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ARTICLE

EFFECTIVENESS OF JOINT FOREST AND LAND KARS TASK FORCE OPERATIONS AND MULTI-STAKEHOLDER COLLABORATION IN COMBAT FOREST AND LAND FIRES IN JAMBI PROVINCE

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Abstract

Forest and land fires (Karhutla) are one of the biggest ecological and socio-economic threats in Indonesia, including in Jambi Province, which is geographically dominated by forest and peatland areas. This study aims to analyze the effectiveness of joint operations of the Karhutla Task Force (Satgas) and stakeholders in combating forest and land fires in Jambi Province through three main dimensions: inter-agency coordination, operational strategies, and supporting and inhibiting factors in operational implementation. The study used a qualitative descriptive approach with data collection techniques through in-depth interviews, documentation studies, and policy analysis, as well as validation through triangulation of sources and methods. The results show that the effectiveness of the Karhutla Task Force's joint operations in Jambi is categorized as quite effective but not optimal. Inter-agency coordination has been running well in the emergency response phase, but remains weak in the aspects of prevention and post-fire recovery. The Task Force's operational strategy shows high effectiveness in law enforcement, but still faces obstacles in the distribution of facilities, human resource gaps, and data integration between agencies. Key supporting factors include the availability of trained human resources, logistical support, the use of early detection technology, and active community participation through the Fire Awareness Community (MPA) program. Conversely, major obstacles include weak institutional synergy, limited communication and infrastructure, and extreme geographic and weather conditions. This study concludes that the effectiveness of the joint operations of the Forest and Land Fire Task Force will increase if the coordination system is developed into a permanent integrated command across agencies, supported by technology-based Geospatial Early Warning Systems, ongoing cross-sector training, and community empowerment in forest and land fire prevention and mitigation. These findings emphasize the need for a transformation from a reactive model to an adaptive collaborative system oriented towards sustainable environmental resilience in Jambi Province.

Keywords: Cross-Institutional Synergy, Disaster Management, Forest and Land Fires, Multi-Stakeholder Collaboration, Organizational effectiveness.

A. INTRODUCTION

Forest and land fires (Karhutla) are one of the most serious ecological and socio-economic problems in Indonesia. This phenomenon recurs almost annually and has a far-reaching impact on people's lives and national environmental stability. From an ecological perspective, Karhutla results in environmental degradation, loss of biodiversity, and damage to the forest ecosystem's function as a life support system. Socially, forest fires cause health

problems due to thick, polluted smoke and have the potential to trigger social conflict, particularly related to land ownership disputes and illegal burning practices. Economically, Karhutla causes significant losses due to the destruction of agricultural land, disruption of plantation production, and the paralysis of transportation and tourism activities (Anhar et al., 2022; Antara, 2023).

One of the regions most vulnerable to Karhutla disasters is Jambi Province, which geographically has extensive forest and peatland areas. According to a report from the Jambi Regional Disaster Management Agency (BPBD) in March 2024, the total burned area reached 768 hectares, spread across eight districts/cities (BPK RI Jambi Province, 2024). The scale of the damage indicates that efforts to combat forest and land fires still face various systemic obstacles, both in terms of preparedness, cross-agency coordination, and operational efficiency.

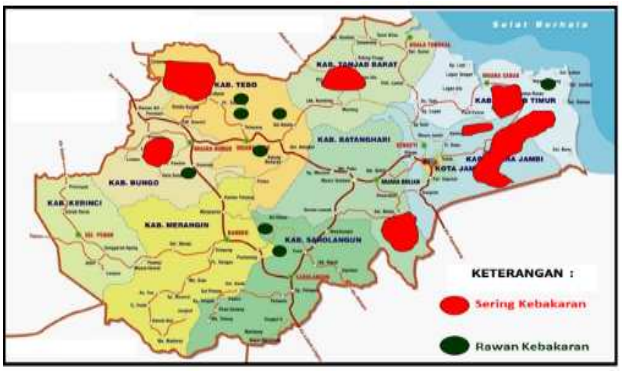

Figure 1. Map of Jambi in the Forest and Land Fire Situation (Report of the Indonesian House of Representatives, 2019)
Source: Processed by Researchers, 2025

As a mitigation measure, the government established a Forest and Land Fire Task Force (Satgas Karhutla), involving members of the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), the Meteorology, Climatology, and Geophysics Agency (BMKG), Manggala Agni, local governments, and civil society. This task force is part of a joint cross-agency operation aimed at integrating fire prevention, extinguishing, and recovery strategies. However, the effectiveness of this joint operation remains debated. In the field, inter-agency coordination is often suboptimal, logistics availability is limited, and standard operating procedures (SOPs) remain inconsistently synchronized. Furthermore, non-technical factors such as extreme weather, budget constraints, and the continued practice of burning land complicate the response on the ground.

Ideally, the joint Karhutla Task Force operation should be synergistic and sustainable. This effort must be supported by strong cross-sectoral coordination, the application of early detection technology, and community empowerment as an integral part of disaster mitigation. Within the context of national policy, this joint operation also implements several regulations that emphasize the importance of multi-level collaboration between agencies. These include Law Number 41 of 1999 concerning Forestry, which prohibits forest burning (Article 50 paragraph 3d), Law Number 18 of 2013 concerning the Prevention and Eradication of Forest Destruction, and Government Regulation Number 4 of 2001, which emphasizes the government's responsibility in preventing and restoring environmental functions due to fires. Furthermore, Presidential Instruction Number 3 of 2020 clarifies the synergistic role of the Indonesian National Armed Forces (TNI) and the Indonesian National Police (Polri) in

assisting the National Disaster Management Agency (BNPB) in conducting regional patrols, extinguishing fires, and enforcing the law against perpetrators of forest fires.

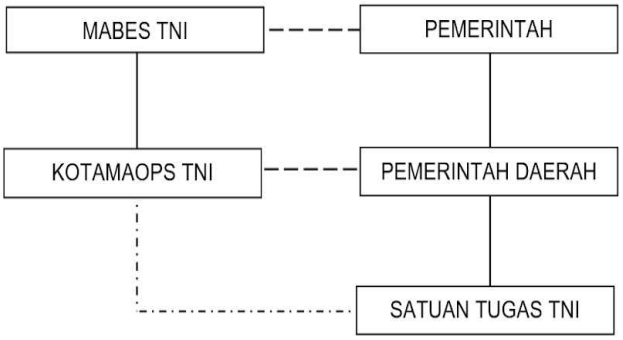

Figure 2. Scheme of the TNI's Role in OMSP Disaster Management (Perpang/78/IX/2010, 2025)
Source: Processed by Researchers, 2025

From a national defense perspective, the role of the Indonesian National Armed Forces (TNI) in non-combat operations, as stipulated in TNI Commander Regulation Number Perpang/78/IX/2010, serves as the operational basis for the involvement of defense personnel in assisting local governments in disaster management, including forest and land fires. At the regional level, Jambi Provincial Regulation Number 2 of 2016 concerning the Prevention and Control of Forest and Land Fires regulates cross-sectoral coordination between local governments, vertical agencies, security forces, and the community in forest and land fire management. Therefore, the implementation of the joint operations of the Karhutla Task Force in Jambi is not only an administrative policy but also an implementation of national and regional legal mandates to maintain ecological resilience and environmental security.

Empirically, the effectiveness of the joint operations of the Karhutla Task Force in Jambi Province demonstrates interesting dynamics. Based on data from the Jambi Regional Police Operations Bureau (2024), the number of hotspots increased significantly from 935 in 2023 to 2,787 in 2024, with a total burned area of approximately 1,191.44 hectares. However, increased law enforcement is also reflected in the increase in the number of suspects in land burning, from 8 in 2023 to 15 in 2024. This data demonstrates that the effectiveness of law enforcement operations has increased, but prevention efforts remain suboptimal.

Table 1. Handling of Forest and Land Fires in Jambi Province in 2023–2024

Year	***Amount of Hotspots***	***Handling/ Law Enforcement***	***Number of Suspects***	***Area of Burned Land (Ha)***
2023	935	6 Case	8 People	+/- 283,09 Ha
2024	2.787	15 Case		+/- 1.191,44 Ha

Source: Jambi Regional Police Operations Bureau, 2024

These issues demonstrate that the effectiveness of the Task Force is measured not only by the number of cases successfully handled, but also by the extent to which prevention, early detection, and community participation systems operate optimally. Several previous studies (Rinaldi, Saad, & Marwoto, 2023; Rahmah & Hamdi, 2022; Roengtam & Agustiyara, 2025) emphasize that successful forest fire mitigation is highly dependent on the quality of

intersectoral coordination, a clear command structure, and the capacity of human resources in the field. However, research comprehensively examining the effectiveness of joint operations of the Karhutla Task Force in the context of Jambi Province is still limited.

This study seeks to fill this gap by comprehensively analyzing the implementation of the effectiveness of joint operations between the Karhutla Task Force and stakeholders in combating forest and land fires in Jambi Province. The analysis focuses on three main dimensions: coordination between stakeholders, operational strategies, and supporting and inhibiting factors in operational implementation. Using a descriptive-qualitative approach, this study seeks to provide an empirical contribution to strengthening disaster management based on cross-sectoral collaboration and a sustainable environmental security system. This research is expected to produce evidence-based strategic recommendations to strengthen cross-institutional synergy and realize collaborative and sustainable disaster management in Jambi Province.

Based on the description above, this research seeks to answer the following key questions:

- How is the coordination between the Karhutla Task Force and stakeholders in implementing joint operations in Jambi Province?
- How effective are the operational strategies implemented in the Karhutla Task Force's joint operations to combat forest and land fires in Jambi Province?
- What are the supporting and inhibiting factors that influence the effectiveness of the joint operations of the Karhutla Task Force and stakeholders in Jambi Province?

B. LITERATURE REVIEW

The literature review serves as the conceptual foundation of this research by examining relevant theories to explain the relationships between the research variables. Through this literature review, this study develops a theoretical framework that explains the effectiveness of the joint operations of the Forest and Land Fire Task Force using a multidisciplinary approach encompassing organizational theory, disaster management, multi-stakeholder collaboration, and environmental security. This approach is crucial for a comprehensive understanding of how coordination, operational strategies, and supporting and inhibiting factors influence the effectiveness of forest and land fire management in Jambi Province.

The theoretical foundation of this research encompasses three main groups: grand theory, middle-range theory, and applied theory. This division is intended to allow the analysis to progress from an abstract conceptual framework to practical application in the field (Merton, 1968).

- ***Grand Theory:*** *Organizational Effectiveness Theory*
- *This theory explains the internal mechanisms of an organization in achieving its strategic goals through the dimensions of structure, processes, and work culture.*
- ***Middle-Range Theory:*** *Disaster Management Theory*
- *This theory is used to understand the cycle of preparedness, mitigation, response, and recovery in the context of forest and land fires.*
- ***Applied Theory:*** *Multi-Stakeholder Collaboration Theory and Environmental Security Theory*
- *These two theories provide an applicable framework for assessing collaborative practices between actors in maintaining environmental resilience and the effectiveness of joint operations in the field.*

Organizational Effectiveness Theory

Organizational effectiveness is a key indicator of an institution's success in achieving its goals. Gibson et al. (in Kharisma & Yuniningsih, 2017) define effectiveness as the extent to

which an organization optimally achieves its planned goals. This view emphasizes the integration of outputs with strategic objectives (outcomes).

Scott (in Budihardjo, 2014) asserts that an organization is a group of individuals working together to achieve common interests. This collaboration is not only structural but also creates informal relationships that support coordination. In a similar context, Hasibuan (2015) emphasizes that an organization is a formal cooperative system between two or more people to achieve common goals.

Organizational effectiveness is measured through three main dimensions: efficiency, adaptability, and legitimacy. Efficiency refers to the optimal utilization of resources; adaptability relates to the organization's ability to adapt to environmental dynamics; and legitimacy relates to social acceptance of the organization's existence and actions.

Shukree et al. (2020) state that leadership, strategy, planning, and program design are key determinants of organizational effectiveness. Visionary leadership and two-way communication enable organizations to stay attuned to environmental changes. A systematic evaluation process plays a crucial role as a feedback mechanism that drives innovation and performance improvement. Thus, organizational effectiveness is measured not only by administrative success but also by the organization's ability to create social and environmental value for stakeholders (Shukree et al., 2020).

In the context of this research, the effectiveness of the joint operations of the Forest and Land Fire Task Force can be understood as the result of the dynamic interaction between coordination structures, operational strategies, and cross-agency work cultures in achieving forest and land fire mitigation goals efficiently and sustainably.

Disaster Management Theory

Disaster management is a discipline that emphasizes the comprehensive disaster management cycle, from mitigation, preparedness, response, and recovery. According to Permana (2018, in Rahmah & Ikhsan, 2022), disaster management focuses not only on reacting to disasters but also on systematic planning to reduce risks before they occur through multi-agency coordination and risk mitigation.

The disaster management cycle can be divided into three phases (Mahardika & Larasati, 2015):

- Pre-disaster, encompassing risk mitigation and preparedness, such as the development of disaster-resistant infrastructure, enforcement of zoning regulations, and public education.
- During a disaster, focusing on rapid response and inter-agency coordination, including the implementation of Standard Operating Procedures (SOPs), evacuation, and the use of technology such as Geographic Information Systems (GIS) for mapping affected areas (Coppola, 2011).
- Post-disaster, emphasizing social, economic, and environmental rehabilitation through the integration of sustainable development and community participation (UNDRR, 2020).

In the context of forest and land fires, disaster management theory is relevant for assessing the extent to which the Karhutla Task Force implements the stages of the cycle. Preparedness in early hotspot detection, mitigation through routine patrols and community engagement, and post-fire ecosystem restoration are tangible indicators of effective disaster management at the regional level.

Therefore, this theory provides a framework for analyzing whether the Karhutla Task Force's operational strategies have been implemented in a planned, adaptive, and measurable manner to reduce the risk of Karhutla in Jambi Province.

Multi-Stakeholder Collaboration Theory

Multi-stakeholder collaboration is a cross-sector coordination process in which the government, community, business, academics, and media work together to design and implement public policies. According to Harlyandra and Kafaa (2021), this collaboration reflects an agreement between actors to share responsibilities, risks, and benefits in achieving common goals.

Tennyson (in Harlyandra & Kafaa, 2021) adds that multi-stakeholder collaboration emphasizes the principles of transparency, accountability, and continuous evaluation. In the context of joint operations of the Karhutla Task Force, such collaboration is necessary to ensure integration between the roles of the government, the Indonesian National Armed Forces (TNI)/Polri (Polri), local communities, and non-governmental organizations (NGOs) in implementing prevention and law enforcement strategies.

A strong collaborative framework also increases the effectiveness of cross-agency coordination, reduces overlapping functions, and strengthens communication mechanisms in the field (Rinaldi et al., 2023). Through solid synergy, the effectiveness of joint operations of the Karhutla Task Force can be maximized not only in handling fire incidents but also in fostering a culture of disaster resilience (resilient communities).

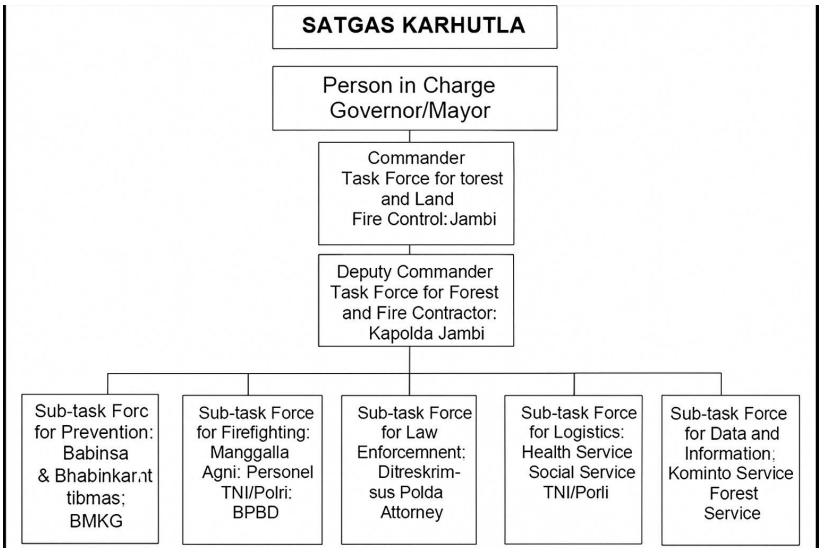

Figure 2. Bagan Satgas Karhutla

Source: Processed by Researchers, 2025 (Adapted from the Jambi Provincial Government Joint Forest and Land Fire Task Force (2019)

Environmental Security Theory

Environmental security theory highlights the importance of maintaining ecosystem integrity as part of national security and human well-being. Coelotto et al. (2024) define environmental security as a condition in which communities are protected from ecological threats such as forest fires, pollution, and climate change.

This concept is rooted in two main approaches: Environmental Security, which focuses on mitigating ecological damage through sustainable natural resource management policies; and Human Security, which emphasizes protecting basic human rights against environmental impacts (UNDP, 2019).

Ruhl (2024), adapting Wilson and Kelling's Broken Windows theory, explains that maintaining order in the microenvironment can prevent greater social and ecological degradation. In the context of forest and land fires, the application of this theory means

preserving forests through strict regulations, public education, and integrated monitoring to prevent land burning.

In practice, this theory is operationalized through four main strategies:

- Strengthening governance and policies, enforcing regulations, reforestation, and sanctions against those who burn.
- Early warning and monitoring systems, using satellite imagery (MODIS, Landsat) for real-time hotspot detection.
- Community empowerment and environmental education, increasing local capacity in fire mitigation.
- Cross-actor collaboration, integrating government, business, and communities in maintaining ecological security.

Thus, environmental security theory provides both a normative and practical basis for formulating forest and land fire control policies that prioritize ecosystem sustainability and human security. This approach is relevant in examining the role of the Forest and Land Fire Task Force and stakeholders in maintaining a balance between development needs and environmental preservation.

C. RESEARCH METHODOLOGY

Research Design and Approach

This study employed a qualitative, descriptive-analytical method with the aim of providing an in-depth understanding of the phenomenon of the effective implementation of joint operations between the Forest and Land Fire Task Force and stakeholders in Jambi Province. This approach was chosen because the research focused on empirical descriptions of cross-agency coordination mechanisms, the effectiveness of operational strategies, and supporting and inhibiting factors in the field (Hardani et al., 2020).

The qualitative approach was used to explore the meanings, perceptions, and experiences of key actors involved in the joint operations. According to Creswell and Creswell (2018), qualitative research allows researchers to understand the full social context through direct interaction with participants and in-depth interpretation of non-numerical data. Thus, this study produces contextual findings that not only describe the phenomenon but also explain the relationships between policies, organizational structures, and the operational dynamics of the Forest and Land Fire Task Force.

Descriptive analysis was used to systematically present field facts, explaining the relationships between variables within the theoretical framework of organizational effectiveness, disaster management, multi-stakeholder collaboration, and environmental security. With this design, the research results are expected to provide rich empirical descriptions and strategic recommendations for improving forest and land fire management governance in Jambi.

Location and Time of Research

The research was conducted in Jambi Province, covering districts/cities with the highest incidence of forest and land fires, according to data from the National Disaster Management Agency (BNPB) and the Jambi Provincial Forestry Service. This location was chosen because it represents the complexity of cross-agency coordination in forest and land fire response operations, involving the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), Manggala Agni, and local communities.

The research was conducted between July and November 2025, coinciding with the fire-prone period in Jambi. This timeframe was chosen to obtain up-to-date and contextual empirical data on the Task Force's operational activities in the field.

Subjects and Objects of Research

The research subjects consisted of key actors directly involved in the implementation of joint operations by the Forest and Land Fire Task Force. Using a purposive sampling method, the researchers identified four key informants, each with the criteria of strategic and operational involvement in forest and land fire prevention and response activities (Creswell & Creswell, 2018). The key informants included:

Table 2. Informant Data

No	Source person
1	Head of the Operations Bureau, Jambi Regional Police
2	Head of the Operations Section of the 042/White Garuda Military Command
3	Deputy Head of the Jambi Provincial Disaster Management Agency (BPBD)
4	Head of the Manggala Agni Section, Jambi Province

Source: Processed by Researchers, 2025

The research objectives include coordination mechanisms, the effectiveness of operational strategies, and supporting and inhibiting factors in the implementation of joint operations by the Forest and Land Fire Task Force. The analysis focuses on how cross-agency collaboration is formed and implemented, and the extent to which the implemented strategies have successfully reduced fire intensity in the study area (Moleong, 2019).

Data collection technique

To ensure the validity and reliability of the findings, this study uses primary data and secondary data with the following layered collection techniques:

- In-depth Interview
  The interview was conducted with structural officials and technical implementers from the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), and Manggala Agni, as well as representatives from the community and the private sector. The interview guide was developed based on indicators of coordination effectiveness, operational strategies, and supporting and inhibiting factors (Kvale & Brinkmann, 2009). Each interview was recorded and transcribed with the informant's consent.
- Documentation
  This involved reviewing official documents such as Standard Operating Procedures (SOPs), Task Force activity reports, regional regulations, satellite hotspot data, and visual archives of field activities (Bowen, 2009). These documents were used to verify and enrich the interview data.
- Literature Study
  Conducted by reviewing scientific literature, national, and regional policies related to forest and land fire management. This literature review strengthens the theoretical framework and provides a comparative context for empirical findings. Several key references include Law No. 41 of 1999 concerning Forestry, Law No. 24 of 2007

concerning Disaster Management, and Ministerial Regulation No. P.32/MENLHK/SETJEN/KUM.1/3/2016 concerning Forest and Land Fire Control.

Data Validity Checking Techniques

The validity and reliability of the data were tested using a triangulation approach of sources, methods, theories, and researchers (Flick, 2018; Creswell & Creswell, 2018).

- Source triangulation was conducted by comparing data from various sources, such as the Task Force, regional officials, and the community.
- Method triangulation used a combination of interviews, observations, and document analysis to confirm data consistency.
- Theoretical triangulation linked findings to various conceptual frameworks, such as theories of organizational effectiveness, disaster management, multi-stakeholder collaboration, and environmental security.

In addition, researchers use member checking and audit trail techniques to ensure that the findings are accurate, transparent, and accountable.

Data Analysis Techniques

Qualitative data analysis was conducted using the interactive model of Miles, Huberman, and Saldaña (2014), which includes four main stages.:

- Data Collection: Data was obtained through interviews, observations, and documentation, then transcribed and categorized based on the research focus.
- Data Reduction: Raw data was selected, simplified, and coded into relevant information units using open, axial, and selective coding techniques.
- Data Presentation: Data was organized in the form of matrices, thematic maps, and interpretive narratives to facilitate the identification of patterns of relationships between variables.
- Conclusion Drawing and Verification: Conclusions were formulated based on thematic synthesis and reconfirmed with primary and secondary data to ensure the consistency and validity of the findings.

Conclusions are formulated based on thematic synthesis and reconfirmed with primary and secondary data to ensure consistency and validity of the findings.

D. RESULT AND DISCUSSION

This research yields empirical findings indicating that the effectiveness of the joint operations of the Forest and Land Fire Task Force in Jambi Province is significantly influenced by three main aspects: (1) coordination across agencies and stakeholders, (2) operational strategies implemented in the field, and (3) supporting and inhibiting factors in operational implementation.

In general, the research results indicate that inter-agency coordination in the joint operations has been quite successful, although not yet fully optimal. Synergy between the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), and the Manggala Agni (Mangala Agni), along with support from local governments, has established a formal coordination structure through an integrated command post. However, in-depth interviews with key informants (Karoops Polda Jambi, Kasiops Korem 042/Gapu, and the Jambi Provincial BPBD) revealed that inter-agency communication remains hampered by issues such as speed of information transmission, differences in command mechanisms, and limited technological resources. In some areas, particularly districts with high fire intensity, operational coordination remains sectoral and reactive to fire incidents, rather than based on integrated prevention.

Field observations indicate that the operational strategy implemented by the Task Force focuses on three main actions: prevention, law enforcement, and firefighting. Quantitative

data supports the effectiveness of some of these strategies, as reflected in improved law enforcement performance. According to data from the Jambi Regional Police Operations Bureau (2024), there was an increase in the number of cases and suspects prosecuted in 2024 compared to the previous year.

In 2023, 935 hotspots were recorded, with 6 law enforcement cases and 8 suspects. Meanwhile, in 2024, the number of hotspots increased to 2,787, with 15 law enforcement cases and 15 suspects apprehended. The area of burned land also increased from approximately 283 hectares in 2023 to over 1,190 hectares in 2024 (Jambi Regional Police Operations Bureau, 2024).

Based on these data, although the number of suspects has increased as an indicator of law enforcement effectiveness, the number of hotspots and the area of burned land has also increased significantly, indicating that effectiveness in the prevention aspect remains relatively low. This suggests that joint operations are more oriented towards responsive measures than preventive measures, while early detection systems and community participation in prevention remain weak.

Furthermore, in terms of supporting factors, it was found that the success of operations was influenced by the availability of cross-agency personnel, logistical support and equipment, and the strengthening of regional policies such as Jambi Provincial Regulation No. 2 of 2016 concerning Forest and Land Fire Control. On the other hand, dominant inhibiting factors included limited infrastructure (such as water bombing aircraft and communication systems), difficult geographic access, extreme weather changes, and low public awareness of the dangers of land burning.

The research also showed that the success of operations in several areas was largely determined by local community involvement in integrated patrols and environmental education. Areas with the Fire Awareness Village program tended to show a significant reduction in the number of hotspots. This underscores the importance of a collaborative, community-based approach in strengthening the effectiveness of future joint operations.

Coordination between the Forest and Land Fire Task Force and stakeholders

Coordination between the Forest and Land Fire (Karhutla) Task Force and stakeholders is central to the effectiveness of the Karhutla control system in Jambi Province. Research shows that coordination has shown significant progress in terms of structure, communication patterns, and division of responsibilities. However, challenges remain in data synchronization, cross-sector communication, and continuity of cooperation. Theoretically, the success of cross-agency coordination is determined by the level of collaboration and shared vision among the parties involved in the disaster management system (Laras, 2019). In the Jambi context, a formal coordination mechanism is implemented through the establishment of an Integrated Command Post (Posko Terpadu), which serves as the control center for planning, coordination, and implementation of joint Karhutla Task Force operations at the provincial and district levels.

The Integrated Command Post serves as an integrated communication and command hub, bringing together elements of the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), the Meteorology, Climatology, and Geophysics Agency (BMKG), Manggala Agni, local governments, plantation companies, and community groups within a unified decision-making system. Within this structure, the Danrem 042/Gapu serves as the Task Force Commander, while the Jambi Regional Police Chief serves as Deputy Commander. Through this hierarchical structure, vertical coordination extends from the provincial command post to the district level, while horizontal coordination is conducted between technical agencies in the field through a radio communication system and regular coordination meetings. This

approach aligns with the unity of command principle in organizational effectiveness theory, where a clear division of tasks and commands is essential for effective cross-agency work (Robbins & Coulter, 2018).

However, coordination effectiveness is determined not only by the existence of a structure but also by the quality of inter-agency communication. Research shows that intensive communication between stakeholders tends to increase during fire emergencies but decreases when conditions are relatively normal. This pattern indicates that the Karhutla Task Force's coordination system remains reactive, not fully proactive and preventative. Robbins & Coulter (2018) state that organizational effectiveness in dealing with complex situations depends on the ability of internal communication to create a rapid, open, and mutually reinforcing flow of information between work units. Therefore, the sustainability of coordination beyond crisis periods is an urgent need for the Karhutla Task Force to ensure that communication patterns and cross-agency synergy remain consistent throughout the year.

One important innovation in the Jambi Forest and Land Fire Task Force's coordination mechanism is the use of information technology through digital-based hotspot monitoring applications, such as the ASAP Digital system and the BMKG's satellite-based monitoring. This system enables early detection and faster information distribution to all sub-task forces in the field, enabling faster decision-making. However, the effectiveness of this technology still faces challenges such as limited internet access, disparities in human resource capabilities in operating the technology, and delays in data updates between agencies. These challenges demonstrate that digital transformation in the disaster coordination system requires consistent support from resources and technical training (BNPB, 2021).

Coordination also includes community involvement in forest and land fire prevention and mitigation. Based on field findings, communities are involved through the Community Awareness Program (MPA), outreach on land clearing without burning (PLTB), and participation in joint patrols. This participation not only increases early warning of potential fires but also strengthens the social legitimacy of forest and land fire management policies. According to Purbowati (2023), community involvement in disaster risk management is a form of community-based governance that strengthens social cohesion and the effectiveness of public policies at the grassroots level. Therefore, community involvement is a crucial dimension in building multi-layered coordination between the government, security forces, and civil society.

However, research has identified several structural and institutional obstacles to implementing cross-sectoral coordination. First, differences in policies and bureaucratic systems between agencies lead to overlapping authority and delays in field responses. Second, data asymmetry between agencies, such as the Regional Disaster Management Agency (BPBD), the Meteorology, Climatology, and Geophysics Agency (BMKG), and Manggala Agni, often leads to differing interpretations of the number and location of hotspots, which impacts on differing response priorities. Third, differences in human resource capacity and infrastructure between regions lead to disparities in response speed and extinguishing effectiveness. Fourth, passive cross-agency communication outside of emergency periods reduces consistency in coordination and long-term preparedness (Dwiyanto, 2008).

In a broader context, coordination between forest and land fire management agencies in Jambi has strategic relevance to the concept of collaborative governance proposed by Ansell and Gash (2008). This model emphasizes the importance of shared responsibility and collective accountability in addressing complex public issues. The implementation of this principle in Jambi is evident in the division of roles between agencies, with the Regional Disaster Management Agency (BPBD) and Manggala Agni responsible for technical

management, the Indonesian National Armed Forces (TNI) and the Indonesian National Police (Polri) for security and logistics, while the local government coordinates policy and funding. While this has shown positive signs, this collaborative mechanism still needs to be strengthened through permanent regulations and a joint command system that operates year-round, not just during the dry season.

Theoretically, the coordination of the Karhutla Task Force with stakeholders in Jambi Province can be categorized as quite effective during the emergency response phase, but less than optimal during the prevention and recovery phases after the fires. This weakness indicates that the coordination system remains event-driven, active during disasters but passive outside of crises (Rinaldi et al., 2022). To increase effectiveness, a transformation towards a full-cycle disaster management coordination system is needed, encompassing prevention, preparedness, emergency response, and recovery in a sustainable manner.

Thus, the success of coordination in the joint operations of the Karhutla Task Force in Jambi Province is not only determined by the organizational structure and availability of resources, but also by the extent to which each stakeholder is able to build trust, open communication, and a shared vision in maintaining ecological sustainability. Therefore, increasing the effectiveness of coordination can be achieved through three strategic steps: (1) strengthening the command system and permanent cross-agency coordination forum, (2) integrating data and real-time monitoring technology, and (3) building a sustainable social communication and public education network. This approach is expected to transform the Karhutla Task Force coordination from a reactive system to a collaborative system that is adaptive, resilient, and oriented towards environmental sustainability.

Effectiveness of the Forest and Land Fire Task Force's Operational Strategy

The effectiveness of the Forest and Land Fire Task Force's operational strategy in Jambi Province serves as a key measure of the success of cross-sectoral efforts to combat forest and land fires. This strategy encompasses not only direct firefighting but also preparedness, prevention, and post-fire recovery. In the context of organizational effectiveness, a strategy is considered effective if it achieves its stated objectives through efficient resource utilization, adaptation to environmental changes, and alignment with broader strategic policies (Robbins & Coulter, 2018). Based on the analysis, the effectiveness of the Forest and Land Fire Task Force's operational strategy in Jambi can be understood through three main dimensions: (1) readiness of human resources and personnel, (2) utilization of technology and supporting infrastructure, and (3) appropriate command mechanisms and adaptation to field conditions.

Human Resource and Personnel Readiness

Human resource readiness is a fundamental element in determining the success of an operational strategy. The diverse elements within the Task Force, including the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), Manggala Agni, and even the local community through the Fire Awareness Community (MPA), reflect a collaborative, cross-sectoral approach. However, this readiness is not yet fully equitable in terms of technical competency and preparedness. There remains a gap between personnel's ability to respond to emergency situations and their ability to implement mitigation and prevention. This situation indicates that the operational paradigm of the Karhutla Task Force is still predominantly oriented toward reactive response rather than preventive action, as stated by Sutopo (2018) in disaster management theory.

Limited personnel rotation and uneven training across agencies also impact the effectiveness of coordination in the field. Incidental joint training results in a lack of uniform procedural standards across agencies. As a result, differences in command patterns and work habits between military, police, and civilian elements often lead to differing perceptions in

decision-making. Unity of command is a fundamental principle absolutely essential for maintaining harmony in integrated operations (Gibson et al., 2014). Thus, increasing the capacity of human resources across agencies through continuous training and standardization of SOPs is a very crucial aspect to strengthen the effectiveness of operational strategies.

Utilization of Technology and Supporting Infrastructure

The second dimension determining the effectiveness of operational strategies is the use of technology in early detection and fire management systems. In the past two years, the Jambi Forest and Land Fire Task Force has implemented the MODIS and SNPP-NOAA satellite-based monitoring systems, integrated with data from the Meteorology, Climatology, and Geophysical Agency (BMKG) and the National Aeronautics and Space Agency (LAPAN). This innovation is a strategic step in accelerating hotspot detection and directing response priorities. Furthermore, the use of drone surveillance and app-based digital monitoring systems such as ASAP Digital further strengthens the Task Force's ability to map fire-prone areas in real time. However, equitable distribution of technology and infrastructure remains a significant challenge.

The disparity in access between areas with adequate infrastructure, such as Jambi City and Batanghari, and those with limited access, such as East Tanjung Jabung and Muarojambi, leads to differences in response speed. This situation indicates that the operational strategy's effectiveness has not been fully achieved at the regional level. Furthermore, limited equipment maintenance and limited availability of spare parts also contribute to decreased equipment preparedness, particularly in the pre-disaster phase. The National Disaster Management Agency (BNPB) (2021) emphasized that the ideal disaster management strategy must encompass a continuous system of preparedness, response, and rehabilitation. However, in Jambi, operational effectiveness tends to be strong during the emergency response phase, but is not optimal in the pre-disaster and post-crisis stages. This means that although technology has been adopted, its use has not been fully integrated into the overall disaster management cycle.

Appropriateness of Command Mechanisms and Field Adaptation

The effectiveness of an operational strategy is also determined by the extent to which command mechanisms operate appropriately and adapt to field conditions. Based on the structure of the Karhutla Task Force, the main command rests with the Danrem 042/Gapu as the Task Force Commander and the Jambi Regional Police Chief as the Deputy Commander. This hierarchical structure aligns with the principle of centralized decision-making, which emphasizes clarity of responsibility and the chain of command. However, observations indicate that in emergency situations in the field, communication between agencies is often direct horizontally, bypassing formal channels. This pattern does expedite decision-making, but also has the potential to lead to overlapping instructions and weak administrative control.

In the context of adaptive disaster management theory (UNDRR, 2020), a balance between centralized decisions and decentralized actions is key to success. This means that field units need the autonomy to act quickly, while remaining within an integrated coordination and reporting framework. This mechanism has begun to be implemented through a two-way reporting system between district and provincial posts, although its implementation still faces challenges in digital data integration and information consistency between agencies.

Organizational Evaluation and Learning

One important indicator of operational strategy effectiveness is the Task Force's ability to continuously evaluate and adapt strategies. Based on interviews with the Regional Disaster Management Agency (BPBD) and Manggala Agni, activity evaluations are generally conducted after the dry season through cross-agency coordination meetings. However, these

evaluations are largely administrative in nature and not fully based on empirical data such as response time, resource utilization effectiveness, or rehabilitation success rates. This indicates that organizational learning mechanisms are not functioning optimally (Moleong, 2018). Without a robust feedback system, operational strategies risk becoming stagnant and unadaptive to changing field dynamics.

Strategic Implications

A comprehensive analysis of the effectiveness of the operational strategy of the Forest and Land Fire Task Force in Jambi Province shows that although the emergency response has been successful, prevention, preparedness, and recovery aspects still require systematic strengthening. Three strategic steps need to be taken to improve effectiveness going forward. First, strengthen the integrated cross-agency training system to create uniform competencies and operational procedures. Second, expand the modernization of infrastructure and technology based on the Geospatial Early Warning System to enable rapid and accurate early detection and decision-making. Third, establish a performance-based evaluation mechanism that serves as the basis for continuous institutional learning.

By implementing an adaptive, data-driven, and prevention-oriented operational strategy, the joint operations of the Forest and Land Fire Task Force in Jambi have the potential to transform from a reactive response model to preventive resilience, a resilient and sustainable system that not only suppresses the number of fires but also strengthens environmental security and long-term community well-being.

Supporting and Inhibiting Factors of the Joint Operations of the Forest and Land Fire Task Force

The effectiveness of the joint operations of the Forest and Land Fire Task Force in Jambi Province is determined by the extent to which supporting factors can be optimized and inhibiting factors can be minimized within the integrated management system. Within the theoretical framework of Multi-Stakeholder Collaboration, Mardikanto (2014) emphasized that the success of cross-sector collaboration depends on four main pillars: agreement on shared goals, trust between actors, open communication, and coordinated work mechanisms. These four pillars serve as the foundation for the Karhutla Task Force in integrating various elements of local government, security forces, technical institutions, the private sector, and the community into a unified operational system that adapts to field conditions.

Supporting Factors

Four main factors support the success of the Karhutla Task Force's joint operations in Jambi: (1) the availability of competent human resources (HR), (2) budget and logistical support, (3) the use of information technology and early detection, and (4) active community participation.

Trained Human Resources (HR)

The presence of trained HR is a key pillar in the effectiveness of joint operations. Task Force personnel, consisting of members of the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), and the Manggala Agni (Mangala Agni), demonstrate strong technical capacity in patrolling, extinguishing, and post-fire response. Repeated experience in dealing with forest and land fires has established a learning-by-doing mechanism that strengthens field reliability. Interviews indicate that integrated cross-agency training, although not yet routine, has contributed to improving technical skills, coordination, and work discipline among personnel.

Sutopo (2018) emphasized that in disaster management, operational effectiveness is largely determined by personnel readiness to deal with dynamic changes in the field. In the Jambi context, this readiness was demonstrated through the adaptive capacity of joint units in the face of challenging terrain and limited resources. Competent human resources enabled

operations to proceed with efficient coordination despite uncertain geographic and weather conditions.

Budget and Logistics Support

Budgetary support allocated by the central and regional governments is a vital factor in supporting the effectiveness of joint operations. Based on field data, operational funds are used for air and ground patrols, procurement of firefighting equipment, transportation, logistics, and personnel needs in the field. Although budget availability is not yet ideal, regular funding mechanisms from the Jambi Provincial Budget (APBD) and assistance from the National Disaster Management Agency (BNPB) and the Ministry of Environment and Forestry (KLHK) have increased operational flexibility in the field.

Robbins and Coulter (2018) state that resource and logistical support are organizational enablers, factors that enable an organization to execute its strategy efficiently. In this context, the adequacy of logistics such as portable pumps, HT radios, GPS, and field vehicles directly contributes to the speed of response and the range of joint operations. However, their distribution remains uneven across districts, indicating the need for priority-based planning.

Utilization of Early Detection Technology

The use of technology is a crucial instrument in strengthening detection systems and rapid decision-making. The Jambi Forest and Land Fire Task Force has operated MODIS and SNPP-NOAA satellite technology, as well as the real-time monitoring system owned by the BMKG (Meteorology, Climatology, and Geophysics Agency) and the Ministry of Environment and Forestry (KLHK) (SIPONGI). Furthermore, the implementation of digital applications such as ASAP Digital and the use of drone surveillance accelerates fire identification and facilitates coordination between fire posts.

The National Disaster Management Agency (BNPB) (2021) emphasized that the success of modern disaster management strategies relies heavily on integrated technology-based information systems. The use of technology in Jambi not only increases the speed of detection but also strengthens the decision-making process at the provincial command level. However, technology access is not evenly distributed in areas with limited telecommunications infrastructure, such as East Tanjung Jabung and Sarolangun, so the effectiveness of early detection systems remains spatially limited.

Active Community Participation

Community involvement through the Community Fire Awareness (MPA) group is a significant social factor in supporting the effectiveness of joint operations. Communities play a vanguard role in early detection and the dissemination of information on land clearing without burning (PLTB). Through joint outreach and training initiated by the Regional Disaster Management Agency (BPBD) and Manggala Agni, communities become not only beneficiaries but also key actors in the community-based disaster management system.

This community participation aligns with the UNDRR (2020) view that community empowerment in disaster mitigation systems is a fundamental element in building local resilience. The active participation of MPA in several sub-districts demonstrates that a socio-cultural approach has a broader impact than mere technical interventions.

Inhibiting Factors

In addition to these supporting factors, the joint operation of the Forest and Land Fire Task Force in Jambi Province also faced a number of interrelated obstacles, encompassing structural, technical, and geographic aspects. The main obstacles identified included (1) weak synergy and coordination across agencies, (2) limited communication and data integration, (3) disparities in human resources and infrastructure, and (4) geographic conditions and extreme weather.

Weak Synergy Across Agencies

One of the most prominent obstacles was the suboptimal synergy between the agencies involved in the joint operation. Although integrated posts have been established as a coordination forum, field practices still demonstrate overlapping authority between technical institutions such as the Regional Disaster Management Agency (BPBD) and the Forestry Service, and security forces (TNI and Polri). Differences in bureaucratic culture and work orientations result in gaps in task implementation.

Dwiyanto (2008) explains that weak coordination between public agencies is often caused by differences in managerial systems and sectoral egos. In the context of the Karhutla Task Force, this is evident in the differences in data and action priorities between regional and vertical agencies, often resulting in delays in tactical decisions in the field.

Limited Communication and Data Integration

Another crucial obstacle is the lack of synchronization of data between agencies. Each agency, including the Regional Disaster Management Agency (BPBD), the Meteorology, Climatology, and Geophysics Agency (BMKG), the Indonesian National Armed Forces (TNI), and the Manggala Agni Agency (Manggala Agni), has its own monitoring system and database. This lack of system integration leads to inconsistencies in the number of reported hotspots and the extent of burned areas. This situation leads to overlapping response efforts and inefficient resource allocation.

The lack of inter-agency communication outside of emergency periods exacerbates the situation. Reactive communication only intensifies when fires spread, but weakens during calm periods. However, continuous communication is a key prerequisite for establishing an adaptive collaborative system oriented towards long-term prevention (Budiati, 2020).

Human Resource and Infrastructure Disparities

Disparities in human resource capabilities and infrastructure between districts are significant obstacles. Regions such as Jambi City and Batanghari tend to have comprehensive infrastructure and experienced personnel, while other areas, such as Tebo, Sarolangun, and East Tanjung Jabung, still lack basic firefighting equipment, operational vehicles, and land transportation access.

These differences result in disparities in response speed and operational effectiveness between regions. The National Disaster Management Agency (BNPB) (2021) notes that disparities in infrastructure and human resource capacity are key determinants of increased fire risk in areas with limited access. Therefore, capacity equity needs to be a medium-term policy priority.

Geographical Conditions and Extreme Weather

Geographical factors also pose a significant challenge to the joint operations of the Karhutla Task Force in Jambi. The area's topography, dominated by peatlands and dense forests, makes it difficult to mobilize heavy equipment and transport logistics. Furthermore, extreme weather conditions such as high temperatures and strong winds accelerate the spread of fires, shortening effective response times in the field.

This situation demonstrates that operational planning must comprehensively consider ecological and geospatial variables. In this context, spatial modeling technology based on early warning systems needs to be integrated into long-term planning for more precise mitigation of specific environmental risks.

Strategic Implications and Recommendations

Based on the comprehensive analysis above, it can be concluded that the success of the joint Karhutla Task Force operations in Jambi Province rests on a balance between strengthening supporting factors and mitigating inhibiting factors. To increase the effectiveness of cross-agency collaboration, three strategic steps need to be implemented.

First, establish a permanent and adaptive cross-institutional coordination mechanism, with an integrated data system connecting the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), the Meteorology, Climatology, and Geophysics Agency (BMKG), and the Ministry of Environment and Forestry (KLHK) within a single geospatial command network. Second, develop a transformational communication model oriented toward building trust and long-term collective learning among stakeholders, rather than simply situational coordination during a crisis. Third, increase the equitable distribution of human resources and technology capacity through joint training, infrastructure modernization, and proportional logistics distribution across regions.

If these steps are implemented consistently, the joint operations of the Karhutla Task Force in Jambi Province will be able to transform from a reactive firefighting system to a disaster management system based on prevention and sustainable environmental resilience. Thus, the effectiveness of joint operations will be measured not only by reducing the extent of fires, but also by their ability to maintain the ecological, social, and economic stability of the region as a whole.

E. CONCLUSION

This study concludes that the effectiveness of the joint operations of the Forest and Land Fire (Karhutla) Task Force in Jambi Province is largely determined by the quality of inter-agency coordination, adaptive operational strategies, and the ability to systematically manage supporting factors and address inhibiting factors. Coordination between stakeholders, involving the Indonesian National Armed Forces (TNI), the Indonesian National Police (Polri), the Regional Disaster Management Agency (BPBD), Manggala Agni, local governments, and the community, has been quite successful in the emergency response context, but still shows weaknesses in the prevention and recovery aspects of post-fire. The reactive nature of inter-agency communication indicates the need for transformation towards a more proactive and sustainable coordination system (Robbins & Coulter, 2018).

From an operational strategy perspective, the effectiveness of joint operations is supported by three main dimensions: human resource readiness, the use of early detection technology, and an integrated command mechanism. However, the study results indicate that the majority of the Task Force's efforts are still oriented towards a rapid response to fires, rather than mitigation and early prevention. The use of satellite-based technology and digital monitoring systems such as ASAP Digital and SIPONGI has increased the speed of hotspot detection, but has not been matched by equitable human resource capacity and infrastructure across Jambi (BNPB, 2021).

Furthermore, the success of operations is also influenced by supporting factors such as the availability of trained human resources, logistical support, and active community participation through the Fire Awareness Community (MPA). Conversely, limited inter-agency communication, resource imbalances, and extreme geographic and weather conditions present significant obstacles to implementation in the field. Conceptually, this study confirms that the effectiveness of the joint operations of the Forest and Land Fire Task Force in Jambi has not been fully realized because the coordination and operational system remains event-driven, active only during crises and passive outside of emergencies. Therefore, a collaborative governance approach oriented towards the full disaster management cycle, encompassing prevention, preparedness, response, and recovery is needed (Ansell & Gash, 2008).

In general, the results of this study confirm that the effectiveness of the joint operations of the Forest and Land Fire Task Force in Jambi Province is in the category of quite effective

but not optimal, with the most obvious success in the aspects of rapid response and law enforcement, while aspects of prevention, public education, and data integration still require institutional strengthening and more sustainable policies.

This study recommends that the future coordination model for the Forest and Land Fire Task Force be directed toward the establishment of a permanent and adaptive integrated cross-agency command system, rather than merely reactive to seasonal fires. It is also necessary to develop an integrated information system based on a Geospatial Early Warning System that connects data from the Regional Disaster Management Agency (BPBD), the Meteorology, Climatology, and Geophysics Agency (BMKG), the Ministry of Environment and Forestry (KLHK), the Indonesian National Armed Forces (TNI), and the Indonesian National Police (Polri) in real time to accelerate decision-making in the field. Furthermore, increasing human resource capacity across sectors, modernizing facilities and infrastructure, and empowering communities through environmental education should be strategic priorities to strengthen long-term ecological resilience.

From an academic perspective, this research opens the door to further studies focusing on policy evaluation and quantitative analysis of the effectiveness of joint operations at the micro-level (district/city), as well as longitudinal studies of the impact of implementing cross-agency collaboration over a longer period. Comparative studies between provinces are also needed to understand differences in coordination patterns and policy effectiveness in other regions with similar ecological characteristics.

The limitations of this study lie in the relatively limited timeframe and number of informants, as the study was conducted only from July to November 2025 and involved four key informants at the provincial level. This situation causes the research results to emphasize the institutional perspective at the macro level, so generalization to the field level still requires further research involving more participants and a mixed-methods approach. Nevertheless, the findings of this study still provide a significant empirical contribution to strengthening governance for forest and land fire management based on multi-sector collaboration in Indonesia.

REFERENCE

Adi Putra Pratama (2021). Pemanfaatan Drone untuk Pemantauan Karhutla. Terradrone.co.id https://terra-drone.co.id/index.php/2021/03/22/pemanfaatan-drone-untuk-pemantauan-karhutla/

Alexander, David E. (2014). *Principles of Emergency Planning and Management*. Liverpool University Press.

Andico Jumare. (2022). Sinergitas Polda Jambi Dan Stakeholder Dalam Upaya Penanggulangan Tindak Pidana Kebakaran Hutan Dan Lahan Di Provinsi Jambi. Tesis Magister Ilmu Hukum, Universitas Batanghari. http://repository.unbari.ac.id/2147/1/B20031011-ANDICO%20JUMAREL.pdf

Anhar et al., (2022). Dampak Kebakaran Hutan dan Lahan Gambut terhadap Manusia dan Lingkungan Hidup (Studi Kasus: Desa Bunsur, Kecamatan Sungai Apit, Kabupaten Siak, Provinsi Riau). Jurnal Sains dan Komunikasi dan Pengembangan Masyarakat, vol. 6(1) 2022, hlm.75-85. https://doi.org/10.29244/jskpm.v6i1.967

Antara (2023). Asap Karhutla Mulai Berdampak pada Penerbangan di Bandara Tjilik Riwut. Humaniora.

ASEAN Secretariat. (1995). ASEAN meeting on the management of transboundary pollution.

https://asean.org/wp-content/uploads/2021/01/ASEANAgreementonTransboundaryHaze Pollution-1.pdf

Asri (2025). Karhutla di Riau 2025: 77,81 Hektar Lahan Terbakar, Status Siaga Ditetapkan di Beberapa Wilayah. Mediacenterriau.go.id. https://mediacenter.riau.go.id/read/90880/karhutla-di-riau-2025-7781-hektare-lahan-terb.html

Badan Nasional Penanggulangan Bencana. (2021). Pedoman Umum Penanggulangan Bencana. Jakarta: BNPB.

Bowen, G. A. (2009) Document Analysis as a Qualitative Research Method. Qualitative Research Journal, 9, 27-40. http://dx.doi.org/10.3316/QRJ0902027

BPK RI Prov. Jambi. (2024). https://Jambi.bpk.go.id/karhutla-di-Jambi-capai-ratusan-hektar/

Budihardjo, M. (2014). *Panduan Praktis Menyusun SOP*. Jakarta: Raih Asa Sukses.

Budiningsih, Kushartati. (2017). Implementasi Kebijakan Pengendalian Kebakaran Hutan dan Lahan di Provinsi Sumatera Selatan. *Jurnal Analisis Kebijakan Kehutanan*, 14(2), pp. 165-186, doi:10.20886/jakk.2017.14.2.165-186.

Ceolotto, Stefano, Pranvav Kakkar, and Niall Farrell. (2024). Ensuring just resilience to climate impacts: a framework for policy implementation, ESRI Working Paper 806, Dublin: ESRI, https://www.esri.ie/publications/ensuring-just-resilience-to-climate-impacts-a-framework-for-policy-implementation.

Coppola, D. P. (2011). *Introduction to International Disaster Management*. Butterworth-Heinemann.

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods*. California: SAGE Publications.

Deni Purbowati. (2023). Tahapan Siklus Penanggulangan Bencana dalam Manajemen Bencana. Akupinta.id https://akupintar.id/info-pintar/-/blogs/tahapan-siklus-penanggulangan-bencana-dalam-manajemen-bencana

Dipta Kharisma, Tri Yuniningsih. (2017). Efektivitas Organisasi Dalam Penyelenggaraan Pelayanan Tanda Daftar Usaha Pariwisata (Tdup) Dinas Kebudayaan Dan Pariwisata Kota Semarang. *Journal of Public Policy and Management Review.* Volume 6, Nomer 2, Tahun 2017. Doi: 10.14710/jppmr.v6i2.16214

DPR RI. (2019). Laporan Kunjungan Kerja Spesifik Komisi IV DPR RI Pencegahan dan Pengendalian Kebakaran Hutan dan Lahan di Provinsi Jambi. https://berkas.dpr.go.id/akd/dokumen/K4-12-e9bc8d6f611297d84f08984711be9987.pdf

Flick, U. (2018). The sage handbook of qualitative data collection. SAGE Publications Ltd, https://doi.org/10.4135/9781526416070

Gibson, J. L., Ivancevich, J. M., & Donnelly, J. H. (2012). *Organizations: Behavior, Structure, Processes*. Irwin

Gilang Helindro (2024). Provinsi Riau Darurat Karhutla hingga November 2024. Betahita.id. https://betahita.id/news/detail/10053/provinsi-riau-darurat-karhutla-hingga-november-2024.html?v=1716964134

Hardani, Andriani, H., Ustiawaty, J., Utami, E. F., Istiqomah, R. R., Fardani, R.A., Sukmana, D. J., Auliya, N. H. (2020) Metode Penelitian Kualitatif & Kuantitatif .Yogyakarta: CV.Pustaka Ilmu Grup

Hasibuan, M. S. P. (2015). *Manajemen Dasar, Pengertian, dan Masalah* (Revisi). Jakarta: Bumi Aksara.

Hayati, Rina. 2020. Pengertian kerangka berpikir menurut para ahli. https://penelitianilmiah.com/pengerti an-kerangka-berpikir-menurut-paraahli/

Kementerian PUPR. (2017). Modul Manajemen Penanggulangan Bencana Pelatihan Penanggulangan Bencana Banjir

Kvale, S., & Brinkmann, S. (2009). *InterViews: Learning the craft of qualitative research interviewing*. Los Angeles, CA: Sage Publications.

Laras Prawestari. (2019). Model Collaborative Governance dalam Pengurangan Risiko Bencana di Indonesia. Universitas Brawijaya.

Mahardika & Larasati. (2015). *Manajemen Bencana: Tinjauan Teoritis dan Praktis*. Yogyakarta: Pustaka Ilmiah.

Miles, M.B, Huberman, A.M, & Saldana, J. (2014). *Qualitative Data Analysis, A Methods Sourcebook*, Edition 3. USA: Sage Publications. Terjemahan Tjetjep Rohindi Rohidi, UI-Press.

Moleong. (2019). Metodologi Penelitian Kualitatif. Bandung : PT. Remaja Rosdakarya.

Muhammad Badri dkk. (2018). Sistem Komunikasi Peringatan Dini Pencegahan Karhutla di Provinsi Riau. https://www.neliti.com/publications/261034/sistem-komunikasi-peringatan-dini-pencegahan-kebakaran-hutan-dan-lahan-di-provin

Paisal Kumar. (2023). Ini 3 Strategi Pokok Satgas Menangani Karhutla di Jambi yang Diapresiasi Kasad Jenderal Dudung Abdurachman.https://www.Jambione.com/news/1362943043/ini-3-strategi-pokok-satgas-menangani-karhutla-di-Jambi-yang-diapresiasi-kasad-jenderal-dudung-abdurachman

Permana, R. (2018). *Manajemen Bencana: Teori dan Praktik*. Bandung: Mitra Cendekia.

Quah, E., (2002). Transboundary Pollution in Southeast Asia: The Indonesian Fires, *World Development, 30(3)*.

Rahmah, M., & Hamdi, M. (2022). Forest and Land Fire Control: Realizing The Policy Effectiveness. *Matra Pembaruan: Jurnal Inovasi Kebijakan*, *6*(1), 15–27. https://doi.org/10.21787/mp.6.1.2022.15-27

Rinaldi, Asmadi Saad, & Marwoto. (2023). Analisis Stakeholder dalam Pengendalian Kebakaran Hutan dan Lahan di Kabupaten Batang Hari Provinsi Jambi. *Jurnal Ilmiah Universitas Batanghari Jambi*. Vol.23(3). http://dx.doi.org/10.33087/jiubj.v23i3.4603

Rizwan, A. ., Hendarso, Y. ., Saptawan, A. ., & Damiri, N. . (2025). Model of collaborative for forest and land fire prevention and management in Ogan Komering Ilir regency South Sumatra Province Indonesia. *International Journal of Innovative Research and Scientific Studies*, *8*(5), 536–543. https://doi.org/10.53894/ijirss.v8i5.8764

Robbins, S. P. (2001). *Organizational Behavior (Edisi Bahasa Indonesia oleh Drs. Benyamin Molan)*. Jakarta: Prenhallindo. (Dikutip dalam Sutarto, E., & Wahyuni, S. (2017). *Efektivitas Organisasi Publik*. Yogyakarta: Gava Media.)

Robbins, S. P., & Coulter, M. (2018). *Management* (14th ed.). Pearson.

Roengtam, S., & Agustiyara, A. (2025). Assessing Collaborative Management Practices for Sustainable Forest Fire Governance in Indonesia. *Forests*, *16*(7), 1072. https://doi.org/10.3390/f16071072

Ruhl, Charlotte. (2024). *Broken Windows Theory of Criminology*. SimplyPschology. https://www.simplypsychology.org/broken-windows-theory.html

Sarwono, J. 2006. Metode Penelitian Kuantitatif dan Kualitiatif. Graha Ilmu. Yogyakarta.

Selvia Rahmah & Ikhsan. (2022). "Manajemen Bencana Dalam Penanganan Pasca Bencana BPBD Kabupaten Aceh Barat." *Journal of Social Politics and Governance* (JSPG), Vol. 4 No. 1, Juni 2022, hlm. 24–37. DOI:10.24076/JSPG.2022v4i1.776.

Shukree, A S C M., Arshad, M M., Ismail, I A., & Alias, S N. (2020). Sustainabiility of Non-Profit Organisations; Organizational Development Process Model. International Journal of Academic Research in Business and Social Sciences, 10(16), 299-306. https://doi.org/10.6007/ijarbss/v10-i16/8313

Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Tan, A. K. J. (2015). *The Haze Crisis in Southeast Asia: Assessing Singapore's Transboundary Haze Pollution Act*. National University Of Singapore Working Paper.

Tay, S. (1998). South East Asian forest fires: haze over ASEAN and international environmental law. Reciel, 7(2), 202-208.

United Nations Development Programme (UNDP) (2019). *Human Development Report 2019: Beyond Income, Beyond Averages, Beyond Today*, New York: UNDP.

United Nations Office for Disaster Risk Reduction (UNDRR) (2020). *Global Assessment Report on Disaster Risk Reduction*.

Yahaya, N. (2000). Transboundary Air Pollution: Haze Pollution in Southeast Asia and its Significance. Journal of Diplomacy and Foreign Relations, 2(2), 41-50.

Yorri Harlyandra dan Kafa Abdallah Kafaa. (2021). Kolaborasi multi-stakeholder pada praktik corporate social responsibility dalam penanganan sampah di Desa Pengarengan Kabupaten Cirebon. Gulawentah: Jurnal Studi Sosial. Vol. 6, No. 1, Juni 2021, Hal 54-68