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SAFETY MANAGEMENT STUDY OF ADVENTURE TOURISM AT CURUG SERIBU, CURUG KENCANA, CURUG RAJAWALI,CURUG PAYUNG AND CURUG WALET : IN CIASIHAN TOURIST VILLA

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Abstract

Waterfall-based tourism has seen tremendous expansion across Indonesia, particularly in Bogor Regency's Ciasihan Tourist Village. The study investigated safety management practices at these sites using Heinrich's Domino Theory as our analytical framework to identify potential hazards. Through direct site visits and conversations with local officials, site operators, and residents, we collected comprehensive data about current safety conditions. The research revealed that safety oversight depends largely on traditional methods and personal knowledge rather than established safety frameworks. While operators recognize dangers from changing weather and attempt to manage crowd sizes, we discovered significant shortcomings: deteriorating facilities including unsafe bamboo handrails and hazardous walkways, lack of structured emergency protocols, absent warning signage, problematic insurance policies, and ambiguous authority between community managers and park administration. The results indicates these tourist areas must transition toward systematic safety management approaches.

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INTRODUCTION

In recent years, Indonesia has witnessed significant growth in the nature-based adventure tourism sector. This phenomenon reflects a global trend where tourists increasingly seek experiences that are not only challenging but also offer deep interactions with the natural environment. Ciasihan Tourist Village in Bogor Regency, West Java, has successfully positioned itself as a premier adventure tourism destination featuring four captivating waterfalls (curug)—Curug Seribu, Curug Kencana, Curug Rajawali, and Curug Walet.

Research conducted by Wiratama and Supriyanto (2022) reveals a 48% increase in the development of nature-based tourism villages in Indonesia during the 2020-2022 period, with waterfalls becoming the primary attraction. Nevertheless, findings by Pratiwi et al. (2023) indicate a concerning situation, where only approximately 32% of adventure tourism destinations in West Java implement safety protocols that comply with national standards for adventure tourism.

Nurhayati and Firdaus (2021) emphasize in their research that adventure tourism in waterfall areas carries significantly higher safety risks compared to other types of nature tourism. This is due to several risk factors such as elevated locations, strong water currents, potentially slippery surfaces, and high-risk activities like hiking, body rafting, and rock climbing that are typically offered in the areas surrounding waterfalls. An investigation by Saputra et al. (2024) in Ciasihan Tourist Village shows an imbalance between the surge in tourist visits, which reaches 37% annually, and the development of infrastructure and safety protocols that still lag behind.

In the context of adventure tourism safety studies, **Heinrich's Domino Theory** provides a relevant conceptual framework. This theory states that accidents result from a series of interrelated causes. If one "domino" or risk factor is eliminated, accidents can be prevented. Heinrich emphasizes the importance

of preventive measures. This concept is highly applicable in the context of adventure tourism safety management in waterfall areas, where identification and elimination of risk factors can significantly reduce the likelihood of accidents.

From the perspective of tourism village development, research by Gunawan and Hariyanto (2022) emphasizes the significance of a community-based approach in managing safety aspects of adventure tourism. This approach requires active involvement of local communities at every stage of safety system development, from planning and implementation to evaluation. Their research results across various nature tourism villages in West Java demonstrate that destinations with high levels of community participation in safety management successfully reduce accident rates by up to 45% compared to destinations managed with conventional approaches.

This research aims to analyze the implementation of safety management in adventure tourism activities at the four waterfalls located in Ciasihan Tourist Village, using the perspective of Heinrich's Domino Theory to identify and eliminate key risk factors. Additionally, this study aims to identify various operational challenges and constraints, as well as formulate strategies for developing sustainable and adaptive safety management systems, taking into account the specific characteristics of each waterfall and the environmental carrying capacity. The results of this study are projected to make a significant contribution to the formulation of a community-based adventure tourism safety management model that can be adapted by similar tourism villages throughout Indonesia.

METHOD

This research uses a qualitative descriptive approach. This research provides an accurate description and explanation of the conditions at hand.

Sugiyono (2020: 9) says that qualitative research methods are used to research on natural object conditions. The researcher is the main instrument in this research, the data collection technique used is triangulation (combined), data analysis is carried out inductively, and research results emphasize meaning rather than generalization. The data collection techniques used in the study include:

1. Field observation, which is carried out through direct observation of the research locus in Ciasihan Tourism Village. This observational process is directed specifically at identifying and evaluating various tourism assets that have the potential to be developed as adventure elements.

2. The interview technique used in this research is a semi-structured technique and is conducted to primary informants, namely the Village Head, Village Secretary, Head of RW, Head of RT, Head of tourist destination management, Waterfall manager, Head of Youth Organization. Unstructured interviews were also conducted with primary informants, namely the local community of Ciasihan village.

RESULTS AND DISCUSSION

Safety Management Systems at Five Waterfall Tourism Sites

The research looked at how safety management is carried out at Curug Seribu, Curug Payung, Curug Walet, Curug Kencana and Curug Rajawali. Data gathered from talks with experts and from observing activities in the field was used to evaluate safety infrastructure, risk management strategies, visitor rules and emergency procedures at each destination.

1.1 Safety Infrastructure Assessment

The results show that the safety infrastructure is not equal at all five sites. Representatives from the two sites said that work on infrastructure is taking place

in stages, with upgraded paths leading to Curug Rajawali and Kencana **seen in figure 1 and 2.** Even so, both sites are still challenged by a 10-meter staircase that needs frequent safety inspections, according to local staff.

In addition, Curug Seribu **seen in figure 5** must deal with more urgent safety concerns. People say that getting to the waterfall is difficult, since the path is steep and very mossy and the only handrails are bamboo that has aged. Because the paths are slippery during rain, these conditions are especially dangerous.

At Curug Payung and Curug Walet, **seen in Figures 3 and 4**, management has started to create emergency evacuation infrastructure, but it has only been done on a small scale. I, as one manager, explained, "I have just made a thirty-six meter path for the evacuation route." Besides, I put in a footbridge to help people avoid danger from higher water levels during bad weather." According to the manager, the cost of construction is the main reason these developments are not moving forward as quickly as possible. Up to now, I have handled this work on my own, without getting outside help.

The results indicate that most safety measures at these sites are set up in reaction to recent problems, not by planning ahead. In addition, major shortages of resources affect the effectiveness and quality of these efforts. It agrees with earlier work on adventure tourism in new destinations that finds that infrastructure does not always keep up with the increase in tourists **(Bentley et al., 2010).**

1.2 Weather Monitoring and Risk Management

The main way all five waterfall sites manage risk is through an informal approach to climate tracking. According to interview results, staff are very aware of possible weather dangers at work. In case it rains heavily, we ask all guests to leave the site. We send a message to the supervisors at the base as well as those

on-site if it's just light rain. If many people are visiting, we limit how many can enter because of worries about rising water and trees falling,"

The method admits that flash floods are a major danger at waterfall sites, a hazard regularly observed globally **(Wilks & Page, 2003)**. Even so, most of the way we monitor wildlife today relies on people observing it by hand, rather than using advanced methods or set guidelines. So, the success of the informal system depends on what each individual knows and understands which can create issues in weather emergencies or when staff change. Because risk assessment is not standardized at all sites, this creates a serious safety management issue, since risk evaluation is so important in adventure tourism **(Morgan & Fluker, 2003).**

1.3 Visitor Management and Capacity Controls

The research found that every site has its own approach to managing how many visitors enter at any one time. Curug Walet in particular is managed with strict limits on how many visitors at a given time. A spokesperson said that swimming is not allowed at Curug Walet due to its limited and narrow space. We allow up to fifteen to twenty visitors into the exhibition at once. Entry is allowed for guests only if another person is leaving at the same time."

Curug Seribu which is shown in **Figure 5,** relies on a safety zoning plan as well. Barriers and warning signs at this location keep people from entering areas where the water is too deep. These measures designed for capacity and zoning are meant to deal with and reduce the special dangers this area presents.

At the same time, the way these controls are applied changes from place to place and it seems that how a manager decides is more important than following established safety guidelines. Our research shows that visitor management usually responds to current developments, rather than following set policies. When lots of people visit, the team on site gives visitors instructions. If heavy rain hits, guests are all required to leave the park. During times of heavy

visitation or when an emergency happens, using a reactive approach may not be enough, so having planned procedures is needed **(Bentley & Page, 2008).**

1.4 Emergency Response and Insurance Coverage

It is clear from the five sites that emergency response strategies are not well established. Any time asked about procedures for handling incidents, respondents provided vague or uncertain replies such as "About the subject above, the PNBP is mentioned, but it remains unclear what the details are."

There were also clear problems with the availability of visitor insurance coverage, according to the study. "According to the managers, insurance can be purchased only at the entrance and not at the waterfall," they say. At other places, people had the same concern and someone even added: "Insurance, supervised by the PNBP, is available at the entrance below, but I do not believe it."

It looks like the uncertainty about insurance and emergency duties is caused by a poorly defined set of governance rules. This land forms part of the national park. National park regulations should explain how tickets and all related facility information are handled. Yet, here there is a noticeable gap in visitor safety because local staff and national park officials do not always coordinate well.

A major problem for safety management in the five locations is the lack of complete emergency response plans and sufficient insurance. This result echoes the findings of **Williams and Soutar (2005)**, who pointed out that being ready for emergencies is key to successful risk management in adventure tourism.

1.5 Accident History and Safety Information

Management has said during interviews that none of the five waterfall sites have ever had any accidents. According to one manager, "Has there ever been an accident at Curug Rajawali and Kencana?" Not at all, there hasn't. Even so, this

should be treated with care, as a lack of a standard method for reporting accidents may affect both the numbers and details recorded.

The research also found that both signs and safety information were lacking. You can notice this when you wonder if there are directions signs provided. Because directional signs aren't found here, only under the road below, it is clear the site is poorly guided. Because safety guidance is unclear, visitors who have not been there before may be more likely to face hazards. It has been shown that good signage and easy-to-find safety information change the way visitors perceive dangers and act at adventure tourism destinations **(Cater, 2006).**

1.6 Comparative Analysis of Safety Management Maturity

Based on the collected data, we can assess the **relative maturity of safety management** at these five waterfall locations:

- **Curug Kencana and Rajawali** show more developed infrastructure maintenance practices, but they **lack formal safety protocols and signage**.
- **Curug Payung and Curug Walet** demonstrate more advanced visitor capacity management and some development of evacuation infrastructure, although its scope is still limited.
- **Curug Seribu** presents the **most significant safety issues** with its deteriorating physical infrastructure, despite having some safety zoning measures in place.

This analysis reveals that **all five locations are still in the early stages of developing their safety management systems**, with a **heavy reliance on informal practices** rather than comprehensive safety frameworks. This finding is consistent with Buckley's (2010) observation that safety systems in adventure

tourism often evolve incrementally, moving from informal to more formal approaches as the destination matures.

Figure

Figure 1. Curug Kencana
Source: Field observation 2025

Curug Kencana is located in Ciasihan Village, Pamijahan District, Bogor Regency. The trekking path at this waterfall is fairly easy because it is not so extreme, only a little further than the Walet waterfall. Curug Kencana is also still lacking in safety management which is still lacking for directions and does not have insurance.

Figure 2. Curug Rajawali
Source: Field observation 2025

When we want to go to Curug Rajawali we will pass Curug Kencana where the two waterfalls are very close together, but to get to Curug Rajawali we have to pass a very steep staircase made of bamboo with steps that are only tread and mossy. At Curug Rajawali there are no people guarding around the waterfall and a sign of a safe limit for swimming.

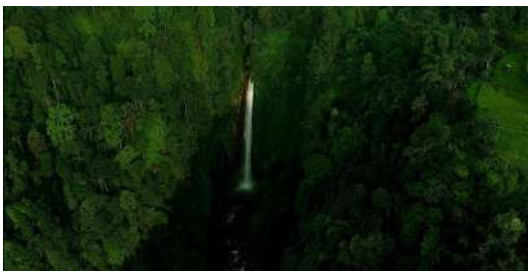
Figure 3. Curug Payung
Source: Field observation 2025

Curug Payung is closer than Curug Rajawali and Curug Kencana, but the path to Curug Payung is more difficult because it goes down quite a lot and high stairs. For Curug Payung, there is no insurance in case of an accident, however, there are people who are on guard and coordinate with the post guard if the weather is bad not to receive more tourists.

Figure 4. Curug Walet
Source: Field observation 2025

When heading to the Walet Waterfall, we pass the same path as the Payung Waterfall, where we have to go down and climb several stairs. To go to the Walet Waterfall, tourists are required to queue and wait for directions from the guard who is there, because the Walet Waterfall cannot be used for swimming and only for taking pictures. In the Walet Waterfall there are also already several people to guard and coordinate with several parties so that it is not too full.

Figure 5. Curug Seribu
Source: Field observation 2025



To get to Curug Seribu we have to trek with an estimate of 15 - 20 minutes and an estimate for returning back 40 minutes. Safety management at Curug Seribu is still lacking because access to Curug Seribu still passes through stairs made of stone and mossy soil, then for the staircase handrail is made of bamboo and is fragile so that it can be dangerous for tourists who come to visit. Curug Seribu also has people who guard there so that tourists do not just swim in dangerous areas.

CONCLUSION

This study concludes that safety management at the five waterfall tourist locations largely depends on informal systems and local knowledge, rather than structured safety protocols. Although the managers show awareness of key risks—especially those related to weather and visitor capacity limits—all locations lack formal emergency procedures, comprehensive safety infrastructure, and clear insurance coverage.

This research identifies several crucial areas that require improvement in safety management:

- Development of standard safety protocols and emergency response procedures.

- Improvement of physical safety infrastructure, particularly at Curug Seribu.
- Implementation of comprehensive safety signage and visitor information systems.
- Clarification of institutional responsibilities between local management and national park authorities.
- Development of formal visitor insurance systems.
- Creation of systematic maintenance inspection schedules.

This case study demonstrates that while adventure tourism at natural sites often begins with informal safety management approaches, the increase in visitor numbers demands more structured systems to ensure visitor safety. The transition from informal to formal safety management is a key challenge for the sustainable development of waterfall tourism in this region.

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