

## THE EFFECTIVENESS OF POLICY, PLANNING, RISK ASSESMENT, DATA MANAGEMENT AND COMMUNICATION ON DISASTER PREPAREDNESS AMONG 8TH INFANTRY BRIGADE IN KELANTAN

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**Abstract:** Natural disasters are a common phenomenon in every country in the world. However, the differences between the impact on the devastation and victims depend on how the disaster is managed and how well preparedness is arranged by the agency responsible for dealing with disaster in helping the affected victims, either natural or unnatural disaster. Good disaster management will consider the authorities' functions until they had a good perception from the community or society. This study examines the relationship between policy, planning, risk analysis, and data management on disaster preparedness of Infantry Battalion personnel in the State of Kelantan in the 8th Infantry Brigade. The quantitative research method by distributing questionnaires was used to obtain feedback on 297 respondents who were sampled for this study. This study uses a questionnaire that contains several questions on policy, planning, risk management, data management, communication, and disaster preparedness. The data were analysed using Statistical Package for Social Science (SPSS) version 25 and Partial Least Squares (PLS) version 3.2.8. The dependent variables are the disaster preparedness of Infantry Battalion personnel in the 8th Infantry Brigade, while the independent variables are the policy, planning, risk analysis, and data management. The study's findings showed a significant relationship between all the independent variables on the disaster preparedness of the Eighth Brigade personnel. In such cases, it is recommended that the Malaysian Army should scrutinize and focus on exposure to all levels in the battalion regarding disaster management. Proposed approaches and improvements and confidence in performing and handling tasks are highly dependent on the experience and knowledge of personnel either formally or informally. Personnel who received more analysed exposure were more confident and contributed to the effectiveness of actions during the mobilization of disaster operations.

**Keywords:** Policy, planning, risk management, data management, disaster preparedness.

### 1. Introduction

Natural disasters are a common phenomenon in every country in the world. However, the differences between the impact on the devastation and victims depend on how the disaster is managed and how well preparedness is arranged by the agency responsible for dealing with disaster in helping the affected victims, either natural or unnatural disaster. This evidence is in line with Kaya et al. (2014), that good disaster management will consider the authorities' functions until they had a good perception from the community or society. From the beginning of its establishment until now, the role and duties of the Malaysian Armed Forces (MAF) in handling disasters had not changed, namely assisting public authorities when disaster situations occur and when requested to help, but physically, whether small or large disasters, the MAF is always on-site, and always at the front due to the responsibility on the social services toward the needs of the community.

Therefore, MAF are always the target of criticism pointing towards weaknesses and shortcomings. It is probably because the MAF is a highly protocolled body, which makes academic studies on disaster management in MAF organizations less implemented. Since the first human resource assets to be mobilized to deal with national disasters are from the Malaysian Army and then followed by the Royal Malaysian Air Forces and Royal Malaysian Navy. Generally, the human resources organized to deal with disaster missions are from Battalions Infantry, then this study targets personnel of the Infantry Battalion. As Kelantan is a state that is synonymous with flood disasters, not to mention having experienced major floods in 2014, and has been the target of great criticism, this study chose Kelantan as the study location, and the study sample focused on all Infantry Battalions in the State of Kelantan under the 8th Infantry Brigade.

The capability of a military force is also closely related to the assets or logistics it owns. Generally, logistics is responsible for providing material assistance and services needed by the armed forces either during war or peace. The management of Malaysian Army logistics assets includes managing Malaysian Army equipment such as armaments, communications, vehicles, office supplies and personnel equipment, and maintaining assets. Among

the critical corps in Malaysian Army logistics management are financial management and asset management, inventory, and material storage to Malaysian Army service branch. Among the crucial aspects that determine the effective management of Malaysian Army logistics are the procurement system, financial allocation, inventory holding, and assistance system must always be on standby at all times so that it is always ready to be moved at any time (ProfilKetenteraan, 2000). The logistical aspect is essential because it influences the success and failure of a military operation through resource support to the armed forces. However, in ensuring the successful role of logistics support, it also depends on maintaining (sustainability) logistics support in the long run. At this point, logistical support is through a joint force controlled by the MAF Headquarters in terms of planning and logistical support in MAF operations. The MAF headquarters is responsible for the planning, logistical support, strategy, or operational concept of the three services branches (Zuridan Muhammad, 2009).

In ensuring the success of this logistical support, MAF makes three primary sources to enable logistical support to be provided through; a) service support which is a single service by a combination of the three branches of services, b) national civil support involves support in terms of energy and public infrastructure to the MAF to be used by the military, c) international support is a source of support through security agreements and cooperation between Malaysia and other countries on the military aspect (Zuridan Muhammad, 2009). Some issues need to be addressed in the existing policy; the military management of all levels understands that Military personnel must be fully involved when a disaster emergency is declared, whereas it is never written in any part of the 20 MKN Instructions. In this case, MAF still requires neat planning to prepare for disaster action on a larger scale should it occur. The most important stage of Bn Inf is that if it is not fully prepared to manage the disaster in question, things may impact Malaysia when it happens in the future.

The issue of risk analysis and data management is still unsatisfactory, and Bn Inf is still unable to fully equip particular expertise and logistical equipment to deal with this situation. Canton (2007) argues that disaster could be well handled if careful planning considers all human resource planning and logistics requirements. He gave an example of careful planning when implemented, the catastrophe of "Hurricane Katrina" that hit the New Orleans on August 27, 2005, can be reduced. Bn Inf needs a good risk analysis and data management system for every operational move that involve its personnel. Skills in performing risk analysis are only disclosed to the government and senior officials in Bn Inf, and it is little exposure given to the officers and personnel at the implementing level.

## **2. Literature Reviews**

### **Social Cognitive Theory**

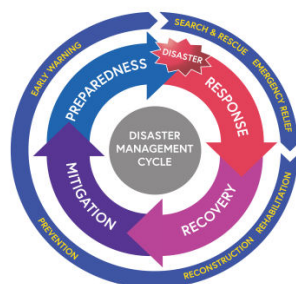
The initial planning covers all aspects of the response, including military personnel, police, firefighters and volunteers, equipment, unexpected issues, policy issues, and the relationship between the organization and the government. Moreover, disaster preparedness program planning is often equated with disaster response planning that focuses on risk reduction issues (Perry & Lindell, 2003). As noted by Kaya et al. (2014), identifying management planning before and after a disaster will aid preparation in terms of understanding hazard definition, risk analysis, activity planning, intervention measures, and management development. Therefore, the program planning process needs to be planned carefully and linking with preparation in such planning (Perry & Lindell, 2003).

These factors have been identified to have a positive effect on influencing individual behavior. According to Staples and Webster (2013), if an individual has high self-efficacy in action, they will do it more effectively. Through this self-assessment, individuals with high self-assessment intentions will feel more confident performing a task than individuals with low self-assessment intentions (Hsu et al., 2007). An individual with low self-assessment intentions will feel that he or she is unable to perform a task or action (Schunk, 1990). Every personnel of the military should have this self-assessment ingrained in them since they donned the uniform of the MAF.

In contrast to social cognitive theory, this theory is more cognitive, where the individual will evaluate in mind before implementing the action. Factors used in social cognitive theory, namely self-efficacy and expected outcomes, contribute to evaluating individuals action the greater the individual's evaluation of doing something, the higher his action of doing it. For example, individuals with high self-esteem will share information about themselves to help other individuals cope with disaster. As for the expected results, individuals will share information related to disasters in the hope of obtaining a result. Therefore, the social cognitive theory is a unified theory used to predict individual military personnel intentions in acting (Hsu et al., 2007).

## Disaster Management Cycle

The Disaster Management Cycle is a cycle with phases that will reduce the occurrence of disasters. This cycle was widely used to describe the overall activities that need to be implemented and steps needed before, during and after the disaster to prevent, reduce, and repair the damage.



**Figure 1:** Disaster Management Cycle Model (MKN, 2013)

This flood phenomenon is one of the natural events arranged by the Almighty Creator and must be borne by the people. Malaysia is also not apart from receiving floods during the monsoon season at the end of each year. Disaster Management is implemented according to the phase of the disaster incident. Each phase is acted upon according to the recommended actions. The prevention phase involves actions that aim to prevent, minimize risk and reduce the impact of disasters or hazards at a place or location. The preparedness phase includes planning and initial preparation to ensure the smooth management of a disaster. The implementation includes the preparation of policies, action plans, guidelines, infrastructure, and human resources. The Emergency Response Plan is the Disaster Management Plan and Disaster Preparedness and Response Center. Recovery and rehabilitation are the phases of post-disaster action that aims to restore and ensure the safety of the location involved in a disaster.

According to Isaac et al. (2014), most of the states in the country are not apart from receiving the threat of major floods, especially the states at the East Coast such as Kelantan, Terengganu, and Pahang, which are familiar with the phenomenon of floods during the monsoon season every year. This situation suggests that the states on the East Coast are synonymous with flood disasters (Tuan PahRokiah et al., 2014). The lack and inefficiency of major flood disaster management in the current and future phases should not be taken lightly. According to Omar (2015), this major flood left a massive impact on the population as it caused the destruction of property, not only houses but also agriculture, livestock, infrastructure facilities such as roads, railways, electricity, and telephones were also affected. Clean water supply is also in short supply. This incident also affected the mental and physical of the people affected by the floods. According to Warfield (2008), disaster management aims to reduce, or avoid potential losses from hazards, guarantee prompt assistance to disaster victims and achieve speedy and efficient recovery. In disaster management is also a process in which a coalition of specific parties such as government, and the general public plan to reduce the impact of a disaster, respond promptly to a disaster, and take steps to repair all damage and losses in the event of a disaster.

**H1:** There is a significant relationship between policy and disaster preparedness

**H2:** There is a significant relationship between planning and disaster preparedness

**H3:** There is a significant relationship between risk management and disaster preparedness

**H4:** There is a significant relationship between data management and disaster preparedness

**H5:** There is a significant relationship between Policy and disaster preparedness and communication as a mediating effect

**H6:** There is a significant relationship between planning with disaster preparedness and communication as a mediating effect

**H7:** There is a significant relationship between risk assessment with disaster preparedness and communication as a mediating effect

**H8:** There is a significant relationship between data management with disaster preparedness and communication as a mediating effect

### 3. Research Methodology

In this research, the quantitative research method is adopted to achieve the objectives of the study. In quantitative research, descriptive analysis was performed to determine the frequency, mean and mean, and other statistics to analyse the findings data, and correlation analysis is to determine the relationship between dependent

variables and independent variables. For the research design, a structured questionnaire survey study design was used to obtain data from the respondents. The population of this study is the personnel of 8th Bn Inf, Eighth Brigade, in the State of Kelantan; including the Royal Malay Regiment, Royal Ranger Regiment, and the Border Regiment where the personnel is or has been involved in disaster management in Kelantan comprising of a total of 297 officers and personnel, amounting to 0.32% of the total personnel of the MAF in the country. Self-administered questionnaires from previous validations were used to collect data from respondents. Disaster preparedness has five constructs: policy effectiveness, planning, risk analysis, data management, and communication covering 49 indicators. The questionnaire included 10 indicators measuring policy, 10 indicators measuring planning, 10 indicators measuring risk analysis, 9 indicators measuring data management, and 10 indicators measuring disaster preparedness. Respondents had to answer the questions by having a five-point Likert scale consisting of very disagree (1), disagree (2), not sure (3), agree (4) and strongly agree (5). Firstly, the researchers asked permission from the Inf Bn, Eighth Brigade for approval to conduct a survey of academic research at the unit for which they were selected, such as Royal Malay Regiment, and the Border Regiment in Kelantan. After obtaining feedback and consent, the researcher handed over the questionnaire to the respondents after briefing them on the topic and objectives of the study. Besides, respondents were assured of the confidentiality of their feedback to obtain more accurate results. After completing the questionnaire, the researchers collected the questionnaire personally. A total of 300 questionnaires were distributed, and only 297 sets of questionnaires were returned, showing a response rate of 99.0%. Statistical Package for the Social Sciences (SPSS) version 25 was used to obtain respondents' demographic data and SmartPLS version 3.2.8 to test the hypotheses of this study.

#### 4. Research Findings

Table 1 shows the demographic analysis of the respondents. For the distribution of respondents according to the regimen, the number of respondents from the Royal Malay Regiment (RMR) was 72.1% (N = 214) of respondents, and 27.9% (N = 83) of respondents is comprised of the Border Regiment (BR). Meanwhile, for the distribution of respondents according to rank, the number of respondents consisting of Officers is 6.1% (N = 18) respondents, and 93.9% (N = 279) respondents consisting of Other Ranks. In terms of the distribution of respondents according to the length of service, the findings show that respondents less than 5 years old are 15.8% (N = 47) respondents, and 20.5% (N = 61) respondents are 6-10 years old, 26.6% (N = 79) respondents are comprised of 11-15 years and 31.6% (N = 94) respondents are comprised of 16-20 years and finally 5.4% (N = 16) respondents are comprised of 21 years and above. Finally, in discussing the demographic analysis of the distribution of respondents according to marital status, respondents who consisted of single status were 22.6% (N = 67) respondents, and 76.8% (N = 228) respondents consisted of married personnel. Finally, 0.7% (N = 2) respondents are composed of personnel with divorced status.

**Table 1: Demographic Analysis**

	Frequency	Percentage (%)
<b>Regiment</b>		
Royal Malay Regiment	214	72.1
Border Regiment	83	27.9
<b>Position</b>		
Officer	18	6.1
Other rank	279	93.9
<b>Length of Service</b>		
Less than 5 years	47	15.8
6-10 years	61	20.5
11-15 years	79	26.6
16-20 years	94	31.6
21 years above	16	5.4
<b>Marital Status</b>		
Single	228	76.8
Married	67	22.6
Divorced	2	0.7
<b>Total</b>	<b>297</b>	<b>100.0</b>

## Measurement Model Evaluation

Confirmatory factor analysis (CFA) was performed to assess internal consistency reliability, indicator reliability, convergent validity, and discriminant validity. As discussed previously, internal consistency reliability was checked using CR values, which should be greater than 0.7 to be considered adequate. The reliability of the indicator is checked using an external beam indicator that must be greater than 0.7. To determine convergent validity, AVE is considered, which should be greater than 0.5. Finally, two measures were used to establish the discriminant validity, a cross-load indicator that compares the square root of the AVE value with the correlation of the latent variable. (Hair et al., 2019).

Table 2 discusses the scale constructs used in the study based on internal consistency reliability, indicator reliability, and convergent validity. Police constructs showed weighting items higher than 0.7 and significant at  $p < 0.05$  between 0.709 - 0.842, AVE (0.06.28), CR (0.944), and Cronbach's alpha (0.934). Also, for the Design construct, the weighting items were higher than 0.7 and significant at  $p < 0.05$  between 0.729 - 0.843. Then, only one PerP6 item construct was less than 0.7, so this item construct was discarded, AVE (0.610), CR (0.934), and Cronbach's alpha (0.920). For the Risk Analysis Construct, the weighting items were higher than 0.7 and significant at  $p < 0.05$  between 0.790 - 0.890, AVE (0.699), CR (0.959), and Cronbach's alpha (0.952). Furthermore, for the Data Management Construct, the weights items were higher than 0.7 and significant at  $p < 0.05$  between 0.775 - 0.881, AVE (0.712), CR (0.957), and Cronbach's alpha (0.949). For Communication Construct, the weighting items were higher than 0.7 and significant at  $p < 0.05$  between 0.770 - 0.820. Then, only one Comm5 item was less than 0.7, and this item was discarded, AVE (0.632), CR (0.923), and Cronbach's alpha (0.903).

**Table 2:** Measurement Model Evaluation

Constructs	Loadings	Alpha	CR	AVE
Pol1	0.709	0.934	0.944	0.628
Pol2	0.814			
Pol3	0.805			
Pol4	0.782			
Pol5	0.842			
Pol6	0.810			
Pol7	0.763			
Pol 8	0.820			
Pol9	0.796			
Pol10	0.778			
PerP1	0.758	0.920	0.934	0.610
PerP 2	0.729			
PerP3	0.782			
PerP4	0.830			
PerP5	0.777			
PerP7	0.843			
PerP8	0.800			
PerP9	0.730			
PenRB1	0.841	0.952	0.959	0.699
PenRB2	0.745			
PenRB3	0.861			
PenRB4	0.890			
PenRB5	0.858			
PenRB6	0.857			
PenRB7	0.851			
PenRB8	0.859			
PenRB9	0.797			
PenRB 10	0.841			
Data1	0.814	0.949	0.957	0.712
Data2	0.876			
Data3	0.854			
Data4	0.873			
Data5	0.819			
Data6	0.775			
Data7	0.846			

Data8	0.881			
Data9	0.853			
Comm1	0.820	0.903	0.923	0.632
Comm2	0.812			
Comm3	0.794			
Comm4	0.795			
Comm6	0.770			
Comm7	0.776			
Comm8	0.798			

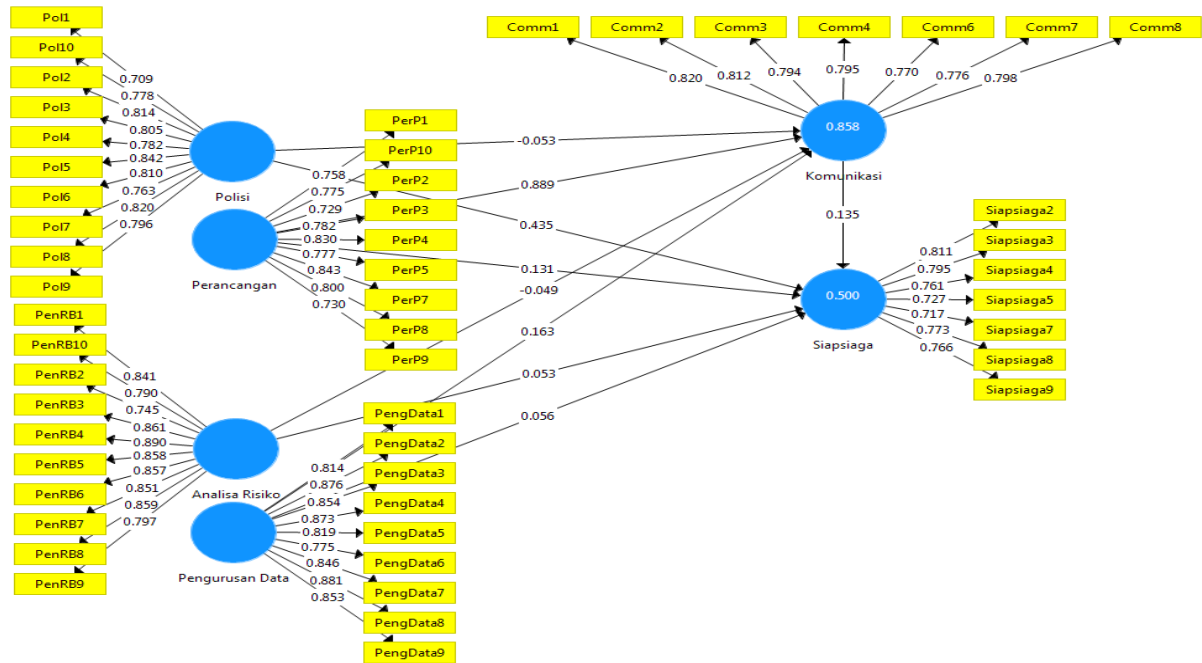


Figure 2: Path Coefficient

Structure Model Evaluation

To test the hypotheses, the structural model in table 3 shows the results of hypothesis testing. In table 3, all three hypotheses are supported. The results obtained from the structural model are used as a predictive function for the relationship between constructs. The variance explained for  $R^2$  in this prediction is reported in the PLS-SEM algorithm report. Table 4 reports that the variable with the variance explained on Disaster Preparedness ( $R^2 = 49.2\%$ ), followed by Communication ( $R^2 = 85.6\%$ ). The general guideline for  $R^2$ , as suggested by Olalere (2013), is 0.20, while values between 0.10 are considered to have a low level of predictive accuracy. The policy showed a value ( $\beta = 0.428, p < 0.01$ ); Planning showed values ( $\beta = 0.250, p < 0.01$ ); Risk Analysis showed a value ( $\beta = 0.046, p < 0.01$ ) and Data Management showed a value ( $\beta = 0.078, p < 0.01$ ) influencing Disaster Preparedness. Based on these results, H1, H2, H3, and H4 are supported.

Table 3: Path Coefficient and hypotheses testing

	Preparedness
Policy	0.428**
Planning	0.250**
Risk Assessment	0.046**
Data Management	0.078**
Communication	0.135**

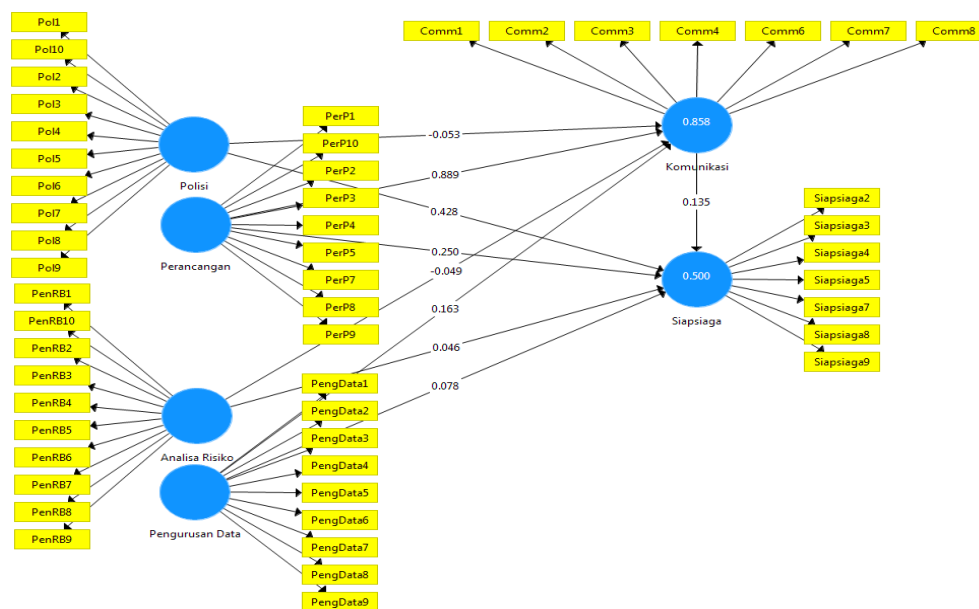
As shown in Table 4, in response to the research questions, the results of the analysis report that communication has a direct impact on the following; Policy, planning, risk analysis, and data management. As

for the relationship between Communication as a mediator between the variables and disaster preparedness, Policy showed a value ( $\beta = -0.053$ ,  $p < 0.01$ ); Planning showed a value ( $\beta = 0.889$ ,  $p < 0.01$ ); Risk Analysis showed a value ( $\beta = 0.049$ ,  $p < 0.01$ ) and Data Management showed a value ( $\beta = 0.163$ ,  $p < 0.01$ ) influencing Disaster Preparedness. The t-value for the Policy is 1.279, Planning is 9.186, Risk assessment is -0.120 and data management is 2.120. it shows that H6 (Planning  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness) and 8 (Data Management  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness) are supported only partially, on the other hand, for the H5 (Policy  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness), and H7 (Risk assessment  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness) are not supported.

**Table 4:** Communication as a mediating effect

	<i>Path a</i>	<i>Path b</i>	<b>Indirect Effect</b>	<i>t-value</i>
H5	-0.053	0.435	-0.023	-1.279
H6	0.889	0.131	0.116	9.186
H7	-0.049	0.053	-0.003	-0.120
H8	0.163	0.056	0.009	2.120

Note:  $t = 1.96$ ;  $p < 0.05$



**Figure 2:** Communication as a mediating effect

## 5. Conclusion

SmartPLS was used to determine the influencing relationship between the dependent and independent variables. The results of the study found that PLS-SEM reported that the Policy dimension showed a value ( $\beta = 0.428$ ,  $p < 0.01$ ); Planning showed values ( $\beta = 0.250$ ,  $p < 0.01$ ); Risk Analysis showed a value ( $\beta = 0.046$ ,  $p < 0.01$ ) and Data Management showed a value ( $\beta = 0.078$ ,  $p < 0.01$ ) influencing Disaster Preparedness. Based on these results, H1, H2, H3 and H4 are supported. For the communication variable as a mediator get that H6 (Planning  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness), H8 (Data management  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness), are supported because of  $t\text{-value} > 1.96$  ( $p < 0.05$ ), whereas H5 (Policy  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness) and H7 (Risk Analysis  $\rightarrow$  Communication  $\rightarrow$  Disaster Preparedness), are not supported. This study has first provided a clear picture of the Infantry Battalion's preparedness in dealing with disasters and the relationship between policy, planning, risk, data and communication in disaster preparedness. The results of this study have also raised many interesting questions and confirm the hypotheses of this study. Furthermore, the results of this study may encourage researchers to explore several new areas of study in the future. Secondly, it expands the scope of the study sample. This study only tested a sample among officers and personnel in Bn Inf, 8 Bgd in Kelantan. It is proposed that this study model be tested in the Malaysian Army or other services in the MAF, such as the Royal Malaysian Navy and the Royal Malaysian Air Force, as well as other national security agencies such as the Malaysian Royal Police and the Malaysian Fire Agency, and the Malaysian Civil Service Force. It will open a wider space for researchers to compare the perceptions of various layers of leaders and personnel who have different patterns and work cultures and their different assignments. Lastly, modifications and improvements on the conceptual model of this study by adding a few elements and variables can be the extension

to this study on disaster preparedness. There are many opportunities in future studies on respondents' organization and personal characteristics that influence disaster preparedness factors.

## **6. Acknowledgements**

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