Collaboration Continuum Model In Improving Preparedness For Disaster

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Abstract

Disaster is an event that can result in loss of property, life and the environment. One of the disaster that occurred is volcanic disaster. The problems caused by disasters are very complex and require careful and targeted planning. Good collaboration continuum in each program is expected to improve preparedness for volcanic eruptions. The purpose of this study was to know how collaboration continuum improving preparedness for disaster. The research design used in this study was quantitative with cross sectional approach. The sampling technique used is total sampling with total sample of 326 respondents. Collecting data using questionnaire. The independent variable in this study is the collaboration continuum model. While the dependent variable in this study is preparedness for disasters. Univariate data analysis was carried out to obtain an overview of variables affecting collaboration continuum in disaster management. Meanwhile, multivariate data analysis in this study used Structural Equation Modeling-Partial Least Square Path Modeling (SEM-PLS). There is a significant relationship in several indicators, namely the relationship between starting condition with unity of action, facilitative leadership with unity of action, institutional design with unity of action, unity action with collaborative process, collaborative process with with monitoring, collaborative process with Preparedness.

Collaboration continuum is influenced by starting conditions, facilitative leadership, institutional design, unity of action, monitoring, and collaborative process. Meanwhile, preparedness is influenced by the collaborative process. Suggestions for all elements involved in the management of disasters are to improve all elements of collaboration so the program can be implemented properly. Preparedness for disasters also needs further improved.

Keywords: Collaboration, continuum, model, preparedness, disaster

Introduction

Disasters are events that often result in loss of property, psychological and environmental stress. The occurrence of disasters is caused by several factors including natural, non-natural, and human factors [1]. Disasters can happen to anyone and at any time. Disasters often happen to someone who is not ready, causing a very large number of victims [2]. recent years, huge amount of damage all around the world caused by destructive disasters has significantly increased [3]. Disasters force us to do good collaboration, so that physical and non-physical losses can be reduced. Volcanic eruptions are complex problems that require planned and targeted management [4]. Disaster problems are complex problems that require collaboration that is carried out in a planned and directed manner. Disaster management efforts must be carried out in a sustainable and systematic manner so that disaster victims can be reduced [5], [6], 7].

Geographically, the frequency of natural disasters in Indonesia is still quite high. Disasters can occur with mild conditions or up to extraordinary conditions. Volcanic activity is monitored and observed by volcano observers, namely the Center for Volcanology and Geological Disaster Mitigation (PVMBG) and reported to the local government. Volcanic activity consists of the lowest to the highest levels, namely level 1 or normal category, level 2 or advisory, level 3 or watch, and level 4 or warning. Disasters that can be caused by volcanic eruptions include lava flows, volcanic mudflow, eruptive materials, hot clouds, toxic gases, and ash. Indonesia has 129 active volcanoes

and 70 potentially very dangerous volcanoes [8] [9]. Natural disasters in the form of volcanic eruptions are something that often happens in Indonesia, this is because Indonesia's geographical location is surrounded by a ring of fire or is in an area of a volcanic ring of fire. The ring of fire is still active, making Indonesia the first country that has the potential to be exposed to the risk of volcanoes. In its history, about 200 years ago, a mountain in Indonesia was recorded to experience the largest eruption in the world. Indonesia is a volcanic disaster-prone area, which is about 17,000 km2 with a population of approximately 5.5 million people in volcanic disaster-prone areas. It is estimated that there are 585,000 people per year who are threatened by volcanic eruptions. During the last 200 years, Indonesia has experienced volcanic eruptions which have resulted in the deaths of approximately 175,000 people [10]. Volcanic eruptions often occur in Indonesia and have left various impacts such as damage, health problems, and other impacts. The potential for natural disasters is quite high in Indonesia, such as floods, landslides, tornadoes, droughts, and tidal waves. Natural disasters that occurred in Indonesia throughout 2021 reached 3058 events. Disaster events in Indonesia from January 1 to December 28, 2021 include : 1288 floods, 791 extreme weather events, 623 landslides, 265 forest and land fires (karhutla), 44 incidents of tidal waves and abrasion, 31 earthquakes, 15 droughts, 1 volcanic eruption. The natural disaster has damaged various public facilities and affected houses and buildings, namely as many as 141,795 houses, 3.699 public facilities, 509 offices, and 438 bridges damaged.

In Law number 24 of 2007 it is stated that every region has a disaster management plan as a disaster management effort. The government regulation number 21 of 2008 also mentions the implementation of disaster management. Disaster management is the responsibility of the government and local governments [12]. In addition to the National Disaster Management Agency or Regional Disaster Management Agency, disaster management also needs to involve related sectors and depends on the disaster that occurs [13]. Relevant sectors must work more closely and collaborate, including in disaster risk management [14]. Collaboration between parties involved in disaster risk management is one of the efforts in

disaster mitigation [15]. Most of the parties involved in disaster risk management are still responsive (emergency response) or handling during and after a disaster occurs. In dealing with disasters, it is related to programs to increase community capacity so that they are able to anticipate disasters, be able to handle emergencies, and handle disaster recovery [16]. The steps taken require good organization [17], [18]. Plans on disaster mitigation are useful for increasing community preparedness in dealing with disasters [19]. The success of handling critical situations during a disaster is highly dependent on the preparations made before a disaster occurs, including the collaboration carried out on disaster risk management. The role of the disaster risk reduction forum is needed to increase pentahelix collaboration. With good collaboration in disaster risk management, it can improve disaster preparedness. Based on the background above, the researchers are interested in researching collaboration continuum model in improving preparedness for disaster.

Methodology

This study uses a quantitative design with a cross sectional research design. The sampling technique used is total sampling with a total sample of 326 respondents in the Kediri Regency, East Java, Indonesia. Data collection in this study used a questionnaire containing questions about collaboration continuum and disaster preparedness. The validity test of the instrument in this study was carried out using the pearson product moment method on the collaboration continuum questionnaire with a P=0.001 value and a P=0.000 preparedness questionnaire, meaning that the items related to coordination and preparedness for volcanic eruptions are valid. The reliability Test carried out with the cronbach alpha test showed a questionnaire about coordination with a value of P = 0.568 and a preparedness questionnaire P = 0.872, meaning that the calculation of the reliability test of the scale was accepted or reliable. The independent variable in this study is the collaboration continuum model. While the dependent variable in this study is preparedness for disasters. Univariate data analysis was carried out to obtain an overview of variables affecting collaboration continuum in disaster management. Assessment indicators in the starting condition include power

imbalances in disaster risk management, resource imbalances in disaster risk management, knowledge imbalances in disaster risk management in the pre-disaster phase. While the assessment indicators in the collaborative process include direct face-to-face dialogue from each stakeholder involved, building trust between the parties involved, having a commitment to the process (motivation to be involved or participating), having a common understanding (shared understanding of what they can do), reach through collaboration that is carried out, and has the continued results of the collaboration process manifested in the form of tangible outputs or outputs. Aspects of institutional design assessment indicators include having basic procedures and rules in collaboration for procedural legal collaboration process, having process transparency, inclusiveness of participants (having equality in participating in disaster risk management for volcanic eruptions), and Forum exclusivity (having a desire to do management) risk of catastrophic volcanic eruptions). The indicators for the facilitative leadership aspect consist of leadership habits in empowering and involving stakeholders in volcanic eruption disaster risk management, there is a discussion about program plans to be implemented in volcanic eruption disaster risk management. Aspects of monitoring indicators include having having impact and adaptation. Meanwhile, multivariate data analysis in this study used Structural Equation Modeling-Partial Least Square Path Modeling (SEM-PLS).

Results

The results of the research that has been carried out get the following results :

General Characteristics of Responden

Table 1 General Characteristics of Responden

Indicator	Category	equency
Gender	Male	
	Female	
Age	12-25 years old	
	26-45 years old	
	46-55 years old	

Last Education	Primary school Junior school Senior school High school
Profession	Government employees Pensionary Private sector worker Businessmen Housewife

Based on the table above, it can be seen that most of the respondents were male by 67,1%, age 26-45 years by 47,8%, graduated from university by 68,5%, workes in the government sector by 33,5%.

Collaboration Continuum

Collaboration continuum in the Kediri Regency, East Java, Indonesia is classified as good with the following details :

Table 2 Collaborative continuum

Aspects	Starting condition	Fasilitative Leadership	Institutional Design	Collaborative Process	Monitoring
Good	53%	62%	54%	55%	51%
Moderate	47%	38%	46%	45%	49%
Less	0%	0%	0%	0%	0%

Outcomes in this study in the form of preparedness in the face of disasters. Based on the results of data collection, it was found that starting condition in collaborative continuum of disasters is in a good condition is mostly 53%, that collaborative process in disaster risk management of disasters is in a good condition is mostly 54%, that fasilitative leadership in disaster risk management of disasters is in a good condition is mostly 62%, that institutional design in disaster risk management of disasters is in a good condition is mostly 54%, that collaborative process in disaster risk management of disasters is in a good condition is mostly 51%,

Table 3 Preparedness For A Disaster

Aspects	Frequency	%
Ready	188	57,6%
Less Ready	138	42,4%
Not Ready	0	0%

Outcomes in this study in the form of preparedness in the face of volcanic

eruptions. Based on the results of data collection, it was found that preparedness in disaster risk management of disasters is in a ready condition is mostly 57,6%.

Collaborative continuum model in improving preparedness for disaster

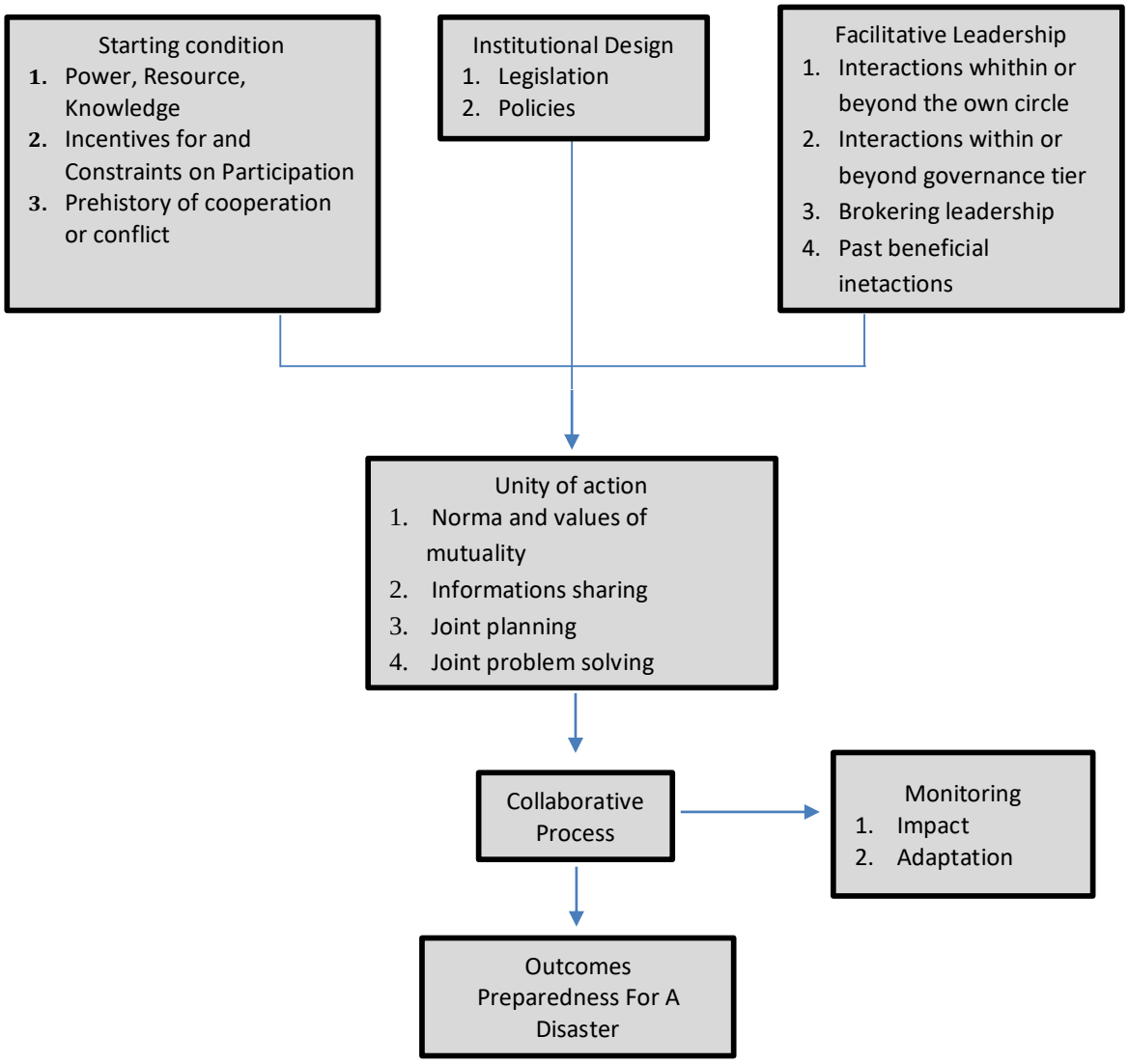

Figure 1 Collaboration Continuum Model In Improving Preparedness For Disaster

The data collection for this research was carried out from August 2022 until April 2023. Based on the results of statistical tests using the Structural Equation Modeling Partial Least Square Path Modeling (SEM-PLS) test, it was found that the relationship between indicators that had

a significant relationship was expressed with a p-value <0.05. There is a significant relationship in several indicators, namely the relationship between Starting condition and Unity of action (p=0.008), facilitative leadership with unity of action (p=0.002), institutional design with unity of action (p=0.001), collaborative process with monitoring (p=0.000), collaborative process with preparedness (p=0.000).

Discussion

Collaboration continuum is very Important in increasing preparedness in dealing with disaters. Collaboration continuum is an arrangement that regulates one or more public institutions directly involving non-state stakeholders in a formal, consensus-oriented, deliberation-oriented collective decision-making process and has the aim of formulating or implementing public policies or managing public programs or assets [20]. Collaboration continuum is a process in which organizations that have an interest in a problem and try to find solutions that are determined together to achieve goals that they cannot achieve individually. Collaboration is a process in which related organizations have an interest in a problem and try to find solutions that are determined jointly to achieve goals that they cannot achieve individually [21]. Collaboration fosters a sense of interdependence and joint action by maintaining the autonomy of the collaborating parties. Unity In action eruptions in the form of norma and values of mutuality, Informations sharing, Joint planning, Joint problem solving [22]. The impact of volcanic eruptions can be reduced collectively by utilizing technology, knowledge, information, and human resources [23]. Disasters cause almost all life systems to change, this makes people think about how to build resilience to disasters [24]. Collaborative governance is an arrangement that regulates one or more public institutions to engage directly with stakeholders in the decision-making process that aims to make or implement public policies or manage programs in disaster risk management [2]. Collaboration continuum which includes starting conditions, collaborative process, institutional design, facilitative leadership, and outcomes is very important so that preparedness in the face of volcanic eruptions can be improved. Disaster risk management requires good organization [25]. At the local level , this kind of plan is more effective because it even ensures micro-level risk management [26]. Disaster mitigation plans are useful for increasing preparedness in dealing with disasters [27]. Good collaboration can improve preparedness for volcanic eruption disasters. Process when all the related organizations have the same interest of an issue and try to solve the problem together to achieve the goals that cannot solved

individually called collaboration [21]. Disaster risk management activities are further enhanced so that preparedness for disasters can be maximized. With good collaboration from the parties involved will be able to increase preparedness in risk management of disasters.

Based on the results of data collection, it was found that preparedness in disaster risk management of disasters is in a ready condition but needs to be improved. The form of preparedness carried out is the formation and strengthening through outreach activities or training to parties involved in disaster risk management. Preparedness is carried out to ensure prompt and appropriate efforts in dealing with disaster events. Preparedness is important in disaster management because with good preparedness it will be easier to adapt to disasters. Preparedness in risk management for volcanic eruptions in the form of : 1. Preparation and testing of disaster emergency management plans 2. Organizing, installing, and testing early warning systems 3. Provision and preparation of supplies to fulfill basic needs 4. Organizing, counseling, training, and rehearsal on emergency response mechanisms 5. Preparation of evacuation sites 6. Compilation of accurate data, information, and updating of permanent procedures for disaster emergency response 7. Provision and preparation of materials, goods, and equipment to fulfill the recovery of infrastructure and facilities [28]. Preparedness include: 1. Developing an early warning system 2. Increasing the capacity of human resources both in managerial and technical terms 3. Empowering the community in health crisis management activities 4. forming an Emergency Medical Team (EMT), Team Rapid Health Assessment Team (RHAT), Public Health Rapid Response Team (PHRRT), and other health teams. Individual capacity development is an effort that can be made to improve or develop a better quality of personal characteristics [29]. Based on the results of the study, it was also found that there was support from the government in disaster risk management. There is a budget that is used for construction and an early warning system. In addition, preparedness is also carried out through community empowerment which is carried out before a volcanic disaster occurs. Meanwhile, in several aspects of preparedness such as the provision and preparation of supplies to fulfill basic needs, preparation of incident locations, provision of materials/goods/equipment to fulfill the recovery of infrastructure and facilities, as well as team formation (such as emergency medical team, rapid health assessment team, rapid response team). public health, and other health teams) is still not carried out optimally in the pre-disaster phase. All aspects of preparedness in volcanic eruption disaster risk management need to be carried out optimally so that the impact can be

reduced.

Conclusion

Based on the results of the study, the following conclusions can be drawn: Collaboration continuum in disaster risk management is mostly good, collaboration has been carried out and the government provides support in the form of budgets for development activities and early warning systems, community empowerment, socialization and training. Preparedness for disaster risk management of disaster is in a ready condition but still needs to be improved. Starting condition with unity of action, facilitative leadership with unity of action, institutional design with unity of action, unity action with collaborative process, collaborative process with with monitoring, collaborative process with Preparedness. Collaboration continuum is influenced by starting conditions, facilitative leadership, institutional design, unity of action, monitoring, and collaborative process. Meanwhile, preparedness is influenced by the collaborative process. Suggestions for all elements involved in the management of disasters are to improve all elements of collaboration so the program can be implemented properly. Collaboration continum can improve preparedness for disasters.

Ethical Considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The author declare that no conflict of interest.

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