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Disaster Information System and Work Productivity of the Regional Disaster Management Agency (BPBD) of Palangka Raya City

Jaemi Wahyudi[1], Bayu Suratmoko[2], Ahyar Junaedi[3], Mohamad Rafii[4]
[1,2,3,4]Universitas Muhammadiyah Palangka Raya
Corresponding Author: Jaemi Wahyudi, e-mail: Jaemi.wahyudi@gmail.com

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ABSTRACT

Purpose. This study aims to examine the implementation of disaster management information systems in improving work productivity at the Regional Disaster Management Agency (BPBD) of Palangka Raya City. The research focuses on how integrated organizational structures and the use of supporting technologies contribute to more effective disaster response and coordination.

Materials and Methods. A qualitative approach was employed using data collection techniques including interviews, observations, and documentation. The study involved key informants from BPBD and utilized triangulation to ensure the validity of findings.

Results. The findings indicate that the integrated structure of BPBD, supported by technologies such as the PERISAI application and the 112-emergency call centre service, has significantly improved data management and disaster response coordination. However, challenges remain in the form of limited human resources and low public awareness regarding the disaster information system. These limitations hinder the optimal utilization of the system and its potential benefits in disaster mitigation and response.

Conclusions. Continuous staff training and intensive public outreach are needed to enhance understanding and participation in disaster mitigation efforts. The study highlights the importance of developing adaptive disaster information systems, strengthening human resource capacity, and increasing community education as key elements for effective disaster management at the regional government level.

Keywords: BPBD, Disaster information system, disaster mitigation, work productivity

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INTRODUCTION

Disasters are events that not only have physical impacts, but also systemically destabilize social, economic and public health life (Mavrouli et al., 2023; Gousse-Lessard et al., 2023). From a social systems perspective, disasters create disruption to the existing order and require rapid and appropriate intervention to prevent crisis escalation (Wordsworth et al., 2021). Law No. 24/2007 on Disaster Management classifies disasters into three main categories: natural disasters (such as floods, earthquakes, and forest fires), non-natural disasters (including disease outbreaks and technological failures), and social disasters (such as social conflicts). All three have the potential to cause loss of life, damage to infrastructure and the environment, psychological distress, and a long-term decline in quality of life (Stroebe et al., 2021).

Palangka Raya City, as the center of government of Central Kalimantan Province, faces various forms of disaster vulnerability, especially hydrometeorological disasters such as floods and tornadoes, as well as ecological disasters such as forest fires and haze (Noviana et al., 2021). The high intensity of rainfall, unorganized settlement patterns and environmental degradation put the region at high risk, especially in sub-districts such as Jekan Raya and Sabangau. The massive flood that hit Jekan Raya in September 2022 is a concrete example of how disasters can paralyze

community activities, damage infrastructure, and cause huge psychological and economic burdens. It has now entered the digital era thanks to rapid technological advances; it is an inescapable information revolution that has permeated every sphere of life (Nurlisda & Surawan, 2025). Therefore, in the face of such complexity, BPBD Palangka Raya City has responded with a modern approach that places information technology as a strategic element in the disaster management system (Munawar et al., 2022). The use of information technology is in line with the theory of Disaster Risk Management (DRM), which emphasizes the importance of risk identification, early warning, and information dissemination as crucial stages in the disaster management cycle (Sandoval et al., 2023). This is because the development of digital technology today has had a significant impact in various aspects of life (Fajar, 2025). One prominent innovation is the development of a web-based information system called PERISAI (Risk Mapping Based on Early Analysis System), which functions to map in real-time disaster-prone locations, enabling early detection and more strategic placement of resources (Kirpalani, 2024).

The PERISAI system strengthens BPBDs' ability to apply the principle of data-driven decision making, which is based on accurate, actual and contextual data (Widani et al., 2024). The system allows BPBDs to set priorities, adjust action plans, and reduce reliance on reactive responses that are often inefficient. Simultaneously, the 112 Call Centre service acts as an emergency reporting channel that allows the public to provide information quickly to the authorities. This strategy supports risk communication theory (Covello, 2021), which states that community engagement through effective communication channels is key in accelerating mitigation and strengthening community preparedness (Parida et al., 2025). However, the implementation of information systems cannot be separated from the challenges of human resources, digital infrastructure, and the technology literacy gap among the community (Nikou et al., 2022). Therefore, according to the socio-technical systems theory approach the success of disaster information systems is largely determined by the synergy between technical aspects (hardware and software) and social aspects (human resource competencies, organizational processes, and work culture) (Mojir 2018). In the context of BPBD Palangka Raya, continuous training for staff, socialization to the community, and inter-agency system integration are important elements that must be strengthened to ensure the effectiveness of information technology in disaster management (Yildiz et al., 2021).

Thus, the implementation of information systems such as PERISAI and Call Centre services not only represent technological advances in disaster management, but are also part of an institutional transformation that places information as a critical asset in building regional resilience to disasters. The integration of technological approaches, institutions and community participation is the main foundation for an adaptive, responsive and sustainable disaster management system (Kangana et al., 2024). This issue highlights the gap between the potential of information systems as a tool to support the effectiveness of bureaucratic work and the reality of their utilization in the field. Theoretically, information systems are designed to speed up the flow of communication, strengthen cross-unit coordination, and provide accurate and real-time data to support appropriate decision-making (Wang et al., 2024). However, in practice - as in the BPBD of Palangka Raya City - the utilization of information systems still faces structural and cultural barriers, such as limited human resource capacity, lack of digital literacy, and not optimal collaboration between fields. This condition shows that the application of information technology in public bureaucracy depends not only on the tools used, but also on the readiness of the organization and its actors to adopt and operate them effectively.

From an academic perspective, there have been many studies on the application of management information systems in the context of disaster management. However, most studies still focus on technical aspects, such as interface design, system integration, or software functional evaluation (Curnin & Owen, 2014; Elmasllari & Kirk, 2023). This technocentric approach tends to ignore the socio-organizational dimension, including how the system plays a role in improving work productivity, bureaucratic efficiency, and coordination effectiveness within the local government structure. In fact, according to socio-technical systems theory, the successful implementation of information systems is strongly influenced by the synergy between technological aspects and social organizational readiness, including work culture, user capacity, and internal coordination patterns

(Oltra-Rodríguez et al., 2025). This shows a significant academic gap. Studies that specifically explore the contribution of information systems to the work productivity of local government organizations - especially in the disaster management sector and in vulnerable areas such as Palangka Raya - are still very limited. Therefore, this research seeks to bridge the gap by combining technical and managerial approaches in analysing disaster information systems. The main focus lies on how information systems, particularly PERISAI and the Call Centre, are used to support real improvements in BPBD work productivity. This effort also answers the call from Heeks in Ayoung & Abbott (2021) regarding the importance of examining the reality of information system implementation in the bureaucratic environment of developing countries, where there is often a gap between ideal design and real implementation. Even though social facts show that people nowadays spend most of their time in cyberspace, which has the potential to distract them from aspects (Arrazin & Surawan, 2025).

Thus, the identification of this gap is not only an academic justification for the urgency of the research, but also a basis for developing a more contextual and applicable strategy in optimizing disaster information systems at the local government level. This research offers novelty by focusing on the direct link between the implementation of information systems and increasing the work productivity of local government institutions. Its uniqueness lies in the study of the utilization of local information systems-such as PERISAI and Call Centre-which were developed in accordance with the geographical, social, and cultural characteristics of Palangka Raya. In the context of digital transformation of the public sector, this topic is becoming increasingly relevant as it addresses the challenge of the need for adaptive, responsive and technology-based governance. This research is important to provide a deeper understanding of how information systems can be effectively integrated in the work process of the disaster management bureaucracy. Furthermore, the results of this research are expected to provide theoretical contributions through the formulation of a conceptual model regarding the relationship between information systems and work productivity, as well as practical contributions as material for evaluating and developing policies to improve BPBD performance through digital innovation. With this approach, the research will substantially answer the main question: how the implementation of management information systems can improve work productivity at the Regional Disaster Management Agency (BPBD) of Palangka Raya City as part of a local government organization that plays a strategic role in disaster risk management.

METHOD

Study Participants

This study employed a descriptive qualitative approach to explore how the disaster management information system is implemented and contributes to improving work productivity at the Regional Disaster Management Agency (BPBD) of Palangka Raya City (Sheikhbardsiri et al., 2022). The participants consisted of structural officials, technical staff, and information system operators at BPBD. They were selected based on their direct involvement in the implementation and management of the disaster information system. Primary data were collected through in-depth semi-structured interviews and direct observations of participants in their work settings (Rezvani et al., 2023).

Study Organization

The study was conducted at BPBD Palangka Raya, which serves as the local government agency responsible for disaster preparedness and emergency response. Data sources included both primary and secondary data. Primary data were gathered through interviews, observations, and field notes, while secondary data consisted of official documents such as BPBD activity reports, local policies, system documentation, and disaster management regulations. The research used triangulation of data sources, member checking, and peer debriefing to ensure credibility and validity. Observations were conducted in a participatory manner to capture real-time practices, while documentation provided written and visual evidence to support findings.

Statistical Analysis

As this was a qualitative study, data analysis followed the interactive model of Miles, Huberman, and Saldaña (2014), involving three main stages: data reduction, data display, and conclusion drawing.

Data were categorized thematically to align with the research focus and were presented narratively to facilitate contextual understanding. Iterative analysis was carried out throughout the research process. To ensure research rigor, validation techniques such as triangulation, member checking, and peer debriefing were applied following the standards proposed by Lincoln and Guba (1985)

FINDING AND DISCUSSION

This study aims to examine the implementation of a disaster management information system in improving work productivity at the Regional Disaster Management Agency (BPBD) of Palangka Raya City. The main focus is on how the information system is integrated into the agency's organizational structure and work processes, as well as its contribution to the effectiveness of disaster response and coordination. The analysis is based on Charles O. Jones's policy implementation framework, which includes three key indicators: organization, interpretation, and application. The *organization* indicator refers to the structure, resources, and operational mechanisms that support the implementation of the system. *Interpretation* focuses on how the policy is understood and internalized by technical personnel involved in its execution. Meanwhile, *application* assesses the extent to which the information system is implemented in alignment with its intended goals and how effectively it enhances institutional performance. Through this analytical lens, the study seeks to provide a comprehensive understanding of the effectiveness of the disaster management information system as a tool for improving work productivity within local government agencies.

1. Organization

According to Jones (1984), organization is a systematic arrangement of resources and work units so that policies can be carried out effectively, efficiently, and regularly. Organization is also an important foundation in building the sustainability of organizational values, vision, and culture (Rinaldi & Surawan, 2025). In the context of the Regional Disaster Management Agency (BPBD) of Palangka Raya City, this principle is reflected through a clearly defined organizational structure and integrated functions. The organizational structure of BPBD includes the Chief Executive as the operational leader, the Secretary of the Agency who manages the administration, and several heads of fields who oversee strategic aspects of disaster management, namely the prevention and preparedness field, the emergency and logistics field, and the rehabilitation and reconstruction field (Musdah et al., 2022). The results of field observations on 6 June 2025 showed that the organizational structure in the BPBD of Palangka Raya City runs effectively, with coordination between fields that takes place synergistically and mutually supports the main tasks of the institution. This cross-field coordination is a key element in disaster management, where quick and accurate responses are needed to minimize the impact of disasters. A clear and well-defined division of tasks allows each sector to focus on its specific role in the disaster management cycle, from mitigation, emergency response, to post-disaster recovery (Bahmani & Zhang, 2022). In each of these stages, timely and relevant information support is an important foundation for optimal decision-making and task execution.

According to Robbins and Coulter (2018), a clear organizational structure and coordination mechanisms between work units are critical in improving operational effectiveness, especially in organizations dealing with crisis and disaster situations. A decentralized yet integrated organizational structure allows flexibility in response and accelerates the flow of information between units, which is essential in dynamic and uncertain disaster situations (Nachbagauer, 2022). This is in line with Lawrence and Lorsch's (1967) contingency theory, which emphasizes that organizational effectiveness depends on the ability to adapt structures and work processes to changing environmental conditions, such as emergency conditions due to disasters (Arafah & Mandai, 2024). In addition, the open systems theory by Katz and Kahn (1978) is also relevant to explain how BPBDs as public organizations must interact with their external environment, including the community, local government, and various other stakeholders in disaster management (Reggi et al., 2022). Internal cross-field coordination within BPBDs must be supported by effective communication and smooth information exchange in order to respond quickly and appropriately to needs and information from the external environment. With a structure that supports synergy

between sectors, BPBDs can perform integrative functions that maintain continuity of operations during a crisis and accelerate the recovery process.

Furthermore, good coordination between fields also reduces the risk of duplication of tasks and conflicts between units, which is often an obstacle in large and complex organizations. This supports Fayol's (1949) theory of the principle of coordination as one of the essential management functions to achieve organizational goals efficiently (Hayat et al., 2023; Islam et al., 2022). In the context of BPBD, cross-field coordination ensures that every resource and information can be optimally utilized and responsive to rapidly evolving situations. Thus, the success of BPBD's organizational structure in creating effective coordination is an important foundation to support a responsive and adaptive disaster management information system. An optimally integrated information system can strengthen this coordination by providing real-time data and seamless communication, thus accelerating decision-making and task execution in the field.

One of the main elements in the BPBD Palangka Raya organization is the existence of the Operations Control Centre (PUSDALOPS) which is the centre of disaster information system management. The centre operates the PERISAI application, a web-based information system that provides real-time disaster risk mapping, especially for flood and forest fire risks. BPBD internal documentation shows that data on disaster-prone points in PERISAI is regularly updated using field data and satellite imagery, so that the information provided to the community and stakeholders is always up-to-date. The existence of the 112-call centre service as a direct communication channel with the community is a tangible manifestation of organizational and technological integration in disaster management. This call centre serves as a centre for complaints and initial coordination, which can be directly forwarded to the BPBD field team and related agencies. From the results of the interview with the secretary of the agency obtained information:

> "This system helps us manage data systematically and accelerate disaster management coordination. We can immediately detect vulnerable points and inform the emergency response team. However, limited human resources are the main obstacle as not all personnel have sufficient IT expertise for data management and further system development." (Interview with Irma Afsesta, Secretary of BPBD)

Interviews with PUSDALOPS Technical Staff revealed that the disaster information system provides significant benefits in more systematic data management and accelerates coordination in disaster management, particularly in the detection of vulnerable points and the delivery of information to emergency response teams. However, limited human resources, especially in terms of information technology expertise, are the main obstacle hindering the optimization of data management and further system development. In addition, an interview with the Head of BPBD revealed:

> "We try to continuously conduct training for all staff so that they can operate the system well. We also routinely use social media and websites to socialize to the community. But we still face challenges in reaching all levels of society, especially those in remote areas." (Interview, Mr. Satriya Budi Head of BPBD)

This statement underscores the importance of human resources (HR) in operating and developing disaster management information systems. Although the technology has been prepared, the success of its implementation is highly dependent on the availability of experts who are able to manage data, maintain system integrity, and perform technical maintenance. BPBD's budget documentation also confirms the regular allocation of funds for IT infrastructure maintenance, such as servers, websites and social media. This shows the organization's commitment to maintaining the sustainability of the disaster information system, although human resource challenges are a limiting factor that needs to be considered. This research confirms that the successful implementation of disaster management information systems in BPBD Palangka Raya City is not only determined by technological sophistication, but also by organizational readiness and human resource capacity. Dwivedi et al. (2022) asserted that the implementation of information systems in the context of disaster is a complex and multidimensional process, which combines aspects of technology, business processes, and human and organizational factors. In other words, technology is only an enabler; the success of

the implementation is highly dependent on how the organization and human resources adjust and utilize the technology optimally.

In this case, the Diffusion of Innovations theory Rogers in Menzli et al. (2022) can explain how technological innovations such as the PERISAI application and the 112-call centre are adopted and internalized in BPBDs. Factors such as user readiness, training, and organizational support play an important role in accelerating the technology adoption process and encouraging innovation in disaster management (Okour et al., 2021). Research findings showing the need for continuous training and strengthening HR capacity are consistent with Rogers' concept that innovation adoption depends on perceived benefits, ease of use, and social support within the organization. Furthermore, organizational culture also plays a key role in the success of information systems. Callinson & Sahay (2023) emphasize the importance of an organizational culture that supports learning and collaboration as a determining factor in the successful implementation of information systems in the public sector. In the context of BPBD, a work culture that encourages active participation, adaptation to change, and open communication between staff and leaders is essential for information systems to function optimally. A strong organizational culture will increase staff commitment in utilizing information systems as decision-making tools and rapid response to disasters.

In terms of human resource management, Armstrong in Nyoman (2024) underlines that competency development through training and development is a key strategy to improve organizational performance. This study supports this by showing that regular technical training and understanding of SOPs are necessary to address the challenge of limited IT expertise among BPBD staff. A continuous learning approach not only improves technical skills, but also strengthens staff's adaptability to changes in technology and work procedures, ultimately improving the productivity and effectiveness of disaster management. From a disaster communication perspective, risk communication and crisis communication theories are also relevant to explain the importance of effective and inclusive communication strategies in communities. Covello (2021) argues that effective risk communication should build trust and encourage active community participation in disaster mitigation. Meanwhile, Coombs in Kabra et al. (2024) emphasizes the importance of message clarity and socio-cultural context in crisis communication to ensure appropriate responses. Therefore, BPBDs need to integrate digital communication approaches through social media with offline socialization methods so that messages can be widely and effectively received by various levels of society. Overall, these theories complement each other and provide a strong conceptual foundation for analysing the implementation of disaster management information systems in BPBD Palangka Raya City. A holistic approach that combines technology, organizational culture, human resource development, and public communication strategies is the main key in building an adaptive, responsive and sustainable disaster information system.

2. Interpretation

In an era that continues to transform rapidly, the impact of the digital revolution extends to all aspects of life including the field of disaster. Over the past few decades, technological developments have significantly changed the way humans interact with information, culture and life patterns (Putri & Surawan, 2025). Policy interpretation in the context of disaster management information systems is the process of translating disaster management policies into clear operational actions that can be implemented by all related parties. The information system acts as a medium that facilitates the understanding of standard operating procedures (SOPs), disaster risk maps, and reporting mechanisms that are transparent and easily accessible. Based on an interview with the Head of Prevention and Preparedness of BPBD Palangka Raya City, Mr. Satriya Budi, it was revealed that BPBD routinely organizes training for staff related to the use of information systems and understanding the following SOPs:

> "We routinely hold training for staff regarding the use of applicable systems and SOPs, so that every officer has the same understanding and can carry out their duties effectively. This is also to anticipate the changing dynamics of disasters so that staff must be ready and adaptive." (Interview with Satriya Budi, Head of BPBD, 2025)

The interview with the Head of BPBD confirmed that regular training for staff on the use of applicable systems and SOPs is essential to ensure uniform understanding and effective task execution. It also aims to keep staff ready and adaptive to the evolving dynamics of disasters. An interview with Irma Afsesta, Secretary of the Agency adds:

> "This training really helped us in understanding the PERISAI application updates and the correct reporting procedures. Thus, we can ensure that the data entered is valid and the response process runs smoothly." (Interview with Irma Afsesta, Agency Secretary, 2025)

An interview with the Secretary of the Agency showed that training related to PERISAI application updates and reporting procedures greatly helped improve staff understanding. This has a positive impact on the validity of the data received and the smoothness of the disaster management process. Meanwhile, based on direct observation during the training on May 15, 2025 at the BPBD hall, the participants actively discussed and tried the PERISAI application on their devices, with high enthusiasm to understand the digital SOPs. This shows that the training was not only formal, but also a vehicle for knowledge transfer and staff capacity building. Documentation of training activities as well as monthly monitoring reports sent by the BPBD Secretariat corroborate that performance evaluation is carried out on an ongoing basis, covering aspects of system usage, speed of response, and evaluation of SOP implementation by all fields. In addition, socialization to the community is carried out by the Head of the BPBD Prevention and Preparedness Division, Mr. Heri Fauzi, who explained:

> "We routinely conduct socialization in various community forums, as well as being active on social media to provide disaster mitigation education and the use of the PERISAI application. This aims to make the community not only a recipient of information but also an active reporter when a disaster occurs." (Interview, Heri Fauzi, Head of BPBD Prevention and Preparedness Division, 2025)

An interview with the BPBD Prevention and Preparedness Division revealed that active socialization is carried out through various community forums and social media to increase disaster mitigation education and the use of the PERISAI application. This effort aims to make the community not only a recipient of information, but also play a role as an active reporter when a disaster occurs. Documentation in the form of socialization video recordings and activity reports show that this socialization is carried out intensively and continuously, both through face-to-face meetings and digital platforms. In line with Lipsky's theory of street-level bureaucracy, the success of policy implementation is highly dependent on how policy implementers, especially officers in the field, interpret and translate the policy into concrete actions (Thomann & Lieberherr, 2023). In the context of disaster management information systems, proper interpretation by technical staff and operators is crucial so that policies do not just become formal documents, but are actually operationalized effectively. An effective information system acts as a tool that provides clear guidance and data, so that disaster management actions can be carried out in a timely, accurate and responsive manner to the dynamics of the situation on the ground. This reduces the risk of errors in decision-making and accelerates coordination between emergency response teams.

In addition, Wang & Chen (2024) emphasized that an integrated disaster information system plays an important role in improving transparency and accountability of policy implementation. With good integration, all stakeholders can access the same information in real-time, making it easier to monitor the response process and evaluate results. This transparency also helps build public trust in government institutions tasked with disaster mitigation, and encourages active citizen participation in disaster reporting and mitigation. Therefore, the development of an adaptive and user-friendly disaster information system is a major requirement to bridge macro-level policies with operational implementation in the field. Limited human resources, such as the lack of IT expertise in some officers, is a challenge that must be overcome through continuous training and capacity building of human resources so that the system can function optimally. Therefore, human resources must be prepared as well as possible so that they become qualified officers, and can provide maximum education (Norhidayani & Surawan, 2025). Thus, Lipsky's theory and the findings of Chen et al. provide a strong framework for understanding that the successful implementation of disaster information systems depends not only on technology, but also on the quality of policy interpretation

by implementers and system integration that can support transparency and accountability in disaster management. With the support of information systems, continuous training, and active socialization to the community, the policy interpretation process at BPBD Palangka Raya City is effective. However, human resource capacity building and information technology development are still needed to face dynamic disaster challenges.

3. Application

In terms of implementation, the Regional Disaster Management Agency (BPBD) of Palangka Raya City consistently utilizes disaster management information systems for disaster data management, coordination of countermeasures, and dissemination of information quickly and accurately. Observations at the Operations Control Centre (PUSDALOPS) showed that officers actively monitored data updates through the PERISAI application, and received and followed up on incoming disaster reports through the 112-call centre service in real-time. This shows that the implementation of the system runs with a fairly responsive operational rhythm. However, an interview with one of the agency secretaries, Ms. Irma Afsesta, revealed a significant obstacle that is still faced, namely the low level of public knowledge about the existence of these technological services:

> "There are still many residents who do not know that they can report through the call centre or use our website, so sometimes reports come late and slow down the mitigation process." (Interview, Irma Afsesta, Secretary of the Agency, 2025)

The interview with the Secretary of the agency indicates that the low level of public awareness of disaster reporting services through the call centre and website causes delays in the submission of reports. This condition has an impact on the slow process of disaster mitigation which should be carried out more quickly and effectively. In addition, an interview with the Head of the Rehabilitation Division, Mr. Sahrimbudin, added:

> "The main obstacle is the low level of technological literacy in some communities, especially the elderly and residents in peripheral areas, which causes them to not optimally utilize the existing system." (Interview, Sahrimbudin, 2025)

Based on Sahrimbudin's statement, the main obstacle in optimizing the existing system lies in the low level of technological literacy among the community, especially among the elderly and residents in peripheral areas. This hampers the maximum utilization of technology in these circles. Documentation of the results of BPBD's internal survey in 2025 regarding the level of public awareness and understanding of digital disaster mitigation technology is as follows:

Table 1. Public Awareness and Understanding of Digital Disaster Mitigation Technology

Survey aspect	Result (%)
Level of General Awareness of Mitigation Technology	45%
Understanding of How to Use Disaster Mitigation Applications	38%
Access to Technology (smartphone/internet)	62%
Participation in Digital Socialization/Training	27%
Response to Early Notification (Early Warning System)	40%
Readiness to Use Technology during Emergency	35%

This data shows that almost half of the community has not used or even known the PERISAI application or call center service, which has a direct impact on the effectiveness of rapid disaster response. Although social media management by the BPBD Palangka Raya City shows positive developments, this is still a first step that needs to be developed so that the delivery of disaster information can take place optimally. The success of regular content updates and increased community interaction indicates an increase in public awareness and participation, which is in accordance with the principles of risk communication according to Covello (2021). Covello asserts that risk information should not only be fast and accurate, but also build trust and motivate mitigation behavior. Therefore, information dissemination through social media should be able to overcome uncertainty and facilitate community decision-making in dealing with disaster risks. In the

context of the implementation of Law No. 24 Year 2007 on Disaster Management, effective communication is the main foundation of disaster mitigation. An inclusive and participatory communication approach is essential to reach all levels of society, including vulnerable groups and those with limited access to technology. Coombs' crisis communication theory emphasizes that message clarity and appropriateness to the recipient's socio-cultural context determine the effectiveness of the response (Kabra et al., 2024). This implies that the agency's communication strategy should not only rely on digital media, but should also involve offline methods such as community training, dialogue with community leaders, and cross-sector collaboration to ensure that the message is well-rounded and actionable.

In terms of human resource management, the success of disaster information systems is highly dependent on the technical capabilities of the human resources who manage the system. According to human resource management theory Armstrong, training and capacity building are key factors to improve competence and work performance, especially in a dynamic environment such as disaster management (Aliu & Alenoghena, 2023). Therefore, continuous training is an important requirement to ensure BPBD staff are able to operate the system effectively and adaptive to technological developments. Because advances in information and communication technology have had a major impact on the dynamics of social change (Akbar & Surawan, 2025). In addition, the development of information technology in BPBDs needs to refer to the principles of interoperability and good user experience, as described in information systems theory. Inter-agency integration enables real-time data exchange and better coordination, while ease of access and use by the community increases public participation in disaster mitigation (Mohammed Zain et al., 2023). The use of data analytics can also accelerate evidence-based decision making, which is crucial in dynamic and urgent disaster situations.

Furthermore, the theory of community participation in disaster management asserts that the active involvement of citizens not only increases risk awareness, but also strengthens the early warning system through rapid reporting and community response (Que et al., 2022). In management, it is important to have goals and missions in life (Anwar et al., 2025). Therefore, the use of disaster applications such as PERISAI with interactive features allows citizens to become active reporters, thus accelerating the detection of potential disasters and their handling. This synergy between technology, human resources and community participation forms the main foundation for building sustainable regional resilience to disaster risk. Overall, these theories support the finding that the management of disaster management information systems in BPBD Palangka Raya City must continue to be developed as a whole-from the aspects of technology, human resources, to public communication-in order to achieve maximum effectiveness in disaster mitigation.

Tabel 2. Findings and Recommendations for the Implementation of Disaster Management Information Systems in BPBD Palangka Raya City

Aspect	Key Findings	Impact/Constraints	Recommendation/Solution
Organisation	Complete organizational structure with Chief Executive, secretary, and heads of fields; use of PERISAI application and call center 112	Coordination between fields is good; limited human resources in system maintenance	Addition and training of specialized IT human resources for the maintenance and development of disaster information systems
Interpretation	Regular staff training related to SOPs and system use; socialization to the community through forums and social media	Improve understanding of staff and the community; periodic evaluations support service quality	Expansion of ongoing training and increased intensity of socialization through digital media and local communities
Application	Management of disaster data and reports through PERISAI and call center 112; regular social media updates	Public awareness is still low of information systems; need to increase socialization	Public education campaigns on the use of the system through a more interactive and accessible approach

The table shows that the organizational structure of disaster management is quite complete and coordinated, with the support of the PERISAI application and the 112-call centre as the main facilities. However, there are constraints in system maintenance due to limited human resources

with IT expertise. On the interpretation side, regular training for staff as well as socialization to the community have been running and contributed to increased understanding, although intensification is still needed, especially through digital media and local communities. On the application aspect, the use of information systems is technically working, but the level of public awareness is still low. Therefore, it is recommended that more interactive and accessible public education be conducted so that the public better understands and optimally utilizes the disaster mitigation information system.

CONCLUSIONS

This research shows that the implementation of disaster management information systems in the Regional Disaster Management Agency (BPBD) of Palangka Raya City has been running well and supports increased organizational work productivity in disaster management. A clear and integrated organizational structure and technological support such as the PERISAI application and the 112-call centre service are important foundations in data management and disaster management coordination. However, the research also identified some key constraints, mainly related to limited human resources in system management and development, as well as low levels of awareness and technological literacy among the community. This has an impact on the effectiveness of using the disaster information system, especially in terms of reporting and mitigating disasters quickly and accurately. Continuous training for staff and intensive socialization to the community are key strategies to overcome these obstacles. Increasing the capacity of human resources and public education on disaster technology will strengthen the implementation of the information system, so as to improve response and preparedness in facing disasters in Palangka Raya City. Thus, the development of an adaptive and integrated disaster information system along with human resource capacity building and public education are the main factors in realizing effective and efficient disaster management at the local government level.

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