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# Risk Management and Government Responsibility for Personnel Safety during Emergency Response Operations

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***Abstract***

*This study examines whether risk management practices at the East Java Provincial Disaster Management Agency (BPBD) during emergency response operations adequately support the government's legal responsibility to protect personnel exposed to occupational hazards. Using a qualitative socio-legal approach, the study draws on interviews with BPBD officials and Rapid Response Team (TRC) personnel, field observations, relevant legislation, institutional documents, and the ISO 31000:2018 framework. The findings show that BPBD obtains preliminary hazard information from disaster information agents and district and municipal BPBDs, conducts follow-up assessments to determine personnel and equipment needs, adjusts deployment to field conditions, and carries out operational monitoring and reviews. However, risk assessment lacks a standardized instrument, written procedures specifically governing risk treatment during emergency response operations are unavailable, and monitoring and review results are not systematically documented. These shortcomings may undermine consistency in risk control decisions and limit institutional accountability. Viewed in relation to the government's duty to protect personnel, these findings reveal a gap between the risk management measures already implemented and the need for consistent, documented, and legally grounded personnel protection. The study contributes by demonstrating how weaknesses in risk management standardization and documentation affect the relationship between operational risk control, institutional accountability, and the government's positive obligation to protect personnel.*
***Keywords:*** *Disaster Management; Government Responsibility; Occupational Safety; Risk Management*

## 1. INTRODUCTION

A disaster involves a series of events caused by natural, non-natural, or human-related factors that may disrupt the livelihoods and lives of communities and can lead to fatalities, property losses, environmental damage, and psychological impacts.[1] Indonesia faces a significant level of vulnerability to various types of disasters influenced by various factors, including its geographic location, geological conditions, climatic characteristics, and community activities. The scale of disaster events in Indonesia can be illustrated by the number of incidents recorded in recent years. According to data released by the National Disaster Management Agency, a total of 4,727 disaster events were recorded in 2025, an increase of approximately 36.15% compared to 2024, which recorded 3,472 disaster incidents.[2] East Java also faces diverse disaster threats. According to the East Java Province Disaster Risk Assessment (KRB) Document for 2022–2026, there are 14 types of disaster threats in East Java.[3] According to records compiled by the Operations Control Center (Pusdalops) of the East Java BPBD, 351 disaster incidents were recorded in 2025. These

[1] Susetya Herawati et al., *Pengurangan Risiko Bencana*, (Kota Malang: PT. Literasi Nusantara Abadi Grup, 2023).
[2] Badan Nasional Penanggulangan Bencana, "Data Informasi Bencana Indonesia," BNPB, accessed June 8, 2026, https://bnpb.go.id/infografis.
[3] Badan Nasional Penanggulangan Bencana, *Kajian Risiko Bencana Nasional Provinsi Jawa Timur 2022 - 2026*, (Jakarta: BNPB, 2022).

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figures provide an overview of the scale of disaster management activities, but they do not directly indicate the level of occupational risk faced by disaster response personnel or the number of work-related accidents they experience. Therefore, personnel safety during emergency response operations needs to be examined by considering the specific hazards encountered in the field and the measures implemented to identify, assess, and control those risks.

The frequent occurrence of disasters underscores the need to strengthen the effectiveness of disaster management efforts. In general, disaster management is carried out through three interconnected stages, namely preparedness and mitigation before a disaster, emergency response during a disaster, and recovery following its occurrence. The emergency response phase is a crucial part of disaster management. Under Law No. 24 of 2007 on Disaster Management, involves several essential activities, including rapid assessments of affected areas, available resources, damage, determination of the disaster emergency status, rescue and evacuation, fulfillment of basic needs, protection of vulnerable groups, and immediate restoration of critical infrastructure and essential facilities.[4] The intensity of activities carried out within a limited period increases the risk of physical and psychological fatigue, thereby increasing the risk of occupational accidents among personnel deployed to disaster-affected areas.[5] This situation is exacerbated by unpredictable environmental conditions that pose potential safety hazards to both disaster-affected communities and personnel directly involved in disaster response. Exposure to hazardous environmental conditions, extreme weather, physical exhaustion, and the potential for workplace accidents means that personnel directly involved in disaster response also face high safety risks while carrying out their duties.[6] Research on firefighters similarly demonstrates that exposure to physical, chemical, and psychosocial hazards, including thermal stress, hazardous substances, and physical exertion, may contribute to occupational injuries and health problems.[7]

The various hazards encountered by personnel in disaster emergency response operations underscore the need for a systematic risk management approach. Such an approach enables potential risks in affected areas to be identified and assessed, while appropriate measures can be taken to control and reduce their possible impacts on personnel. According to Nurnaningtyas and Rendrarini, risk management is essential for ensuring the

[4] Pemerintah Republik Indonesia, "Undang-Undang Republik Indonesia Nomor 24 Tahun 2007 tentang Penanggulangan Bencana," 2007.

[5] Korwa Viona Mona and Widowati Evi, "Faktor-Faktor Yang Berhubungan Dengan Kelelahan Kerja Pada Pekerja Di BPBD Kota Semarang," *Indonesian Journal of Public Health and Nutrition* 1, no. 3 (2021): 388–95, https://doi.org/10.15294/ijphn.v4i2.9720.

[6] Sonlimar Mangunsong, Sarmalina Simamora, and Anayani Dalillah, "Manajemen Risiko dalam Mengantisipasi Kejadian Bencana di Wilayah Kerja Puskesmas Kota Palembang," *Jurnal Kesehatan Poltekkes Palembang* 18, no. 1 (2023): 73–80, https://doi.org/10.36086/jpp.v18i1.1664.

[7] María F Cuenca-Lozano and César O Ramírez-garcía, "Occupational Hazards in Fire Fighting : Systematic Literature Review," *Safety and Health at Work* 14, no. 1 (2023): 1–9, https://doi.org/10.1016/j.shaw.2023.01.005.

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safety of personnel involved in emergency response operations.[8] The urgency for risk management is aligned with Law No. 1 of 1970 on Occupational Safety, which emphasizes the protection of workers from potential hazards in the workplace.[9] This is also consistent with Government Regulation No. 88 of 2019 concerning Occupational Health, which provides a legal framework for protecting workers from risks arising from their work activities.[10] Legal protection for personnel involved in disaster emergency response operations is essential because their duties expose them to high occupational risks, including serious injury and death. The high-risk nature of search and rescue operations raises important questions concerning the extent to which legal protection can adequately safeguard personnel while performing their duties.[11]

The government's obligation to ensure the safety of its personnel through the implementation of risk management also applies to local government administration, including the Provincial Government of East Java. In the area of disaster management, this commitment is enshrined in East Java Provincial Regulation No. 1 of 2026 on the Application of Disaster Management Practices. This regulation emphasizes the importance of strengthening institutional capacity, human resources, volunteers, and various protective measures in the implementation of disaster management.[12] The East Java BPBD, as a regional Agency tasked with administering government affairs in the context of disaster management, serves a strategic function in addressing various types of threats and conducting emergency response operations across all 38 regencies and cities in East Java. Consequently, its personnel are among those who are directly exposed to various potential hazards and safety risks in the field. Therefore, the East Java BPBD is not only required to ensure the success of emergency response operations but is also obligated to protect the safety of the staff carrying out their duties.

The occupational risks faced by disaster management personnel are not merely theoretical but have been substantiated by several studies. Research by Rivando Dengo et al. shows that personnel assigned to emergency response operations experience high levels of occupational fatigue.[13] The same study also documented workplace accidents involving 11 BPBD personnel from Gorontalo Regency. The risks faced by BPBD personnel were also identified by Bakari et al., including the risk of death, minor injuries, severe injuries,

[8] Netty Nurnaningtyas and Diana Rendrarini, "Tantangan Manajemen Risiko Bencana di Rumah Sakit Aman Bencana (RSAB)," *Jurnal Qua Teknika* 15, no. 2 (2025): 76–81, https://doi.org/10.36910/automash.v1i24.1739.

[9] Pemerintah Republik Indonesia, "Undang-Undang Nomor 1 Tahun 1970 tentang Keselamatan Kerja," 1970.

[10] Pemerintah Republik Indonesia, "Peraturan Pemerintah Republik Indonesia Nomor 88 Tahun 2019 Tentang Kesehatan Kerja," 2019.

[11] Hakim Fajrin and Lusia Sulastri, "Legal Protection for Search and Rescue Officers (Civil Servants) in the Implementation of Search and Rescue Operations," *Jurnal Ar Ro'is Mandalika (ARMADA)* 6, no. 2 (2025): 469–74, https://doi.org/10.59613/armada.v6i2.5688.

[12] Pemerintah Provinsi Jawa Timur, "Peraturan Daerah Provinsi Jawa Timur Nomor 1 Tahun 2026 tentang Perubahan atas Peraturan Daerah Nomor 3 Tahun 2010 tentang Penanggulangan Bencana di Provinsi Jawa Timur," 2026.

[13] Moh Rivandi Dengo et al., "Analysis of Work Fatigue on Firefighters at BPBD Gorontalo Regency," *Jurnal Promotif Preventif* 6, no. 2 (2023): 230–36, https://doi.org/10.47650/jpp.v6i2.744.

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respiratory problems, serious injuries, economic losses, and material losses.[14] These findings indicate that emergency response operations place personnel in a high-risk work environment. This is further supported by empirical evidence showing that fire brigade workers are exposed to occupational hazards and work-related injuries associated with the nature of their duties.[15] In addition, a report from Tribunnews.com mentions a workplace accident involving a member of the Nganjuk BPBD while rescuing a victim trapped in a well.[16] This accident occurred because the officer was exposed to toxic substances inside the well, resulting in his death. Furthermore, a report from Kumparan.com states that a Military District Commander (Danramil) and the Head of the Emergency and Logistics Division of Sumedang BPBD died after being buried by a secondary landslide while managing a landslide disaster in Sumedang Regency, West Java.[17] These incidents demonstrate that the risks faced by responders are a reality on the ground. Therefore, the government has an obligation to provide protection to responders and to minimize the impact of risks that may arise during the performance of their duties through the implementation of risk management during disaster emergency response operations.

Research on risk management has been conducted across various sectors, including studies on occupational risks faced by disaster response personnel and the implementation of structured risk management frameworks in different organizational settings. However, understanding the risks faced by personnel alone does not fully explain how disaster management institutions manage those risks in practice or how their risk management practices relate to their responsibility to protect personnel during emergency response operations

Ein (2023) conducted a systematic review of 382 studies examining the physical and psychological challenges faced by military, medical, and public safety personnel involved in natural disaster relief operations. Their findings identified several challenges experienced by disaster response personnel, including structural constraints, resource limitations, psychological problems, physical health risks, and social difficulties.[18] This study provides a broad understanding of the multidimensional challenges faced by disaster response personnel. However, its focus is on the challenges experienced by responders rather than on

[14] Putrianing Nur M Bakari, Herlina Jusuf, and Putri Ayuningtias Mahdang, "Analisis Risiko Kecelakaan Kerja Pada Bagian Penanganan Kebakaran Di BPBD Kab . Gorontalo Menggunakan Metode Task Risk Assessment ( TRA )," *Jurnal Kolaboratif Sains* 9, no. 1 (2026): 1606–17, https://doi.org/10.56338/jks.v9i1.10357.

[15] Eshetu Abera Worede et al., "Work-Related Injury Characterization and Factors among Fire Brigade Workers in Ethiopia," *Scientific Reports* 15, no. 12401 (2025): 1–10, https://doi.org/10.1038/s41598-025-96776-z 9.

[16] Tribunnews.com, "Warga Nganjuk Tewas Seusai Hirup Gas Dari Sumur, 1 Anggota BPBD Nganjuk Juga Tewas, 4 Dirawat," 2018, https://jatim.tribunnews.com/2018/12/18/warga-nganjuk-tewas-seusai-hirup-gas-dari-sumur-1-anggota-bpbd-nganjuk-juga-tewas-4-dirawat. accessed by 13 August 2026

[17] Kumparan.com, "Kendala Evakuasi Korban Longsor Sumedang: Faktor Cuaca Hingga Akses Jalan Kecil," 2021, https://kumparan.com/kumparannews/kendala-evakuasi-korban-longsor-sumedang-faktor-cuaca-hingga-akses-jalan-kecil-1uzLT1qtZtP. accessed by 14 August 2026

[18] Natalie Ein et al., "Physical and Psychological Challenges Faced by Military, Medical and Public Safety Personnel Relief Workers Supporting Natural Disaster Operations: A Systematic Review," *Current Psychology* 43, no. 2 (2023): 1743–58, https://doi.org/10.1007/s12144-023-04368-9.

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how disaster management institutions implement a structured risk management framework to identify, assess, and control occupational risks. This distinction is relevant to the present study, which examines how risk management is implemented within a regional disaster management agency to protect personnel during emergency response operations.

Hugelius (2024) examined health problems experienced by disaster responders following the 2023 Turkey-Syria earthquake through a cross-sectional study involving 525 respondents. The study found that 46% of respondents experienced physical or mental health problems during or after deployment, while some required medical care or evacuation.[19] These findings provide empirical evidence of the health consequences that disaster response personnel may experience in the course of their assignments. Nevertheless, the study primarily examines health outcomes rather than the institutional processes used to identify, assess, and control occupational risks before, during, and after emergency response operations. The present study addresses this different but related concern by examining the risk management practices implemented by the East Java Provincial Disaster Management Agency (BPBD) and their implications for personnel protection.

Wang (2024) examined comprehensive health, safety, and environmental risk management in social emergency rescue organizations. Their study considered multiple factors relevant to rescue operations, including personnel, equipment, management, environmental conditions, and task-related risks.[20] This research highlights the importance of a structured and multidimensional approach to risk management in emergency rescue organizations. However, the study's focus on risk management within social emergency rescue organizations does not directly address how a regional government disaster management agency implements risk management in fulfilling its responsibility to protect personnel. The present study therefore examines the application of risk management within a provincial government institution, with particular attention to operational practices and their relationship with personnel safety.

Afrioza et al. (2025) examined the implementation of ISO 31000:2018 in micro, small, and medium enterprises (MSMEs). Their study found that risk identification, analysis, evaluation, and treatment had not been implemented comprehensively.[21] This research demonstrates the relevance of ISO 31000:2018 as a framework for assessing the implementation of risk management. However, its focus on the MSME sector differs from the operational and institutional context of disaster emergency response, where personnel may encounter hazardous and rapidly changing conditions. Consequently, the

[19] Karin Hugelius, Jason Murphy, and Karin Blomberg, "Health Problems among Disaster Responders to the 2023 Turkey-Syria Earthquake : A Cross- Sectional Study," *BMC Emergency Medicine* 24, no. 226 (2024): 1–8, https://doi.org/10.1186/s12873-024-01143-2.

[20] Mengyao Wang et al., "Heliyon Comprehensive Risk Management of Health, Safety and Environment for Social Emergency Rescue Organization," *Heliyon* 10, no. 1 (2024): e23021, https://doi.org/10.1016/j.heliyon.2023.e23021.

[21] Selvy Afrioza, Ahmad Rasyiddin, and Alysa Azizah, "Penerapan ISO 31000:2018 Dalam Manajemen Risiko UMKM: Tinjauan Literatur Dan Tantangan Pada Sektor Tradisional Dan Digital," *JEDBUS (Journal of Economic and Digital Business)* 2, no. 2 (August 31, 2025): 85–90, https://doi.org/10.37048/jedbus.v2i2.639.

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implementation of ISO 31000:2018 in a regional disaster management agency requires examination not only in terms of risk management practices but also in relation to the institution's responsibility to protect personnel exposed to occupational hazards.

Taken together, the studies reviewed above demonstrate that disaster response personnel face multidimensional occupational risks and that structured risk management provides a basis for identifying, assessing, and controlling such risks. However, the studies differ in their primary focus: some examine the physical and psychological challenges experienced by responders, while others address health outcomes or the implementation of risk management in different organizational settings. The relationship between the quality of risk management implementation, institutional accountability, and the government's responsibility to protect personnel within a regional disaster management agency remains insufficiently examined in the literature reviewed here. The research gap therefore concerns not merely the application of ISO 31000:2018 to a particular institution, but also how risk assessment, risk treatment, and monitoring and review are implemented in practice and how weaknesses in these processes may affect consistent risk control and institutional accountability. Accordingly, this study examines the implementation of risk management at the East Java Provincial Disaster Management Agency (BPBD) using the ISO 31000:2018 framework and analyzes its implications for the government's responsibility to protect personnel during emergency response operations.

## 2. METHOD

This study adopts a qualitative socio-legal approach to examine the implementation of legal norms relating to personnel safety during disaster emergency response operations. The socio-legal approach enables the study to examine both the applicable legal framework and its implementation in institutional practice.[22] The analysis focuses on risk management practices at the East Java Provincial Disaster Management Agency (BPBD) and their implications for the government's responsibility to protect personnel involved in emergency response operations.

The study was conducted at the East Java Provincial BPBD using primary and secondary data. Primary data were collected through interviews with the Head of the Emergency and Logistics Division, the Chair of the Emergency Response Task Force, the Head of the Logistics Team, four TRC squad commanders, and eight TRC personnel. Informants were selected based on their roles and knowledge of risk management and personnel safety, using snowball sampling. Interviews addressed risk assessment, risk treatment, personnel and equipment deployment, and monitoring and review. The researcher also observed institutional practices at the East Java Provincial BPBD, while monitoring conditions at disaster sites was conducted by Disaster Information Agents and TRC personnel. Information on field monitoring was obtained through interviews and institutional accounts, not direct observation by the researcher. Secondary data included

[22] Ika Atikah et al., *Pengantar Metode Penelitian Hukum Socio-Legal*, (Bandung: Widina Media Utama, 2024).

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legislation, scientific literature, and institutional documents. Data adequacy was assessed based on relevance to the research questions and comparison across informants and sources.

The data were analyzed through data reduction, data display, and conclusion drawing.[23] During data reduction, information from interviews, observations, and relevant documents was organized according to the research focus. The data were then presented and examined in relation to three components of the ISO 31000:2018 framework: risk assessment, risk treatment, and monitoring and review. The empirical findings were subsequently examined against relevant legal provisions on disaster management and occupational safety and health, as well as the concept of the State's positive obligation to protect personnel. This analysis was intended to identify the extent to which risk management practices corresponded with applicable legal obligations and to examine the implications of identified implementation gaps for personnel protection and institutional accountability.

## 3. RESULTS AND DISCUSSION

### 3.1 Implementation of Risk Management for the Safety of East Java BPBD Staff During Disaster Emergency Response Operations

Emergency response operations are an essential phase of disaster management that requires personnel to work in challenging and often unpredictable environments. These operations are considered high-risk due to changing environmental conditions, the potential for secondary disasters, and physical fatigue resulting from demanding tasks and frequent deployments. Such conditions may expose emergency response personnel to occupational hazards while carrying out their duties in disaster-affected areas.

The frequency of disaster incidents in East Java requires emergency response personnel to remain prepared for deployments under varying conditions. Each incident may present different hazards and operational challenges, making it important to identify and manage occupational risks systematically. Effective risk management is therefore necessary not only to protect personnel safety but also to support the safe and effective implementation of emergency response operations.

**Table 1.** Number of Disaster Events in East Java, 2022–2025

| Year | Number of Disaster Events |
|---|---|
| 2022 | 244 |
| 2023 | 118 |
| 2024 | 393 |
| 2025 | 351 |

***Source:*** *Pusdalops BPBD East Java, 2026*

[23] P. P. Mitra, *Socio-Legal Research: Theory and Methodology* (Gurgaon: Thomson Reuters, 2021).

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Based on Table 1, the number of disaster incidents in East Java in recent years has been quite high. This high frequency of disaster incidents has resulted in East Java Provincial BPBD personnel facing a high workload in disaster emergency response activities. During these assignments, one of the most important aspects is ensuring the safety of personnel from potential risks in disaster-affected areas. One of the measures taken is the implementation of risk management through the identification, analysis, evaluation, and control of various risks.

The implementation of risk management for the safety of East Java BPBD personnel during disaster emergency response operations was analyzed using the ISO 31000:2018 framework. The risk management implementation approach used in this study is shown in the figure below.

**Figure 1.** Risk Management Implementation Flow




***Source:*** *Author's Compilation, 2026*

The application of risk management in this study is examined following the framework's stages of identifying, analyzing, evaluating, treating, and monitoring risks.[24] This study evaluates risk management application through three main components: risk assessment, risk treatment, and monitoring and review.[25] Risk assessment consists three stages: identifying, analyzing, and evaluating risks.[26]

### 3.1.1 Risk Assessment

Within the ISO 31000:2018 framework, risk assessment consists of risk identification, risk analysis, and risk evaluation to understand risks and support appropriate decision-making.[27] In emergency response operations, this process is essential for identifying potential hazards, assessing their implications for personnel safety, and determining appropriate response measures. Since each type of disaster presents different characteristics and potential hazards, risk assessment needs to consider the specific conditions encountered during emergency response operations.

[24] Hongmu Lee, *Risk Management: Fundamentals, Theory, and Practice in Asia* (Singapore: Springer, 2021).
[25] ISO 31000: 2018, "BSI Standards Publication Risk Management — Guidelines," *BSI Standard Publication*, 2018.
[26] Gea Alzera Kosanda, Dominicus Savio Priyarsono, and Tanti Novianti, "Occupational Safety Risk Management of Ragunan Zoo Staff Based on Iso 31000," *Multidiciplinary Output Research For Actual and International Issue* 5, no. 3 (2025): 5188–98, https://doi.org/10.54443/morfai.v5i3.4062.
[27] Hakimah Hamir, Rabihah Md., and Sum, "An Analysis of Risk Management Processes and Comparison with ISO31000:2018," *Asian Journal of Research in Business and Management* 3, no. 4 (2021): 16–30, https://doi.org/10.55057/ajrbm.2021.3.4.3.

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The research findings indicate that the East Java BPBD assesses risks using preliminary information and observations during disaster events. Preliminary information is collected before personnel deployment through Disaster Information Agents and the BPBDs of affected regencies and cities. This information is subsequently clarified to obtain details about incident characteristics, severity, and potential hazards. Observations during disaster events provide additional information about actual conditions at the disaster site. These sources of information support operational decisions regarding risk levels and the personnel and equipment required for emergency response operations.

The initial information-gathering process was explained by the Head of the Emergency and Logistics Division of the East Java BPBD, Mr. Satriyo Nurseno, S.STP, M.IP:

*"Before deploying personnel to the field, we will request preliminary information regarding the conditions in the disaster-affected areas from the disaster information agents, who serve as extensions of the East Java BPBD Jatim in the region, as well as from the district and city disaster management agencies in the areas affected by the disaster."*

The information collected varies according to the type of disaster. In landslide incidents, for example, the requested information includes the estimated affected area, surrounding soil conditions, and characteristics of the landslide crown. This indicates that preliminary risk identification considers the characteristics of the specific hazard. The information serves as an initial basis for understanding potential risks before deployment and for determining the aspects requiring further clarification.

The Chair of the East Java BPBD Emergency Response Task Force, Mr. Heru Wibowo, SE., MM., explained how assessment results inform operational decisions:

*"Before deploying personnel, the first step we take is to identify the location. After that, we conduct an assessment and determine the risk level. This assessment is carried out by disaster information officers and the district/city BPBD. It also serves to determine the number of personnel and the equipment to be brought by the East Java BPBD personnel."*

The follow-up process was further described by the Head of the Logistics Team at the East Java BPBD, Mr. Suprapto, S.Si., M.Si (han):

*"When we receive disaster incident reports from agents and district/city BPBDs at the East Java BPBD Operations Center, we follow up by asking for details about the incident, the severity of the situation on-site, and any apparent hazards. We do this before deploying personnel to ensure that the resources we mobilize are appropriate for the conditions and risks on the ground."*

These findings demonstrate that initial reports are not used solely as the basis for deployment. The East Java BPBD follows up on the information by requesting further details about the incident, its severity, and apparent hazards. The information obtained, together with observations during disaster events, informs operational judgments concerning risk levels and resource requirements. However, the findings do not establish the use of a standardized risk matrix or uniform hazard classification to systematically assess the likelihood and consequences of identified hazards. Instead, the assessment relies on reported

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information, observations of disaster conditions, and operational considerations when determining deployment requirements.

The absence of standardized written assessment instruments across regencies and cities may lead to differences in assessment practices and risk classification. Furthermore, the interviews do not establish specific operational criteria used to determine risk levels or a uniform mechanism for documenting how initial assessments are updated as disaster conditions evolve. Although information clarification and field observations support operational decision-making, the absence of standardized criteria may limit the consistency and traceability of risk assessments, potentially affecting the accuracy of personnel and equipment allocation. This finding highlights the need for a more systematic assessment mechanism that integrates preliminary reports, observations at disaster sites, and changes in conditions during emergency response operations. A similar emphasis on systematic risk assessment is found in research on social emergency rescue organizations, which develops a risk assessment system covering personnel, equipment, management, environmental, and task-related factors to support risk classification and control.[28]

### 3.1.2 Risk Treatment

Under ISO 31000:2018, risk treatment refers to the implementation of measures selected to address risks based on the findings of the preceding risk assessment. In the field of disasters, risk treatment can be understood as efforts undertaken at the disaster site based on risks that have been previously identified, analyzed, and evaluated.[29]

Efforts to manage risk during emergency response operations by the East Java BPBD were examined through interviews with four Rapid Response Team (TRC) squad commanders and eight TRC personnel from the East Java BPBD. Based on the results of these interviews, information was obtained regarding various forms of risk management in the application of emergency response operations, as illustrated in the following table.

**Table 2.** Risk Management for the Safety of East Java BPBD Personnel

| Risk Management Aspects | Findings from Informants/Documents |
|---|---|
| Adjustments based on disaster type | Risk management approach is adjusted according to the type of disaster and the conditions encountered in the field. |
| Deployment of personnel | Personnel deployment during emergency response operations is based on Standard Operating Procedure (SOP) for Resource Deployment |

[28] Wang et al., "Heliyon Comprehensive Risk Management of Health , Safety and Environment for Social Emergency Rescue Organization."

[29] Wonder Mahembe and Ashley T. Mutezo, "Operational Risk Management during Disasters: A Case of South African Tourism Small Businesses," *Jamba: Journal of Disaster Risk Studies* 17, no. 1 (2025): 1–8, https://doi.org/10.4102/jamba.v17i1.1761.

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| Risk Management Aspects | Findings from Informants/Documents |
|---|---|
| Logistics fulfillment | The fulfillment of logistical needs during emergency response operations is tailored to the conditions and requirements, and is supported by the SOP for Logistics Distribution. |
| Provision of equipment and Personal Protective Equipment (PPE) | The necessary equipment and PPE have been provided and tailored to the needs of each type of disaster. |
| Personnel Competencies | Personnel receive training in their respective areas of expertise, such as water rescue, vertical rescue, urban search and rescue, and other types of training. |
| Guidelines for Emergency Response Operations | There are currently no written standard operating procedures (SOPs) that specifically govern personnel safety during disaster emergency response operations. |
| Protection against potential risk impacts | There is currently no specific insurance available for disaster response personnel; the only coverage available is BPJS Ketenagakerjaan, which is the same as that provided to personnel not involved in emergency response operations. |

***Source:*** *Author's Compilation, 2026*

Based on the table above, several measures have been taken to manage risks at disaster sites. These risk management measures are tailored to the type of disaster and on-site conditions. This was stated by one of the TRC Squad Commanders at the East Java BPBD, Mr. Dedy Susatya Budi, ST.:

*"The risk treatment during emergency response operations is adjusted according to the type of disaster we are facing. When dealing with floods, the equipment, logistics, and personnel deployed are focused on flood response. However, In responding to forest and land fires, we mobilize specialized personnel along with the necessary equipment and logistical resources for fire suppression."*

That statement was reinforced by one of the TRC members, Mr. Ery Susanto, who said:

*"Not all TRC personnel are deployed when a disaster occurs. Each of us has a specific area of specialization in disaster response. When personnel with water rescue expertise are required, those with this specialization are deployed. Likewise, when vertical rescue personnel are needed, those with the relevant expertise are deployed."*

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The information gathered from the informants indicate that the East Java BPBD has generally implemented risk management in accordance with the ISO 31000:2018 framework. Within this framework, risk management entails determining appropriate responses to identified risks by taking into account the outcomes of the preceding risk assessment. The findings indicate that the East Java BPBD has existing SOPs for resource mobilization and logistics distribution. However, no specific written SOP governing personnel safety during disaster emergency response operations is available. This finding identifies a gap in the institutional arrangements for personnel safety rather than the complete absence of operational SOPs. Without specific safety procedures, the implementation of preventive measures may depend on operational judgments and field conditions, potentially affecting consistency across emergency response operations.

### 3.1.3 Monitoring and Review

Monitoring and review, from the perspective of ISO 31000:2018 risk management, are steps taken to monitor the implementation of risk treatments and the evolution of the risks faced. In the context of disasters, this is carried out through monitoring efforts during emergency response operations, accompanied by periodic evaluations and a final evaluation after the emergency response operations are completed. These monitoring and review activities are conducted to ensure the safety and security of personnel during emergency response operations, to identify evolving risks and obstacles, and to determine solutions for subsequent response efforts. This was stated by the Head of the Emergency and Logistics Division at the East Java BPBD. :

*"Of course, we conduct what is known as monitoring. For example, during landslide response operations, we deploy safety officers to ensure the safety and security of all personnel, as well as to identify any other potential hazards that may arise during the response. Meanwhile, we conduct reviews or evaluations at the end of each day for daily assessments and at the conclusion of the operation to identify challenges and solutions to the obstacles encountered."*

The results of the interviews indicate that the East Java BPBD has implemented monitoring and review in accordance with ISO 31000:2018 during emergency response operations. However, based on the observations made in this study, this implementation has not been supported by written standards or instruments that specifically regulate the monitoring and review processes during emergency response operations. To date, monitoring and review have primarily been communicated verbally by those responsible for the operations. As a result, the findings of these monitoring and review processes have not been systematically documented for reporting to leadership or for evaluation in preparation for future operations. This finding is consistent with disaster response research emphasizing

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the importance of standardized indicators and data collection tools to support consistent evaluation of response performance.[30]

### 3.2 Risk Management as a Form of Government Responsibility for the Safety of East Java BPBD Personnel during Disaster Emergency Response Operations

The state has a responsibility to protect fundamental legal interests, including life and health, from potential threats. Christian Starck's concept of "State Duties of Protection," as discussed by Calliess, provides a theoretical basis for understanding this responsibility as part of the state's obligation to protect individuals through the exercise of public authority.[31] In the context of disaster management, this perspective raises the question of whether the government has established adequate measures to protect personnel who perform emergency response operations under hazardous conditions.

From a statutory perspective, Law No. 1 of 1970 on Occupational Safety provides a relevant legal basis for preventing workplace accidents, informing personnel about workplace hazards, and providing the protective measures required by occupational safety regulations.[32] Law No. 24 of 2007 on Disaster Management also establishes the responsibilities of the government and regional governments in disaster management and disaster risk reduction.[33] These provisions provide a general legal foundation for preventive protection, although they do not explicitly prescribe a particular risk matrix or a specific safety standard operating procedure for disaster emergency response personnel.

The state's protective responsibility can also be examined through the doctrine of positive obligations, which emphasizes that the protection of fundamental rights may require active preventive measures rather than merely the establishment of legal rules. Backé examines this doctrine in relation to effective fundamental rights protection.[34] Stoyanova further highlights the importance of assessing the nature and magnitude of potential risks when determining appropriate preventive measures.[35] Wibye's discussion of positive and negative duties provides an additional theoretical perspective for evaluating state action and

[30] Nikolaos Markou Pappas et al., "Key Performance Indicators in Pre - Hospital Response to Disasters and Mass Casualty Incidents : A Scoping Review," *European Journal of Trauma and Emergency Surgery* 50, no. 5 (2024): 2029–37, https://doi.org/10.1007/s00068-024-02533-8.

[31] Christian Calliess, "Fundamental Rights Protection in Germany: The Multifaceted Dimensions of Freedom Defined by the Duty to Respect and the Duty to Protect," *SSRN Electronic Journal*, 2021, https://doi.org/10.2139/ssrn.3847822.

[32] Pemerintah Republik Indonesia, "Undang-Undang No. 1 Tahun 1970 tentang Keselamatan Kerja," Pasal 3 ayat (1) huruf a, Pasal 9, dan Pasal 14, 1970.

[33] Pemerintah Republik Indonesia, "Undang-Undang No. 24 Tahun 2007 Tentang Penanggulangan Bencana," Pasal 5 dan Pasal 8, 2007.

[34] Anna V. Backé, "The Positive Obligations Doctrine: A Means of Effective Fundamental Rights Protection in EU Member States?," *Maastricht Journal of European and Comparative Law* 31, no. 2 (2024): 147–70, https://doi.org/10.1177/1023263X241268874.

[35] Vladislava Stoyanova, "Framing Positive Obligations under the European Convention on Human Rights Law: Mediating between the Abstract and the Concrete," *Human Rights Law Review* 23, no. 3 (2023): 1–34, https://doi.org/10.1093/hrlr/ngad010.

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inaction in fulfilling protective responsibilities.[36] These scholarly arguments inform the analysis in this study but do not independently establish binding obligations under Indonesian law.

The empirical findings indicate that the East Java BPBD undertakes risk assessment through preliminary information about disaster conditions, observations during disaster events, and operational decisions concerning personnel and equipment deployment. However, the research confirms that these assessments are not supported by standardized written instruments, such as a uniform risk matrix across regencies and cities. This condition indicates a weakness in administrative implementation and risk governance because inconsistent assessment procedures may affect the uniformity, traceability, and reliability of risk-related decisions. Nevertheless, the absence of a specific risk matrix does not, by itself, establish a statutory violation, since the legal provisions discussed above do not explicitly require that particular instrument.

Risk treatment demonstrates both existing protective measures and institutional limitations. The East Java BPBD has Standard Operating Procedures (SOPs) for resource mobilization and logistics distribution, and the research identifies the provision of personal protective equipment, operational equipment, and regular personnel training. These measures represent practical efforts to support personnel safety. However, the research also confirms that no specific SOP governing personnel safety during emergency response operations is available. Although the general occupational safety framework establishes requirements concerning workplace hazards and protective measures, the absence of a specific safety SOP should be assessed in relation to the applicable legal obligations rather than automatically classified as a statutory violation.

Government Regulation No. 50 of 2012 on the Implementation of Occupational Safety and Health Management Systems establishes requirements for occupational safety and health management, including planning, implementation, monitoring, and evaluation within the scope of its application.[37] However, Article 5 specifies the circumstances in which companies are required to implement such systems. Therefore, the direct applicability of this Regulation to the East Java BPBD must be established before deficiencies identified in this study can be classified as non-compliance with its specific requirements.

Another issue identified in the research concerns insurance protection for personnel involved in emergency response operations. The personnel examined in this study are civil servants, comprising Civil Servants (PNS) and Government Employees under Work Agreements (PPPK). Law No. 20 of 2023 on State Civil Apparatus recognizes social security entitlements for ASN, including employment accident insurance and death

[36] Johan Vorland Wibye, "Beyond Acts and Omissions — Distinguishing Positive and Negative Duties at the European Court of Human Rights," *Human Rights Review*, no. 1 (2022): 479–502, https://doi.org/10.1007/s12142-022-00663-3.

[37] Pemerintah Republik Indonesia, "Peraturan Pemerintah Republik Indonesia Nomor 50 Tahun 2012 tentang Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja," Pasal 5 dan 6, 2012.

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insurance.[38] Government Regulation No. 66 of 2017 regulates employment accident and death insurance for ASN and amends that framework.[39] The research does not indicate that personnel lack all insurance or social security protection; rather, it establishes that no additional insurance specifically tailored to the risks of disaster emergency response operations is provided. Accordingly, the absence of supplementary insurance raises a policy question concerning the adequacy of existing protection for personnel facing distinctive operational hazards, but does not automatically establish a statutory violation. A similar concern regarding occupational safety protection for personnel performing hazardous duties is reflected in Murwiyandono and Rahmat's study of firefighters employed by the Madiun City Government.[40]

Monitoring and review reveal a further weakness in risk governance. The research confirms that evaluations are conducted verbally during or after emergency response operations, without written evaluation reports systematically documenting findings and follow-up actions. This practice may limit the traceability of decisions, the identification of recurring safety problems, and the accountability of corrective measures. Article 14 of Government Regulation No. 50 of 2012 addresses monitoring and evaluation of occupational safety and health performance, including the use of results to support corrective action; however, the Regulation's direct applicability to the East Java BPBD requires separate legal assessment.[41] In addition, Clause 6.7 of ISO 31000:2018 recommends that risk management processes and their outcomes be documented and reported through appropriate mechanisms.[42] Thus, the absence of written evaluation reports indicates a weakness when assessed against the ISO 31000:2018 framework, although it does not, by itself, establish a violation of a statutory documentation requirement applicable to the BPBD.

Overall, the findings indicate that the East Java BPBD has implemented several measures intended to protect personnel, while weaknesses remain in the standardization of risk assessment, the availability of specific safety procedures, and the systematic documentation of evaluations. These conditions are best characterized as weaknesses in administrative implementation and risk governance. They may also indicate a gap in the practical fulfillment of the government's protective responsibility where the identified weaknesses reduce the effectiveness of preventive measures. However, establishing a legal

[38] Pemerintah Republik Indonesia, "Undang-Undang Nomor 20 Tahun 2023 tentang Aparatur Sipil Negara," Pasal 21, 2023.

[39] Pemerintah Republik Indonesia, "Peraturan Pemerintah Nomor 66 Tahun 2017 tentang Perubahan atas Peraturan Pemerintah Nomor 70 Tahun 2015 tentang Jaminan Kecelakaan Kerja dan Jaminan Kematian bagi Pegawai Aparatur Sipil Negara," 2017.

[40] Dhazeng Murwiyandono and Diding Rahmat, "Hukum Perlindungan Keselamatan dan Kesehatan Kerja (K3) bagi Pekerja Pemadam Kebakaran Pemerintah Kota Madiun," *Lex Omnibus: Jurnal Hukum Tata Negara dan Administrasi Negara* 1, no. 1 (2024): 19–28, https://doi.org/10.08221/lexomnibus.v1i1.42.

[41] Pemerintah Republik Indonesia, "Peraturan Pemerintah Nomor 50 Tahun 2012 tentang Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja," Pasal 14, 2012.

[42] International Organization for Standardization, ISO 31000:2018, Risk Management—Guidelines (Geneva: ISO, 2018), Clause 6.7.

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violation requires the identification of a binding provision applicable to the institution and evidence that its requirements have not been fulfilled.

## 4. CONCLUSION

This study finds that the East Java Provincial BPBD has implemented risk management to protect personnel during emergency response operations through risk assessment, risk treatment, and monitoring and review. However, implementation remains limited by the absence of standardized risk assessment instruments, specific written safety procedures, and systematic documentation of evaluation results. These limitations may affect the consistency of risk control, the traceability of operational decisions, and institutional accountability. The absence of additional insurance specifically tailored to disaster response operations also raises concerns about the adequacy of existing personnel protection. From a legal perspective, these findings indicate weaknesses in administrative implementation and risk governance that may affect the effectiveness of the government's protective responsibility, although they do not automatically establish statutory violations. The novelty of this study lies in linking the implementation of ISO 31000:2018-based risk management with the government's responsibility to protect emergency response personnel. Strengthening risk assessment standardization, developing specific written safety procedures, documenting evaluation results, and reviewing personnel protection mechanisms are therefore necessary to improve safety and accountability.

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The authors declare that generative artificial intelligence was used as an assisting tool during the preparation of this manuscript. Specifically, ChatGPT, Claude, and Grammarly were used to improve the language quality and overall readability of the text. All AI-generated outputs were critically reviewed, edited, and verified by the authors to ensure accuracy and maintain scientific integrity. The authors assume full responsibility for the final content of the manuscript. The use of generative artificial intelligence was limited to a supporting role and does not constitute authorship. Furthermore, no data analysis or interpretation was conducted by artificial intelligence without the authors' supervision and active involvement.