

EMPLOYEE PERFORMANCE IN DISASTER LOGISTICS DISTRIBUTION: THE INFLUENCE OF HUMAN RESOURCE CAPABILITY, PLACEMENT, AND SUPERVISION

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ABSTRACT

Introduction/Main Objectives: Disaster logistics distribution plays a critical role in ensuring timely and accurate delivery of humanitarian assistance during emergencies. Despite adequate human resource capability, employee placement, and supervision within disaster management agencies, employee performance in disaster logistics distribution remains suboptimal. This study aims to examine the influence of human resource capability, employee placement, and supervision on employee performance in disaster logistics distribution.

Background Problems: The study addresses the question of whether human resource capability, placement, and supervision significantly affect employee performance in disaster logistics distribution, both partially and simultaneously.

Novelty: Previous studies have mainly focused on humanitarian logistics systems and operational performance, while limited empirical evidence has examined the combined effects of human resource capability, employee placement, and supervision on employee performance in disaster logistics distribution, particularly within Indonesian regional disaster management agencies.

Research Methods: This study employed a quantitative explanatory survey design involving 62 employees responsible for disaster logistics distribution at the Regional Disaster Management Agency (BPBD) of Central Java and Semarang City. Data were collected through questionnaires, interviews, and document analysis. Multiple linear regression analysis was performed using SPSS after validity, reliability, and classical assumption tests.

Findings/Results: The findings indicate that employee performance in disaster logistics distribution is generally at a moderate level. Human resource capability, placement, and supervision significantly influence employee performance both individually and simultaneously. Human resource capability was identified as the most influential factor, while the model explained 86.6% of the variance in employee performance.

Conclusion: Human resource capability, appropriate employee placement, and effective supervision are essential determinants of employee performance in disaster logistics distribution. Strengthening these factors can improve disaster logistics effectiveness and organizational responsiveness during emergency situations.

Implementation Potential: The findings provide practical implications for disaster management agencies by supporting evidence-based policies in recruitment, competency development, employee placement, and supervisory practices to enhance disaster logistics performance. They also contribute to academic discussions on human resource management in humanitarian logistics.

Keywords: disaster logistics; employee performance; human resource capability; placement; supervision

JEL Classification: M12; M54; H84

1. INTRODUCTION

Indonesia is a country with a high frequency of disasters, making the need for an effective disaster logistics system increasingly urgent. The distribution of logistics during the emergency response phase is not only related to the availability of relief goods but also concerns the accuracy of delivery to the intended recipients in the shortest possible time. When distribution does not run optimally, the impact can affect the safety of affected communities, delay recovery, and reduce public trust in disaster management agencies. Semarang City, as one of the regions located on the northern coast of Central Java, often experiences disasters such as tidal floods, extreme weather, and landslides, making logistics distribution capacity a strategic aspect in disaster emergency management. Delayed or inappropriate distribution of logistics can prolong the

emergency response period and weaken public trust in disaster management institutions (Jiang et al., 2019), as shown in the following data:

Table 1. Recapitulation of Disaster Events Data BPBD Semarang City

No	Type of Disaster	2020		2021		2022		2023		2024	
		Total	Loss (Mil)	Total	Loss (Mil)	Total	Loss (Mil)	Total	Loss (Mil)	Total	Loss (Mil)
1	FLOOD	45	1.200	38	900	52	1.450	60	1.800	55	1.400
2	LANDSLIDE	22	650	18	520	25	1.100	30	1.250	28	1.000
3	TORNADO	6	90	8	150	5	80	7	120	6	100
4	COLLAPSED HOUSE	10	200	9	180	12	300	14	420	11	300
5	FALLEN TREE	27	45	20	30	22	40	30	55	25	50
6	FIRE	90	3.200	78	2.500	95	3.400	85	3.000	88	3.100
7	DROUGHT	12	0	20	0	8	0	5	0	7	0

Source: Strategic Plan of BPBD Semarang City 2020-2024

By observing the amount of loss in millions of rupiah caused by disasters over the years (Table 1), it can be concluded that the impact of disasters in Semarang City, Central Java, tends to increase both in intensity and quality. These impacts on development outcomes, such as infrastructure, property, casualties, as well as losses and damages to community assets, are becoming more significant. In the Second Amendment of the Strategic Plan of the Regional Disaster Management Agency (BPBD) of Semarang City for 2020–2024, it is stated that: “Although development planning in Semarang City has been designed with the goal of improving community welfare, strengthening social justice, and minimizing destructive impacts on the environment while protecting communities from disaster threats, in reality, its implementation is still often hindered by response efforts that are not yet systematic and lack coordination.”

In practice, the challenges of disaster logistics distribution are not only caused by terrain, geographical conditions, or infrastructure but are also influenced by the quality of human resource management in the field. The performance of employees involved in the series of distribution processes, from planning, handling goods, coordination, to final delivery, becomes a decisive factor in the success of disaster logistics distribution. Several disaster evaluations have shown that there are still cases of delayed distribution, mismatches between aid types and needs, and a lack of target accuracy. This condition

indicates that improving employee performance requires more serious attention, not only from the procedural aspect but also from the managerial and organizational perspectives.

Although distribution technology and infrastructure continue to develop, the performance of employees who carry out the distribution process remains a key factor. In the context of disaster logistics, the human factor has been proven to be one of the main determinants of whether the aid supply chain can operate responsively and effectively (Lu & Feng, 2021). Without adequate competence and proper placement, employees in the field may face challenges such as slow decision-making, disharmony in stakeholder coordination, and errors in aid allocation (Sahinoz, 2019).

Personnel capability, job placement suitability, and the effectiveness of supervision are three factors that are believed to contribute significantly to employee performance in disaster logistics distribution. Adequate capability enables employees to make quick decisions in uncertain situations and to work in coordination with various stakeholders. Proper employee placement provides opportunities for employees to work according to their competencies and the characteristics of field tasks. Meanwhile, supervision plays a role in maintaining procedural discipline, preventing repeated mistakes, and ensuring that processes run according to established standards. These three variables serve as an essential foundation for creating a logistics distribution performance that is responsive, accurate, accountable, and aligned with the needs of disaster-affected communities.

In the literature on disaster logistics and human resource management, three aspects are often cited as key factors influencing employee performance during emergency response, namely human resource capability, employee placement, and organizational supervision. First, human resource capability includes specific technical competencies in emergency logistics, mental readiness, and multi-stakeholder coordination skills, all of which are proven to be crucial in humanitarian aid missions (Idris et al., 2025). Second, employee placement, which refers to the assignment of personnel to functions and terrains that match their competencies and field conditions, helps create a more effective and efficient work situation during emergencies (Yang et al., 2024). Third, organizational and operational supervision is needed to ensure that

distribution procedures are followed, the quality of aid is maintained, and accountability is implemented (Čižiūnienė et al., 2025).

1.1. Problem Formulation

Based on the above description, the research questions can be formulated as follows:

1. At what level is employee performance in disaster logistics distribution?
2. Do the variables of capability, placement, and supervision have a partial influence on employee performance in logistics distribution?
3. Do the variables of capability, placement, and supervision have a simultaneous influence on employee performance in logistics distribution?
4. Among the variables of capability, placement, and supervision, which one has the most significant influence on employee performance in logistics distribution?

2. LITERATURE REVIEW

2.1. Human Resource Capability

Employee performance in the process of disaster logistics distribution reflects the level of individual effectiveness in carrying out tasks related to aid delivery, including speed, accuracy, and target precision. In emergency situations, employee performance is strongly influenced by the ability to make quick decisions, inter-agency coordination, and discipline in implementing standard operating procedures (Altay & Green, 2006). In the context of humanitarian logistics, employee performance is considered a determining factor in the smooth flow of logistics during the emergency response phase (Wassenhove, 2006). Slow distribution, miscommunication, and misallocation of aid are often not solely caused by physical barriers but are closely related to human resource management at the operational level (Jahre et al., 2016). Therefore, research on the factors influencing employee performance is crucial in the context of disaster logistics policy.

Employee performance in the context of disaster logistics distribution is a crucial aspect that determines the effectiveness of aid delivery, response speed, and target accuracy. In disaster relief operations, this performance is not only measured by the quantity of goods delivered but also through aspects such as inter-organizational

coordination, rapid decision-making, handling dynamic field conditions, and adherence to operational standards (Altay & Green, 2006). The literature shows that in the context of humanitarian logistics, the quality of individual and team performance is one of the key variables for the success of the aid supply chain (Van Wassenhove, 2006).

2.2. Placement

Employee placement is the process of assigning individuals to job positions that match their skills, experience, and the characteristics of the tasks. Proper placement increases work effectiveness, prevents role conflict, and minimizes operational errors (Mathis & Jackson, 2016). In the context of disaster response, appropriate placement helps employees work more adaptively in challenging environments and under situational pressure (Yang et al., 2024). Improper placement of employees in disaster logistics operations often leads to slow coordination, psychological stress, and failure to implement standard operating procedures (Cozzolino, 2012). Therefore, placement is an important variable that deserves to be examined in relation to logistics distribution performance.

The aspect of employee placement or assigning personnel to positions that match their competencies and job conditions also plays an important role in improving performance. Proper placement creates a good fit between employees, their work, and field conditions, which in turn enhances motivation, task efficiency, and reduces operational errors (Mathis & Jackson, 2016). For example, a quantitative study in Indonesia showed that job placement has a significant positive influence on employee performance (Octavia, Erlina, & Mardiana, 2022). Although specific research in disaster logistics remains limited, the principle of “placing the right person in the right job” remains relevant, especially when disaster field conditions demand rapid adaptation and the ability to work in unstable environments.

2.3. Supervision

Supervision is defined as the effort to ensure that the distribution process runs according to the organization’s standards, procedures, and targets (Robbins & Judge, 2019). In disaster logistics distribution, supervision aims to ensure accountability, prevent

aid misallocation, and minimize deviations (Čižiūnienė et al., 2025). The more effective the supervision system, the higher the level of employee compliance with procedures, which in turn has a positive impact on performance (Mahmood et al., 2019).

Supervision in disaster logistics distribution organizations relates to how processes are carried out in accordance with standards, including monitoring, feedback, and enforcement of procedures. Effective supervision can improve discipline, accountability, and ensure that distribution activities are not hindered by organizational deviations or negligence (Robbins & Judge, 2019). For example, Mohr, Hammer, Brady, Perry, and Bodner (2021) in their study found that supervisory support significantly improved employees' daily well-being, which can implicitly be interpreted as an improvement in working conditions and performance (Mohr et al., 2021). In the context of disaster logistics, strong supervision can reduce the risk of slow or misdirected distribution caused by a lack of operational control.

2.4. Employee Performance

Employee performance in the process of disaster logistics distribution reflects the level of individual effectiveness in carrying out tasks related to aid delivery, including speed, accuracy, and target precision. In emergency situations, employee performance is strongly influenced by the ability to make quick decisions, inter-agency coordination, and discipline in implementing standard operating procedures (Altay & Green, 2006). In the context of humanitarian logistics, employee performance is considered a determining factor in the smooth flow of logistics during the emergency response phase (Van Wassenhove, 2006). Slow distribution, miscommunication, and misallocation of aid are often not solely caused by physical barriers but are closely related to human resource management at the operational level (Jahre et al., 2016). Therefore, research on the factors influencing employee performance is important in the context of disaster logistics policy.

2.5. Conceptual Framework

In order to understand how the three variables are interconnected and influence employee performance in disaster logistics distribution, the conceptual model of this study proposes that human resource capability, employee placement, and organizational

supervision have both simultaneous and individual positive effects on employee performance. Such a relationship is consistent with the AMO (Ability-Motivation-Opportunity) theoretical framework, which states that ability (Ability) must be supported by proper conditions (Opportunity) and managerial control or monitoring (Monitoring/Opportunity) to achieve optimal performance (Gu, 2023).

Referring to the explanation above, it can be concluded that employee capability, placement, and supervision are closely related to employee performance in disaster logistics distribution. Employees with adequate abilities who are placed in appropriate positions and supported by good supervision tend to exhibit better performance. These relationships form the basis for developing the hypotheses in this study, which state that employee capability, placement, and supervision, both partially and simultaneously, have a significant influence on employee performance in disaster logistics distribution. Thus, this research aims to fill the empirical gap regarding how these three internal managerial factors interact in the context of disaster logistics distribution in Semarang City in particular, and in Central Java in general.

3. METHOD

This study uses a quantitative approach with an explanatory and survey research format. Explanatory research assumes that a phenomenon or event occurs due to specific causes; therefore, explanatory research aims to explain why such a phenomenon happens (Sarwono, 2006). The research area includes two offices, namely the Regional Disaster Management Agency (BPBD) of Central Java and the BPBD of Semarang City. Data collection was carried out by distributing questionnaires to 62 (sixty-two) respondents, all of whom are employees responsible for handling disaster logistics distribution, selected through purposive sampling. In addition, interviews were conducted with randomly selected respondents. Documentary data collection techniques were also employed to support initial mapping and to complement data that could not be obtained through interviews or questionnaires.

The variables involved in this study are human resource capability (X1), placement (X2), supervision (X3), and employee performance (Y). Before the questionnaires were distributed to the actual respondents, validity and reliability tests

were conducted to ensure that the questionnaires met the criteria of a good instrument. Similarly, before the data were further processed using multiple linear regression techniques, classical assumption tests were conducted, including normality tests, heteroscedasticity tests, autocorrelation tests, and multicollinearity tests. After the classical assumption tests were completed and the results met the required conditions for further analysis, multiple linear regression analysis was performed with the assistance of the SPSS (Statistical Program for the Social Science) software.

4. RESULTS AND DISCUSSION

After processing the data, the following results and information were obtained: of the 62 respondents who returned the questionnaires, most of their performance in the distribution of flood disaster logistics was at a moderate level (42%); followed by low (38%); and high (20%). The data points were spread around the diagonal line, indicating that the data were normally distributed. The data distribution showed no specific or clear pattern, and the points were scattered above and below the value 0 on the Y-axis or vertical axis, thus it can be concluded that the regression model is homogeneous. Therefore, it can be stated that there is no heteroscedasticity problem.

Table 2. Recapitulation of Disaster Events Data BPBD Semarang City

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.930 ^a	.866	.859	.15813	1.846

a. Predictors: (Constant), X3(supervision), X1(human resource capability), X2(placement)

b. Dependent Variable: Y(employee performance)

By observing the Model Summary^b table, it was found that the Durbin-Watson value was 1.846 (ranging between -2 and +3). Therefore, it can be stated that the data in this study did not experience an autocorrelation problem.

Table 3. Recapitulation of Disaster Events Data BPBD Semarang City

Coefficients ^a											
Model		Unstandardize		Standard		Sig.	Correlations			Collinearity	
		d Coefficients	Coeffici	ents	t					Statistics	
		B	Std. Error	Beta				Zero-order	Partial	Part	Toleranc
1	(Constant)	.684	.211		3.248	.002					
	X1(human resource capability)	.386	.094	.420	4.111	.000	.895	.475	.198	.222	4.505
	X2(placement)	.238	.092	.281	2.588	.012	.881	.322	.124	.197	5.078
	X3(supervision)	.252	.091	.279	2.760	.008	.871	.341	.133	.227	4.414

a. Dependent Variable: Y(employee)

By observing the Coefficients^a table, it was found that the Variance Inflation Factor (VIF) values for each variable were as follows: human resource capability (X1) was 4.505; placement (X2) was 5.078; and supervision (X3) was 4.414. Since all VIF values were less than 10 (< 10), it can be stated that this study did not experience any multicollinearity problem.

By observing the Coefficients^a table, the significance values of each variable were found as follows: capability (X1) was 0.000; placement (X2) was 0.012; and supervision (X3) was 0.008. Since all significance values were less than 0.050 (< 0.050), it can be concluded that each variable has a partially significant effect on the employee performance variable. Therefore, there is strong reason to reject H0 and accept H1, which states that *“the variables of capability, placement, and supervision partially affect employee performance in disaster logistics distribution.”*

In addition, by observing the Coefficients^a table, it was also found that the capability variable had the most significant influence, followed successively by the supervision variable and then the placement variable. This is supported by the calculated t-values for each variable as follows: capability (X1) was 4.111; placement (X2) was 2.588; and supervision (X3) was 2.760. The highest t-value was found in the human resource capability variable, followed by supervision, and the lowest was the placement variable. Therefore, there is strong reason to reject H0 and accept H1, which states that *“among the variables of human resource capability, placement, and supervision, the*

human resource capability variable has the most significant effect on employee performance in disaster logistics distribution.”

Table 4. Recapitulation of Disaster Events Data BPBD Semarang City

ANOVA ^b						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.355	3	3.118	124.701	.000 ^a
	Residual	1.450	58	.025		
	Total	10.805	61			

a. Predictors: (Constant), X3(supervision), X1(human resource capability), X2(placement)

b. Dependent Variable: Y(employee performance)

By observing the Anova^b table, it was found that the calculated F value was 0.000. Since the calculated F value was smaller than 0.050 (< 0.050), this indicates that the independent variables consisting of three variables, namely human resource capability (X1), placement (X2), and supervision (X3), have a simultaneous effect on the dependent variable, which is employee performance. Therefore, there is strong reason to reject H0 and accept H1, which states that *“there is a significant simultaneous influence of human resource capability, placement, and supervision variables on employee performance in disaster logistics distribution.”*

By observing the Model Summary^b table, it was found that the R Square value was 0.866 or 86.60 percent. This means that the independent variables consisting of the three variables contributed 86.60 percent to the dependent variable. Thus, it can be concluded that there is still an influence of other variables not included in this study amounting to 13.40 percent. These variables may include compensation, workload (stressors), and others.

The results of the hypothesis testing indicate that human resource capability in disaster logistics distribution has a significant effect on employee performance in disaster logistics distribution. This is shown by the data analysis results with a significance value of 0.000, which is smaller than 0.050 (< 0.050).

The results of this study are consistent with the theory proposed by Altay and Green (2006), which states that in emergency situations, employee performance is

strongly influenced by the ability to make quick decisions, inter-agency coordination, and discipline in implementing standard operating procedures. In addition, Van Wassenhove (2006) also stated that in the context of humanitarian logistics, employee performance is a determining factor in the smooth flow of logistics during the emergency response phase. The findings of this study are also supported by the theory presented by Jahre et al. (2016), which states that slow distribution, miscommunication, and incorrect allocation of aid are often not solely due to physical obstacles but are related to human resource management at the operational level.

The results of this study are in line with research conducted by Rajakaruna (2017), who found a strong relationship between humanitarian logistics skills in individuals and the performance of humanitarian logistics organizations. Individual skills influence the speed and accuracy of the aid supply chain. Rezapour et al. (2025), through a case study on aid distribution, showed that personnel capacity such as technical competence and experience improves responsiveness and distribution accuracy. Meduri (2021) stated that competency inventorying during crises identified 34 essential competencies such as leadership, communication, and analytical thinking that correlate with emergency task effectiveness. These findings support the interpretation of human resource capability as a multidimensional construct.

Thus, it can be stated that in this study, it has been proven that human resource capability, in this case the BPBD employees in disaster logistics distribution, significantly affects employee performance in disaster logistics distribution. The higher the capability value, the higher the employee performance value. Conversely, the lower the human resource capability in disaster logistics distribution, the lower the employee performance in disaster logistics distribution.

Hasil The results of hypothesis testing indicate that placement has a significant effect on employee performance in disaster logistics distribution. This is shown by the data analysis results with a significance value of 0.012, which is smaller than 0.050 (< 0.050).

The results of this study are relevant to the theory proposed by Mathis and Jackson (2016), which states that proper placement increases work effectiveness, prevents role conflict, and minimizes operational errors. This is also supported by Yang et al. (2024), who state

that in the context of disasters, appropriate placement helps employees work more adaptively to field conditions and situational pressure. Furthermore, it is consistent with the theory proposed by Cozzolino (2012), which explains that improper employee placement in disaster logistics operations often results in slow coordination processes, psychological anxiety, and failure to implement standard operating procedures.

The findings of this study are consistent with the results of Yang et al. (2024), who, through optimization research, showed that personnel placement considering competency and task-field suitability increases operational effectiveness and reduces execution time. Likewise, studies conducted by Shaw (2022) and Zhang (2021) indicate that location-allocation and prepositioning research emphasizes the importance of resource placement, including personnel and temporary facilities, to accelerate post-disaster distribution. Although the focus was on facilities, the principle of placement is relevant to employee allocation.

Thus, it can be stated that this study proves that appropriate placement of personnel according to their individual characteristics in disaster logistics distribution significantly affects employee performance in disaster logistics distribution. The higher the employee placement value, the higher the employee performance. Conversely, the lower the employee placement value in disaster logistics distribution activities, the lower the employee performance in disaster logistics distribution.

The results of hypothesis testing also show that the quality of supervision significantly affects employee performance in disaster logistics distribution. This is demonstrated by the data analysis result with a significance value of 0.008, which is smaller than 0.050 (< 0.050).

The results of this study are consistent with the theory proposed by Robbins and Judge (2019), which defines supervision as an effort to ensure that distribution processes run according to standards, procedures, and organizational targets. It is also in line with the theory proposed by Čižiūnienė et al. (2025), which states that in disaster logistics distribution, supervision aims to ensure accountability, prevent misallocation of goods, and minimize deviations. It also aligns with Mahmood et al. (2019), who stated that the more effective the supervision system, the higher the level of employee compliance with procedures, resulting in a positive impact on performance.

The findings of this study are supported by the research conducted by Tsetim (2019), which showed that various supervision styles, such as authoritarian, companionable, and synergistic, all have a significant effect on employee productivity, and supportive supervision also improves performance. Similarly, Mohr et al. (2021) found that supervisor support significantly improves employees' daily well-being and work performance, which is relevant in the context of work pressure during emergency response situations. Furthermore, research conducted by Čižiūnienė et al. (2025) showed that in the context of logistics during crises, sustainable HRM practices, including operational supervision, strengthen staff resilience and procedural compliance.

Thus, it can be stated that this study proves that supervision of employees in disaster logistics distribution significantly affects employee performance in disaster logistics distribution. The higher the supervision value, which includes dimensions of direct supervision, indirect supervision, and both formal and informal supervision, the higher the employee performance in disaster logistics distribution. Conversely, the lower the supervision value in disaster logistics distribution, the lower the employee performance in disaster logistics distribution during floods.

Referring to the results of hypothesis testing, which state that “there is a significant simultaneous influence of the variables of capability, placement, and supervision on employee performance in disaster logistics distribution,” the fact that most employee performance levels in logistics distribution are moderate and low, with only a small portion at a high level, may be due to a lack of compensation or recognition for employees and high workload (stressors). This is supported by the finding that the contribution of the independent variables, including capability, placement, and supervision, to the dependent variable, namely employee performance in disaster logistics distribution, is 86.60 percent. This means that there is still 13.40 percent contributed by other variables not included in this study, such as compensation or rewards and workload. It is very likely that employee performance in disaster logistics distribution would be mostly at a moderate and high level, or even largely at a high level, if this study had included the variables of compensation and workload.

5. CONCLUSION

The conclusions of this study are as follows: (1) The performance of employees in disaster logistics distribution is mostly at a moderate level, followed by low and high levels; (2) Human resource capability, placement, and supervision have both partial and simultaneous effects on employee performance in disaster logistics distribution; (3) Among these variables, the capability variable has the most significant influence on employee performance in disaster logistics distribution; (4) There are several other variables not included in this study that also affect employee performance in disaster logistics distribution.

6. IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

Referring to the results of this study, which indicate that capability, placement, and supervision have a significant effect on employee performance in disaster logistics distribution, the findings have implications for the government, particularly the Regional Disaster Management Agency (BPBD). When recruiting employees, candidates who truly possess the ability to handle disasters, especially flood disasters, should be selected. Furthermore, when assigning employees to divisions responsible for distributing disaster logistics, those who are genuinely willing to work in the field during flood disasters should be chosen and placed accordingly. Employee performance will be even better if adequate supervision is continuously carried out so that employees responsible for disaster logistics distribution perform their duties more seriously.

This study was conducted after a flood disaster; therefore, the characteristics of the affected community only represent the case of flood disasters. There has been no comparison with other types of disasters, such as earthquakes or fires. This is one of the study's limitations, and future research should be conducted after other types of disasters, such as earthquakes or fires, occur. Since the disaster logistics distributed in each type of disaster differ, the characteristics of affected communities and the handling techniques also differ.

It is also suggested for future researchers to include other independent variables besides capability, placement, and supervision, such as compensation, workload, or other

relevant variables. Furthermore, future studies should also be conducted on communities affected by disasters other than floods, such as earthquakes or fires.

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