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DO YOU TRUST OUR PUBLIC PROTECTION? EXPLORING ITS MODERATING EFFECT IN THE RELATIONSHIP BETWEEN PERCEIVED SUSCEPTIBILITY AND FLOOD PREPAREDNESS INTENTION

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Abstract: Frequent flooding in Malaysia has resulted in substantial human casualties and property damage. Pahang, situated on East Coast Peninsular Malaysia, is highly susceptible to significant flood events, especially during the monsoon season. Increasing awareness of the susceptibility to catastrophes has been observed to have a positive influence on individuals' inclination to acquire knowledge and understanding of disaster preparedness, thereby reducing their vulnerability to such events. This research investigated the correlation between perceived susceptibility, flood preparedness intention, and trust in public protection among a sample of 200 residents from the state. The proposed model underwent testing through the application of the structural equation modelling technique, specifically the partial least squares method. The findings revealed a positive relationship between perceived susceptibility and flood preparedness intention, and this relationship weakened with higher levels of trust in public protection. This study aims to contribute to the body of knowledge regarding flood preparedness in Malaysia, particularly in Pahang. Furthermore, this study is anticipated to assist policymakers in formulating specific policies to help individuals deal with flood situations.

Keywords: Disaster risk reduction, flood preparedness intention, perceived susceptibility, sustainability, trust in public protection.

Introduction

Floods represent one of the most pervasive and destructive natural disasters experienced worldwide. However, addressing the challenges posed by floods extends beyond traditional disaster response efforts; it necessitates a holistic approach that integrates principles of sustainability. Uitto and Shaw (2016) contended that the concept of sustainable development and disaster risk reduction, especially in disaster preparedness activities, are highly interrelated. Dua (2024) argued that promoting sustainable livelihoods is crucial, especially in areas prone to disasters such as floods.

Most of the states in Malaysia are prone to flood risk due to the natural physical topography and drainage, as well as human geography of settlement and land use (Safiah Yusmah *et al*., 2020). Arymugam *et al*. (2024) stated that the northeast monsoon, which lasts from November to March, is the wettest time of the year for most of Malaysia's states, including Pahang. According to Zahid *et al*. (2017), Pahang has the highest population vulnerability to flooding. The United Nations Office for Disaster Risk Reduction (UNDRR) emphasises that the sensitivity of individuals and economic assets to loss and damage is equally as important as the scale of the disaster itself in determining disaster risk (Gumasing *et al*., 2022).

Although flood-prone areas in many developed countries have been extensively documented, Akukwe and Ogbodo (2015)

argued that research into flood susceptibility remains inadequate in developing countries. To mitigate the impact of future floods, it is crucial to investigate the relationship between the perception of susceptibility and the intention to take preventive measures. Addressing the challenges of flooding requires a multifaceted approach, especially flood preparedness (Ridzuan *et al*., 2024). Pinelli *et al*. (2009) and Smith *et al*. (2015) found that reducing exposure to natural hazards could be achieved by promoting protective behaviours at the individual level. Cognitive dissonance theory offers insight into how individuals seek to harmonise their beliefs concerning flood vulnerability, their trust in public protection agencies, and their intentions for flood preparedness. When cognitive dissonance causes discomfort, it serves as a driving force for individuals to engage in actions that harmonise with their beliefs, reduce disparities, and relieve psychological unease. The presence of trust in public protection agencies introduces an additional dimension of intricacy to this relationship, as it has the potential to either strengthen or diminish the necessity for individual preparedness intention. Additionally, Dillon and Phillips (2001) emphasised the significance of trust in authorities as a factor influencing community action, which justifies its inclusion here. It is a common belief that individuals' perceptions of flood risk have been reduced due to widespread public flood protection, discouraging them from preparing for future flood disasters (Terpstra *et al*., 2009). However, these assumptions have yet to be substantiated (Terpstra, 2011). Hence, this study attempts to examine the relationship between perceived susceptibility and flood preparedness intention. Besides that, this study also intends to examine the moderating effect of trust in public protection on the relationship between perceived susceptibility and flood preparedness intention.

The significance of the study lies in its utilisation of cognitive dissonance theory to investigate the interplay between trust in public protection, perceived susceptibility, and flood preparedness intention. By exploring how individuals' trust in public authorities moderates the relationship between their perception of susceptibility to flooding and their intention to prepare for such events, the study offers valuable insights into the psychological mechanisms underlying disaster preparedness behaviours. Understanding these dynamics can inform the development of more effective strategies for promoting flood preparedness initiatives, ultimately contributing to the enhancement of community resilience and reduction of vulnerability to flood-related risks.

Literature Review

Theoretical Background

One of the key concepts in social psychology is Festinger's theory of cognitive dissonance (Jones, 1985), which posits that individuals strive for harmony between their beliefs and actions (Dwivedi *et al*., 2018). This theory is built upon the fundamental premise that people naturally seek consistency, and when they encounter inconsistencies, they often make efforts to rationalise them to alleviate their psychological discomfort (Festinger, 1957). Following this perspective, individuals encounter a sense of dissonance when they perceive a mismatch between their attitudes and behaviours. This approach underscores the importance of maintaining consistency between one's beliefs and actions (Dwivedi *et al*., 2018). Festinger, who initially introduced the concept of cognitive dissonance in 1957, contended that people strongly favour harmony, or congruence, and actively steer clear of discord. According to the theory of cognitive dissonance, individuals seek to avoid any conflict between their convictions and their actions. For instance, if someone believes they are highly susceptible to flooding but takes no preventive measures, cognitive dissonance may arise. Nevertheless, strong trust in public safety authorities can serve as a rationale for inaction, weakening the link between perceived vulnerability and the intention to prepare.

Perceived Susceptibility and Flood Preparedness Intention

Perceived vulnerability, as defined by Weber *et al*. (2018), pertains to the extent to which an individual expects a particular emergency to impact their vicinity within the upcoming year. Perceived susceptibility is the state of being susceptible to harm or risk from a particular hazard, as defined by Miller *et al*. (2013). Beliefs about one's susceptibility to the dangers of behaviour are known as perceived susceptibility (Hamilton *et al*., 2021). An individual's perceived susceptibility (sometimes termed vulnerability) is their estimation of how likely it is that they will be affected by a given danger or hazard (Ngo *et al*., 2020). Susceptibility, vulnerability, likelihood, and probability collectively describe the potential for an individual to experience mental, physical, or emotional harm due to a specific event or circumstance (Gerrard, 2020). As per the findings from multiple studies (Maloney *et al.*, 2011; Kanakis & McShane, 2016; Inal *et al.,* 2018), the primary factor influencing a person's level of preparedness is their perception of vulnerability.

A person's evaluation of their vulnerability to a particular threat depends on their perception of the likelihood of experiencing harm from the specific object or event in question (Rainear & Lin, 2021). Residing in an area prone to natural disasters increases an individual's exposure to the risks associated with such events (Kurata *et al*., 2022). Enhancing one's understanding of the susceptibility to disasters encourages people to engage more in disaster prevention efforts, consequently reducing their susceptibility to these disasters (Jeong & Yoon, 2018; Agrawal, 2018; Crowley, 2020).

People residing in flood-prone areas and low-lying regions face increased vulnerability due to a lack of warning systems and awareness (Williams *et al*., 2020; WHO, 2020). Given their susceptibility to the adverse impacts of flooding disasters, individuals are more motivated to adopt preventive measures to mitigate the potential consequences of such events (Kusumastuti *et al*., 2021). The perceived severity of a disease's consequences or the seriousness of the disease risk serves as a driving force for people to take action (Carpenter, 2010; Sheppard & Thomas, 2021). As emphasised by Ejeta *et al*. (2016), individuals must recognise their vulnerability to flood-related threats before they are inclined to prepare for them. This is corroborated by a study conducted by Masud *et al*. (2018), which found that perceived susceptibility positively and significantly influences the intention to engage in prevention measures, particularly concerning flood hazards in marine protected areas. Therefore, the hypothesis is as follows:

H_1: There is a positive relationship between perceived susceptibility and flood preparedness intention.

Trust in Public Protection – Moderating Variable

Under psychological theory, a causal relationship exists between an individual's awareness of danger and their inclination to take precautionary measures. However, empirical studies have yielded inconsistent outcomes regarding the positive connection between risk perception and protective behaviour (Scovell *et al*., 2022). Several prior investigations ((Lindell & Whitney, 2000; Siegrist & Gutscher, 2006; Bubeck & Botzen, 2013; Lindell, 2013) revealed conflicting associations between risk perception and readiness for natural disasters. To better comprehend the strength or weakness of the link between perceived susceptibility and the intention to prepare for flooding, it is essential to introduce a moderating variable, as past research has produced conflicting results. In this study, one such moderating factor under examination is trust in public protection (reliance on government safety provisions).

Trust in public protection refers to the assurance individuals have in the government's ability to safeguard against flood-related dangers (Han *et al*., 2016). Just as Willis *et al*. (2011) highlighted the significance of contextual

factors, such as confidence in government, in shaping preparedness behaviour, Kohn *et al*. (2011) underscored the intricate and multifaceted nature of these influences. Trust in disaster preparedness efforts is connected with evacuation behaviour (McCaughey *et al*., 2017). As suggested by Malesic (2019), trust is not merely an outcome but a driver of institutional success, rooted in the anticipated benefits from institutions' effective performance. Trust in institutions grows when they perform effectively and diminishes when they fall short (Mishler & Rose, 2001). In the context of risk, as defined by Löfstedt (2005), "trust in institutions" entails constituents accepting decisions without questioning their rationale. Establishing trust in crisis management institutions necessitates an understanding of their values, as asserted by Cvetkovich and Löfstedt (1999).

For disaster response to be effective, trust among all parties involved is crucial (Malesic, 2019). Krüger *et al*. (2015) observed that trust in authorities is a key factor influencing disaster preparedness intentions. In contrast, research conducted by Gammoh *et al*. (2023) revealed a negative relationship between trust in government institutions and the intention to prepare for floods among Jordanians. Higher levels of trust in public flood protection reduced people's perceptions of flood risk, which, in turn, decreased their intention to prepare for flood risk, as revealed in an analysis of trust mechanisms (Wang *et al*., 2022). Individuals who trust the government and other authorities may refrain from taking preventive measures against flooding because they believe the government will effectively manage the situation. Because of their significant level of trust, individuals may perceive less necessity for implementing preventive measures. The moral hazard that emerges when people have confidence in the government's crisis management capabilities implies that individuals with elevated levels of political trust, such as in Singapore, are more inclined to take risks and exhibit less caution when it comes to isolating themselves from others (Wachinger *et al.*, 2012; Wong & Jensen, 2020). Therefore, the hypothesis is as follows:

H_2: The positive relationship between perceived susceptibility and flood preparedness intention will be weaker when trust in public protection is higher.

Materials

Measurements

This study employed a questionnaire to collect data for empirically testing the hypotheses. The research used a modified version of the five-item, five-point Likert scale perceived susceptibility measure developed by Ejeta *et al*. (2016). A four-item trust in public protection assessment, originally introduced by Terpstra (2011), was adapted using a five-point Likert scale. Flood preparedness intentions were assessed using three items on a seven-point Likert scale. This measurement was adopted and adapted from Najafi *et al*. (2017) and Sai (2022). Various points on the Likert scale were utilised in this study to prevent the occurrence of common method bias (CMB). Podsakoff *et al*. (2003) stated that CMB occurs when the same individual answers both exogenous and endogenous variables simultaneously. They also suggest that researchers employ different scales, especially for exogenous and endogenous variables, to mitigate this issue.

The measurement scales in this study were primarily developed through a thorough review of the existing literature and subsequent adjustments made to suit the specific context in Malaysia, ensuring their reliability and validity. Participants in the survey were asked to indicate the extent to which they agreed with certain statements. Before the actual survey, a trial run of the questionnaire was conducted to ensure its comprehensibility and ease of use. Based on feedback from experts in the field, several questionnaire questions were revised and updated.

Sample

The state of Pahang in Malaysia was selected for this study because its residents face the highest flood risk in the country (Zahid *et al*., 2017).

The State Disaster Management Committee (2021), in its Report of Disaster Incidents Across the Country for the Year 2021, revealed that on the east coast, Pahang was the most adversely affected by floods, with the number of victims reaching 94,865 people with 21 deaths. The study's sample size was determined using the G*Power software. Following the recommendation by Gefen *et al*. (2011), considering three predictors, a medium effect size, and a power of 80%, the minimum required sample size is 76. This study obtained a sample of 200, exceeding the minimum requirement.

Data Collection

This research employed an online survey using Google Forms as the data collection tool. The use of Google Forms, a well-established survey platform, was chosen to ensure respondent privacy. Conducting surveys online offers advantages, such as cost and time savings, reduced data entry errors, and the ability to reach a larger respondent pool (Wang *et al*., 2019). Respondents could access the questionnaire through a provided URL. The participants were given assurance that their responses would remain anonymous to boost questionnaire response rates and encourage greater participation. To ensure inclusivity, the online survey was compatible with all major web browsers and devices. The survey was designed to be completed quickly, typically taking between 10 and 15 minutes.

Methodology

This study utilised structural equation modelling (SEM) to analyse survey data. SEM is a structural analysis method rooted in multivariate statistical analysis. This approach combines elements of factor analysis and multiple regression analysis to explore the cause-and-effect relationships between observable characteristics and latent traits. Researchers favour this method because it yields precise estimates of various interrelated factors within a single analysis and visually represents these relationships using causal models, path diagrams, and more. SEM is widely adopted in the field of social sciences. Haenlein and Kaplan (2004) categorised SEM into two distinct approaches: covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM). In this study, PLS-SEM was utilised for data analysis due to its reduced reliance on restrictive assumptions regarding variable distribution and error terms (Zhang, 2007). SEM comprises two core models: the measurement model and the structural model. The measurement model primarily focuses on elucidating the links between variables and their corresponding constructs. In contrast, the structural model emphasises the relationships among these constructs. In SmartPLS 4.0, measurement models were employed to assess the predictability and validity of variables, while structural models investigated the hypothesised connections between constructs.

Cronbach's alpha values and composite reliability (CR) were employed to assess the measurement model's consistency in this study, with both indicators having a cutoff of 0.7, as recommended by Fornell and Larcker (1981). Convergent validity was established by comparing the factor loadings of measurement items to the latent variables' Average Variance Extracted (AVE), where both the factor-loading value and AVE had a critical value of 0.5 (Fornell & Larcker, 1981) for evaluating measurement model validity. To assess discriminant validity, the Heterotrait-Monotrait (HTMT) ratio was selected (Henseler *et al*., 2015), with a value below 0.85 being preferrable, as suggested by Kline (2016).

Results

Descriptive Sample Information

Table 1 provides an overview of the gender distribution, ethnicity, educational attainment, and residential communities of the surveyed group. It shows that 71 individuals (35.5%) identified as male, while 129 individuals (64.5%) were female. In terms of ethnicity, the largest group (61.0%) identified as Malay, followed by 17.5% Chinese, 21.0% Indian, and 0.5% under the "others" category. Educational

Table 1: Demographic profile of the respondents

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	71	35.5
	Female	129	64.5
Ethnicity	Malay	122	61.0
	Chinese	35	17.5
	Indian	42	21.0
	Others	1	0.5
Highest Education	Schools	70	35.0
	Undergraduates	93	46.5
	Postgraduates	37	18.5
Types of community	Rural Community	40	20.0
	Sub-urban	59	29.5
	Urban	101	50.5

attainment ranged from 35.0% completing education up to the school level, 46.5% being undergraduates, and 18.5% holding postgraduate degrees. The data also revealed that 20.0% of respondents hailed from rural communities, 29.5% from suburban areas, and 50.5% from urban environments.

Common Method Bias

Podsakoff *et al*. (2003) stated that common method biases might occur when researchers use the same respondents to answer both the independent and dependent variables. This study involved the collection of data from a single source, where one individual responded to both the dependent and independent variables. This approach raised concerns about the potential for common method variance, prompting the application of both procedural and statistical techniques as discussed by Ngah *et al*. (2019). In terms of procedural technique, this study employed different scale endpoints for the endogenous variable (flood preparedness intention). A seven-point Likert scale was used for assessing flood preparedness intention, while a five-point Likert scale was employed for measuring both perceived susceptibility and trust in public protection. Additionally, statistical remedies, such as full collinearity (FC), were utilised to detect and control for any potential common method variance issues in this study. The outcomes of the FC analysis indicated that the perceived susceptibility, trust in public protection, and flood preparedness intention constructs all fell within the range of 1.125 to 1.363 (Table 2). These values were below the minimum threshold of 3.3 recommended by Kock (2015), affirming that FC did not present an issue in this study.

Table 2: Full collinearity assessment

Construct	TPP	SUC	INT
VIF	1.125	1.329	1.363

Note: TPP – Trust in public protection, SUC – Perceived susceptibility, INT – Flood preparedness intention.

Measurement Model

The scales employed in this study were adapted from existing measures within the field. Their adaptation was guided by the specific requirements and potential applications relevant to this research, resulting in these scales demonstrating good content validity. Tables 3 and 4 present the results of validity and reliability. Table 3 illustrates that all three latent variables exhibited composite reliabilities (CRs) exceeding 0.7, indicating a high degree of reliability. Additionally, both the average variance extracted (AVE) values for the latent variables and the factor loadings of the measured

Table 3: Convergent validity

Constructs	Items	Loading	CR	AVE
INT	INT1	0.936	0.949	0.862
	INT2	0.946		
	INT3	0.902		
SUC	SUC1	0.923	0.968	0.859
	SUC2	0.954		
	SUC3	0.945		
	SUC4	0.942		
	SUC5	0.867		
TPP	TPP1	0.869	0.945	0.812
	TPP2	0.934		
	TPP3	0.904		
	TPP4	0.896		

Note 1: TPP – Trust in public protection, SUC – Perceived susceptibility, INT – Flood preparedness intention
Note 2: CR – Composite reliability, AVE – Average variance extracted

items exceeded 0.5, providing supporting evidence for convergent validity.

Furthermore, Table 4 reveals that HTMT values ranged from 0.19 to 0.46, confirming that discriminant validity is established.

Table 4: Discriminant validity (HTMT)

	INT	SUC	TPP
INT			
SUC	0.463		
TPP	0.194	0.189	

Note: TPP – Trust in public protection, SUC – Perceived susceptibility, INT – Flood preparedness intention.

Structural Model

The assessment procedures for the structural model necessitate an initial examination of multicollinearity among the model's constructs. As per Garson (2016), the significance test of independent variables faces challenges associated with multicollinearity, which can elevate the error rate. To evaluate multicollinearity among the latent variables, this study utilised the variance inflation factor (VIF) in PLS-SEM. The VIF values in Tables 5 and 6 remained below the threshold of 3.3, as recommended by Hair *et al*. (2021). Consequently, it can be affirmed that multicollinearity does not affect the predictor variables within the structural model.

Direct-effect Analysis

Bootstrapping with 10,000 subsamples was performed to evaluate the significance of the structural model relationships using percentile bootstrapping to build confidence intervals (Sarstedt *et al*., 2023). H_1 hypothesised a positive relationship between perceived susceptibility and flood preparedness intention. The study's findings confirmed this relationship ($\beta = 0.509$, $t = 8.547$, $LL = 0.408$, $UL = 0.604$, $p < 0.005$), supporting H_1. Regarding effect size analysis (f^2), Cohen (1988) categorised it into three distinct levels: Small, medium, and large effect sizes when the f^2 values are 0.02, 0.15, and 0.35, respectively. Table 5 reveals that perceived susceptibility had a large effect on flood preparedness intention ($f^2 = 0.383$). This study also assessed the coefficient of determination (R^2). Cohen (1988) categorised an R^2 value of 0.26 or higher as substantial, an R^2 value of 0.13

Table 5: Direct path coefficient

	Relationship	Beta	SE	t-value	p-value	VIF	F^2	LL	UL
H1	SUC -> INT	0.509	0.060	8.547	0.000	1.034	0.383	0.408	0.604

Note 1: SUC – Perceived susceptibility, INT – Flood preparedness intention
Note 2: SE – Standard error, VIF – Variance inflation factor, LL – Lower limit, UL – Upper limit.

to < 0.26 as moderate and an R^2 value of 0.02 to < 0.13 as weak. Figure 1 depicts that the R^2 value of the model is 0.345 (substantial).

Moderation Effect Analysis

This study postulated that the positive relationship between perceived susceptibility and flood preparedness intention would be weaker when trust in public protection is higher. As shown in Table 6, the study's findings revealed that trust in public protection negatively moderated the relationship between perceived susceptibility and flood preparedness intention ($\beta = -0.262$, $t = 3.700$, LL = -0.361, UL = -0.134, $p < 0.005$). Hence, H2 was supported.

PLSpredict

Assessing predictive performance is a crucial aspect of any research project, as emphasised by Shmueli *et al*. (2019). To leverage predictive model assessment within PLS-SEM, Shmueli *et al*. (2016) introduced PLSpredict, a methodology based on holdout samples that provide predictions at the item or construct level. PLSpredict allows for the evaluation of a model's predictive capacity beyond the training dataset. This evaluation entails computing the PLS-linear regression model (LM) values for all items associated with each construct. Notably, the flood preparedness intention construct exhibited a strong predictive capability when root mean squared error (RMSE) values were compared against the naive LM benchmark (refer to Table 7).

Discussion

The first research objective of this study is to examine the relationship between perceived susceptibility and flood preparedness intention. The study's findings revealed a positive correlation between perceived susceptibility and flood preparedness intention. This finding is consistent with previous research by Weyrich *et al*. (2020), who observed that a higher public threat appraisal of flood risk corresponds to a greater intention to implement flood mitigation measures. Similarly, Wang *et al*. (2022) found that perceptions of flooding risk can significantly influence residents' preparedness intentions. Ejeta *et al*. (2016) have argued that residents' perceived susceptibility and the severity of the risk they perceive play crucial roles in

Table 6: Assessment of moderation analysis

	Relationship	Beta	SE	t-value	p-value	VIF	f^2	LL	UL
H2	TPP x SUC -> INT	-0.262	0.071	3.700	0.000	1.043	0.12	-0.361	-0.134

Note 1: TPP – Trust in public protection, SUC – Perceived susceptibility, INT – Flood preparedness intention
Note 2: SE – Standard error, VIF – Variance inflation factor, LL – Lower limit, UL – Upper limit

Table 7: Predictive power

	PLS-SEM_RMSE	LM_RMSE	PLS-LM	Q^2predict	Results
INT1	1.287	1.354	-0.067	0.239	High Predictive Power
INT2	1.247	1.337	-0.090	0.284	
INT3	1.161	1.280	-0.119	0.271	

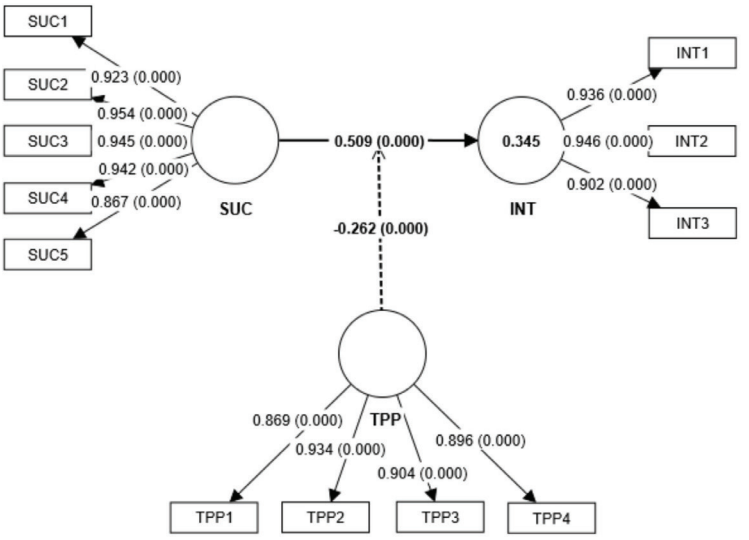

Figure 1: Research framework

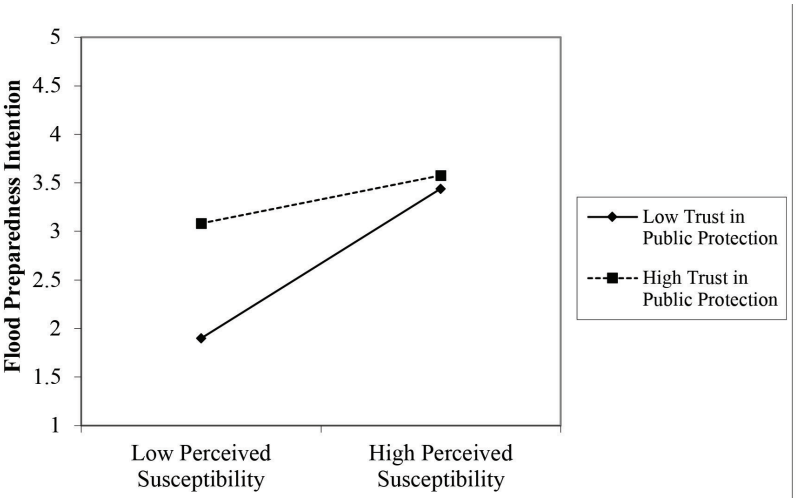

Figure 2: Dawson's plot: Trust in public protection moderating effect on perceived susceptibility → flood preparedness intention

their participation in community-oriented activities aimed at preventing and mitigating the consequences of flood hazards.

The second objective is to examine the moderating effect of trust in public protection on the relationship between perceived susceptibility and flood preparedness intention. The study observed that trust in public protection negatively moderates the association between perceived susceptibility and the intention to undertake flood preparedness measures. When individuals have higher confidence in the government's ability to ensure their safety, the positive connection between their perception of flood risk and their preparedness intention weakens. This aligns with prior studies (Terpstra, 2011; Wachinger *et al*., 2013; Buchanan *et al.,* 2019; Papagiannaki *et al*., 2019; Zhang *et al*., 2021; Wang *et al*., 2022).

As individuals residing in disaster-prone regions anticipate government assistance during natural calamities, they tend to engage

in fewer precautionary measures, as noted by Aliagha *et al*. (2015). Similarly, Bayer and Vári's (2003) found that most respondents believed that the government should bear the primary responsibility for their welfare in the event of a flood, advocating for equal compensation to all victims, regardless of their socioeconomic status. Drawing on survey data collected from a statistically significant sample of Greek households, Papagiannaki *et al*. (2019) illustrated that having trust in government efforts related to flood management has an adverse influence on flood anxiety, resulting in reduced levels of preparedness. According to Poussin *et al*. (2014), residents' reluctance to adopt preventive measures against flooding may be rooted in their confidence in public flood prevention programmes. Similarly, Zhang *et al*. (2021) found an inverse relationship between trust in public flood protection and citizens' perceptions of flood risk.

Citizens typically lack the specialised knowledge necessary to assess the uncertainties that lead to unforeseen outcomes, as highlighted by Terpstra (2011). The capacity to tolerate these uncertainties and maintain a relatively carefree attitude behind flood defences hinges on residents' trust in experts who have conducted in-depth studies on such matters, as observed by Earle and Cvetkovich (1995). Research conducted by Siegrist and Cvetkovich (2000) emphasised how trust simplifies complex situations. They suggest that people's risk assessments are influenced by their confidence in responsible risk managers, particularly in situations where individuals lack a comprehensive understanding of a hazard. In essence, individuals tend to perceive risks as less severe when they have greater trust in each other, and conversely, they take risks more seriously when trust is lacking. While individuals without technical expertise may not be equipped to assess the effectiveness of flood defences, they can estimate the likelihood of flooding based on their trust in these defences and their observations (Wang *et al*., 2022).

The implementation of flood barriers effectively reduces the likelihood of flooding. These flood defences, such as dikes or dams, are visibly integrated into the landscape and can offer insights into the quality of risk management practices. Additionally, people's assessments of the probability of flooding, representing a cognitive evaluation of flood risk, may also be predictable, as discussed by Terpstra (2011). For example, in Cologne, Germany, located approximately 175 km upstream from the Dutch border along the Rhine, Grothmann and Reusswig (2006) observed a similar correlation. Their study revealed that individuals with higher confidence in government flood protection were less susceptible to flooding and consequently took fewer precautionary measures. Terpstra (2011) hypothesised that residents might be less prepared for flood crises when they place significant trust in flood defences, as this can diminish their perceptions of flood danger, specifically their perceived susceptibility to flooding. In line with the findings of Kusumastuti *et al*. (2021), community-based knowledge serves to alleviate stress and anxiety among individuals susceptible to flood disasters, particularly those who are well-acquainted with the community's developed flood warning systems.

Nevertheless, Seebauer and Babcicky (2018) discovered that in France, individuals were more inclined to take precautions against flooding when they had confidence in the government's effectiveness in this regard. Conversely, studies (Terpstra, 2010; Health *et al*., 2017; Valkengoed & Steg, 2019) showed that a lack of trust in the government may diminish the sense of urgency to adopt preventive measures. Specifically, trust was found to alleviate concerns, subsequently reducing readiness (Papagiannaki *et al*., 2019).

Citizens often find themselves relying on their government's capacity to execute specific risk prevention measures or effectively manage disasters, as highlighted by Kellens *et al*. (2013). This observation can be partially explained by a study conducted in Texas, the United States, which revealed that greater trust in authorities' disaster response efforts resulted in reduced willingness among individuals to engage in

protective behaviours. This phenomenon occurred because people developed a dependency on authorities for protection, as noted by Heath *et al*. (2017). Similarly, research conducted in Greece demonstrated that individuals with higher levels of trust tend to perceive their protective actions as less significant when government intervention is involved, as indicated by Kievik *et al*. (2012).

Conclusions

The seriousness of climate change in recent times has prompted researchers worldwide to investigate the factors influencing citizens' engagement in disaster risk reduction activities. The frequent occurrence of floods in East Coast Peninsular Malaysia, particularly in Pahang, underscores the pressing need for comprehensive and sustainable flood management strategies aimed at mitigating flood impacts. The primary objective of this study was to establish a connection between perceived susceptibility and flood preparedness intention. Additionally, this study sought to explore the moderating impact of trust in public protection on the relationship between perceived susceptibility and flood preparedness intention. In summary, this study revealed a positive influence of perceived susceptibility on flood preparedness intention, while trust in public protection was found to negatively moderate the relationship between perceived susceptibility and flood preparedness intention.

From a theoretical perspective, this paper contributes to the existing body of research on disaster risk reduction in Pahang, Malaysia. Notably, it is the first study to investigate how trust in flood protection influences the connection between perceived susceptibility and flood preparedness intention. By applying cognitive dissonance theory, this model introduces a more nuanced dimension to prior investigations into Malaysians' responses to disasters. Cognitive dissonance theory sheds light on the interplay between individuals' perceptions of their vulnerability to flooding and their inclination to take preventive measures. When there is a mismatch between their beliefs and readiness to undertake preventive actions against flooding, especially in cases of high trust in public protection, individuals may experience discomfort. Gaining a deeper understanding of this cognitive process can prove invaluable in enhancing the preparedness of communities and individuals for floods.

The concept of perceived susceptibility emerges as a potentially influential factor affecting flood preparedness intention, drawing support from both existing literature and the findings presented in this study. These research findings hold value for both scholars and policymakers in Pahang, offering insights for improving preparedness and response to natural disasters. The study's recommendations advocate for the Pahang state government to initiate public awareness campaigns targeting residents in flood-prone regions. Elevating public awareness regarding flood protection and establishing effective communication channels between citizens and the government are deemed imperative.

To enhance the perception of flood hazards, the campaign should focus on past flood incidents and their consequences. Additionally, it should highlight the proactive measures taken by public protection agencies to safeguard communities, while emphasising the critical importance of flood preparedness. To help residents better understand their vulnerability, local flood risk information, such as flood hazard maps and flood-prone zones, should be readily accessible. The government can disseminate this information through websites, brochures, and community meetings. Government agencies must effectively communicate that disaster preparedness is a shared responsibility involving both the community and the government. This includes clearly defining the specific preparedness actions that citizens are accountable for. Policymakers can further strengthen the engagement between communities and public safety organisations by addressing the counterproductive moderating effect of trust on the link between perceived susceptibility and flood preparedness intention.

Ultimately, this can contribute to enhancing Pahang's preparedness and response capabilities in dealing with floods.

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Conflict of Interest Statement

The authors declare that they have no conflict of interest.

References

Agrawal, N. (2018). Disaster perceptions. *Natural Disasters and Risk Management in Canada*, 193-217. https://doi.org/10.1007/978-94-024-1283-3_5

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior Human Decision Processes, 50*(2), 179-211.

Akukwe, T. I., & Ogbodo, C. (2015). Spatial analysis of vulnerability to flooding in Port Harcourt Metropolis, Nigeria. *Sage Open*, *5*(1), 215824401557555. https://doi.org/10.1177/2158244015575558

Aliagha, G. U., Mar Iman, A. H., Ali, H. M., Kamaruddin, N., & Ali, K. N. (2015). Discriminant factors of flood insurance demand for flood-hit residential properties: A case for Malaysia. *Journal of Flood Risk Management, 8*(1), 39-51. https://doi.org/10.1111/jfr3.12065

Arumugam, A., Sigid, M. F., Ab Rahman, A., & Fadhullah, W. (2024). Land use changes and climate parameters assessments in a tropical highland region of Cameron Highlands, Malaysia. *Journal of Water and Climate Change*, jwc2024552.

Bubeck, P., & Botzen, W. J. W. (2013). Response to "The necessity for longitudinal studies in risk perception research". *Risk Analysis, 33*(5), 760-762. https://doi.org/10.1111/risa.12028.

Buchanan, M. K., Oppenheimer, M., & Parris, A. (2019). Values, bias, and stressors affect intentions to adapt to coastal flood risk: A case study from New York City. *Weather, Climate, and Society, 11*(4), 809-821. https://doi.org/10.1175/wcas-d-18-0082.1

Carpenter, C. J. (2010). A meta-analysis of the effectiveness of health belief model variables in predicting behavior. *Health Communication, 25*(8), 661-669. https://doi.org/10.1080/10410236.2010.521906

Crowley, J. (2021). Social vulnerability factors and reported post-disaster needs in the aftermath of hurricane florence. *International Journal of Disaster Risk Science, 12*, 13-23. https://doi.org/10.1007/s13753-020-00315-5.

Cvetkovich, G. (2013). *Social trust and the management of risk*. Routledge.

Dillon, J., & Phillips, M. (2001). *Social capital discussion paper* [Unpublished Manuscript].

Dua, P. (2024). Sustainable approaches to mitigating flood disasters in the River Yamuna. *Paritantra: Journal of Systems Science and Engineering*, 12.

Dwivedi, Y. K., Shareef, M. A., Mukerji, B., Rana, N. P., & Kapoor, K. K. (2018). Involvement in emergency supply chain for disaster management: A cognitive dissonance perspective. *International Journal of Production Research, 56*(21), 6758-6773. https://doi.org/10.1080/00207543.2017.1378958

Earle, T., & Cvetkovich, G. (1995). *Social trust: Toward a cosmopolitan society*. Greenwood Publishing Group.

Ejeta, L. T., Ardalan, A., Paton, D., & Yaseri, M. (2016). Predictors of community preparedness for flood in Dire-Dawa town, Eastern Ethiopia: Applying adapted version of Health Belief Model. *International Journal of Disaster Risk Reduction, 19*, 341-354. https://doi.org/10.1016/j.ijdrr.2016.09.005

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Gammoh, L. A., Dawson, I. G., & Katsikopoulos, K. (2023). How flood preparedness among Jordanian citizens is influenced by self-efficacy, sense of community, experience, communication, trust and training. *International Journal of Disaster Risk Reduction, 87*, 103585. https://doi.org/10.1016/j.ijdrr.2023.103585

Gefen, D., Rigdon, E. E., & Straub, D. (2011). Editor's comments: An update and extension to SEM guidelines for administrative and social science. *MIS Quarterly, 35*(2), iii-xiv.

Gerrard, M. (2020). Perceived vulnerability. Perceived vulnerability division of cancer control and population sciences (DCCPS). https://cancercontrol.cancer.gov/brp/research/constructs/perceived-vulnerability.

Grothmann, T., & Reusswig, F. (2006). People at risk of flooding: Why some residents take precautionary action while others do not. *Natural Hazards, 38*(1-2), 101-120. https://doi.org/10.1007/s11069-005-8604-6

Gumasing, M. J. J., Prasetyo, Y. T., Ong, A. K. S., & Nadlifatin, R. (2022). Determination of factors affecting the response efficacy of Filipinos under Typhoon Conson 2021 (Jolina): An extended protection motivation theory approach. *International Journal of Disaster Risk Reduction, 70*, 102759. https://doi.org/10.1016/j.ijdrr.2021.102759

Hamilton, K., Keech, J. J., Peden, A. E., & Hagger, M. S. (2021). Changing driver behavior during floods: Testing a novel e-health intervention using implementation imagery. *Safety Science, 136*, 105141. https://doi.org/10.1016/j.ssci.2020.105141

Han, Z., Lu, X., Hörhager, E. I., & Yan, J. (2016). The effects of trust in government on earth-quake survivors' risk perception and preparedness in China, *Natural Hazards, 86*, 437-452, https://doi.org/10.1007/s11069-016-2699-9.

Heath, R. L., Lee, J., Palenchar, M. J., & Lemon, L. L. (2018). Risk communication emergency response preparedness: Contextual assessment of the protective action decision model. *Risk Analysis, 38*(2), 333-344. https://doi.org/10.1111/risa.12845.

Inal, E., Altintas, K. H., & Dogan, N. (2018). The development of a general disaster preparedness belief scale using the health belief model as a theoretical framework. *International Journal of Assessment Tools in Education, 5*(1), 146-158. https://doi.org/10.21449/ijate.366825

Jawatankuasa Pengurusan Bencana Negeri. (2021). *Laporan kejadian bencana di seluruh negara bagi tahun 2021*. https://portalbencana.nadma.gov.my/ms/laporan

Jeong, S., & Yoon, D. K. (2018). Examining vulnerability factors to natural disasters with a spatial autoregressive model: The case of South Korea. *Sustainability, 10*(5), 1651. https://doi.org/10.3390/su10051651.

Jones, E. E. (1985). Major developments in social psychology during the past five decades. *Handbook of Social Psychology, 1*, 47-107.

Kanakis, K., & McShane, C. (2016). Preparing for disaster: Preparedness in a flood and cyclone prone community. *Australian Journal of Emergency Management, 31*(2), 18-24. https://doi/10.3316/informit. 330957279713745.

Kellens, W., Terpstra, T., & De Maeyer, P. (2013). Perception and communication of flood risks: A systematic review of empirical research. *Risk Analysis: An International Journal, 33*(1), 24-49. https://doi.org/10.1111/j.1539-6924.2012.01844.x.

Kievik, M., ter Huurne, E. F., & Gutteling, J. M. (2012). The action suited to the word? Use of the framework of risk information seeking to understand risk-related behaviors.

Journal of Risk Research, 15(2), 131-147. https://doi.org/10.1080/13669877.2011.601318

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1-10. https://doi.org/10.4018/ijec.201510010.

Krüger, F., Bankoff, G., Cannon, T., Orlowski, B., & Schipper, E. L. F. (Eds.). (2015). *Cultures and disasters: Understanding cultural framings in disaster risk reduction.* Routledge.

Kurata, Y. B., Prasetyo, Y. T., Ong, A. K. S., Nadlifatin, R., & Chuenyindee, T. (2022). Factors affecting perceived effectiveness of Typhoon Vamco (Ulysses) flood disaster response among Filipinos in Luzon, Philippines: An integration of protection motivation theory and extended theory of planned behavior. *International Journal of Disaster Risk Reduction, 67*, 102670. https://doi.org/10.1016/j.ijdrr.2021.102670

Kusumastuti, R. D., Arviansyah, A., Nurmala, N., & Wibowo, S. S. (2021). Knowledge management and natural disaster preparedness: A systematic literature review and a case study of East Lombok, Indonesia. *International Journal of Disaster Risk Reduction, 58*, 102223. https://doi.org/10.1016/j.ijdrr.2021.102223.

Lindell, M. K. (2013). North American cities at risk: Household responses to environmental hazards. In H. Joffe, T. Rossetto & J. Adams (Eds.), *Cities at risk: Living with perils i n the 21st century* (pp. 109-130). Netherlands: Springer.

Lindell, M. K., & Perry, R. W. (2000). Household adjustment to earthquake hazard: A review of research. *Environment and Behavior, 32*(4), 461-501. https://doi.org/10.1177/00139160021972621

Lofstedt, R. E. (2012). *Risk management in post-trust societies*. Routledge.

Malesic, M. (2019). The concept of trust in disasters: The Slovenian experience. *Disaster Prevention and Management: An International Journal, 28*(5), 603-615. https://doi.org/10.1108/dpm-11-2018-0375

Maloney, E. K., Lapinski, M. K., & Witte, K. (2011). Fear appeals and persuasion: A review and update of the extended parallel process model. *Social and Personality Psychology Compass, 5*(4), 206-219. https://doi.org/10.1111/j.1751-9004.2011.00341.x

Masud, M. M., Sackor, A. S., Alam, A. F., Al-Amin, A. Q., & Ghani, A. B. A. (2018). Community responses to flood risk management–An empirical investigation of the Marine Protected Areas (MPAs) in Malaysia. *Marine Policy, 97*, 119-126. https://doi.org/10.1016/j.marpol.2018.08.027

McCaughey, J. W., Mundir, I., Daly, P., Mahdi, S., & Patt, A. (2017). Trust and distrust of tsunami vertical evacuation buildings: Extending protection motivation theory to examine choices under social influence. *International Journal of Disaster Risk Reduction, 24*, 462-473. https://doi.org/10.1016/j.ijdrr.2017.06.016

Miller, C. H., Adame, B. J., & Moore, S. D. (2013). Vested interest theory and disaster preparedness. *Disasters, 37*(1), 1-27. https://doi.org/10.1111/j.1467-7717.2012.01290.x

Mishler, W., & Rose, R. (2001). What are the origins of political trust? Testing institutional and cultural theories in post-communist societies. *Comparative Political Studies, 34*(1), 30-62. https://doi.org/10.1177/0010414001034001002

Najafi, M., Ardalan, A., Akbarisari, A., Noorbala, A. A., & Elmi, H. (2017). The theory of planned behaviour and disaster preparedness. *PLoS Curr., 6*(1), 1-6. https://10.1371/currents.dis.4da18e0f1479bf6c0a94b29e0dbf4a72.

Ng, S. L. (2022). Effects of risk perception on disaster preparedness toward typhoons:

An application of the extended theory of planned behavior. *International Journal of Disaster Risk Science, 13*(1), 100-113. https://doi.org/10.1007/s13753-022-00398-2

Ngo, C. C., Poortvliet, P. M., & Feindt, P. H. (2020). Drivers of flood and climate change risk perceptions and intention to adapt: an explorative survey in coastal and delta Vietnam. *Journal of Risk Research, 23*(4), 424-446. https://doi.org/10.1080/13669877.2019.1591484

Papagiannaki, K., Kotroni, V., Lagouvardos, K., & Papagiannakis, G. (2019). How awareness and confidence affect flood-risk precautionary behavior of Greek citizens: The role of perceptual and emotional mechanisms. *Natural Hazards and Earth System Sciences, 19*(7), 1329-1346. https://doi.org/10.5194/nhess-19-1329-2019.

Pinelli, J.-P., Torkian, B. B., Gurley, K., Subramanian, C., & Hamid, S. (2009). *Cost effectiveness of hurricane mitigation measures for residential buildings*. Paper presented at the 11th America's Conference on Wind Engineering, San Juan, PR.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal Application Psycholology. 88*(5), 879-903. https://doi.org/10.1037/0021-9010.88.5.879

Poussin, J. K., Botzen, W. W., & Aerts, J. C. (2014). Factors of influence on flood damage mitigation behaviour by households. *Environmental Science & Policy, 40,* 69-77. https://doi.org/10.1016/j.envsci.2014.01.013, 2014.

Rainear, A. M., & Lin, C. A. (2021). Communication factors influencing flood-risk-mitigation motivation and intention among college students. *Weather, Climate, and Society, 13*(1), 125-135. https://doi.org/10.1175/wcas-d-20-0016.1

Ridzuan, M. R., Razali, J. R., Ju, S. Y., & Abd Rahman, N. A. S. (2024). That is not my house? Household renters' flood preparedness intention in the East Coast Region of Malaysia. *Journal of Integrated Disaster Risk Management, 14*(1), 1-26. https://doi.org/10.5595/001c.92758

Safiah Yusmah, M. Y., Bracken, L. J., Sahdan, Z., Norhaslina, H., Melasutra, M. D., Ghaffarianhoseini, A., ... & Shereen Farisha, A. S. (2020). Understanding urban flood vulnerability and resilience: A case study of Kuantan, Pahang, Malaysia. *Natural Hazards, 101*, 551-571. https://doi.org/10.1007/s11069-020-03885-1

Sai, L. N. (2022). Effects of risk perception on disaster preparedness toward typhoons: An application of the extended theory of planned behavior. *International Journal of Disaster Risk Science, 13*(1), 100-113. https://doi.org/10.1007/s13753-022-00398-2

Sarstedt, M., Hair Jr, J. F., & Ringle, C. M. (2023). "PLS-SEM: Indeed a silver bullet"–Retrospective observations and recent advances. *Journal of Marketing Theory and Practice, 31*(3), 261-275. https://doi.org/10.1080/10696679.2022.2056488.

Scovell, M., McShane, C., Swinbourne, A., & Smith, D. (2022). Rethinking risk perception and its importance for explaining natural hazard preparedness behavior. *Risk Analysis, 42*(3), 450-469. https://doi.org/10.1111/risa.13780

Seebauer, S., & Babcicky, P. (2018). Trust and the communication of flood risks: Comparing the roles of local governments, volunteers in emergency services, and neighbours. *Journal of Flood Risk Management, 11*(3), 305-316. https://doi.org/10.1111/jfr3.12313

Sheppard, J., & Thomas, C. B. (2021). Community pharmacists and communication in the time of COVID-19: Applying the health belief model. *Research in Social and Administrative Pharmacy, 17*(1), 1984-

1987. https://doi.org/10.1016/j.sapharm.2020.03.017

Siegrist, M., & Cvetkovich, G. (2000). Perception of hazards: The role of social trust and knowledge. *Risk Analysis, 20*(5), 713-720. https://doi.org/10.1111/0272-4332.205064

Siegrist, M., & Gutscher, H. (2006). Flooding risks: A comparison of lay people's perceptions and expert's assessments in Switzerland. *Risk Analysis, 26*(4), 971-979. https://doi.org/10.1111/j.1539-6924.2006.00792.x

Siegrist, M., Gutscher, H., & Earle, T. C. (2005). Perception of risk: The influence of general trust, and general confidence. *Journal of Risk Research, 8*(2), 145-156. https://doi.org/10.1080/1366987032000105315

Smith, D., Henderson, D., & Ginger, J. (2015). Cyclone resilience research: Phase 2. Suncorp Group. http://www.suncorpgroup.com.au/sites/default/files/pdf/news/Suncorp%20Report_Phase%20II_Final_21_07_2015.pdf.

Tan, K. L., Sia, J. K. M., & Tang, K. H. D. (2022). Examining students' behavior towards campus security preparedness exercise: The role of perceived risk within the theory of planned behavior. *Current Psychology, 41*(7), 4358-4367. https://doi.org/10.1007/s12144-020-00951-6.

Terpstra, T. (2010). *Flood preparedness: Thoughts, feelings and intentions of the Dutch Public* [Unpublished Doctoral Dissertation, University of Twente]. Enschede, Netherlands.

Terpstra, T. (2011). Emotions, trust, and perceived risk: Affective and cognitive routes to flood preparedness behavior. *Risk Analysis: An International Journal, 31*(10), 1658-1675. https://doi.org/10.1111/j.1539-6924.2011.01616.x

Terpstra, T., Lindell, M. K., & Gutteling, J. M. (2009). Does communicating (flood) risk affect (flood) risk perceptions? Results of a quasi-experimental study. *Risk Analysis: An International Journal, 29*(8), 1141-1155. https://doi.org/10.1111/j.1539-6924.2009.01252.x

Uitto, J. I., & Shaw, R. (2016). Sustainable development and disaster risk Reduction: Introduction. In *Sustainable development and disaster risk reduction: Disaster risk reduction* (pp. 1-12). Japan, Tokyo: Springer. https://link.springer.com/chapter/10.1007/978-4-431-55078-5_1

van Valkengoed, A. M., & Steg, L. (2019). Meta-analyses of factors motivating climate change adaptation behaviour. *Nature Climate Change, 9*(2), 158-163. https://doi.org/10.1038/s41558-018-0371-y.

Wachinger, G., Renn, O., Begg, C., & Kuhlicke, C. (2013). The risk perception paradox—Implications for governance and communication of natural hazards. *Risk Analysis, 33*(6), 1049-1065. https://doi.org/10.1111/j.1539-6924.2012.01942.x

Wang, T., Lu, Y., Liu, T., Zhang, Y., Yan, X., & Liu, Y. (2022). The determinants affecting the intention of urban residents to prepare for flood risk in China. *Natural Hazards and Earth System Sciences, 22*(6), 2185-2199. https://doi.org/10.5194/nhess-22-2185-2022

Weber, M. C., Schulenberg, S. E., & Lair, E. C. (2018). University employees' preparedness for natural hazards and incidents of mass violence: An application of the extended parallel process model. *International Journal of Disaster Risk Reduction, 31*, 1082-1091. https://doi.org/10.1016/j.ijdrr.2018.03.032

Weyrich, P., Mondino, E., Borga, M., Di Baldassarre, G., Patt, A., & Scolobig, A. (2020). A flood-risk-oriented, dynamic protection motivation framework to explain risk reduction behaviours. *Natural Hazards and Earth System Sciences, 20*(1), 287-298. https://doi.org/10.5194/nhess-20-287-2020,

WHO. (2020). Preparedness for cyclones, tropical storms, tornadoes, floods and earthquakes during the COVID-19 pandemic. *World Health Organisation*. https://www.who.int/publications/i/item/WHO-2019-nCoV-Advisory-Preparedness-2020.1.

Williams, L., Arguillas, M. J. B., & Arguillas, F. (2020). Major storms, rising tides, and wet feet: Adapting to flood risk in the Philippines. *International Journal of Disaster Risk Reduction, 50*, 101810. https://doi.org/10.1016/j.ijdrr.2020.101810.

Willis, K. F., Natalier, K., & Revie, M. (2011). Understanding risk, choice and amenity in an urban area at risk of flooding. *Housing Studies, 262*, 225-239. https://doi.org/10.1080/02673037.2011.549215

Wong, C. M. L., & Jensen, O. (2022). The paradox of trust: Perceived risk and public compliance during the COVID-19 pandemic in Singapore. *Journal of Risk Research 23*(7-8), 1021-1030. https://doi.org/10.1080/13669877.2020.1756386

Zahid, Z., Saharizan, N. S., Hamzah, P., Hussin, S. A. S., & Khairi, S. S. M. (2017, November). Multi-dimensional flood vulnerability assessment using data envelopment analysis. In *AIP Conference Proceedings* (Vol. 1905, No. 1). AIP Publishing.

Zhang, K., Parks-Stamm, E. J., Ji, Y., & Wang, H. (2021). Beyond Flood Preparedness: Effects of experience, trust, and perceived risk on preparation intentions and financial risk-taking in China. *Sustainability, 13*(24), 13625. https://doi.org/10.3390/su132413625.