 15) and with project connectivity to the national early warning system (indicator 28) are not yet common practice in most construction projects, particularly small- and medium-scale projects. This makes these indicators less relevant or difficult to implement widely.

Several other indicators, such as emergency response training for all workers (indicator 18), routine evacuation simulations (indicator 20), and the appointment of a dedicated disaster risk manager within the project team (indicator 30), are considered more appropriate for implementation during the construction or operational phase, rather than the project planning stage. Experts argue that during the planning stage, the primary focus of project management remains on technical aspects, cost, and time, making these indicators less relevant and worthy of prioritisation.

Indicators related to post-disaster recovery (indicator 25), scenario-based risk assessment (indicator 26), and consideration of social factors in vulnerability analysis (indicator 27) are also considered too complex and require cross-sectoral data that is often unavailable at the project level. Therefore, although these indicators are conceptually important, experts believe their application is still limited in current construction project planning practices.

These validation results indicate that the developed disaster preparedness checklist encompasses core aspects of disaster preparedness that are relevant and applicable. Meanwhile, indicators declared invalid can be considered for further development as advanced indicators or adjusted for specific project contexts with higher capacity and complexity.

Table 5. Validation feedback

Indicator	Relevance	Clarity	Implementability	Overall	Status
Indicator 1	3.00	2.50	3.00	2.83	valid
Indicator 2	3.00	3.00	2.75	2.92	valid
Indicator 3	3.25	3.00	2.50	2.92	valid
Indicator 4	3.25	3.25	3.25	3.25	valid
Indicator 5	2.75	3.00	2.75	2.83	valid
Indicator 6	3.25	3.25	3.00	3.17	valid
Indicator 7	3.25	3.25	3.00	3.17	valid
Indicator 8	2.75	2.75	2.25	2.58	valid
Indicator 9	3.25	3.25	2.25	2.92	valid
Indicator 10	3.25	3.25	2.50	3.00	valid
Indicator 11	3.00	3.00	2.25	2.75	valid
Indicator 12	3.00	2.75	2.25	2.67	valid
Indicator 13	2.75	2.75	2.75	2.75	valid
Indicator 14	3.00	3.00	2.75	2.92	valid
Indicator 15	2.50	2.50	1.75	2.25	*invalid*
Indicator 16	2.75	2.75	2.50	2.67	valid
Indicator 17	3.25	3.25	2.75	3.08	valid
Indicator 18	2.50	2.50	2.00	2.33	*invalid*
Indicator 19	3.50	3.50	3.00	3.33	valid
Indicator 20	2.50	2.50	2.00	2.33	*invalid*
Indicator 21	3.25	3.00	2.50	2.92	valid
Indicator 22	3.25	3.25	2.50	3.00	valid
Indicator 23	3.25	3.25	2.75	3.08	valid
Indicator 24	2.50	2.50	2.25	2.42	*invalid*
Indicator 25	2.25	2.25	2.00	2.17	*invalid*
Indicator 26	2.25	2.25	2.00	2.17	*invalid*
Indicator 27	2.00	2.00	1.75	1.92	*invalid*
Indicator 28	2.00	2.00	1.50	1.83	*invalid*
Indicator 29	2.75	2.75	2.25	2.58	valid
Indicator 30	2.50	2.50	2.00	2.33	*invalid*

Table 6. Validated checklist

No	Indicators	Yes	No	Notes
Design and Engineering Mitigation				
1	Is disaster risk considered in design criteria and material selection?			
2	Are local and international building codes for disaster resilience applied?			
3	Have engineering simulations (e.g., flood, seismic) been conducted?			
4	Are critical systems (power, water, data) designed with redundancy and protection?			
5	Are passive design strategies for disaster mitigation (e.g., floodable spaces, natural ventilation) incorporated into the early design phase of the construction project?			
Site Security and Accessibility				
6	Has a hazard mapping been conducted for the project location?			
7	Are emergency evacuation routes available and clearly marked?			
8	Does the project site have alternative access if the main route is cut off due to a disaster?			
9	Does the work area have a site risk assessment (e.g., earthquake/landslide/flood prone)?			
10	Are historical disaster data used in site selection and design planning?			
Supporting Infrastructure and Physical Protection				
11	Are all critical assets (utilities, structural components) mapped and analyzed for exposure?			
12	Have temporary protections for buildings or structures been prepared (e.g. flood barriers)?			
13	Is the drainage system in the work area adequate to prevent flooding?			
14	Are heavy equipment and materials stored in areas safe from disaster risks?			
Team Readiness and Coordination				
15	Is there a maintenance plan that includes disaster readiness measures?			
16	Has the disaster response focused on human coordination and safety?			
17	Is there an emergency communication system (e.g., HT radio, evacuation numbers)?			
Project Recovery Protocol				
18	Are responsibilities clearly assigned for disaster response roles?			
19	Is there a maintained muster area/emergency assembly point?			
20	Is there a protocol for stopping work in the event of a disaster early warning?			
External Coordination and Supporting Documents				
21	Are written emergency procedure documents available at the project site?			
	TOTAL			

The use of this checklist can increase project resilience to external disruptions. Projects that consistently use checklists in their planning will build historical risk documentation, which can later be used as evaluation material for subsequent projects or compiled into operational standards within the company. This is very important for companies operating in various regions with different disaster risk profiles.

From an institutional perspective, implementing this checklist also encourages better collaboration between project implementers and external parties, such as the BNPB (National Disaster Management Agency), BMKG (Meteorology, Climatology, and Geophysics Agency), local governments, and donor agencies that require disaster preparedness documents. The checklist can be used as evidence of readiness during an audit or in the event of an incident. Thus, its implementation not only enhances the project's safety and sustainability but also strengthens the company's reputation in the eyes of stakeholders.

The integration of this checklist in a construction project is not only a matter of procedural compliance but is a strategic investment in project sustainability and safety. The earlier and more routinely this checklist is used, the higher the chance for the project to minimise disruption and losses due to disasters. Therefore, implementing this checklist is recommended as part of a permanent policy in construction project management, especially in disaster-prone countries such as Indonesia.

5. CONCLUSION

This study shows that there is a real gap in the implementation of disaster risk management in construction projects, especially in the form of the absence of a standardized checklist for the planning stage of construction projects. Although various literature and international standards, such as PMBOK and ISO 21500, have discussed risk management in general, the aspect of natural disaster risk is still often ignored or not described at the operational level or at the project level. This causes many construction companies to rely on an undocumented, ad-hoc approach to dealing with potential disasters.

The disaster preparedness checklist developed in this study seeks to address this need by providing a practical tool for project teams to assess project readiness and vulnerability to natural disasters. This checklist covers aspects of design, location, infrastructure, team preparedness, project recovery protocols, and external coordination, and is designed to be easily integrated into existing project control systems.

For further development, this study opens the door to empirical studies that test the effectiveness of using the checklist in real projects, in the form of case studies and trials across various project types and geographical conditions. In addition, further development could also include adapting the checklist to local characteristics, national regulatory frameworks, and integrating it with existing project management and risk management systems, allowing for broader use in construction practice. Thus, the existence of a disaster risk checklist not only increases project resilience but also supports the creation of a more responsive and sustainable construction culture amid the growing threat of future disasters.

DECLARATION OF GENERATIVE AI IN THE WRITING PROCESS

During the preparation of this work, the author used ChatGPT to generate outlines and proofread for clarity and grammar. After using this tool/service, the author reviewed and edited the content generated by the tool as necessary and takes full responsibility for the content of the publication.

REFERENCES

Afkhamiaghda, P. candidate, M., Elwakil, P. P. C. P. E., Afsari, P. K., & Rapp, Dm. P. C. R. (2021). Factors affecting the post-disaster temporary housing construction. *Journal of Emergency Management*, *19*(8), 79–95. https://doi.org/10.5055/jem.0632

Akinradewo, O., Aigbavboa, C., & Akinradewo, O. (2019). Impact of Construction Project Planning on Contractor's Profit. *IOP Conference Series: Earth and Environmental Science*, *385*(1), 012009. https://doi.org/10.1088/1755-1315/385/1/012009

Amaratunga, D., Haigh, R., Malalgoda, C., & Keraminiyage, K. (2017). *Mainstreaming disaster resilience in the construction process: Professional education for a resilient built environment. A report of the CADRE project: Collaborative Action towards Disaster Resilience Education*.

Arumsari, F. (2017). *Pengembangan Checklist Penilaian Risiko Keselamatan dan Kesehatan Kerja (K3) dan Kesiapan Mitigasi Bahaya pada Gedung Perguruan Tinggi: Studi Kasus Institut Teknologi Sepuluh Nopember Surabaya (Development of an Occupational Safety and Health Risk Assessment Checklist and Hazard Mitigation Readiness in Higher Education Buildings: Case Study of Sepuluh Nopember Institute of Technology, Surabaya)* [Thesis]. Institut Teknologi Sepuluh Nopember.

Asian Development Bank (ADB). (2017). *Disaster Risk Assessment for Project Preparation: A Practical Guide*. Asian Development Bank.

Barandiarán, M., Esquivel, M., Lacambra, S., Suárez, G., & Zuloaga, D. (2019). *Disaster and Climate Change Risk Assessment Methodology for IDB Projects: A Technical Reference Document for IDB Project Teams*. Inter-American Development Bank.

Damayanti, E. S. (2023). Risk Management: In an Overview of Literature Review. *Formosa Journal of Science and Technology*, *2*(4), 1115–1122. https://doi.org/10.55927/fjst.v2i4.3837

Danil, M. (2021). Manajemen Bencana (Disaster Management). *Prosiding Mitigasi Bencana*, 7–14.

Diputera, I. G. A., Lestari, I. G. A. A. I., & Utama, I. P. R. A. (2024). Analisis dan Mitigasi Risiko Pembangunan Gedung Mall Pelayanan Publik Kabupaten Gianyar (Risk Analysis and Mitigation for the Construction of the Public Service Mall Building in Gianyar Regency). *Jurnal Teknik Gradien*, *16*(01), 9–17. https://doi.org/10.47329/teknik_gradien.v16i01.1180

Edjossan-Sossou, A. M., Vuillet, M., Mehdizadeh, R., & Deck, O. (2020). Agent-based model for simulating households' self-evacuation decision in high-rise buildings under critical infrastructure failures induced by a slow-onset flood conditions – A case study in Paris. *IDRiM Journal*, *10*(2). https://doi.org/10.5595/001c.18160

Fathonah, M. (2025). *Analisis Manajemen Risiko Bencana Alam pada Proyek Konstruksi Tol Yogyakarta-Bawen Seksi I (Natural Disaster Risk Management Analysis on the Yogyakarta-Bawen Toll Road Section I Construction Project)*. Universitas Islam Indonesia.

Febriansyah, A., Rianto, R., Wardana, A. K., & Fauzi, E. R. (2020). Rapid Assessment of Buildings Affected by Earthquake: Case Study in Pidie Jaya, Aceh, Indonesia. *Civil Engineering and Architecture*, *8*(6), 1217–1224. https://doi.org/10.13189/cea.2020.080606

Hansen, S. (2024). Tinjauan Pustaka sebagai Sebuah Metode Penelitian (Literature Review as a Research Method). In *Metodologi Penelitian Kuantitatif, Kualitatif & Mix Method* (pp. 192–218). Balai Literasi Bangsa.

Heagele, T. N. (2016). Lack of Evidence Supporting the Effectiveness of Disaster Supply Kits. *American Journal of Public Health*, *106*(6), 979–982. https://doi.org/10.2105/AJPH.2016.303148

International Federation of Red Cross and Red Crescent Societies (IFRC). (2019). *The Checklist on Law and Disaster Preparedness and Response*. International Federation of Red Cross and Red Crescent Societies.

International Organization for Standardization (ISO). (2018). *ISO 31000:2018: Risk Management – Guidelines*. International Organization for Standardization.

International Organization for Standardization (ISO). (2021). *ISO 21500:2021: Project, Programme and Portfolio Management – Context and Concepts*. International Organization for Standardization.

Kamari, M., & Ham, Y. (2021). Semantic Detection of Potential Wind-Borne Debris in Construction Jobsites: Digital Twining for Hurricane Preparedness and Jobsite Safety. *Computing in Civil Engineering*, 902–909.

Khodabakhshian, A., Puolitaival, T., & Kestle, L. (2023). Deterministic and Probabilistic Risk Management Approaches in Construction Projects: A Systematic Literature Review and Comparative Analysis. *Buildings*, *13*(5), 1312. https://doi.org/10.3390/buildings13051312

Kim, T.-Y., Han, G.-S., Kang, B.-S., & Lee, K.-H. (2022). Development of a risk assessment model against disasters in high-rise buildings and results of a building simulation analysis. *Journal of Asian Architecture and Building Engineering*, *21*(2), 249–262. https://doi.org/10.1080/13467581.2020.1869016

Kok, C. W., Shavarebi, K., Abu Talib, I. F. B., Wider, W., & Nga, E. (2023). Preparedness for contingencies: a systematic review of the factors that influence the crisis resilience of project managers. *F1000Research*, *12*, 158. https://doi.org/10.12688/f1000research.129532.1

Liang, X., & O'brien, W. J. (2016). Analysis of the Criticality and Frequency of Alignment Elements in Project Execution Plans. *Construction Research Congress 2016*, 140–149. https://doi.org/10.1061/9780784479827.015

Nakoe, M. R., & Lalu, N. A. S. (2022). *Manajemen Bencana (Disaster Management)*. UD Duta Sablon.

Pastrana-Huguet, J., Casado-Claro, M.-F., & Grau-Vila, C. (2025). Disaster Preparedness Through Traditional DRR-Related Knowledge. a Comparative Study of the Cultures of Prevention in the Pacific Rim and Mediterranean Coastal Communities. *Journal of Integrated Disaster Risk Management*, *15*(1), 127–157.

Pham, L., Palaneeswaran, E., & Stewart, R. (2019). Role of Maintenance in Reducing Building Vulnerability to Extreme Events. *IABSE Symposium*, 1452–1457. https://doi.org/10.2749/guimaraes.2019.1452

PPPSDAK. (2017). *Modul Manajemen Penanggulangan Bencana: Pelatihan Penanggulangan Bencana Banjir (Disaster Management Module: Flood Disaster Management Training)*. Pusat Pendidikan dan Pelatihan Sumber Daya Air dan Konstruksi.

Pranckutė, R. (2021). Web of Science (WoS) and Scopus: The Titans of Bibliographic Information in Today's Academic World. *Publications*, *9*(1), 12. https://doi.org/10.3390/publications9010012

Project Management Institute (PMI). (2021). *A Guide to the Project Management Body of Knowledge (PMBOK Guide) Seventh Edition and the Standard for Project Management*. Project Management Institute.

Sensin, C., & Gokmenoglu, T. (2024). Sharing the Responsibility: Ministry of National Education's Disaster Preparedness and Response to Kahramanmaraş Earthquake. *IDRiM Journal*, *14*(1). https://doi.org/10.5595/001c.94365

Shahriar, B., & Roy, U. K. (2024). Practical Indicators to Improve Urban Flood Resilience of a Community: A Case of Urban Flood Mitigation in Dhaka, Bangladesh. *IDRiM Journal*, *14*(2). https://doi.org/10.5595/001c.124782

Stahlschmidt, S., & Stephen, D. (2022). From indexation policies through citation networks to normalized citation impacts: Web of Science, Scopus, and Dimensions as varying resonance chambers. *Scientometrics*, *127*(5), 2413–2431. https://doi.org/10.1007/s11192-022-04309-6

Toyfur, M. F., Pribadi, K. S., Wibowo, S. S., & Sengara, I. W. (2017). Pemilihan Bentuk Model Penilaian Risiko Bencana Gempa Bumi untuk Ruas Jalan Nasional di Indonesia (Selection of Earthquake Disaster Risk Assessment Model Form for National Road Sections in Indonesia). *Prosiding Simposium II – UNIID* , 122–129.

Umboh, AH., Malingkas, GY., & Rumayar, ALE. (2021). Pemodelan Pengelolaan Risiko Proyek Konstruksi oleh Perusahaan Pelaksana Konstruksi: Studi Kasus Proyek Konstruksi di Pemerintah Daerah Kabupaten Minahasa (Modeling of Construction Project Risk Management by Construction Companies: Case Study of Construction Projects in the Minahasa Regency Regional Government). *Jurnal Ilmiah Media Engineering*, *11*(2), 145–156.

UNDRR. (2021). *Disaster resilience scorecard for cities: Detailed level assessment*. United Nations Office for Disaster Risk Reduction.

UNISDR. (2015). *UNISDR Working Papers on Public Investment Planning and Financing Strategy for Disaster Risk Reduction: Review of Seychelles*.

UNISDR. (2017). *National Disaster Risk Assessment: Hazards Specific Risk Assessment*. UN International Strategy for Disaster Reduction (UNISDR).

Vishnu, R. S., Anilkumar, S., & P., B. (2024). Disaster Risk Assessment and Analysis of Physical Infrastructure: A Comprehensive Review of Scientific Methods and Techniques. *IDRiM Journal*, *14*(2). https://doi.org/10.5595/001c.124123

Wang, Q., & Waltman, L. (2016). Large-scale analysis of the accuracy of the journal classification systems of Web of Science and Scopus. *Journal of Informetrics*, *10*(2), 347–364. https://doi.org/10.1016/j.joi.2016.02.003

Zhao, X. (2024). Construction risk management research: intellectual structure and emerging themes. *International Journal of Construction Management*, *24*(5), 540–550. https://doi.org/10.1080/15623599.2023.2167303

Zulfiar, M. H., & Jayady, A. (2018). Kajian Kerentanan pada Sektor Konstruksi dalam Pengurangan Risiko Bencana Gempa Bumi (Vulnerability Assessment in the Construction Sector in Reducing Earthquake Disaster Risk). *Jurnal Karkasa*, *4*(1), 1–7.

Zwikael, O., & Globerson, S. (2006). Benchmarking of project planning and success in selected industries. *Benchmarking: An International Journal*, *13*(6), 688–700. https://doi.org/10.1108/14635770610709059