

# Resources and Cooperation in Integrated Emergency Management Systems in Disaster Management

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## ABSTRACT

Preparedness is an effort carried out to anticipate the possibility of a disaster in an area, this action is taken to avoid the loss of life, loss of property, and changes in the life of the community. Preparedness to face a disaster is a condition of individuals and groups who have physical and psychological abilities in dealing with disasters. The government's role in responding to disaster relief efforts is carried out through several regional policies and regulations with the support of several community organizations, companies, private institutions and institutions, the military, and other community organizations. The regulatory framework that has been issued by the government seeks to respond to various disaster events in Indonesia by building a disaster management system in terms of legislation, institutions, implementation (pre, emergency response, and post-disaster). which is relevant to the focus of the research that the researcher is looking for, namely resources and cooperation in the emergency response system in disaster management, while the results of this study explain that community empowerment in an effort to deal with emergency cases is an effort to increase the effectiveness of the integrated emergency service system, especially to deal with natural and non-natural disasters. Through the provision of education and training as first aid materials, both formally and informally delivered and carried out regularly and continuously, it is hoped that the community will be able to know the various efforts and countermeasures in the context of dealing with disasters appropriately. Disaster preparedness policy is very important and is a concrete effort issued by the government and several related parties, especially in carrying out disaster preparedness activities. The policy also affects the disaster warning system, resource mobilization, funding, management organization, and important facilities for disaster emergencies.

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## 1. Introduction

Disasters can indeed come at any time, and the process is often not predictable in advance, even though in fact in this era of sophisticated technology, humans have succeeded in creating various disaster detection tools, some of which still experience technical problems and problems when they are in the area. In the field, for this reason, a more systematic and controlled disaster anticipation management is needed, one of which is built through the organization of human resource management. Indonesia is a very large country and is located on the equator at a cross position between two continents and two oceans which is prone to disasters with a fairly high frequency. Some of the annual disasters that often hit Indonesia include earthquakes, floods, landslides, volcanic eruptions, tsunamis and several non-natural disasters that often come periodically so that this country is always unprepared when facing various problems resulting from

the arrival of disasters. -the disaster [1].

Disasters are serious disturbances that have an impact on the state of a country, resulting in losses to human life, material and the environment that exceed the community's ability to cope. According to data released by the National Health Crisis Center, natural disasters are the most frequent disaster category in Indonesia with details reaching 53%, followed by non-natural disasters at 38% and the rest social disasters at 9%. In addition, the effects of disasters are also capable of threatening and causing human casualties, environmental damage, property losses, and psychological impacts. The intensity of disasters in Indonesia can reach more than 1,000 times a year or reach 3 times a day, of course this must be addressed wisely, both by the government and the wider community, because according to the experience we often face so far our country is still difficult in terms of post-disaster management and recovery, response and preparedness efforts for disasters are needed both by the community, government and professional groups.

Disaster preparedness is all activities carried out before facing a disaster with the aim of developing operational capacity and facilitating an effective response through a knowledge base, skills, and minimum capabilities regarding disaster response, public health and emergency preparedness. Disaster preparedness must be applied especially to areas that have a very high level of disaster risk every year. Building preparedness is an important element in dealing with various unwanted events, for that the process must be carried out properly because it will determine the resilience of community members in the face of a disaster [2].

If referring to the regulations issued by the government through the application of Law no. 24 of 2007 concerning Disaster Management was jointly stipulated by the government and the DPR to build a strong disaster management system in Indonesia, or Government Regulation no. 21 of 2008 concerning the Implementation of Disaster Management, the government seeks to establish a regulatory framework that seeks to respond to various disaster events in Indonesia by building a disaster management system in terms of legislation, institutions, implementation (pre, emergency response, and post-disaster) as well as in terms of budgeting.

In the RI Government Regulation No. 21 of 2008 concerning the Implementation of Disaster Management, preparedness is an operational form in situations where there is a potential disaster with one form of activity related to it is human resources, in this case the readiness of human resources must be ensured to have a capability. in carrying out disaster management quickly, precisely and accurately.

According to the Regulation of the Head of BNPB Number 4 of 2008 there are several factors that affect the preparedness of officers in dealing with disasters, including (1) Activation of disaster alert posts with all their supporting elements (2) Simulation training or technical rehearsals for each disaster management sector (SAR, social, health , infrastructure and public works) (3) Inventory of emergency support resources (4) Preparation of support and mobilization of resources (5) Preparation of fast and integrated information and communication systems to support disaster tasks (6) Preparation of early warning system instruments, as well as the last is resource mobilization (personnel and facilities) [3].

According to data obtained by researchers from several literature sources regarding indicators of preparedness in dealing with disasters, including those obtained from the results of research by Sutton and Tierney (2006), Perry and Lindell (2008), that they reveal that there are several general factors that are directly involved in preparedness. , which includes several things, namely the knowledge and attitudes possessed by a person affect attitudes and concerns to be ready and alert in anticipating disasters, especially for those who live in areas prone to natural disasters. Individual knowledge and attitude indicators are basic knowledge that everyone should have, including knowledge about disasters, their causes and symptoms, as well as what to do if a disaster occurs in their area.

Furthermore, the emergency response plan is a concept that is owned by individuals or communities in dealing with emergencies in an area caused by a disaster. Emergency response plans are an important part of a preparedness process, especially those related to evacuation, rescue and rescue, so that disaster victims can be handled as early as possible. An emergency response plan is very important, especially on the first day of a disaster or a period when outside assistance has not yet arrived. Disaster preparedness plans include making maps, temporary shelters, information hotline numbers, command posts, training/simulation rehearsals, risk analysis and recovery planning [4].

Then the existence of supporting resources is one indicator of preparedness that considers how various existing resources are used to restore emergency conditions due to disasters to normal conditions. This indicator generally looks at the various resources needed by individuals or communities in an effort to recover or survive in a disaster or emergency situation that can come from internal or external sources from the affected area. Resources according to Sutton and Tierney's research are divided into 3 parts, namely human resources, funding/logistics resources, and technical guidance and material resources.

The implementation of disaster preparedness does not only involve the role of the government and civil society, but also involves health workers. As one of the important components in responding to disaster management in an area, nurses have a very strategic role because the failure of the roles and responsibilities of nurses will also have an impact on failure in dealing with disaster victims. So besides being an expert in their field, nurses are also required to know how to prepare for disaster risk. Therefore, the presence of disaster preparedness measures issued by the government in order to form an integral part of the national system agenda is expected to be fully responsible for disaster management and develop disaster management plans and programs which include prevention, mitigation, preparedness, response, rehabilitation and reconstruction.

## 2. Methods

Researchers conducted a literature search that was relevant to several incidents related to resource preparedness and cooperation in the disaster emergency management system. In carrying out this research, researchers also used descriptive methods, namely to collect data on indicators related to the focus of the problem being sought. The search was carried out through electronic databases such as (Pubmed, Science Direct and Google scholar) as well as a review of several previous articles that were still relevant, while the inclusion criteria used were (1) Research articles published in the last 10 years, namely in 2010 to 2020 (2) The research article discusses the factors that influence the Implementation of the Integrated Emergency Management System (SPGDT) in Indonesia and consists of several other factors such as Resources, Response Time, and Innovation. (5) Research articles are published in Indonesian and/or English. (6) The full text of the article can be accessed [5].

**TABLE 1.**  
LITERATURE STUDY FINDINGS

Researcher Name (Year)	Article Title	Results
Dian Budi Santoso, Angga Eko Pramono, Agasi Gilang Persada (2019)	Development of Interoperability of the Kebumen Regency Integrated Emergency Management System (SPGDT)	The updated data includes data on duty doctors, specialists, availability of inpatient rooms, blood bags, and ventilators. In practice, not all operators update the data periodically. There are often delays in updating data so that the information displayed on the SPGDT website does not match the actual conditions. Operators who use SIMRS and SIMPUS must also perform double data entry if a patient enters or leaves hospitalization. Inpatient data must be inputted twice into SIMRS/SIMPUS and SPGDT, this certainly adds to the operator's workload. Data on SPGDT is expected to be updated automatically along with updates inpatient data at SIMRS/SIMPUS. To facilitate this, an Application Program Interface (API) was developed that facilitates data interoperability between SPGDT and SIMRS and SIMPUS.
Rizka Hayaturrahmi, Cut Husna (2018)	Resource Preparedness and Cooperation in an Integrated Emergency Management System in Disaster Management	the preparedness of nurses in the integrated emergency response system in disaster management at the Banda Aceh Mother and Child Hospital, in terms of the percentage is in the ready category (61.2%). This can be supported by the majority of respondents with a working period of 6-10 years (38.8%), the majority of nurses are in the emergency room, totaling 22 people so that all emergency room nurses are always ready in the event of an emergency, and the majority of nurses have attended emergency training or disaster as many as 68 people (66%). This shows that most of the implementing

Researcher Name (Year)	Article Title	Results
Utami, Kurnia Wahyu (2015)	Analysis of Readiness for Implementation of the Integrated Emergency Management System Program in the Emergency Installation of the Tidar Regional General Hospital, Magelang City	nurses in the ER, ICU, NICU, PICU, and Inpatient Rooms are ready to handle all disaster events that can occur suddenly and which are not predicted in advance. In general, the medical personnel in the hospital are sufficient, but not necessarily per unit, but so far they have fulfilled the requirements to serve emergency room patients. And there is an informant who added that every year there must be additional HR for health workers. From this statement it can be concluded that the overall availability of health workers is sufficient both in quantity and quality. But on the other hand, there are key informants who say that specifically for nurses the number is still lacking, especially with the increasing number of patient visits after Tidar Hospital became a second-level referral.
Hadi Purnomo (2018)	The Role of Government, Humanitarian Organizations and Grassroot in Disaster Management	Disaster management is important for handling disaster events in order to reduce or minimize victims. The government cannot afford to deal with disasters alone. The involvement of various parties in the relief effort is an important factor. The success of disaster management cannot be separated from the role of various parties, including the government, humanitarian organizations and the community (grassroots). Cooperation of various will provide enormous benefits. The interaction of civil society which includes the government, humanitarian organizations and the community is a force for the sustainability of disaster management that is faster and more effective, in a shorter and longer term covering the local area where the disaster occurred.
Osmar Shalih, Riant Nugroho (2019)	Reformulation of Disaster Management Policy in Indonesia	From the discussion above, that in Law Number 24 of 2007 concerning Disaster Management, a National Disaster Management System has been described and is an integrated disaster management system which includes aspects of legislation-regulation, planning, institutional and funding, as well as disaster management. The re-formulation of disaster management policies that need to be strengthened for the disaster management system are as follows: (1) Pre-disaster, (2) Emergency Response, and (3) Post-disaster.

### 3. Results and Discussion

#### 3.1 Disaster Management System

Disasters do not only affect the regional area, but also have a comprehensive impact on the surrounding areas, so that assistance and support are needed through an integrated emergency response management system that is quickly integrated, especially for people who are directly affected by it. The stages can start from active collaboration between the government, the private sector, volunteers, and community organizations which are the basis of the disaster management system, while the integrated approach to disaster management includes aspects of prevention, preparedness, response and recovery. The disaster management system itself is a set of plans, procedures, resources, personnel and various relationships that aim to reduce the effects of hazards, emergencies and disasters faced by the community, including those concerning cooperation between human resources and technology that are connected collectively [6].

Disaster management in Indonesia at the national level is handled by a government agency which is often called the National Coordinating Board, which has the task of coordinating and saving emergencies, as well as collaborating with several other institutions such as the Coordinating Minister for People's Welfare, Minister of Social Affairs, local governments. and private institutions. The Indonesian government officially and legally handles disaster management by establishing the National Coordinating Agency for Disaster Management and Refugee Management at the national level, while at the provincial level it is called the Refugee Implementing

Coordinating Unit. Management in disaster relief is very important because it has a role to concentrate on managing processes effectively, besides that operations management is also a transformation process in improving systems that create and deliver services to disaster victims [7].

Basically, disaster events have different characteristics, but in essence they have the same concept of disaster relief cycle in disaster management. The disaster management cycle describes the disaster management process which is essentially pre-disaster, pre-disaster, during disaster and post-disaster actions. Assistance to disaster victims is prioritized for human safety, but also to reduce the impact of disasters that have direct relevance to human life.

**TABLE 2.**  
GENERAL OBJECTIVES OF DISASTER RESPONSE

No	General purpose
1	Save life
2	Preventing a wider disaster
3	Help suffering
4	Save the environment
5	Maintain property
6	Facilitate trial and investigation of criminal, public, technical and other purposes
7	Providing information to the public
8	Promotes self-help and recovery
9	Making repairs to normal as soon as possible

Disaster victims need assistance from various resources, both from the government, the private sector and other communities, this is to overcome the conditions resulting from the disaster. Disaster assistance can be divided into several different stages, including the warning stage, the emergency stage (rescue measures, medical assistance, temporary housing), and the recovery or rebuilding stage.

**TABLE 3.**  
STAGES OF DISASTER ASSISTANCE

Researcher	Stages
Wolenksy (2017)	Before the disaster
	Emergency response
	Immediate recovery (two years)
	Long term recovery (10 years)
Wolenksy (1990)	Warning
	Planning and preparation
	response (response)
Helsloot dan Ruitenber (2004)	Recovery
	Warning
	Emergency
	Recovery

In Law No. 24 of 2007 concerning disaster management, the implementation of disaster management, especially post-disaster is divided into several stages including, rehabilitation, namely improving the environment of areas affected by disasters, such as repairing public facilities and infrastructure, then health services and socio-economic recovery, culture [8]. Meanwhile, at the reconstruction stage, the recovery is divided into rebuilding community social facilities, implementing appropriate design, improving social, economic and cultural conditions, improving the function of public services and improving key services in the community. In simple terms, disaster management is all aspects related to disaster, starting from the delivery of knowledge, disaster risk, and avoiding disaster risk. Besides that, disaster management is also a dynamic process of working management functions including planning, organizing, mobilizing and controlling [9].

Disaster management works by carrying out activities in each field of work, namely

prevention, mitigation and preparedness, emergency response, and recovery. In general, disaster management aims to (1) Prepare yourself for all disasters or unwanted events (2) Suppress losses and victims that can arise as a result of the impact of a disaster or event (3) Increase awareness of all parties in the community or organization about disasters so that they are involved in the process of disaster management (4) Protecting community members from the dangers or impacts of disasters so that victims and suffering experienced can be reduced.

Emergency response management must become a necessity and be stated in policies and various regulations. Without the support and desire of various parties, the emergency response management program will not meet satisfactory results. At the national level, the policy itself is of course determined by a President and for regional areas it is regulated by the local regional head. This policy is the basis for implementing disaster management in each region or company/organization. Based on this policy, a disaster control strategy can be developed and defined, the provision of the necessary resources and the organization for its implementation. This policy is also very important because it is proof of the commitment of local leaders to the implementation of disaster management in their respective environments. Thus, all related parties, subordinates and members of the disaster control team will receive real support from local leaders (government) [10].

Various legislation or regulations at the post-disaster stage from the Regional Regulation level to BNPB regulations have actually been provided by the central government, but in practice the process has not fully regulated the role of multi-stakeholders at the post-disaster stage, as stated in BNPB regulation Number 5 of 2017 regarding Plans. Post-disaster Rehabilitation and Reconstruction (R3P), however, this legislation does not regulate the role of multi-stakeholders and tends to prioritize the BNPB institution as the main implementer, especially in terms of post-disaster rehabilitation and reconstruction. The proposed reformulation of disaster management policies for planning aspects at the post-disaster stage, namely the need for a more operational recovery plan (not an indication of a program), but an action plan with a spatial planning-based approach and a prolonged principle.

### **3.2 An Overview of Readiness for the Implementation of an Integrated Emergency Management System**

The Integrated Emergency Management System, hereinafter abbreviated as SPGDT, is an integrated and call center-based Emergency Victim/Patient service mechanism using telecommunication access codes and involving the role of the community. The telecommunication access code, hereinafter referred to as Call Center, is a system design using the concept of an integrated call center based on special telecommunication network-based services in the health sector owned by the government. The launch of the Call Center service is in line with the agenda of the five nawacitas, namely improving the quality of life of the Indonesian people, so that in its journey the Ministry of Health continues to strive to provide the best service, especially in the health agenda, while some of the actions provided include emergency algorithms, sending assistance from officers and ambulance, as well as sending patients to the nearest health care facility [11].

The results of this study are in accordance with the explanation of the literature study put forward by Kristina about the health care system during the disaster emergency response with a case study in the Ciamis Regency area with qualitative research methods with informants from health service units (Puskesmas and Hospitals) and institutions (BPBD, Polres, Kodim, Social Service, PMI, Health Office. It is found that the network of cooperation in the health sector has been well established. The system of cooperation that is carried out if there is a risk of health problems due to disasters (eg Extraordinary Events (KLB), will be taken over by the District Health Office and in coordination with the Regional Hospital as a reference point. The study also explains about disaster preparedness carried out by one of the maternal and child hospitals where they have cross-sectoral collaboration with the Ministry of Health, Health Service, BPBD (Disaster Management Agency) Regions), NGOs and training facilities other health services.

Coordination and cooperation in the health sector and non-health sector and emergency response teams from government agencies is very important to meet the needs of preparedness and in the event of a disaster. A well-established coordination will lead to a few gaps and overlapping work during the emergency response phase. Handling of victims with emergencies can be carried out properly in accordance with the Integrated Emergency Management System

(SPGDT) if a coordination system has been established by involving all parties, both related sectors and cross programs in accordance with each related profession. Good coordination and cooperation will lead to harmony in the effective cooperation of the parties involved in disaster management. It aims to improve complementary approaches and identify ways to work well together in reducing mortality and morbidity rates for victims of natural and non-natural disasters [12].

The emergency response system itself consists of five components, namely the system of communication, education, transportation, funding and quality control. Communication in SPGDT is carried out related to clarity of where news of emergency events is conveyed, communication can be developed by using social media as a means of communication during daily emergency conditions or when a disaster occurs. The community is given education about how to ask for help, life support techniques basics, control bleeding, self-evacuation and how to contact emergency transportation. Transportation is an important part of SPGDT because it is directly related to the type of transportation that will be used by disaster victims. The funding source itself can come from health insurance, including non-governmental organizations or from the relevant government, with the condition that system repairs and improvements must be carried out periodically to ensure the quality of emergency services.

Community empowerment in an effort to overcome emergency cases is an effort to increase the effectiveness of the integrated emergency service system, especially in the context of dealing with disasters. Several models of community empowerment that have developed, especially in Indonesia, include first aid response where this model emphasizes the importance of community participation in the emergency service system and activities to increase community participation. Then the second model is called first aid response, where this model is one of the programs developed in several developing countries such as Indonesia, especially in improving the emergency response system outside the hospital, especially for the general public. This program was officially introduced in 2010 to meet the needs of emergency services in dealing with a disaster event. In addition, this program also emphasizes community involvement by providing training or education to the community regarding disaster emergencies. Through empowerment and education, it is hoped that the community can provide first aid to emergency sufferers and contact agencies that can provide first aid, such as hospitals or several other health services [13].

The results of this study are also supported by the findings of a literature study conducted by Dian Budi Santoso in 2019 under the title Development of the Integrated Emergency Management System (SPGDT) interoperability in his innovation explaining the interoperability design between SPGDT with SIMPUS and SIMRS named API (Application) [14]. Programming Interface). API is a simple, flexible, and efficient interface for querying or interacting with databases of a Representational State Transfer (REST) pattern-based system for the web. The research was conducted in the Semarang City area where the results of the study explain that the SOPs currently owned by the Semarang City Health Office only consist of SOPs for Great Ambulance officers and SOPs for the community that regulate how to access API services. These things are socialized through regular meetings (tiered information) held at the Semarang City Health Office with a routine meeting agenda that invites several leaders of puskesmas, hospitals, and several other stakeholders in the context of national disaster management [15].

Emergency training for the general public aims to increase public awareness in helping emergency sufferers and to recognize emergency cases widely in disaster areas. Emergency training programs should be conducted in certain groups with the aim of building effective capacity in dealing with the overall disaster crisis. Through the provision of education and training as first aid materials, both formally and informally delivered and carried out regularly and continuously, it is hoped that the community will be able to know the various efforts and countermeasures in the context of dealing with disasters appropriately. Disaster preparedness policy is very important and is a concrete effort issued by the government and several related parties, especially in carrying out disaster preparedness activities. The policy also affects the disaster warning system, resource mobilization, funding, management organization, and important facilities for disaster emergencies.

#### 4. Discussion

Based on the results of the analysis and discussion of research on resources and cooperation in the emergency response system in disaster management on several literature reviews, the following conclusions can be drawn, disaster management is indeed very important to be applied to the community in order to provide handling of an event or event. disasters in order to significantly reduce and minimize disaster victims. The involvement of various parties in the effort to provide assistance and services, especially in disaster management, is an important factor because it involves various aspects such as post-disaster recovery, distribution of disaster assistance, and providing first aid to all victims. Meanwhile, disaster preparedness is all activities carried out before facing a disaster with the aim of developing operational capacity and facilitating an effective response through a knowledge base, skills, and minimum capabilities regarding disaster response, public health and emergency preparedness. Disaster preparedness must be applied especially to areas that have a very high level of disaster risk every year. Building preparedness is an important element in dealing with various unwanted events, for that the process must be carried out properly because it will determine the resilience of community members in the face of a disaster.

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