CLUSTERING PEOPLE TRUST BEHAVIOR IN EMERGENCY EVACUATION: EVIDENCE FROM SINABUNG VOLCANO ERUPTION

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ABSTRACT

Sinabung is one of the volcanoes in Indonesia which commands government and societal attention since its first eruption in 2010. In contrast to other volcanoes in Indonesia, Sinabung volcano is still on the warning level up to and including the present time. According to the prior interview conducted to 14 participants from local government and local leaders in Medan and Karo, Indonesia, the long duration of warning level encourages some people to behave differently and become complacent since the 2010 eruption. People who initially trusted the government in the 2010 eruption currently doubt and distrust the government information and instruction. This study aims to compare the result from the prior interview and survey in order to categorize and cluster people regarding their trust behavior by using a Situational Judgment Test. This clustering result can be utilized as a foundation to build a conceptual model of trust behavior in Agent-Based Modeling and Simulation (ABMS) for further research and investigation.

1   INTRODUCTION

Trust is defined as "*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another*" (Rousseau et al., 1998, p. 395). The role of trust is a key aspect to ensure the effectiveness of risk communication and to allow the public to respond to crisis events quickly and also to lower the possibility of incorrect information.

According to cultural theory, people can be distinguished into four category based on their trust behavior (Douglas, 1978). First, the individualist prefers less regulation by the government. People in this group are relatively free from control by others. Second, the hierarchies has high loyalties and high respect to follow strong group boundaries and bind prescriptions. They believe that rules and regulation enable to handle uncertainty. Third, the egalitarian has the high group loyalties but little respect for externally imposed rules, other than those imposed by nature. Group decisions are arrived at democratically and leaders rule by force of personality and persuasion. Fourth, the fatalist has minimal control over their own lives. They are resigned to their fate and they see no point in attempting to change it.

Unfortunately, the cultural theory receives a number of criticisms. This theory oversimplifies people perception of risk into several groups and the empirical studies to measure and categories person into a group are also difficult to be conducted (Renn, 1992).

The study conducted by Dake (1990) attempts to measure cultural bias by using attitudinal measures. People are clustered in a particular group when their individual's score must have one score above the mean for the sample and for other three scores, they must score below the sample mean. From this study, only 32% of the participants (41 of 129) can be stratified into one group, eight participants have no cultural bias and 80 participants have more than one group. The modification of situational judgment test (SJT) proposed by Ng & Rayner (2010) is claimed as more appropriate measurement of cultural biases

than attitudinal measurement by Dake (1990) because it can capture the situational cognitions of individuals – the crux of cultural theory.

2   METHOD

To achieve the aforementioned research objective, this study utilizes the result of interview from 14 participants gathered from the prior stage of the study and SJT survey conducted to 400 casualties in Sinabung. The SJT survey consists of eight different scenarios with four option in each scenario in which each option in each scenario reflects each cultural theory category. For each scenario, a ranking of 1 would be given three points; a ranking of 2, two points; a ranking of 3, one point; and a ranking of 4, zero points. At the end of the scoring process, each respondent will have a score for each of the four cultural types. The highest score of four cultural types represents their cluster.

3   RESULT AND DISCUSSION

By using SJT survey to 400 respondents in Sinabung, 202 respondents (50.5%) are categorized as hierarchies, 99 respondents (24.8%) are categorized as individualist, 58 respondents (14.5%) are categorized as egalitarian and 17 respondents (4.3%) are categorized as fatalist. The result of SJT survey is different with the result of prior interview with local government and local leader. This survey concludes that most people in Sinabung still trust to the government though the long warning status exists. This clustering result will be utilized as a foundation to build a conceptual model of trust behavior in emergency evacuation using Agent-Based Modeling and Simulation (ABMS) for further research and investigation. A further conceptual model will utilize Modelling Agent System using Institutional Analysis (MAIA). It will explain about the agent and their behavior based on the survey result and clustering process that have been conducted.

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