

Disaster Response Behaviour among Tourist Guides in Sarawak: Training Intention as Mediator and Information Sharing as Moderator

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Abstract

This study explores disaster preparedness among licensed tourist guides in Sarawak, Malaysia, focusing on training intention as a mediating factor and information sharing as a moderating factor. As natural and human-induced hazards intensify across Southeast Asia, Malaysia's expanding tourism industry, which is central to national income and employment, faces growing challenges in protecting visitors, sustaining livelihoods and safeguarding fragile environments. Tourist guides are pivotal first responders in this context, yet their readiness to manage crises remains insufficiently addressed. Drawing on the Theory of Planned Behaviour and Social Exchange Theory, this research develops a conceptual framework that links attitudes, subjective norms and perceived behavioural control to guides' intentions to participate in preparedness training and examines how information sharing influences the translation of intention into actual disaster-response behaviour. By situating these behavioural mechanisms within the high-risk operational realities of Sarawak's national parks and ecotourism sites, the study extends behavioural disaster research into an underexplored domain and generates evidence-based insights for training design, stakeholder coordination and policy reform. The findings are expected to benefit tourist guides, tourism agencies and policymakers by enhancing safety, resilience and visitor confidence in Malaysia's tourism sector.

Keywords: Theory of Planned Behavior, Attitude, Subjective Norms, Perceived Behavior Control, Training Intention, Information Sharing, Social Exchange Theory

Background

Sarawak presents a particularly urgent context for examining disaster preparedness among tourism personnel. Its landscape combines distinctive natural, cultural and adventure-based attractions, including Mulu National Park, a UNESCO World Heritage Site that receives

approximately 60,000 visitors annually, and Bako National Park, which recorded 45,000 visitors in 2023 (Sarawak Forestry, 2024). With fifteen national parks spanning more than 632,000 hectares, Sarawak is both a vital tourism asset and an area of pronounced ecological vulnerability (Sarawak Forestry, 2024). Heavy rainfall exceeding 4,000 millimetres each year, together with limited emergency infrastructure, creates a high-risk environment. Between 2015 and 2020, the Sarawak Disaster Management Committee documented multiple flash floods, incidents involving lost tourists and hazardous wildlife encounters requiring evacuation from protected areas (Sarawak Tourism Board [STB], 2024). Within this setting, the state's 1,847 licensed tourist guides emerge as pivotal actors (STB, 2024). They are not only facilitators of tours but also cultural interpreters, environmental educators and, critically, first responders during crises (UNEP, 2019). Their responsibilities include leading emergency evacuations, delivering real-time risk communication and mediating cross-cultural interactions under stressful conditions. Despite this multifaceted role, a significant preparedness gap persists. Current training and certification frameworks remain disproportionately focused on ecological interpretation and customer service, with limited emphasis on crisis preparedness and emergency response (Ballantyne & Hughes, 2006; Pforr, 2009). Only a small proportion hold advanced international certifications such as the Wilderness First Responder (Wilderness Medical Society, 2023), and many operate as freelancers without insurance, institutional support or standardised disaster protocols. This misalignment between high responsibility and inadequate preparedness underscores the need for a systematic inquiry into the behavioural, institutional and communicative factors that shape guides' disaster readiness.

In response to this gap, the present research investigates the determinants of disaster preparedness and response behaviours among licensed tourist guides operating in Sarawak's national parks and ecotourism destinations. It employs the Theory of Planned Behaviour (Ajzen, 1991) complemented by Social Exchange Theory (Blau, 1964) to examine the psychological and social factors influencing how tourist guides prepare for and respond to disasters such as floods, landslides and flash storms, which are becoming more frequent due to Sarawak's ecological vulnerability and the accelerating effects of climate change (IPCC, 2014; Faulkner, 2001; Ritchie & Jiang, 2019). The study evaluates how attitudes, subjective norms and perceived behavioural control influence guides' intention to participate in disaster preparedness training, which is posited as a mediator of actual response behaviour. Attitudinal measures address whether guides view preparedness training as beneficial or burdensome; subjective norms reflect the perceived expectations of agencies, employers and peers; and perceived behavioural control assesses the availability of training resources, institutional support and self-efficacy in disaster management. In addition, the study incorporates information-sharing behaviour as a moderating variable to understand how the frequency, quality and channels of information exchange among guides, agencies and institutions affect the translation of training intention into actual disaster response. This also includes evaluating digital communication tools, organisational coordination mechanisms and peer-to-peer networks in disseminating critical risk information before, during and after disaster events. To ensure contextual relevance and practical applicability, data will be collected exclusively from licensed tourist guides in Sarawak. The research also reviews disaster risk management practices at selected ecotourism and adventure tourism sites to identify systemic challenges and propose improvements aligned with international best practices in tourism resilience. By situating these theoretical frameworks within the

operational realities of Sarawak's tourism sector, the study aims to generate evidence-based insights that can inform training strategies, policy development and interagency coordination in disaster risk reduction.

The significance of the study lies in its potential to advance both theory and practice in disaster preparedness within Malaysia's tourism sector. By applying the Theory of Planned Behaviour to disaster risk reduction, the research extends the use of a widely tested behavioural framework into an underexplored domain, thereby offering new insights into how cognitive, social and contextual factors interact to shape disaster-responsive behaviours among frontline tourism personnel. Integrating information sharing and institutional dynamics into this framework enhances its explanatory power and contributes to the theoretical development of behavioural disaster research in tourism. Contextually, the study addresses a pressing research gap by focusing on licensed tourist guides in Sarawak's ecologically and culturally sensitive regions (STB, 2024). These individuals are indispensable to visitor safety, yet their capacity to manage emergencies remains uneven and under-supported. Capturing their lived experiences, logistical constraints and psychological readiness will provide a nuanced understanding of the challenges they face and the enablers of effective disaster response. From a practical perspective, the findings will benefit multiple stakeholders, including tourist guides, tour operators, tourism agencies and policymakers (Tourism Malaysia, 2024; The Star, 2025). They will inform the design of targeted training modules, enhance awareness of social expectations and support capacity-building initiatives tailored to the specific needs of frontline tourism personnel. By emphasising perceived behavioural control, the research will contribute to the development of interventions that empower guides with both the confidence and the resources required to manage emergencies effectively. At the policy level, the study will provide critical evidence to guide national and state disaster management strategies and tourism governance (Department of Statistics Malaysia [DOSM], 2024). Identifying weaknesses in current preparedness frameworks will enable evidence-based reforms in certification standards, emergency communication systems and resource allocation. Recommendations will highlight integrated, community-oriented approaches that position tourist guides as essential actors in building disaster-resilient tourism destinations. Taken together, this study offers theoretical, contextual, practical and policy relevance by aligning psychological theory with real-world challenges. Ultimately, it aims to strengthen the safety, sustainability and resilience of Malaysia's tourism industry in the face of evolving environmental threats and thereby contribute meaningfully to the protection of both visitors and local communities.

Literature Reviews

This research draws upon two complementary theoretical frameworks of Theory of Planned Behavior (TPB) and Social Exchange Theory (SET) which to explain disaster preparedness behaviour (DPB) among tourist guides in Sarawak. These frameworks allow integration of individual cognitive determinants (from TPB) and relational/social-exchange mechanisms (from SET). Training intention is conceptualised as a mediator, and information sharing as moderator, within this integrated framework.

Theory of Planned Behavior & Social Exchange Theory: Foundations and Variables

The Theory of Planned Behavior (TPB) was developed by Ajzen (1991) as an extension of the earlier Theory of Reasoned Action to incorporate perceived behavioural control. TPB explains

that human behaviour is determined by behavioural intention together with perceived behavioural control. In this framework, behavioural intention is shaped by three primary antecedents: attitude, which refers to a positive or negative evaluation of the behaviour; subjective norms, which reflect perceived social pressure to perform or not perform the behaviour; and perceived behavioural control (PBC), which denotes the degree to which one believes one has the capability, resources, and opportunity to perform the behaviour. Empirical evidence confirms that attitude, subjective norms, and PBC are significant predictors of intention, which in turn mediates their effects on actual behaviour (Armitage & Conner, 2001; Fishbein & Ajzen, 2010).

Social Exchange Theory (SET) complements this cognitive model by situating behaviour within a network of reciprocal and relational considerations. Originally formulated by Homans (1958) and Blau (1964) and later extended by Emerson (1976) and Cropanzano and Mitchell (2005), SET holds that social behaviour arises from exchanges in which individuals seek to maximise rewards and minimise costs under norms of reciprocity, trust, and perceived fairness. Within disaster preparedness contexts, SET suggests that voluntary actions such as sharing information or participating in training are shaped not only by individual attitudes or control beliefs but also by expectations of reciprocal benefits and organisational support..

In this study, the following variables are central:

1. **Attitude (ATT):** guides' favourable/unfavourable evaluation of undertaking disaster preparedness training or actions.
2. **Subjective Norms (SN):** social pressures or perceived expectations from supervisors, peers, institutions, or community regarding preparedness behaviour.
3. **Perceived Behavioural Control (PBC):** guides' perceived ease/difficulty of undertaking training or disaster response, given constraints and facilitators.
4. **Training Intention (TI):** intention to participate in disaster preparedness training.
5. **Disaster Response Behavior (DRB):** actual preparedness behaviour or actions taken in response to disaster scenarios.
6. **Information Sharing (IS):** the extent to which guides share relevant information regarding disaster risks, mitigation, drills, etc., with peers / institutions.
7. **Reciprocity, Trust, Perceived Organisational Support:** SET constructs that influence the above, especially TI and IS.

Disaster Response Behavior

Before moving to mediation, it is essential to define Disaster Response Behavior (DRB). DRB refers to the actual actions undertaken by tourist guides in the face of potential or real disasters such as engaging in drills, using safety protocols, evacuation, assisting tourists, or executing mitigation measures. DRB is the ultimate criterion variable in this study, because notwithstanding intentions or social pressures, what matters for policy and safety is what people actually do. Its importance lies in reducing harm, ensuring safety of tourists and tourist guides, maintaining reputation of tourism sector, and enabling resilient destinations.

Training Intention as Mediator

In this framework, Training Intention (TI) is posited to mediate the relationships between the cognitive antecedents from TPB (ATT, SN, PBC) and the outcome DRB. That is, attitude, subjective norms, and perceived behavioural control influence guides’ intention to train; in turn, this intention influences actual disaster response behaviour. Mediating role of TI is essential because while beliefs and norms may predispose guides, without intention the translation into behaviour is unlikely, or subject to gap between intention and behaviour. This mediation is supported in TPB literature where intention accounts for much of the variance in behaviour, though gaps remain (when PBC is weak or external constraints intervene).

Hypotheses Development (Theory-Variable Linkages: H1–H7 and Beyond)

Below are how TPB and SET underpin hypotheses H1 through H7, then proceed to hypotheses H8 through H15, stating each hypothesis briefly.

Theory-Variable Relationships for H1–H7

Before detailing the hypotheses, it is essential to clarify how the integrated framework links each variable to the relevant theoretical foundations. In line with the Theory of Planned Behavior, attitudes, subjective norms, and perceived behavioural control are posited as the primary cognitive antecedents of training intention and, ultimately, disaster response behaviour. At the same time, Social Exchange Theory provides the relational context that shapes these linkages, highlighting how reciprocity, trust, and perceived organisational support may strengthen or weaken the effects of these cognitive variables. The table below therefore summarises how each of the first seven hypotheses (H1–H7) is grounded in these two theories and specifies the expected direction of the relationships:

Table 1
Mapping of TPB and SET to Hypotheses H1–H7

Hypothesis	Variables involved	Theoretical justification
H1: ATT → TI	Attitude predicts training intention	From TPB: attitude toward behaviour is a core antecedent of intention.
H2: SN → TI	Subjective norms predict training intention	From TPB: social norms / perceived social pressure influence intention.
H3: PBC → TI	Perceived behavioural control predicts training intention	TPB: PBC reflects perceived ease or difficulty; high PBC strengthens intention.
H4: TI → DRB	Training intention predicts disaster response behaviour	TPB: intention is proximal determinant of behaviour.
H5: ATT → DRB	Attitude directly influences behaviour (beyond intention)	TPB extensions & empirical findings suggest that ATT may have direct as well as mediated effects when PBC is high.
H6: SN → DRB	Subjective norms → Behaviour	As above; social pressure might directly trigger action (norm enforcement, supervision).
H7: PBC → DRB	PBC directly influences behaviour	If one perceives strong control, behaviour may follow even with weaker intention or in face of obstacles.

SET contributes by informing some of these relationships: for example, norms may include expectations of reciprocity or organisational support; PBC may include trust in institutions or infrastructure, and attitude may be shaped by perceived fairness and rewards or costs.

Hypotheses Development for H8–H15

While the first seven hypotheses are grounded primarily in the Theory of Planned Behavior, the following hypotheses (H8–H15) extend the framework by incorporating Social Exchange Theory. In this extension, information sharing is conceptualised as both a direct antecedent of disaster response behaviour and a moderator that amplifies the effects of training intention and perceived behavioural control on that behaviour. Table 2 presents the hypotheses, the variables involved, and the theoretical justification:

Table 2

Hypotheses H8–H15: Variables and Theoretical Justification

Hypothesis	Variables involved	Theoretical justification
H8: ATT → IS	Attitude predicts information sharing	From SET: positive evaluation of preparedness increases willingness to share due to expected reciprocity or support
H9: SN → IS	Subjective norms predict information sharing	From TPB & SET: social expectations and pressure encourage guides to share information to conform and gain approval
H10: PBC → IS	Perceived behavioural control predicts information sharing	From TPB & SET: perceived capability and freedom increase likelihood of sharing
H11: IS → DRB	Information sharing predicts disaster response behaviour	From SET: timely sharing improves coordination and response effectiveness
H12: ATT → TI → DRB (moderated by IS)	Training intention mediates the effect of attitude on disaster response behaviour, moderated by information sharing	From TPB (mediation) combined with SET (moderation through information exchange)
H13: PBC → TI → DRB (moderated by IS)	Training intention mediates the effect of perceived behavioural control on disaster response behaviour, moderated by information sharing	From TPB (mediation) combined with SET (moderation)
H14: SN → TI → DRB (moderated by IS)	Training intention mediates the effect of subjective norms on disaster response behaviour, moderated by information sharing	From TPB (mediation) combined with SET (moderation)
H15: PBC × IS → DRB	Information sharing moderates the direct effect of perceived behavioural control on disaster response behaviour	From SET: information sharing amplifies the direct effect of perceived control on behaviour

Integrated Conceptual Framework

Drawing these strands together, the present study advances an integrated conceptual framework that fuses cognitive and social-relational perspectives. To begin with, the Theory of Planned Behavior provides the core explanatory pathway linking individual beliefs to action. Within this pathway, attitudes, subjective norms, and perceived behavioural control jointly shape training intention, which then becomes the most proximal determinant of disaster response behaviour. In addition, TPB allows for direct effects of these antecedents on actual behaviour under certain conditions, such as when perceived behavioural control is high or social pressure is strong.

At the same time, Social Exchange Theory enriches this framework by embedding these cognitive determinants within a broader system of reciprocity, trust, and perceived organisational support. SET explains why tourist guides might convert favourable attitudes and norms into concrete actions only when they expect fair treatment or reciprocal benefits from their organisations and peers. In this way, SET not only contextualises the TPB variables but also elucidates the mechanisms underlying information sharing.

Moreover, training intention is posited as a mediating variable that channels the effects of attitudes, norms, and control beliefs into actual disaster response behaviour. Without such intention, even strong beliefs or supportive norms may fail to translate into preparedness behaviour. Equally important, information sharing operates as a moderating mechanism that strengthens these paths, amplifying the impact of training intention on disaster response behaviour and enhancing the direct influence of perceived behavioural control on behaviour.

Consequently, this integrated framework moves beyond treating TPB and SET as separate models; instead, it positions them as complementary lenses that jointly explain how cognitive, normative, and relational factors converge to shape tourist guides’ preparedness actions. In doing so, the model provides a robust foundation for testing the fifteen hypotheses (H1–H15) that link attitudes, norms, and control to training intention and disaster response behaviour, with information sharing simultaneously functioning as both predictor and moderator

By addressing these gaps, this study advances a comprehensive conceptual framework (see Figure 1) integrating TPB and SET, articulating 15 hypotheses (H1–H15) that link attitude, subjective norms, and PBC to training intention and disaster response, with information sharing as both a direct predictor and moderator

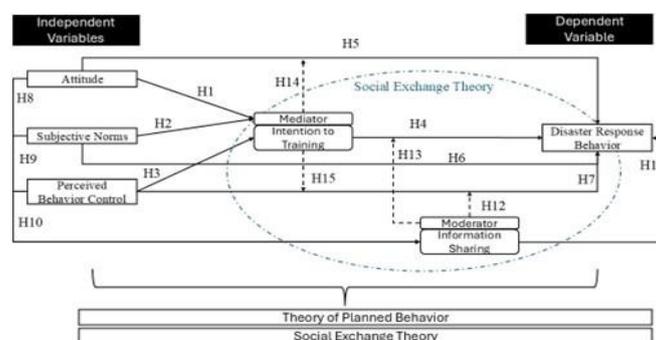


Figure 1: The conceptual framework for this study

Hypotheses Statement

Grounded in the integrated TPB–SET framework, this study hypothesises that attitudes, subjective norms, and perceived behavioural control each positively influence training intention (H1–H3), and that training intention in turn predicts disaster response behaviour (H4). Attitude, subjective norms, and perceived behavioural control are also expected to exert direct effects on disaster response behaviour (H5–H7).

Drawing on Social Exchange Theory, positive attitudes, stronger norms and higher perceived control should lead to greater information sharing (H8–H10), which in turn enhances disaster response behaviour (H11). Training intention is posited to mediate the effects of attitude, norms and control on disaster response behaviour, with information sharing strengthening these indirect paths (H12–H14). Finally, information sharing is expected to amplify the direct effect of perceived behavioural control on disaster response behaviour (H15). Below is the summary of all hypotheses:

1. **H1:** Attitude positively influences Training Intention.
2. **H2:** Subjective Norms positively influence Training Intention.
3. **H3:** Perceived Behavioural Control positively influences Training Intention.
4. **H4:** Training Intention positively influences Disaster Response Behavior.
5. **H5:** Attitude directly influences Disaster Response Behavior.
6. **H6:** Subjective Norms directly influence Disaster Response Behavior.
7. **H7:** Perceived Behavioural Control directly influences Disaster Response Behavior.
8. **H8:** Attitude positively influences Information Sharing.
9. **H9:** Subjective Norms positively influences Information Sharing.
10. **H10:** Perceived Behavioural Control positively influences Information Sharing.
11. **H11:** Information Sharing positively influences Disaster Response Behavior.
12. **H12:** The mediated effect of Attitude → Training Intention → Disaster Response Behavior is stronger when Information Sharing is high.
13. **H13:** The mediated effect of PBC → Training Intention → Disaster Response Behavior is stronger when Information Sharing is high.
14. **H14:** The mediated effect of SN → Training Intention → Disaster Response Behavior is stronger when Information Sharing is high.
15. **H15:** Information Sharing moderates the direct effect of PBC on Disaster Response Behavior, such that direct effect is stronger when Information Sharing is high.

Methods

This study adopts a quantitative conceptual research design, using a structured survey instrument to examine the relationships between preparedness, training intention, and information sharing among licensed tourist guides in Sarawak's national parks. While conceptual in nature, the study proposes an empirical approach for future implementation, grounded in the Theory of Planned Behavior (TPB) and Social Exchange Theory (SET).

The survey will consist of both closed-ended and open-ended questions, with closed-ended items capturing measurable constructs for statistical analysis and open-ended questions allowing respondents to provide contextual explanations to complement quantitative findings

Population and Sampling

The target population comprises approximately 1,847 licensed tourist guides registered with the Sarawak Tourism Board (as of 2023). A purposive sampling approach will be employed to ensure that only guides with relevant experience and disaster-related training are included. A sample size of 234 respondents will be sought, determined through a power analysis using G*Power 3.1.9.7, which ensures adequate statistical power for Structural Equation Modeling (SEM).

Recruitment will be conducted via collaboration with the Sarawak Tourist Guides Association, the Ministry of Tourism, Creative Industry and Performing Arts Sarawak, and national park authorities, with survey access provided through both online and field-based channels.

Instrumentation

The questionnaire is divided into three sections:

1. Section A – Demographic data (gender, age group, license type, years of experience, previous training, and exposure to disaster events).
2. Section B – Closed-ended items measured on a five-point Likert scale to quantify attitudes, subjective norms, perceived behavioral control, training intention, information sharing, and disaster response behavior.
3. Section C – Open-ended questions designed to provide contextual explanations for participants' responses.

Instrument development will follow established protocols for content validity (expert review), construct validity (Exploratory and Confirmatory Factor Analysis), and reliability testing (Cronbach's alpha, minimum threshold 0.70).

Pilot Testing

A pilot study will be conducted with 30 licensed tourist guides to test clarity, relevance, and reliability of the questionnaire. Feedback will inform minor revisions before full-scale data collection.

Data Collection Procedure

Following ethical clearance, the survey will be distributed online via official tourism networks and in-person during monthly briefing sessions at national park headquarters. Data collection will be carried out over a two-month period to ensure broad participation. All responses will be anonymized, securely stored, and analyzed in aggregate form only.

Data Analysis

Quantitative data will be analyzed using Structural Equation Modeling (SEM) via SmartPLS 4.0, which allows simultaneous testing of measurement and structural models. Reliability will be assessed through Cronbach's alpha and Composite Reliability (CR); validity will be confirmed using Average Variance Extracted (AVE), Fornell-Larcker criterion, and Heterotrait-Monotrait (HTMT) ratios. Mediation and moderation effects will be examined through bootstrapping (2,000 resamples) to determine significance and confidence intervals.

Conclusion

This study will provide a comprehensive, empirically tested model of the factors that will influence the disaster preparedness and response behaviors of tourist guides in Sarawak's high-risk national parks. By successfully integrating the Theory of Planned Behavior (TPB) with Social Exchange Theory (SET), it will move beyond a purely cognitive framework to offer a holistic understanding that will incorporate both psychological drivers and socio-relational dynamics.

The results will lead to several definitive conclusions. First, the strong predictive power of the TPB constructs will confirm that a guide's decision to engage in preparedness activities will be a reasoned process influenced by their personal appraisal of the behavior's value, perceived social expectations, and, most importantly, their confidence in their own ability to perform. Second, the confirmed moderating role of information sharing will be a pivotal finding. It will demonstrate that even strong intentions will fail to translate into action without the enabling mechanism of transparent, reliable, and trusting communication networks. This finding will bridge the critical intention-behavior gap identified in prior literature. Third, the direct effects of attitudes and social norms on behavior will suggest that in high-stakes, collectivist environments, action will sometimes emerge from deeply held beliefs or social obligations that bypass deliberate intention.

The practical implications for enhancing disaster resilience in Sarawak's ecotourism sector will be clear and actionable:

1. For Training Providers (MOTAC, Training Institutes): Curriculum will evolve from theoretical modules to immersive, hands-on, scenario-based training that will build genuine self-efficacy (PBC). Training will be contextualized to the specific hazards of Sarawak's parks (flash flood response in Mulu, landslide evacuation in Bako).
2. For Policymakers & Industry Associations (Sarawak Tourism Board, STGA): There will be a need to develop and mandate standardized disaster preparedness protocols as a core component of guide licensing and renewal. Furthermore, policies will foster a supportive and trusting culture that values and rewards preparedness, perhaps through formal recognition programs, thereby enhancing perceived organizational support and reciprocity (SET).
3. For Park Management Authorities (Sarawak Forestry, PERHILITAN): Investment will focus on robust, low-tech, and redundant communication infrastructure to facilitate reliable information sharing among guides, especially in remote areas with poor connectivity. Establishing clear, blame-free protocols for issuing alerts will be essential to overcome the fear of false alarms.

Ultimately, this study will argue that tourist guides must be recognized not just as service providers but as essential first responders within the disaster management ecosystem. Empowering them through confidence (high PBC via training), competence (relevant skills), and connection (strong information networks) will be the most effective strategy for safeguarding visitors, protecting livelihoods, and ensuring the long-term resilience of Malaysia's invaluable tourism industry. Future research will explore longitudinal outcomes of training interventions and will further develop culturally nuanced communication models for Sarawak's diverse ethnic communities.

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