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First Responder's Standard Operating Procedure for Employing Drones to Expedite Insurance Claims

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Abstract

Drones offer cost-effective real-time data collection, payload delivery, and have accelerated various commercial, industrial, and recreational applications. They are commonly used for research, disease transmission monitoring, disaster site assessment, and biohazard monitoring. However, disaster victim insurance claims are hampered by insufficient cooperation between first responders, typically the Civil Defence Department, and the insurance industry. This paper proposes integrating drones into standard operating procedures for disaster victim identification by first responders. Improved collaboration between first responders and insurers can expedite insurance claims, benefiting both parties and disaster victims. Insights are drawn from feedback provided by Civil Defence Department Malaysia's first responders and experienced forensic experts in search and rescue operations.

Keywords: *Takaful*; Insurance; First Responder; Claim;

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1.0 Introduction

Disaster and emergency response requires quick and efficient responses to ensure minimal casualties and aid for those affected (Fischinger, 2018). Advances in drone technology offer the potential for low-cost, real-time data collection, payload delivery, and surveying emergency sites (Smalley et al., 2017). The primary objective of this conceptual paper is to evaluate how integrating drone technology in first responder standard operating procedures can expedite the insurance claims process. This encompasses analyzing the feedback from Malaysia's Civil Defense Department and forensic experts, addressing potential benefits and challenges.

In order to evaluate the effectiveness of drone employment for first responders during a disaster, data has been collected and analyzed through interviews with experts in the fields of disaster and emergency response, *takaful* associations, drone technology, and

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the insurance industry (England et al., 2019). These interviews have been conducted to gain a better understanding of the way in which first responders use drones and the ways in which the insurance sector can collaborate with first responders to expedite the filing of insurance claims for disaster victims (Basin et al., 2018).

Several further concerns need to be addressed in this area of research, such as who would be permitted to use drones for disaster response—government agencies, non-governmental organisations, or private companies—and how they would be taught to fly drones in such circumstances (England et al., 2019). Additionally, would there be a general coordinator of drones in a specific crisis, and how would these drone operators interact with one another when working in proximity in a post-disaster context (Fischinger, 2018)? Additionally, how will disaster management personnel acquire the skills necessary to correctly interpret the data and pictures from drone flights and incorporate that data into their evaluations and decision-making (Lopes, 2019)? How would drone work with current disaster management procedures (Smalley et al., 2017)? What should the approval procedure be for host nation governments to permit foreign drones to enter their countries and be operated in their jurisdiction if the disaster response is in a foreign country (Basin et al., 2018)?

2.0 The Use of Drone by the First Responder

Drones have the potential to improve operations in a variety of industries, including disaster management, transportation, agriculture, and conservation (Lopes, 2019). Disaster managers, transportation planners, farmers, and others with an interest in drones must make sure that as the Federal Aviation Administration (FAA) creates regulations and guidelines for drone use, these regulations address public concerns about safety and privacy while also taking into account the unique requirements and capabilities of drones (Smalley et al., 2017). In the creation and implementation of rules and regulations, it is crucial to consider factors like land use, the degree of urbanisation, and development, as well as vehicle characteristics like size, weight, flying height, and cargo (Fischinger, 2018). In order to accelerate the development of drone technology, sensors, and capabilities during disasters, drone operators must collaborate with the first responders, forensics, researchers, and developers (Basin et al., 2018). In addition, to incorporate this crucial technology into current practises and processes and to develop new rules, policies, guidelines, procedures, and best practices, a wide range of stakeholders must collaborate (England et al., 2019).

Drones are also being used in agriculture, disaster relief, and other economic sectors (Smalley et al., 2017); however, more drone usage needs to be implemented in first responder standard operating procedures. Governmental bodies, researchers, technology businesses, and other parties are developing and testing new drone technology features such as navigation systems, sensors, cameras, software, and other drone instruments (Fischinger, 2018). While some government agencies are experiencing difficulty integrating unmanned aircraft systems into the airspace, others are encouraging and supporting the development of novel drone uses (Lopes, 2019). Comprehensive advice, as well as sector-specific plans, must be developed to enable a safe and orderly change of airspace for drones (Basin et al., 2018; England et al., 2019), particularly in view of its use by the first responder.

2.1 First Responder, Insurance and Takaful Operator Collaboration

First responders are individuals who are among the first to arrive and provide assistance at the scene of an emergency, such as an accident, natural disaster, or terrorist attack. This group typically includes paramedics, emergency medical technicians, police officers, firefighters, rescuers, and other trained members of organizations connected with this type of work. (Federal Emergency Management Agency, 2019).

Takaful is a system that offers risk protection based on Islamic principles (based on Shariah), which sets it apart from traditional insurance by avoiding factors like gambling, uncertainty, and *riba* that Islam prohibits. Life insurance showed only a 5.2% growth, and general insurance experienced a 1.8% contraction in the first half of 2017, compared to family and general *takaful* businesses that expanded by 7.5% and 5.9%, respectively (Zainul, 2018). *Takaful* operators, their agents, and policyholders themselves (in the form of investment returns) have all benefited greatly from the growth in family and general *takaful* business. However, there are problems with this industry's claim management procedure.

For the protection of policyholders (participants) of *takaful* operators, claim handling is a critical concern. Policyholder claims must be handled quickly because the *takaful* business depends on it. Although the time frame may be extended in the event of a disaster if many people are involved, the *takaful* operators must check the facts and evaluate the claims within 14 days for each of the stages. This must be fixed so that *takaful* operators can quickly aid policyholders. So, for *takaful* operators, finishing the process by the deadline is a big priority.

In line with the social objectives of the existence of *takaful* operators, drone technology development has to be followed and encouraged (Lopes, 2019). Comprehending how drones can better assist disaster managers, first responders, forensics, *takaful* operators, and other parties involved in saving lives and lowering risks from technological and natural hazards is important in addition to comprehending drone capabilities and uses (Smalley et al., 2017). It is necessary to spread technology more widely and to share the laws, rules, and regulations that go with it (Fischinger, 2018). To guarantee that drones are utilized responsibly and safely, formal laws and regulations must be linked with industry-based best practices and policies (Basin et al., 2018). Concerns about safety, privacy, and appropriate use will probably grow as drones migrate from the military and amateurs into more common use (England et al., 2019).

2.2 Disaster Risk Management

In the context of disaster risk management, Disaster Victim Identification (DVI) is an essential process that bridges the gap between emergency responses and the initiation of insurance claims. The methodical approach of DVI ensures that victims of disasters are accurately identified, facilitating a smoother transition to the recovery phase. The integration of advanced technologies, particularly

drones, has revolutionized first responders' capabilities, enabling quicker site assessments and data collection (Aitken & Lunetta, 2020). Forensic practitioners play a pivotal role in the DVI process, contributing their expertise across various specialities such as pathology, odontology, and DNA analysis. This interdisciplinary approach ensures a comprehensive and reliable identification process, which is critical for the subsequent steps, including insurance claims processing (Brown & Smith, 2021). Insurance companies, on the other hand, rely heavily on accurate and timely information from disaster sites to expedite claims processing. The data collected through DVI processes and enhanced by drone technology can significantly reduce the time required to process claims, providing much-needed relief to disaster victims (Kumar & James (2020)). The collaboration between first responders, forensic experts, and insurance companies is crucial in the aftermath of a disaster. Effective communication and data sharing among these stakeholders is essential for a coordinated response, ensuring that the needs of the victims are addressed promptly and efficiently. (Thompson & Black, 2022). The challenges and complexities of DVI, as highlighted by recent studies, underscore the need for continuous improvement and adaptation in disaster management practices. By learning from past incidents and incorporating new technologies, stakeholders can enhance their response strategies, ultimately leading to better outcomes for disaster victims (Williams & Goodwin, 2021).

2.3 Disaster Risk Management Structure

The disaster risk management structure is designed to mitigate the impacts of disasters through coordinated efforts between various stakeholders, including first responders and insurance companies. First responders are at the forefront of disaster response, providing immediate aid and assessing the extent of the damage (Smith & Darcy, 2020). Effective communication and collaboration between first responders and insurance companies can significantly enhance disaster response and recovery efforts. By sharing information and resources, these entities can ensure that aid is delivered efficiently and that victims receive the support they need in a timely manner (Johnson & Thompson, 2021). The integration of technology and data analytics into the disaster risk management structure can further improve the coordination between first responders and insurance companies. Drones, for example, can be employed to collect real-time data from disaster zones, providing both parties with accurate and up-to-date information. (Green & Olshansky, 2021).

3.0 Methodology

This paper presents a portion of a larger research project funded by the Transdisciplinary Research Grant Scheme (TRGS) on the effects of drones on identifying disaster victims. The focus of this study, however, is on how to fasten the insurance claim by using the first responders' standard operating procedure for using drones.

This study uses a qualitative approach, namely a case study, to investigate this little-discussed topic, as suggested by Merriam and Grenier (2016) and Yin (2018). Thus, semi-structured interviews were conducted with the following key informants for this study: a first responder (who is a member of the Civil Defence Force Malaysia); a forensic expert who served as the previous Chief Department or Chief Services; and national advisors for the Ministry of Health Malaysia's Forensic Medicine Services.

Prior to the interview session, the interview questions were created and evaluated by subject matter experts with backgrounds in forensics and first responders. In order to ensure that the appropriate procedures are followed to avoid errors and ensure ethical conduct, the research protocol for this study has been designed and matched to the study's purpose. As a result, it will improve the interview questions' validity and reliability, which aids in achieving the study's goal, as suggested by Merriam and Tisdell (2016) and Bryman (2016). The utilisation of drones, insurance, first responders, and claims were all topics that were explored in the interview conversations. Thematic analysis, an approach for detecting, assessing, and reporting patterns or themes, was used to analyse the transcribed data. The first responder, forensics expert, and drone specialist were present during the interview sessions, which were organised during a drone simulation.

In a qualitative study, the saturation point is a crucial factor in deciding how many key informants are required to collect data or at what level of achievement. This is because, according to Merriam and Tisdell (2016), a single key informant can be adequate for a study if the "richness" of the data or information can achieve the research purpose. The saturation point will, however, be closely related to the research objective and depend on whether the study is for a PhD, research grant, or consultation, according to the perspectives of many qualitative gurus who have shared their perspectives on this (Blaikie & Priest, 2019; Guest et al., 2006). In other words, compared to PhD research, which is expected to demonstrate the validity of the study with at least 15 key informants to correlate with the lengthy nature of PhD research, consultation projects and research grants are subject to a specific time frame to complete the research.

The Transdisciplinary Research Grant Scheme (TRGS), which focuses on the effects of drones on disaster victim identification, is also a larger research effort that this study is a part of. Therefore, there are more than two crucial informants. Loss adjusters, actuaries from accounting experts, *maqasid* Shariah experts, *takaful* operators, senior management from the central bank and members from the Malaysian *Takaful* Association (MTA) were also included in the original key informants.

4.0 Findings and Discussions

4.1 Importance of Agency Collaboration

Agency collaboration emerged as a vital theme, with respondents emphasising the necessity of inter-agency coordination, especially during disasters. While a shared goal exists, aligning different agencies towards that objective can be challenging. Respondents advocated for government-backed Standard Operating Procedures (SOPs) as a mechanism for alignment. The Civil Defence

Department plays a pivotal role as the disaster secretariat. They often arrive first on the scene and coordinate with the Royal Malaysia Police. This role emphasises the need for a cohesive strategy and SOPs for the Civil Defence Department and other involved agencies. The Civil Defence Department employs a well-planned strategy of dispatching teams of 10-15 members. Backup teams are sent for extended operations, reflecting a thoughtful approach to manpower deployment.

Civil Defence Department has started incorporating drones and other high-tech equipment like Sonar into their operations. An ongoing training program to upskill individuals for drone operations indicates a significant move toward technological adoption. KPIs focus on rapid disaster response. Allowances for Civil Defence Department members vary; permanent staff are eligible for overtime, whereas volunteers depend entirely on such allowances, raising concerns about their long-term sustainability. For drones to function effectively across sectors, solid inter-agency collaboration is necessary. A unified drone unit involving various agencies could help streamline operations and enforce an SOP. Despite the numerous advantages drones offer, such as speed and accuracy in data collection, their adoption rate still needs to be higher. Challenges include the high perceived costs and the need for specific permits, particularly in sectors like *takaful*, where the technology is nascent.

Drones are tailored for specialised applications like border patrol and experimental autonomous flights. Collaborations with entities like the Royal Military Forces are helping to extend the drones' operational capabilities. Agencies like the National Disaster Management Agency (NADMA) play a vital role in policy formulation and coordination, if not in the direct purchase of drones, underscoring the growing acceptance and strategic importance of drones within governmental operations. Drones are increasingly being adopted for natural disaster management across sectors, including agriculture and *takaful*, albeit at varying degrees of maturity. Different types of drones are employed based on their specific functionalities. No-fly zones (NFZs) around critical infrastructure, such as airports, must be carefully considered in drone operations to avoid unauthorised entry into these zones. Drone operations require trained manpower, varying according to the mission context. Teams can range from first responders to specialised pilots and co-pilots for disaster victim identification. Adoption rates of drone technology are higher in other countries, which could serve as a model for accelerating adoption in Malaysia, particularly in emergency response and law enforcement sectors. While the Royal Malaysia Police have the financial capacity for drones, the actual use is limited due to manpower constraints and skill level, indicating a need for more comprehensive training programs.

4.2 Operational Infrastructure of Drone-Assisted SOP

The Civil Defence Department's operational infrastructure, anchored by the Operation Control Centre (PKOP), is robust and facilitates efficient emergency responses. District-level units like MERSK 999 aid in this multi-tiered coordination. Various agencies such as the Civil Defence Department, Royal Military Forces, and the Fire and Rescue Department of Malaysia frequently collaborate. There is an increasing trend towards using drones and other technologies to improve emergency responses, although trials are ongoing. Legal frameworks and SOPs guide first-responder operations, although rapid technological advances challenge these established norms, calling for updated SOPs. Financial disparities among volunteers and permanent staff, along with the high costs of implementing new technologies like drones, are significant challenges that must be addressed. The Royal Malaysia Police is often the Disaster Operation Commander and has begun integrating drones. However, there needs to be more operational expertise, leading to hesitancy among pilots and a reliance on external technical support.

Drones and other technologies are not just for surveillance but can be used for sanitising high-risk areas and assisting in disaster victim identification, thus providing safety and efficiency gains. This rescue group works closely with the Royal Malaysia Police and other agencies, providing specialised units free of charge, highlighting the importance of multi-stakeholder engagement in effective disaster response. One of the most salient points to emerge from the data analysis is the crucial role of inter-agency collaboration in disaster management. While agencies have a shared goal, aligning these entities proves challenging. SOPs backed by the government could serve as a mechanism to streamline collaborative efforts. The Civil Defence Department has a robust operational infrastructure, with a centralised Operation Control Centre coordinating with district-level units for efficient emergency response.

The Civil Defence Department acts as a disaster secretariat, often arriving first at the disaster scene. It is pivotal in decision-making and logistics, further underscoring the need for standardised agency procedures. Civil Defence Department demonstrates a well-thought-out deployment strategy, including backup teams, allowing for sustained operations over multiple days. Civil Defence Department has adopted drones into its operations, signalling its move towards technological sophistication. Talent training programs in drone operations further solidify this transition. While the Civil Defence Department aims for rapid disaster response, logistical and administrative challenges include the timely completion of forms. The allowance system also varies between permanent staff and volunteers, affecting the latter's long-term commitment. The staffing within the Civil Defence Department consists of permanent government employees and volunteers, with different financial arrangements affecting their sustainability.

4.3 Collaborative Networks in Disaster Response

Multi-agency collaboration involves key players like the Civil Defence Department, Royal Military Forces, the Fire and Rescue Department of Malaysia, and the Royal Malaysia Police, using advanced technologies like drones for enhanced coordination. Both the Civil Defence Department and Royal Military Forces are in the process of integrating drone technology for advanced disaster response capabilities. Legal norms guide the activities of first responders, but rapid technological advances are creating a need for updated SOPs. Despite existing systems, there are challenges, such as the need for better-coordinated SOPs and volunteers' financial limitations. First responders from various departments play critical roles in activities ranging from search and rescue to body transportation, guided by KPIs focused on swift actions. Technological adoption aims to enhance the safety and efficacy of disaster response activities, including using drones for sanitising high-risk areas. The Royal Malaysia Police are often the first to respond to disaster sites and have the

authority in legal proceedings, indicating a centralised command structure. Adopting advanced technologies like drones brings significant financial considerations, particularly highlighted by the cost data related to American military drones. Royal Malaysia Police is the Disaster Operation Commander, ensuring a layered and organised emergency response mechanism. While the Royal Malaysia Police is integrating drones, there is a noticeable skill gap and hesitancy among new pilots to use this technology to its full extent, calling for more comprehensive training programs.

Rescue Bencana Malaysia collaborates closely with other agencies, offering their services free of charge, further emphasising the collaborative and non-commercial nature of disaster response. The Royal Malaysia Army is another critical first responder, providing logistical support and facilities in disaster situations. Their role highlights the multi-agency network essential for effective disaster management.

5.0 Conclusion

This conceptual paper focuses on the use of drones by the first responder, together with the potential issues and challenges that can be experienced by the first responder when they use drones. Thus, it protects the participants and properties from losses arising from perils such as accidents, fire, floods, and others. Likewise, *takaful* operators need sufficient time to investigate a financial claim before determining and disbursing the compensation. The use of drones by the first responder will expedite the identification process of the dead victims by the forensics department. Therefore, the victims' hirer can get the death certificate to claim from the *takaful* operators. *Takaful* operators can shorten the time taken for the overall claim process. Thus, looking at the potential use of drones by the first responder helps to fulfil the purpose of *takaful* from the Shariah perspective – mutual assistance. The principles of fairness, transparency, and social justice in *takaful* appeal to the very greatness of the human spirit. By being transparent, fair and smooth, *takaful* dealing will be considered in line with the objectives of shariah and its activities. The social benefits that the policyholders will receive by using drone technology show how *takaful* really works. By looking at the potential benefits of drones by the first responder, *takaful* operators are able to contribute better and assist their policyholders. In terms of limitation, this study focuses only on how the first responder's drone-assisted standard operating procedure can be used to speed up the insurance claim. However, it is important to note the views of other experts, such as the disaster experts. The importance of drone-assisted SOPs can also be studied by analysing data from NADMA representatives. Therefore, it is recommended that similar studies be conducted by interviewing other areas of expertise to get a more comprehensive understanding of the importance of drone-assisted SOPs to expedite insurance claims.

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Paper Contribution to Related Field of Study

To improve the lives of disaster victims, this article aims to emphasize how crucial it is for first responders to use drones as part of their routine standard operating procedure and to work with the insurance industry. Drones will be heavily utilized for every stage, beginning with disaster mitigation, disaster preparedness, disaster responses, and disaster recovery if drone-assisted DVI is used as part of disaster management action in Malaysia with participation from insurance companies and *takaful* operators, which can also be extended to other interested parties.

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