

Analysis of Regional Disaster Preparedness in Serang Regency

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Abstract

Serang Regency is the district with the highest number of disaster events in Banten Province in the last four years and will increase sharply in 2024 as many as 91 disaster events and in 2025 as many as 173 disaster events. This trend shows that Serang Regency has consistent and persistent disaster risk characteristics, especially indicating the existence of complex environmental structural or geographical problems and requiring in-depth studies. In disaster management efforts, the Serang Regency Government issued Serang Regency Regional Regulation Number 4 of 2014 concerning Disaster Management. The purpose of the research is to analyze regional disaster preparedness in Serang Regency. The theory used according to LIPI-UNESCO/ISDR (2006) 5 parameters of preparedness, namely: (1) Knowledge and attitude; (2) Policies and guidelines; (3) Emergency response plan; (4) Early warning system; and (5) Resource mobilization ability. The method used is qualitative descriptive. Overall, disaster preparedness in Serang Regency shows a consistent pattern, namely strengths in normative and non-structural aspects, such as local knowledge, legal-formal, documentary planning, and coordination systems, but still faces limitations in implementive and structural aspects, such as simulations that are not routine, limited facilities and infrastructure, and minimal budgets. This condition shows that disaster preparedness in Serang Regency has a strong foundation, but it is not fully optimal in its implementation in the field.

Keywords: Disaster, Region, Preparedness.

INTRODUCTION

Disasters are one of the global threats that need to be anticipated because they cannot be predicted when they occur. Disasters can be in the form of natural disasters, non-natural disasters, and social disasters. Natural disasters are caused by natural events, such as floods, landslides, tsunamis, droughts, and so on. Non-natural disasters are caused by non-natural events, such as technological failures, modernization failures, epidemics, and disease outbreaks. Meanwhile, social disasters are caused by humans, such as terror, conflict, war, fire, pollution, and so on. Natural disasters, non-natural disasters, and social disasters have an impact on losses to human life, be it causing casualties, environmental damage, property damage, disease outbreaks, and causing social and economic problems. According to the United Nations Report (2018) "Poverty & Death: Disaster Mortality 1996-2015", 90 percent of disaster-related deaths occur in low- to middle-income countries. Rich countries have suffered extraordinarily large economic losses due to natural disasters, while poor countries have suffered loss of life. Of the 1.35 million people who have died from natural disasters over the past 20 years, more than half have died from earthquakes, and the rest from disasters related to weather and climate. The majority of these deaths occur in low- and middle-income countries, where the number of fatalities per disaster and per 100,000 population is experienced by the poorest countries.

In early 2020, the world was threatened by non-natural disasters due to the Corona Virus which claimed many lives. The World Health Organization (WHO, 2020) designated the status of Corona Virus

Disease 2019 (Covid-19) as a Pandemic on March 11, 2020 and called on countries to take urgent and aggressive measures for the prevention and control of Covid-19. In 2020-2021, WHO estimates that there will be 14-9 million excess deaths due to Covid-19 occurring globally, while the Institute for Health Metrics and Evaluation (IHME) estimates that there will be 18-2 million deaths and 17-7 million deaths estimated by The Economist for the same period [Jha et al, 2022]. Indonesia is one of the countries affected by Covid-19 with the second highest number of deaths in Asia (BBC New Indonesia, 2022). On June 22, 2023, the status of the Covid-19 pandemic in Indonesia ended through Presidential Decree (Keppres) Number 17 of 2023 concerning the Determination of the End of the Corona Virus Disease 2019 (COVID-19) Pandemic Status in Indonesia. However, other disasters need to be anticipated.

Indonesia is an archipelagic country that geographically has a huge potential for natural disaster vulnerability because it is located at the confluence of four tectonic plates, namely the Asian continental plate, the Australian continent, the Indian Ocean plate, and the Pacific Ocean plate. In the southern and eastern parts of Indonesia, there is a volcanic arc that extends from the islands of Sumatra, Java, Nusa Tenggara, to Sulawesi. The sides are old volcanic mountains and lowlands that are partly dominated by swamps. Therefore, Indonesia is very prone to natural disasters, such as volcanic eruptions, earthquakes, tsunamis, floods, landslides, and extreme weather. Indonesia is among the countries in the world that are affected by many natural disasters, as can be seen in the following graph:

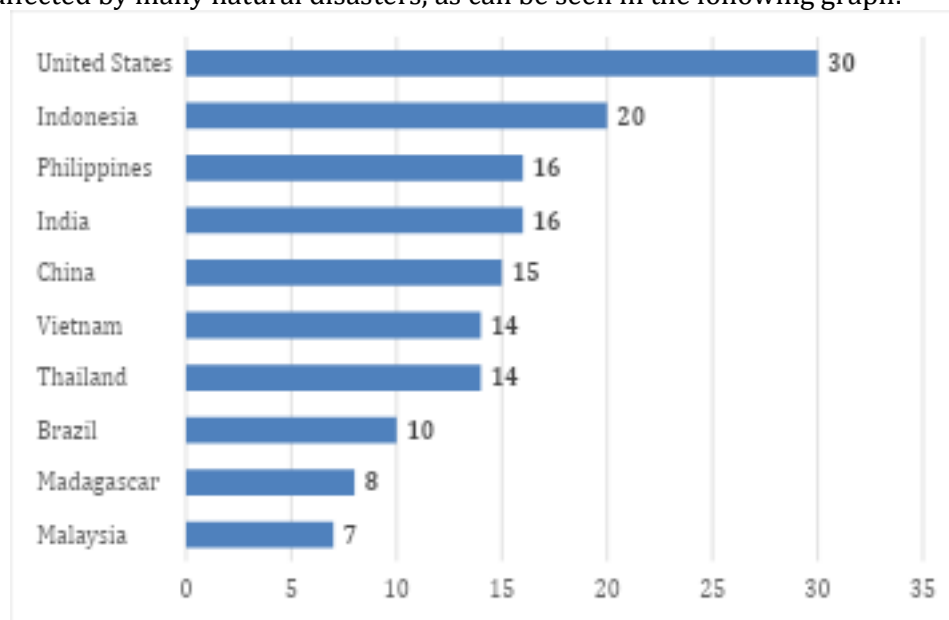


Chart 1. Top 11 Countries With The Most Global Disasters in 2025

Source: Centre for Research on the Epidemiology of Disasters (CRED), 2025.

Based on Chart 1, Indonesia is ranked as the second country with the most natural disasters in the world in 2025 based on the "2025 Disasters in Numbers" Report from the Centre for Research on the Epidemiology of Disasters (CRED, 2025). The worst natural disaster in Indonesia in 2025 was tropical storm Senyar in late November causing 1,109 reported fatalities and leaving 3.2 million people in need of assistance in Sumatra, Indonesia. In addition, based on the World Risk Report 2025, Indonesia is one of the countries with the highest disaster risk in the world with a World Risk Index (WRI) of 39.80.

Table 1. The Countries with the Highest Disaster Risk Worldwide 2025

No.	Countries	World Risk Index (WRI)
1	Philippines	46,56
2	India	40,73
3	Indonesia	39,80
4	Colombia	39,26
5	Mexico	38,96
6	Myanmar	36,91
7	Mozambique	34,39
8	Russia	31,22
9	China	30,62
10	Pakistan	26,82

Source: The World Risk Report 2025.

Based on Table 1, Indonesia is the country with the third highest disaster risk in the world after the Philippines and India, which is 39.80 out of 100. These values reflect the complex structural challenges of disaster exposure and vulnerability creating a complex network of risks in disaster management. The following are the trends of disasters in Indonesia in the last 11 years:

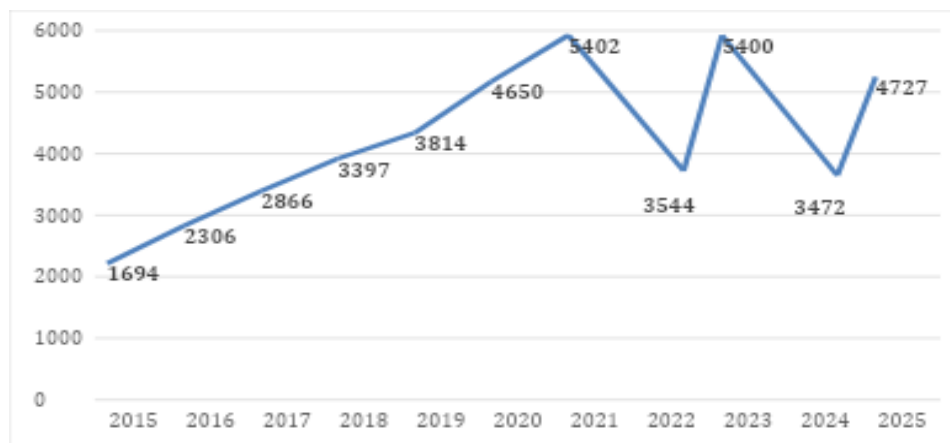


Chart 2. Disaster Trends in Indonesia in 2015-2025

Source: Researcher data processing from Indonesian Disaster Information Data (DIBI) National Disaster Management Agency (BNPB) 2015-2025 (processed 2026).

Based on Chart 2, the number of disaster events in Indonesia has experienced a fluctuating trend in the last ten years. A negative trend occurred from 2015 to 2021, where there was a significant increase in disasters with the highest number in 2021 of 5,402 disaster events, then decreased in 2022 by 3,544 incidents. However, in 2023 there will be an increase of 5,400 disaster events and will decrease to 1,478 disaster events in 2024, then in 2025 there will be an increase of 4,727 disaster events.

Table 2. Number of Disasters in Indonesia by Type in 2022-2025

No .	Types of Natural Disasters	Number of Events			
		2022	2023	2024	2025
1	Flood	1.531	1.255	1.420	2.009

No .	Types of Natural Disasters	Number of Events			
		2022	2023	2024	2025
2	Forest and Land Fires	252	2.052	973	1.329
3	Extreme Weather	1.094	456	733	958
4	Landslides	633	591	207	330
5	Drought	4	1.011	89	37
6	Tidal Waves and Abrasion	0	0	27	28
7	Earthquakes	29	31	15	28
8	Volcanic Eruptions	1	4	8	7
9	Tsunami	0	0	0	1
Quantity		3.544	5.400	3.472	4.727

Source: Researcher Data Processing from the Indonesian Disaster Data Geoportal of the National Disaster Management Agency (BNPB) 2022-2025 (processed 2026).

Based on Table 2, in 2022, floods became the most natural disasters with 1,531 incidents, followed by extreme weather with 1,094 incidents, and landslides with 633 incidents. In 2023, the most disaster events were forest and land fires with 2,052 incidents, floods with 1,255 incidents, and drought with 1,011 incidents. The number of disasters will decrease in 2024 with a total of 3,472 incidents with the most natural disasters being floods with 1,420 incidents, forest and land fires with 973 incidents, and extreme weather with 733 incidents. In 2025, there will be an increase in disasters in Indonesia by 4,727 disaster events with the most types of natural disasters, namely floods with 2,009 disaster events, forest and land fires with 1,329 disaster events, and extreme weather with 958 disaster events. In addition, in 2025 there will be a minor tsunami due to the earthquake that occurred in Kamchatka, Russia.

**Table 3. Number of Disasters in Indonesia by Province in Java
Year 2022-2025**

No.	Province	Number of Disaster Events			
		2022	2023	2024	2025
1	West Java	824	843	203	586
2	East Java	400	134	160	390
3	Central Java	488	629	138	335
4	Banten	80	62	28	115
5	Special Region of Yogyakarta	29	176	9	55
6	DKI Jakarta	17	17	11	36
Total		1.838	1.861	549	1.517

Source: Researcher Data Processing from the Indonesian Disaster Data Geoportal of the National Disaster Management Agency (BNPB) 2022-2025 (processed 2026).

Based on Table 3, West Java Province is the province with the most disasters occurring on the island of Java with the number of disaster incidents as many as 824 incidents in 2022, 843 incidents in 2023, 203 incidents in 2024, and increasing to 586 incidents in 2025. Meanwhile, Banten Province, which is directly adjacent to West Java Province to the west, experienced a decrease in disaster events from 2022 to 2024, but a sharp increase in 2025 totaled 115 disaster events. Although Banten Province is the fourth most common disaster in Java, Banten Province has a high Disaster Risk Index on the island of Java, as shown in the following table:

Table 4. Banten Province Disaster Risk Index 2021-2025

Year	Disaster Risk Index (IRB)	Risk Class	Rank se-Indonesia	Rank throughout Java Island
2021	149.08	Height	10	1
2022	144.51	Height	12	1
2023	132.21	Medium	18	1
2024	128,64	Medium	16	1
2025	103,58	Medium	16	3

Source: Researcher data processing from IRBI in 2021, 2022, 2023, 2024, 2025 (processed 2026).

Based on Table 4, the Banten Province Disaster Risk Index has experienced a positive trend because it has decreased in the last five years (2021-2025), where the IRBI score in 2025 is 103.58 with a medium risk class category. However, this decline needs to continue to be watched out for because Banten Province will be the province with the highest Disaster Risk Index on the island of Java in 2021-2024, although in 2025 the highest IRBI will be occupied by East Java Province with a score of 108.36. Banten Province is a province that has a high disaster potential because this area is often hit by floods in the rainy season and in history has also been hit by a large tsunami due to the eruption of Mount Krakatau in 1883 [Husein et al, 2017]. The following is the Disaster Risk Index for districts/cities in Banten Province:

Table 5. Banten Province Disaster Risk Index for 2021-2023

No.	City/Regency	Disaster Risk Index (IRB)					Risk Class
		2021	2022	2023	2024	2025	2025
1	Lebak Regency	182.04	199.57	172.98	185.64	145.98	Medium
2	Serang Regency	176.14	154.18	136.82	123.30	138.44	Medium
3	Pandeglang Regency	177.46	203.05	169.21	192.52	116.82	Medium
4	Cilegon City	121.23	115.97	119.49	111.01	112.94	Medium
5	Serang City	168.56	156.20	140.12	127.57	109.52	Medium
6	Tangerang Regency	146.93	130.45	141.43	125.22	73.12	Medium
7	Tangerang City	132.80	116.80	104.55	95.74	68.01	Medium
8	South Tangerang City	87.44	79.86	73.06	68.10	63.83	Medium

Source: Researcher data processing from IRBI in 2021, 2022, 2023, 2024, 2025 (processed 2026).

Based on Table 5, the Disaster Risk Index by district/city in Banten Province fluctuates. In 2021 and 2023, Lebak Regency will be the district with the highest Disaster Risk Index in Banten Province with an index of 172.98 in 2023. Meanwhile, Pandeglang Regency became the district with the highest Disaster Risk Index in Banten Province in 2022 with an index of 203.05. Pandeglang Regency will be the district with the highest Disaster Risk Index in 2025. Lebak Regency and Pandeglang Regency are two districts in Banten Province with a high disaster risk in 2024, but in 2025 all districts/cities in Banten Province will be recorded as medium risk classes.

In anticipation of disaster events, the central government issued Law (UU) Number 24 of 2007 concerning Disaster Management. This law states that the central government and local governments are responsible and have the authority to implement disaster management carried out in the pre-disaster, emergency response, and post-disaster stages. The central government established the

National Disaster Management Agency as the director and implementer of disaster management. The local government is authorized in the implementation of disaster management, one of which is through the establishment of regional disaster management policies and the establishment of the Regional Disaster Management Agency (BPBD). In following up on Law Number 24 of 2007, the Banten Provincial Government issued Banten Provincial Regulation Number 1 of 2015 concerning the Implementation of Disaster Management [14] and established the Banten Provincial Regional Disaster Management Agency through Regional Regulation Number 3 of 2010. BPBD is tasked with overcoming every regional disaster, both in the form of preventive and repressive efforts. The following is the number of disaster events in Banten Province by district/city in the last three years:

**Table 6. Number of Disasters in Banten Province by Regency/City
Year 2022-2025**

No.	City/Regency	Number of Disaster Events			
		2022	2023	2024	2025
1	Serang Regency	32	27	91	173
2	South Tangerang City	15	5	2	21
3	Tangerang Regency	7	11	0	18
4	Lebak Regency	8	4	7	16
5	Serang City	6	4	3	14
6	Pandeglang Regency	7	5	1	11
7	Cilegon City	1	9	3	10
8	Tangerang City	4	1	2	9
Banten Province		80	66	109	272

Source: Researcher Data Processing from BNPB 2022-2024, BPS Banten Province 2025, and BPDB Serang Regency 2022-2025 (processed 2026).

Based on Table 6, the number of disaster events decreased from 2022 to 2023, but increased sharply in 2024 as many as 115 disaster events and 272 disasters in 2025. Serang Regency is the district with the highest number of disaster events in Banten Province in the last four years and will increase sharply in 2024 as many as 91 disaster events and in 2025 as many as 173 disaster events. This trend shows that Serang Regency has consistent and persistent disaster risk characteristics, especially indicating the existence of complex environmental structural or geographical problems and requiring in-depth studies. Based on the topography of the area, Serang Regency is a disaster-prone area because it is close to Mount Anak Krakatau so it has the potential for tsunamis and landslide-prone mountains. In addition, Serang Regency in the area around the river border has a high potential for flooding due to the relatively flat soil contour with the basin area, also coupled with lithology of rock types and high rainfall. The research of Prawiradisastra et al (2018) using the results of SAGA Topographic Wetness Index (TWI) modeling resulted in a total area prone to flooding in Serang Regency of 62,608 Ha dominated by the high and low classes with 25,050 Ha and 29,741 Ha, respectively, while the medium class was 7,817 Ha. There are high and medium flood classes, namely in Cikande, Bojonegoro, and Puloampel which if floods occur will cause significant losses. The cause of floods that often occur in Serang Regency is because the Cibanten river has narrowed which results in being unable to withstand the water discharge from the Sindang Heula reservoir, the river's inadequate capacity so that it hits residential areas as well as limited rice fields, lakes and dams, and high rainfall (Gultom, 2023).

In an effort to manage disasters, the Government of Serang Regency issued Regional Regulation of Serang Regency Number 4 of 2014 concerning Disaster Management in Serang Regency and through

Regional Regulation Number 11 of 2016 concerning the Formation and Composition of the Regional Apparatus of Serang Regency and the Regulation of the Regent of Serang Number 74 of 2016 concerning the Organizational Structure and Work Procedures of the Regional Disaster Management Agency of Serang Regency, The Serang Regency Government delegated tasks and functions related to disasters to the Serang Regency Regional Disaster Management Agency (BPBD). Furthermore, the main duties and functions of BPBD are emphasized in the Serang Regent Regulation Number 111 of 2016 concerning the Main Duties, Functions and Description of Duties at the Serang Regency Regional Disaster Management Agency. The Serang Regency BPBD is a leading sector in disaster management in Serang Regency.

Field data shows that in a relatively short period of time, Serang Regency has experienced repeated hydrometeorological disasters. In early January 2026, the Regional Disaster Management Agency (BPBD) of Serang Regency recorded floods, landslides, and strong winds that hit 13 sub-districts, impacting 20 villages with the number of affected residents reaching 3,514 heads of families (KK) or 11,700 people, as well as 3,164 units of affected residents' houses. Only two months later, in early March 2026, a similar disaster occurred again and spread to 34 villages in 14 sub-districts with 3,652 families or 10,892 people affected, including vulnerable groups in the form of 357 elderly, 247 toddlers, and 283 children (BPBD, 2026; Antara Banten, 2026; Kompas, 2026; Metro TV, 2026). The recurrence of disaster events in relatively similar sub-districts, such as Kramatwatu, Ciruas, Kibin, Pontang, Padarincang, and Mancak, indicates that the preparedness and mitigation efforts that have been carried out have not been fully effective in suppressing the impact of disasters. On the other hand, the Serang Regency BPBD also faces various operational obstacles in the field, including limited operational vehicles, lack of field facilities and infrastructure, the wide distribution of incident locations that must be handled simultaneously, and budget limitations as a result of the central government's budget efficiency policy.

Disaster preparedness is one of the important stages in the disaster management management cycle which aims to reduce the risks and impacts caused through a series of activities carried out to anticipate disasters through appropriate and effective and effective organization and steps. The level of preparedness of a region can be seen from the extent of the knowledge of the apparatus and the community, the available policies and guidelines, the emergency response plan, the early warning system, and the ability to mobilize the resources possessed.

Based on this description, the researcher is interested in conducting a research entitled "Analysis of Regional Disaster Preparedness in Serang Regency" in order to find out and analyze the extent of the preparedness level of the local government and the people of Serang Regency in dealing with potential disasters, as well as the factors that are obstacles in its implementation in the field.

LITERATURE REVIEW

According to Law number 24 of 2007 concerning disaster management, the definition of preparedness is a series of activities carried out to anticipate disasters through organization and through appropriate and effective steps. UNESCO (2023) explained that there are 4 stages in the disaster management cycle, including: 1) mitigation, 2) preparedness, 3) emergency response, and 4) recovery. Based on Government Regulation Number 21 of 2008 article 15 explains that the implementation of disaster management in situations where there is a potential for disaster includes: preparedness, early warning and disaster mitigation. Article 16 explains that preparedness is carried out to ensure the implementation of quick and appropriate actions in the event of a disaster. According to LIPI – UNESCO/ISDR (2006) Preparedness is one part of the disaster management process and in the current concept of disaster management, increasing preparedness is one of the important elements of pro-active disaster risk reduction activities, before a disaster occurs. In general, *disaster preparedness* is defined as the condition of individual, household, and community readiness to anticipate, respond, and recover from the impact of a disaster threat, which is reflected in the possession of an emergency plan, standby

equipment, mitigation knowledge, and involvement in supportive social networks (Zaremohzzabieh et al., 2021). Preparedness is not only related to aspects of knowledge, but also attitudes, action plans, early warning systems, and the ability to mobilize resources (Virgiani, Aeni, & Safitri, 2022). According to the opinion of Ao, Tan, Tan, Zhong, Zhang, and Wang (2022) show that public trust in stakeholders and the assistance provided contribute significantly to improving preparedness behavior. Meanwhile, according to the opinion of Nguyễn, Bostrom, Abramson, and Moy (2023) emphasized that conventional household-based preparedness measures tend to ignore the role of social capital and community-based resources, which have actually proven to be significant in supporting coordination and collective action when disasters occur.

According to Meyda (2023), it was found that social capital, which includes beliefs, networks, and norms in society, has a significant effect on preparedness for flood disasters. Knowledge is another important determinant. The level of community knowledge correlates with preparedness for landslides (Jesita and Wahyuni, 2023) while Anwar's (2022) opinion found a relationship between knowledge and preparedness attitudes in adolescent groups. The relationship between housing characteristics and disaster preparedness in low-income populations and found that age played a role in the relationship, where the elderly group with less decent housing conditions showed lower levels of preparedness (Chen, Teixeira, and Coley, 2025).

According to LIPI-UNESCO/ISDR (2006) explains that there are 5 parameters in preparedness, namely: (1) Knowledge and attitude; where the knowledge possessed can usually affect the attitude and concern of the community to be ready and alert in anticipating disasters, especially for those who live in coastal areas that are vulnerable to natural disasters. (2) Policies and guidelines; Where policies that significantly affect preparedness include: public education, emergency planning, disaster warning systems and resource mobilization, including funding, management organizations, human resources and essential facilities for disaster emergencies. In order for the policy to be implemented optimally, operational guidelines are needed. (3) Emergency response plan; where this plan is an important part of preparedness, especially related to evacuation, relief and rescue, so that disaster victims can be minimized. This effort is crucial, especially in times of disaster and the first days after a disaster before help from the government and from outside parties arrives. (4) Early warning system; where this system includes warning signs and distribution of information about the occurrence of disasters, training and simulation are needed, what to do if they hear warnings, where and how to save themselves at a certain time and (5) resource mobilization ability; where both human resources (HR), as well as funding and important infrastructure for emergencies are potential that can support or otherwise become an obstacle in disaster preparedness.

RESEARCH METHODS

This study uses a qualitative approach with a descriptive method, which aims to describe and analyze regional disaster preparedness in Serang Regency based on five parameters of LIPI-UNESCO/ISDR (2006) preparedness, following the operational dimensions of the research:

Table 7. Research Operational Dimension

Research Focus Dimensions	Analysis of Regional Disaster Preparedness in Serang Regency	
	Operational Definition	Sub Dimension
Knowledge and Attitudes	Understanding of the authorities/community about disaster risks in their area	a. Disaster knowledge b. Disaster experience c. Preparedness attitude

Research Focus	Analysis of Regional Disaster Preparedness in Serang Regency	
Dimensions	Operational Definition	Sub Dimension
Policies and Guidelines	Availability of disaster regulations and SOPs	a. Regulation b. Standard Operating Procedures (SOP)
Emergency Response Plan	Preparedness of evacuation plans and division of roles	a. Contingency plan b. Routine simulation
Early Warning System	Availability and functionality of the alert system	a. Early Warning System b. Citizen Information Network
Resource Mobilization Capability	Readiness of human resources, facilities, and budget	a. Human Resources b. Infrastructure c. Budget

Source: Researcher, 2026.

Research instruments, namely human instruments or the researcher himself. Data collection was carried out through non-participation observations, interviews, and documentation studies. The validity of the data was tested using source triangulation and triangulation techniques. The data analysis uses an interactive model from Miles, Huberman, and Saldana (2014) which consists of four stages that are interrelated, namely: data collection, data condensation, data presentation, and verification/conclusion.

RESULTS AND DISCUSSION

This study uses a disaster preparedness analysis framework developed by the Indonesian Institute of Sciences (LIPI) in collaboration with UNESCO/ISDR (2006), which has been widely used in disaster preparedness studies in Indonesia. This model consists of five main parameters, namely: (1) Knowledge and attitude; (2) Policies and guidelines; (3) Emergency response plan; (4) Early warning system; and (5) Resource mobilization ability.

I. Knowledge and Attitudes

Knowledge and attitude parameters analyze the extent to which local government officials and the community have knowledge about the types, characteristics, and risks of disasters that threaten their areas, as well as attitudes and concerns about disaster risk reduction efforts. In the framework of LIPI-UNESCO/ISDR (2006) preparedness, knowledge and attitudes are placed as fundamental parameters because an individual's understanding of the characteristics, symptoms, and causes of a disaster will affect their attitude of concern and readiness to be prepared to face threats. The better the knowledge you have, the greater the tendency of a person to be prepared for a disaster that may occur.

a. Disaster Knowledge

Knowledge of the types of disasters includes a basic understanding of the characteristics, symptoms, and causes of a threat. According to the framework of LIPI-UNESCO/ISDR (2006), disaster knowledge is the foundation for the formation of vigilance attitudes. Individuals with better knowledge of the characteristics of disasters in their area tend to have higher levels of preparedness than those with limited knowledge. This indicates that strengthening disaster literacy, both through socialization and informal education, is a crucial first step before the apparatus and the community are able to develop appropriate anticipatory steps.

The knowledge of the people of Serang Regency about disasters is not evenly distributed. Even so, the local government through the Serang Regency BPBD always strives to improve education

through socialization related to disasters to the community. Here are some of the socializations carried out by BPBD from 2023 to 2025:

Table 8. Socialization Activities of BPBD Serang Regency in 2023-2025

Year	Activities	Activity Description
2023	IDRIP-DESTANA Project	The Indonesia Disaster Resilience Initiatives Project (IDRIP)-DESTANA (Disaster Resilient Village) is a collaboration between the Government of Indonesia through BPBD and the World Bank to support financing and technical assistance in the implementation of strategic investment projects, improving disaster risk governance in Indonesia, and government and community preparedness in dealing with tsunami threats. In 2023, socialization and coordination activities for the IDRIP-DESTANA project Strengthening Community Resilience Capacity Strengthening Region 1 will be carried out in six villages, namely Bulakan Village, Karang Suraga Village, Anyar Village, Salira Village, Argawana Village and Sumuranja Village
2023	Socialization and Workshop of Community-Based Disaster Early Warning System (SPDBBM)	The Directorate of Early Warning of BNPB together with the Serang Regency BPBD held a Socialization and Workshop on the Community-Based Disaster Early Warning System (SPDBBM) in Pasauran Village. This activity resulted in the formation of a village Disaster Preparedness Team, early warning protocols, hazard monitoring protocols, and maps and evacuation protocols through early warning simulations. The focus is related to the threat of the eruption of Mount Anak Krakatau and the potential for an atypical tsunami. The Serang Regency BPBD is committed to replicating this model to other vulnerable villages.
2025	School Education	The 2025 education program targets schools in areas prone to floods, landslides, earthquakes, and fires as a result of mapping with the Serang Regency Education and Culture Office, one of which is at SMAN 1 Anyer (in accordance with the focus of disaster-prone areas in Anyer District, namely prone to earthquakes and tsunamis).
2025	Disaster Resilient Family Program	The Serang Regency BPBD, through the "Srikandi BPBD" team, conducted a socialization of the concept of Disaster Resilient Families with the target of socialization being family units (fathers, mothers, children) in order to understand specific threats in their respective home environments, such as fires (densely populated areas), fallen trees, landslides (hills), and tsunamis (coastal). This is part of the household-based Disaster Risk Reduction (DRR) strategy.
2026	JITUPASNA (Post-Disaster Needs Assessment)	The Serang Regency BPBD held a socialization of JITUPASNA (Post-Disaster Needs Assessment) at the village and sub-district levels by targeting sub-district/village officials, Babinsa, Bhabinkamtibmas, volunteers, and community cadres.

Year	Activities	Activity Description
		Until mid-2025, 13 out of 29 sub-districts in Serang Regency have participated in socialization, meaning that only about 45% of sub-districts are covered by the JITUPASNA program.

Source: Researcher Data Processing, 2026.

In addition to socialization, the Serang Regency BPBD has begun to build a foundation through the synergy of the formation of a Disaster Preparedness Village (KSB) managed by the Serang Regency Social Service. The Disaster Preparedness Village is a community-based disaster management program as stipulated in the Regulation of the Minister of Social Affairs Number 128 of 2011 concerning Disaster Preparedness Villages. The establishment of Disaster Preparedness Villages encourages the formation of disaster-resilient communities in dealing with various potential disaster risks in their respective regions. However, its coverage is still limited to certain areas and has not yet reached all disaster-prone sub-districts. The Disaster Preparedness Village in Serang Regency has been determined through the Decree of the Regent of Serang Number: 460/Kep.782-Huk.Dinsos/2024 concerning the Determination of Disaster Preparedness Villages (KSB) in Serang Regency which is the official legal basis for the determination of areas with the status of Disaster Preparedness Villages in Serang Regency. The coverage of the Serang Regency Disaster Preparedness Village is only 4 out of 29 sub-districts or around 14% of the total sub-districts, namely Anyar District, Cinangka District, Kopo District, and Kragilan District. These four sub-districts are prioritized because they are areas prone to disaster risk. Anyar and Cinangka Districts are coastal areas prone to earthquakes and tsunamis. Kopo District is prone to flooding from the Ciberang-Cidurian River, and Kragilan District is also a flood-prone area.

Thus, the knowledge of the people of Serang Regency about disasters still needs continuous strengthening, especially in the aspect of disaster preparedness. This is reflected in the scope of education and the establishment of Disaster Preparedness Villages which are still limited to a small part of the area, while the Serang Regency area has a very wide scope consisting of 29 sub-districts. In fact, based on mapping conducted by the Serang Regency BPBD, the potential for hydrometeorological disasters such as floods, landslides, and extreme weather is spread across various other sub-districts that are not included in the assisted areas of the Disaster Preparedness Village, such as Padarincang, Ciruas, Mancak, Bojonegara, Pulo Ampel, Baros, Ciomas, Pontang, and Kramatwatu (Radar Banten, 2025). This indicates that most of the sub-districts identified as at risk of disasters do not have a formally organized community-based preparedness structure so that if a disaster occurs in these areas, the community's readiness to respond independently will be spontaneous and untrained. Strengthening disaster preparedness knowledge in Serang Regency needs to be directed not only to the expansion of the scope of the program area, but also to the sustainability of the implementation of the program itself, so that people in all disaster-prone areas have equal readiness in dealing with disaster threats that may occur at any time.

b. Disaster Experience

According to the framework of LIPI-UNESCO/ISDR (2006), disaster experience is one of the factors that form the parameters of knowledge and attitudes that are the parameters with the highest weight (45%) in the measurement of the community preparedness index. People who have experienced a disaster event directly tend to have better knowledge and sensitivity than people who have never experienced it. Previous disaster experiences serve as a source of collective learning that strengthens preparedness in the future. This experience generally encourages the public and officials to take concrete steps, such as socializing threat recognition, installing warning signs at vulnerable

points, and improving mitigation supporting infrastructure. Areas that have experienced repeated disasters should ideally have learning capital that can be converted into more mature preparedness policies and practices, provided that the learning is documented and followed up systematically.

Serang Regency is classified as a multi-disaster-prone area. A number of sub-districts in the Serang Regency area have been affected by floods, landslides, and land shifts since early 2026. In addition, at least 15 sub-districts in Serang Regency are flood-prone areas, and their coastal areas also face the threat of tsunamis. The following is a recapitulation of disaster events in Serang Regency in the last four years:

**Table 9. Recapitulation of Disaster Events in Serang Regency
Year 2022-2024**

No.	Types of Disasters	Number of Events			
		2022	2023	2024	2025
1	Extreme Weather	17	3	91	117
2	Flood	0	9	0	37
3	Soil Movement	15	7	0	19
4	Earthquakes	0	8	0	0
5	Drought	0	0	0	0
6	Tsunami	0	0	0	0
Quantity		32	27	91	173

Source: Processing Researcher Data from the Disaster Incident Logbook of the Serang Regency BPBD 2022-2025 (processed 2026).

Based on the data in Table 9, it is known that the trend of disaster events in Serang Regency shows a consistent pattern of increase over the past four years, with a significant spike in 2025 which will reach 173 disaster events. This sharp increase indicates that the Serang Regency area is increasingly vulnerable to disaster threats, both triggered by climate change factors and local geographical and environmental conditions. The dominance of extreme weather as the most common type of disaster (117 events or about 67.6% of the total events) indicates that hydrometeorological phenomena are the main threats that need special attention in disaster mitigation efforts in this region, most likely related to the impact of global climate change that causes increasingly erratic rainfall intensity, strong winds, and heat waves. Meanwhile, floods, which occupy the second position with 37 incidents (around 21.4%) indicate a close relationship with extreme weather, considering that high rainfall is often the main trigger for flooding, especially in areas with inadequate drainage systems or water catchment areas that have changed their function to built land. As for the occurrence of land movements as many as 19 incidents (around 11%), although the number is smaller than the previous two types of disasters, it is still necessary to be vigilant because it has the potential to cause large losses, especially in areas with sloped topography or unstable soil conditions. Overall, the pattern of these disasters shows that Serang Regency faces interrelated multi-hazard challenges, so an integrated disaster management strategy is needed, with the top priority being the improvement of the extreme weather early warning system, the improvement of drainage infrastructure and spatial management to reduce the risk of flooding, as well as continuous monitoring of areas prone to land movements.

The data on the increase in disaster events is in line with the experience of disasters directly felt by the people of Serang Regency, where the increasing frequency of events, especially extreme weather as the dominant type of disaster, shows that the community is now facing disaster threats more regularly and repeatedly than in previous years. The high number of extreme weather events

and interrelated floods indicates that most people, especially those living in low-lying areas, riverbanks, or areas with poor drainage, are likely to have experienced several direct impacts such as inundation, damage to homes, disruption of economic activities, and threats to life safety.

These repeated experiences can indirectly form their own adaptation patterns in the community, both in the form of local wisdom in dealing with seasonal floods and increased vigilance attitudes ahead of the rainy season. However, a sharp spike in incidents in 2025 may also indicate that the experience and adaptation capacity of the community formed from previous events is not fully adequate to deal with the increasing intensity and frequency of disasters, so it is still necessary to strengthen capacity through disaster education, emergency response training, and strengthen community-based early warning systems so that traumatic experiences due to disasters do not continue recurrence without significant improvements in risk reduction. In addition, the existence of soil movement events, although the number is smaller, shows that some people in sloped areas also have different disaster experiences, so the mitigation and education approaches provided need to be adjusted to the type of threats and specific experiences faced by each community group in various areas of Serang Regency.

The disaster experience of the people of Serang Regency shows that the threat of extreme weather and flooding is not a new phenomenon, but a recurring occurrence and has formed a collective consciousness at the local level. For example, the areas of Pamarayan, Tirtayasa, Tanara, Kibin, and Tunjung Teja Districts along the Ciujung River, as well as Padarincang and Anyer Districts, have long been known as flood subscription areas, while Mancak District which is in mountainous areas is a prone area to land movement, so according to the local BPBD, people in flood-prone areas generally already know the pattern of when the flood will occur which indicates the existence of local knowledge that formed from repeated experiences. This reality was proven again in early 2026, when the Serang Regency BPBD recorded that around a thousand people from hundreds of families were still surviving in evacuation camps due to floods that had not receded with the worst concentration in Carengan and Binuang Districts, and more than ten thousand houses were affected with dozens of houses physically damaged and dozens of public facilities damaged due to a series of hydrometeorological disasters.

This kind of traumatic experience also encourages the strengthening of the community-based preparedness system, as can be seen from the efforts of the Serang Regency Social Service to establish Disaster Preparedness Villages in flood-prone areas to minimize casualties, as well as the program to install flood evacuation boards with Disaster Preparedness Community Groups (KMSB) in low-lying villages prone to flooding by the Serang Regency BPBD. In addition, flood disaster management is carried out through coordination with all relevant agencies/agencies/institutions, coordination with the District Fire Station along with the Rapid Reaction Team (TRC) and volunteers at the scene of the incident, as well as the implementation of routine early warning, reporting, and administrative activities, with information monitoring through the BNPB, Banten Province BPBD, and BMKG websites. In addition, coordination was also carried out with Tagana, the Serang Regency Social Service, ORARI (Amateur Radio Organization of the Republic of Indonesia), RAPI (Indonesian Inter-Population Radio), PMI (Indonesian Red Cross) Serang Regency, and Serang Regency Scouts Concerned supported by the operation of Pusdalops-PB (Disaster Management Operations Control Center) picket officers of the Serang Regency BPBD to assist in the evacuation of flood-affected areas.

Thus, repeated experiences of extreme weather and floods in Serang Regency have formed an anticipatory community adaptation pattern based on local knowledge as reflected in the community's local knowledge of the pattern and timing of floods in their respective areas, as well as the formation of village/sub-district disaster preparedness institutions such as disaster preparedness villages and the installation of flood evacuation boards at vulnerable points. However, the sharp increase in the

number of disaster events in 2025 indicates that the current adaptation capacity still needs to be strengthened, given that constraints such as limited rescue support equipment are still the main obstacles in disaster preparedness in the field.

c. Preparedness Attitude

According to the framework of LIPI-UNESCO/ISDR (2006), preparedness attitudes are part of the Knowledge and Attitude parameters, where the basic knowledge of the community about the characteristics, symptoms, and causes of a disaster will affect their attitudes and concerns to be ready and alert in anticipating it. Preparedness is a manifestation of the knowledge and experience possessed, in the form of awareness and readiness to act appropriately when disaster threats arise. Several studies on community preparedness in various regions of Indonesia have found that the dimension of knowledge and attitudes is often a weak point, especially in areas that have minimal educational stimulus about disasters. This condition confirms that the attitude of preparedness is not formed automatically, but needs to be built through continuous interventions such as counseling, training, and active involvement of the community in disaster activities.

The preparedness attitude of the Serang Regency BPBD shows a relatively good level of readiness from an institutional perspective, but still faces limitations in the aspect of resources. The Serang Regency BPBD has implemented a responsive operational system, as reflected in the operation of the Pusdalops-PB which is on standby 24 hours to monitor disaster conditions, carry out routine coordination with BNPB, Banten Province BPBD, and BMKG, and establish cooperation with various elements as a backup emergency communication network. This preparedness attitude can also be seen from the anticipatory steps taken ahead of the rainy season and the potential for extreme weather, such as an appeal to residents in vulnerable areas and readiness to evacuate if the river water level continues to rise.

In addition, there is the Indonesia Disaster Resilience Initiatives Project (IDRIP)-DESTANA (Disaster Resilient Village) project which is a collaboration between the Government of Indonesia through BPBD and the World Bank to support financing and technical assistance in the implementation of strategic investment projects to improve disaster risk governance in Indonesia and the preparedness of the government and community in dealing with the threat of tsunami, one of which is carried out in Anyar Village by the BPBD of Serang Regency as follows:



Figure 1. Socialization of the IDRIP-DESTANA Project in New Village

Source: Report on the Results of Socialization and Coordination Activities in Village/Village Level IDRIP-DESTANA Project Region 1 Capacity Building Village Resilience, Serang Regency BPBD, 2023.

The IDRIP-DESTANA Region I project covers the areas of Bulakan Village, Karang Suraga Village, Anyar Village, Salira Village, Argawana Village and Sumarang Village. Figure 1 is a socialization and coordination activity of the IDRIP-DESTANA Project in Anyar Village, Serang Regency which was attended by 30 people with female representatives at least 45% of the participants, by involving stakeholders, namely representatives of the village government, representatives of regional administrators (RT/RW), community/customary/religious leaders, representatives of disabilities and the elderly, and representatives of volunteer forums aimed at improving community preparedness in dealing with disasters, Especially earthquakes and tsunamis.

However, the Serang Regency BPBD still faces real obstacles on the ground, such as limited operational vehicles and logistics stocks when handling major floods in early 2026, including urgent needs in the form of water suction devices, water supply vehicles, and inadequate clean water supply, which indicates that institutional preparedness has not been fully balanced with the adequacy of supporting infrastructure.

The preparedness attitude of the people of Serang Regency is quite good in areas that have long been subject to disasters, such as the Cijung River and Ciberang-Cidurian River watersheds in Kopo District, where the local community is said to already know the pattern and time when floods will occur, as a result of repeated experiences that form a natural vigilance against the threat. This preparedness is also strengthened through region-based institutional initiatives, such as the establishment of disaster preparedness villages in flood-prone villages aimed at minimizing casualties , as well as the installation of flood evacuation boards in vulnerable points such as in Malabar Village, Bandung District, which serves as a visual guide for residents when they have to evacuate. However, the high number of disaster events that will increase sharply in 2025 indicates that the preparedness attitude that has been built, both from the community and BPBD, has not been fully able to keep up with the increasing scale and frequency of disasters, especially extreme weather which is more difficult to predict than seasonal floods whose patterns are better known to the public. This condition emphasizes the need for continuous strengthening of all preparedness parameters, especially in the aspect of resource mobilization and capacity building to face types of disasters that are relatively new or less familiar to the community, such as soil movements in the mountainous area of Mancak District.

Thus, in the sub-aspect of preparedness attitude, both the community and the Serang Regency BPBD have shown a fairly responsive and alert attitude to disaster threats, reflected in the willingness of people in vulnerable areas to immediately report to officers or go to evacuation sites when the water level continues to rise, as well as the readiness of BPBD in responding quickly to every incident through evacuation, rapid assessment, and distribution of assistance to affected residents. This preparedness attitude is also strengthened by concern for vulnerable groups, such as the elderly and toddlers, who are also of special concern in the evacuation process and distribution of aid. However, this good preparedness attitude still seems to be more prominent in the form of reactive response when a disaster has occurred, compared to proactive preventive measures to reduce risk early, so in the future it is necessary to encourage the strengthening of more preventive preparedness attitudes, for example through increased community participation in routine mitigation training and strengthening the disaster preparedness culture that does not only arise when disasters are already threatening. but it is part of the daily life habits of the people of Serang Regency.

II. Policies and Guidelines

Based on the LIPI-UNESCO/ISDR (2006) framework, the Policy and Guidelines parameter is one of the five parameters of disaster preparedness, which specifically measures the concrete efforts of local governments in carrying out disaster preparedness activities. Policy parameters and guidelines analyze the availability of policies, regional regulations, standard operating procedures (SOPs), contingency

plans, and technical guidelines for disaster management that are the operational basis for regional disaster management institutions.

a. Regulation

Specifically, regulations in policy parameters and guidelines include the existence of legal umbrellas and formal policies that are the basis for implementing disaster preparedness in a region. This regulation basically assesses the extent to which local governments have a clear and institutional legal basis (not just oral or incidental policies) to ensure the sustainability of disaster preparedness programs, including funding, management organizational structure, human resources, and essential facilities needed in disaster emergency conditions.

Government Regulation Number 21 of 2008 concerning the Implementation of Disaster Management and Minister of Home Affairs Regulation Number 101 of 2018 concerning Technical Standards for Basic Services require local governments to prepare and legalize disaster management plan documents as part of regional development planning. The existence of a Regional Regulation or Decree that specifically regulates disasters is an indicator of the formal commitment of local governments, as well as a legal basis for budget allocation, institutional formation, and the implementation of preparedness programs in a sustainable manner. Regional disaster preparedness in Serang Regency hierarchically refers to central and regional regulations that are tiered and integrated.

Table 10. Disaster Management Policy Level

Policy Level	Policy Basis
Central Level	Law Number 24 of 2007 concerning Disaster Management Mandate Articles 35 and 36 so that each region has a disaster management plan.
	Government Regulation Number 21 of 2008 concerning the Implementation of Disaster Management
	Government Regulation Number 22 of 2008 concerning Funding and Management of Disaster Assistance
	Presidential Decree No. 87 of 2020 concerning the Disaster Management Master Plan (RIPB) 2020-2044
	Permendagri Number 101 of 2018 concerning Minimum Service Standards (SPM) for Disaster Management Sub-Affairs
	Regulation of the Minister of Social Affairs Number 128 of 2011 concerning Disaster Preparedness Villages
	BNPB Regulation Number 1 of 2025 concerning the National Plan for Disaster Management for 2025-2029
Banten Province Level	Regional Regulation of Banten Province Number 3 of 2010 concerning the Establishment of the Regional Disaster Management Agency (BPBD) of Banten Province
	Banten Provincial Regulation Number 1 of 2015 concerning the Implementation of Disaster Management
	Banten Governor Regulation Number 30 of 2010 concerning the Description of Duties, Functions, and Governance of the Implementing Elements of the Banten Provincial BPBD

Policy Level	Policy Basis
	Banten Governor Regulation Number 71 of 2014 concerning the Establishment of the Regional Disaster Management Operations Control Center (Pusdalops-PB) of Banten Province
Serang Regency Level	Serang Regency Regional Regulation Number 4 of 2014 concerning Disaster Management in Serang Regency Regulating principles/principles/objectives, responsibilities & authorities, rights & obligations of the community, implementation of disaster management, funding, and criminal provisions.
	Regulation of the Regent of Serang Number 74 of 2016 concerning the Position, Organizational Structure, Duties, Functions, and Work Procedures of the Serang Regency BPBD This regulation is the operational basis for BPBD to carry out mandatory affairs of peace, public order, and community protection.

Source: Researcher, 2026.

Table 10 shows the consistency and harmonization of structural regulations from the central to the regions, where Law No. 24 of 2007 became the main legal umbrella, was lowered into PP and Presidential Regulation at the national level, then adopted by Banten Province through Regional Regulation No. 3 of 2010 and Regional Regulation No. 1 of 2015, and finally implemented in Serang Regency through Regional Regulation No. 4 of 2014 as the main regulation and Perbup No. 74 of 2016 as the institutional technical arrangement of BPBD Serang Regency.

Thus, the existence of regulations has been formally fulfilled in Serang Regency, where the existence of a tiered legal umbrella from the central to the regional level is the legal-formal basis for the implementation of disaster preparedness. The fulfillment of this regulatory hierarchy shows that the sub-aspects of regulation in the parameters of Policies and Guidelines according to the framework of LIPI-UNESCO/ISDR (2006) have met the formal-legality requirements because each level of government has a clear legal umbrella and is interconnected in stages. However, the fulfillment of this formal regulatory aspect does not fully guarantee the effectiveness of implementation in the field, considering that the Serang Regency BPBD still faces real obstacles in terms of limited resources, facilities, and personnel in carrying out the mandate of the regulation optimally. Strengthening regulations in the future needs to be accompanied by strengthening budgets, human resources, and technical facilities, so that the goals of the regulations that have been prepared in stages can be effectively achieved in reducing the risk and impact of disasters for the people of Serang Regency.

b. SOP (Standard Operating Procedure)

SOP (Standard Operating Procedure) in the parameters of Policies and Guidelines according to the framework of LIPI-UNESCO/ISDR (2006) occupies the position as the most operational/technical instrument that complements the sub-dimensions of regulations (Law, PP, Perda) which are more normative-legal in nature. SOPs are the basic framework for a coordinated and effective emergency response plan because they have defined in detail the roles and responsibilities of all stakeholders. The Regulation of the Head of BNPB Number 2 of 2017 concerning Guidelines for the Preparation of SOPs within BNPB is a technical reference for the preparation of standard procedures for disaster management, including at the regional level. A well-structured SOP functions to ensure that each party involved understands the role, coordination flow, and action steps in each phase of the disaster. Without clear and socialized SOPs, responses to disasters risk being uncoordinated and slow, especially in the critical early stages of the event.

The Serang Regency BPBD already has a disaster Standard Operating Procedure (SOP) document regulated in the Decree of the Chief Executive of the Serang Regency Regional Disaster Management Agency Number: 027/007/SK-SOP/BPBD/2018 concerning Standard Operating Procedures (SOP) within the Regional Disaster Management Agency of Serang Regency, as follows:



**Figure 2. Decree of the Chief Executive of the Countermeasures Agency
Serang Regency Regional Disaster Number: 027/007/SK-SOP/BPBD/2018**

Source: BPBD Serang Regency, 2018.

Based on Figure 2, the SOP is made as a reference for employees within the Regional Disaster Management Agency of Serang Regency in carrying out the management process and providing services in supporting the implementation of their duties, principals, and functions in the field of regional disasters. The following are the SOPs at the Serang Regency BPBD related to regional disaster preparedness:

**Table 11. Standard Operating Procedures (SOP) in the Field of Prevention and
Preparedness BPBD Serang Regency**

No.	SOP Details
1	Disaster Technical Guidance
2	Disaster Management Team Training
3	Socialization of Risk Reduction Plans (DRR)
4	Formation of Disaster Volunteers
5	Technical Guidance on the Ciujung Watershed Action Plan
6	Establishment of Resilient Villages (DESTANA)
7	Disaster Preparedness Apple Activities
8	P2WKSS Activities (Increasing the Role of Women towards a Healthy and Prosperous Family)

Source: BPBD Serang Regency, 2018.

Based on Table 11, it is known that the Serang Regency BPBD has specifically prepared Standard Operating Procedures (SOP) for Prevention and Preparedness, which covers eight types of activities. The existence of this SOP is concrete evidence that local governments not only set regulations normatively, but also translate them into structured and sustainable technical work programs. The existence of the SOP for Technical Guidance for the Ciujung Watershed Action Plan shows consistency between policies and actual risks in the field considering that the Ciujung watershed is indeed identified as the main flood-prone area in Serang Regency covering Pamarayan, Tirtayasa, Tanara, Kibin, and Tunjung Teja Districts. In addition, the SOP for the Establishment of Disaster Resilient Villages (DESTANA) also strengthens the preparedness base to the grassroots level, in line with the practice of establishing disaster preparedness villages that have been identified in several vulnerable sub-districts.

Thus, the sub-dimension of SOPs in the parameters of Policies and Guidelines according to the framework of LIPI-UNESCO/ISDR (2006) has been fulfilled formally-administratively in Serang Regency, because the tiered legal umbrella from the central, provincial, to district levels has been equipped with internal technical guidelines in the form of SOPs so that structurally the Serang Regency BPBD has a clear framework in carrying out its duties and functions as a leading sector of disaster management in the regions.

III. Emergency Response Plan

Based on the framework of LIPI-UNESCO/ISDR (2006), the Policy and Guidelines parameter is one of the main parameters in analyzing disaster preparedness related to the action plan prepared for evacuation, relief, and rescue with the aim of minimizing casualties due to disasters.

a. Contingency Plan

Within the preparedness framework developed by LIPI-UNESCO/ISDR (2006), contingency plans are an integral part of disaster management efforts. Contingency plans are participatory planning documents, prepared by multi-sectors and multi-parties, and dynamic because they must be continuously updated according to the development of the situation. This document is an important prerequisite for a quick and effective emergency response, because without careful contingency planning, a lot of time will be wasted in the first days of emergency handling. Thus, the availability of contingency plans specific to the dominant threat type in a region will greatly determine the speed and effectiveness of handling when a disaster actually occurs.

BNPB through the Directorate of Preparedness of the Deputy for Prevention has prepared a Contingency Plan (renkon) to deal with the threat of disasters in Serang Regency, as follows:

(1) Tsunami Contingency Plan

The tsunami contingency plan in Serang Regency has been prepared with representatives of the Banten Provincial BPBD, Serang Regency BPBD, BMKG, affected village heads, academics, SOEs, TNI, Polri, Education Office, Social Service, Health Office, Public Works Office, PMI, Senkom, PHRI, media, and other community organizations and legalized in the following Serang Regent Regulation:

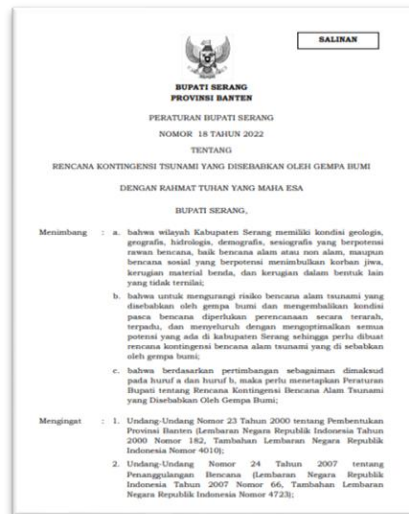


Figure 3. Serang Regent Regulation Number 18 of 2022

Source: BPBD Serang Regency, 2018.

As a form of strengthening the legal umbrella and commitment to implementation, this contingency plan was then legalized through the Serang Regent Regulation Number 18 of 2022 concerning the Tsunami Contingency Plan Caused by Earthquakes, so that it becomes an official reference for all stakeholders in efforts to mitigate, prepare, and handle tsunami disaster emergencies in Serang Regency. The tsunami disaster contingency plan caused by the earthquake aims to be a conceptual foundation, operational basis and integrated implementation in disaster risk reduction in the region.

(2) Regional Flood Risk Management Plan

The Serang Regency Government has official guidelines contained in Serang Regent Regulation Number 298 of 2023 concerning the Regional Flood Risk Management Plan (RPRB) for 2023–2027, which is the main guideline in integrated and systematic flood disaster management in the Serang Regency area. The main strategies set out in this plan include various structural and non-structural mitigation measures, with one of the infrastructure focuses being the addition of retention ponds as the main instrument in the Serang Regency Government Center (Puspemkab) area to control water overflow and reduce the risk of inundation in the area. Through this RPRB, it is hoped that flood management in Serang Regency can be carried out in a more planned, measurable, and sustainable manner, so as to minimize the impact of material and life losses due to flood disasters that often occur, especially during the rainy season.

Thus, the disaster risk assessment that has been prepared aims to ensure that disaster management in Serang Regency is no longer reactive, but more anticipatory through planned mitigation measures, including the development of an early warning system and increased preparedness not only from the government, but also the community and the private sector. The Regional Government of Serang Regency through BPBD continues to prepare a gradual disaster risk assessment for other types of disaster threats, such as hydrometeorological disasters considering that the Serang Regency area also often faces disaster threats other than tsunamis. This gradual approach is taken so that each study can be compiled in depth and accurately, so that it can be a strong foundation in the formulation of mitigation policies, increased preparedness, and the development of an early warning system that involves not only the government, but also the active participation of the community and all stakeholders in Serang Regency.

b. Routine Simulation

Routine simulation is a simulation or disaster emergency response training activity carried out by the Regional Government and the community. Routine simulation is an important thing to do because it can train the speed, responsiveness and knowledge of the community procedurally in dealing with disaster situations. So that when this routine simulation is carried out, the community's response will be faster and more directed. According to LIPI-UNESCO/ISDR (2006) which states that knowledge without real practice (simulation) tends not to last long in people's memories, so periodic exercises are the key to the success of disaster preparedness. The Serang Regency BPBD has conducted several disaster simulations, ranging from earthquake, tsunami, flood, and fire disaster simulations. The following is one of the fire and earthquake simulations carried out by the Serang Regency BPBD which was carried out at the Serang Regent Hall:



Figure. 4. Fire and Earthquake Disaster Simulation by BPBD Serang Regency

Source: Bantentv.com, 2026.

Based on Figure 4, it shows that the simulation activities that have been carried out by the Serang Regency BPBD are related to hydrometeorological disasters and earthquake disasters. This activity aims to practice directly from the theory that has been previously conveyed by the Serang Regency BPBD. Based on the results of research conducted by Syahrir et al. (2025) at SMK Nusantara, Palu City, it is concluded that Palu City needs to develop a preparedness program such as an emergency response simulation to improve these achievements. Other similar research findings emerged from research from Utami (2021) showing that the implementation of the Disaster Preparedness School program in Sirnaresmi Village, which found that in the parameters of attitudes and actions, schools have been given disaster knowledge, but these activities are only carried out once, not routinely/periodically. The difference in these findings indicates that the success of the sub-dimension of routine simulation is greatly influenced by local contexts, such as previous disaster experience, institutional support, and intensity of counseling programs, not to mention constraints from BPBD related to the availability of budget to conduct routine simulations that are still limited, so that the implementation is not routine but only a few times. Therefore, the sub-dimension of routine simulation tends to be a weak point in disaster preparedness compared to the knowledge-attitude parameters, except in areas that already have a structured and sustainable preparedness program.

IV. Early Warning System

Based on the framework of LIPI-UNESCO/ISDR (2006), the parameters of the early warning system are four elements that are interrelated and form a complete series, namely knowledge of *risk* which includes understanding of the dangers and vulnerabilities of an area, monitoring *and warning service*) that produces accurate and timely forecasts and early warnings, dissemination *and communication* that ensures information reaches the at-risk community through clear and fast channels, and response *capability* that describes the preparedness of the community and related institutions in following up on received warnings; These four parameters are interdependent so a weakness in one element can lead to the failure of the early warning system as a whole.

a. Early Warning System

The Early Warning System is an integrated system that includes systems and processes for monitoring hazards, prediction, disaster risk assessment, communication, and preparedness where the community, government, NGOs, and other parties can take quick and timely actions aimed at reducing disaster risk before a dangerous event occurs (UNDRR, 2017). According to LIPI-UNESCO/ISDR (2006), *the early warning system* is one of the important parts of community preparedness. With early warning, the stages in disaster management can be interconnected with each other, namely between disaster preparedness and emergency response. If early warning is carried out in a timely manner, then events that can cause a catastrophic disaster can be minimized. It can also be influenced by several factors, such as the accuracy of the warning, the time required from the time from the issue of the warning to the arrival of the disaster, and the extent of the readiness and ability of the community to respond to warnings that arise and take appropriate anticipatory actions. In Serang Regency, the early warning system is managed by the Serang Regency BPBD. To detect early warning of disasters, there are several systems used by the Serang Regency BPBD, including using the Indonesia Tsunami Early Warning System (InaTEWS) network managed by BMKG. This system is also equipped with earthquake detection sensors and early warning sirens installed in coastal areas prone to disasters such as Anyer District, Cinangka District, and Puloampel District. The Serang Regency BPBD also has an operation control center to monitor the threat of disasters and extreme weather. Another early warning system is a system used to detect potential flood disasters in several sub-districts, one of which is located in Banten Village, Kasemen District, Serang Regency. The early warning system serves to detect the threat of flood disasters that will be received by the community when there is a potential for future disaster events. The following is a Figure of the early warning system in Banten Village:



Figure 5. Early Warning System in Banten Village

Source: Researcher, 2026.

Figure 5 shows that the Regional Government, namely BPBD, has carried out its duties and obligations to provide protection to the community and carry out disaster preparedness through an early warning system that aims to reduce disaster risk, prevent casualties, and build community preparedness. In principle, an effective Early Warning System is people-centered, integrated between agencies, and able to reach all levels of society. The Meteorology, Climatology, and Geophysics Agency emphasizes that a good early warning system includes four main elements, namely disaster risk assessment, continuous observation and prediction, ease of understanding warning messages for the general public, and rapid dissemination of information and reaching remote areas. The availability of Early Warning System devices alone will not be optimal if it is not accompanied by regular maintenance and periodic functional tests, considering that unmaintained devices are at risk of failing to function properly when needed. In addition, the public also needs to be equipped with knowledge and understanding of the early warning system so that they can respond to danger signs quickly, precisely, and in a targeted manner.

b. Citizen Information Network

Citizen information networks are part of the disaster warning system within the preparedness parameters according to LIPI-UNESCO/ISDR (2006). Citizen information networks are related to the distribution of information received by the community related to warnings of potential disasters. Citizen information networks are collaborative communication that encourages the community to respond quickly and appropriately. Through formal and informal networks, the public can obtain education about risks, safety measures, and evacuation plans (Zaid, 2025). Citizen information networks function to facilitate the dissemination of information and build awareness of potential dangers, so as to empower the community to take preventive measures against the risk of danger. Based on the researcher's observations, Serang Regency has two forms of citizen information networks, namely through online and offline platforms. On the online platform, the public can get information about early warnings of disasters through BPBD social media, emergency call centers, and other government information channels. Meanwhile, offline information networks are obtained by the community through training and simulations for the community. Training and simulation of disasters contain information such as what people should do when a disaster occurs, where they should take refuge, and how they should be able to save themselves. This information network is one of the important keys in the disaster warning system and synergy between stakeholders and the community is needed. Facts on the ground show that training and simulations have been carried out for people in disaster-prone locations, one of which is Anyar Village. The following is documentation of training activities and disaster simulations carried out in Anyar Village:



Figure 6. Early Warning System Training and Simulation in New Village

Source : Community-Based Early Warning System Activity Report for 2024, 2026.

Based on Figure 6, it shows that the Serang Regency BPBD has conducted training and simulation of the early warning system to the community, especially in Anyar Village. This activity was carried out with the aim of providing understanding to the community when a disaster occurs, such as what to do when a disaster occurs, and how the community must save themselves. This activity involved the participation of the Serang Regency BPBD, the Anyar Village Government, and the Community Community. In Serang Regency, a citizen information network can also be obtained from disaster preparedness community groups. The disaster preparedness community group or also known as disaster preparedness village volunteers is a volunteer initiated by the Serang Regency Social Service and fostered by the Serang Regency BPBD which functions to provide protection to the community from the threat of disaster risk through prevention of countermeasures based on local wisdom. These volunteers were formed to be an extension of the Regional Government to be able to provide socialization to the community regarding disaster emergency response. Thus, citizen information networks are one of the important keys in disaster preparedness because the information and knowledge obtained by the community will affect the actions taken by the community in dealing with disaster emergency response and can reduce the risk of hazards that occur due to disasters.

V. Resource Mobilization Capability

Based on the framework of LIPI-UNESCO/ISDR (2006), the parameters of resource mobilization capability analyze the extent to which a region or community is able to mobilize and mobilize human resources, equipment, logistics, facilities, and funds quickly and effectively when warnings are received and when disasters occur, so that emergency response actions can be carried out without significant obstacles so that the ability to mobilize resources in a region is better. The higher the effectiveness of the community's response to the early warnings given.

a. Human Resources

Human resources are the most important element in the parameters of resource mobilization ability because it is humans who play the role of the main driver of the entire emergency response process—from receiving and interpreting warnings, making decisions, operating evacuation equipment and facilities, organizing logistics, to carrying out evacuation and relief in the field to the

extent of how sophisticated the technology, equipment, or funds are available. everything will not function optimally without personnel who are trained, ready to standby, have knowledge, skills, and good coordination skills; In other words, other resources (equipment, infrastructure, and funds) are just tools whose effectiveness depends entirely on the quality and readiness of the people who run them, making human resources a determining factor for the success or failure of the overall resource mobilization.

The implementing human resources in regional disaster preparedness in Serang Regency are the Regional Disaster Management Agency (BPBD) of Serang Regency, which was formed based on the mandate of Law Number 24 of 2007 concerning Disaster Management as a technical institution under the coordination of the Regent of Serang. BPBD acts as the main driving force in various preparedness efforts, ranging from the preparation of contingency plans and mapping of disaster-prone areas, the formation and training of rapid reaction teams and volunteers, the provision of infrastructure facilities such as early warning systems and disaster logistics, to socialization and education to the community through simulations and the Disaster Resilient Village/Urban Village program. In its implementation, BPBD does not work alone, but coordinates with various parties such as the TNI/Polri, the Health Office, the Social Service, PMI, and other volunteer organizations, so that disaster preparedness in Serang Regency can be carried out in an integrated and cross-sectoral manner.

The Serang Regency BPBD is operationally regulated through the Serang Regent Regulation Number 74 of 2016 concerning the Position, Organizational Structure, Duties, Functions, and Work Procedures of the Serang Regency BPBD. This regulation is the legal basis for BPBD in carrying out mandatory government affairs related to basic services, especially in the fields of peace, public order, and community protection, with disaster sub-affairs as one of its main focuses. Based on the legal umbrella, the Serang Regency BPBD carries out various disaster preparedness functions, ranging from the preparation of contingency plans, mapping of disaster-prone areas, the formation and training of rapid reaction teams and volunteers, the provision of disaster infrastructure facilities, to socialization and education of the community through programs such as Disaster Resilient Villages/Villages, so that the role of BPBD as the main implementer of regional disaster preparedness has a clear legal basis and structured.

The geographical condition of the Serang Regency area is quite wide with a large population makes it difficult for the local government, especially the Serang Regency BPBD in handling disaster risk reduction with various types of potential disasters. In addition, the wide coverage of the area makes it difficult to provide socialization and counseling about disasters to the community. Serang Regency consists of 29 sub-districts and 326 villages with the number of people in Serang Regency according to the Central Statistics Agency of Banten Province in 2025 of 1,720.32 thousand people, an increase from the previous year with a population of 1,701.80 thousand people. The number of field personnel of the Serang Regency BPBD is 236 officers, consisting of 115 firefighters and 121 members of the Rapid Reaction Team (TRC)/Operator. Pusdalops/Rescue (SAR Team). The number of disaster management implementers is adjusted to the needs of each region based on applicable regulations.

Serang Regency is the district with the highest number of disaster events in Banten Province, so it needs more personnel to reach the affected areas. However, the number of human resources owned by the Serang Regency BPBD is currently still not comparable to the breadth of the work area and the high frequency of disaster events that must be handled. The following are the problems in terms of Serang Regency BPBD resources related to regional disaster preparedness based on the Serang Regency BPBD Strategic Plan for 2021-2026:

Table 12. Mapping Human Resource Problems at the Serang Regency BPBD

No.	Problem	Field
1	Lack of human resources who understand disaster risk reduction and disaster preparedness.	Prevention and Preparedness (Pre-Disaster)

Source: Final Draft of the Regional Disaster Management Agency Strategic Plan Year 2021-2026.

Based on Table 12, it is known that the fundamental problem in each field in the Serang Regency BPBD is the limitation of implementing human resources, be it in pre-disaster, emergency response, and post-disaster conditions which cause less than optimal implementation of disaster management in Serang Regency. The limited number of personnel, especially functional and field personnel, has an impact on the suboptimal response speed and handling range to all affected points, especially in areas that are geographically difficult to reach. This condition requires a strategy to increase the capacity of human resources, both through the addition of personnel, increasing competencies through training and simulations, and optimizing the involvement of volunteers and the community, so that disaster preparedness in Serang Regency can run more effectively and responsively.

Despite being faced with limited human resources, the response time of the disaster preparedness team is very fast. This cannot be separated from the crucial role of the Rapid Reaction Team (TRC) of the Serang Regency BPBD which immediately moved within less than 24 hours after the disaster report was received to conduct a rapid assessment of the impact, needs, and emergency status in the field. The following is the response time of the Serang Regency BPBD in a disaster event:

Table 13. Response Time of the Rapid Reaction Team (TRC) of the Serang Regency BPBD in 2025

No.	Types of Disasters	Number of Districts	Number of Villages	Number of Disaster Events	Respon Time
1	Extreme Weather	25	72	117	5 - 30 minutes
2	Flood	15	32	37	5 - 20 minutes
3	Soil Movement	8	13	19	5 - 15 minutes

Source: Researcher Data Processing from the 2025 Serang Regency BPBD Disaster Incident Logbook (processed 2026).

Based on Table 13, it is known that the average response time of the Rapid Reaction Team (TRC) of the Serang Regency BPBD is 5 to 30 minutes. This shows that the qualifications and operational preparedness of the TRC BPBD of Serang Regency have been very optimal and meet national emergency handling standards. Based on the Minimum Service Standards (SPM) of the Regency/City Regional Disaster Sub-Affairs (Permendagri No. 101 of 2018), the national response time standard for disaster victim rescue and evacuation services is no later than 24 hours after the disaster occurs.

Thus, although the limitation of human resources is the main inhibiting factor in optimizing the disaster preparedness stage in Serang Regency, the high dedication of personnel and the effectiveness of field coordination are able to produce a very fast TRC response time (5 to 30 minutes) so that rescue and evacuation services for victims continue to run optimally and meet the national

minimum service standards. The achievement of this short response time proves that the non-structural preparedness aspect, especially in the elements of human resource capacity and information coordination systems, has been well built. The speed of this emergency action is clear evidence that Serang Regency's preparedness does not only rely on the availability of a routine budget, but also on optimizing social capital and the mental readiness of personnel in facing crisis situations. To strengthen human resources, strategic steps are needed in the form of adding personnel, increasing competencies through training and simulations, and optimizing the role of volunteers and the community so that preparedness in dealing with potential disasters can be carried out more effectively, responsively, and reaching all regions in Serang Regency.

b. Facilities and Infrastructure

Facilities and infrastructure are important elements in the parameters of resource mobilization ability because their availability directly determines the speed, accuracy, and range of movement of personnel, equipment, logistics, and other assistance to disaster-affected locations. Without adequate transportation support (such as operational vehicles, inflatable boats, or heavy equipment), reliable communication facilities, and supporting infrastructure such as logistics warehouses, command posts, and adequate evacuation routes, the resource mobilization process will experience obstacles, especially in areas with difficult geographical conditions or minimal accessibility. Thus, the completeness and readiness of facilities and infrastructure also determine the effectiveness and speed of BPBD's response in disaster management in Serang Regency.

Based on the Researcher's observations, the Serang Regency BPBD building has not been optimal in providing technical and logistical support for the implementation of disaster activities, especially disaster preparedness. In order to improve readiness and responsiveness, BPBD needs to have adequate facilities, including an operational center (Pusdalops), a planning room, and a coordination meeting room, where an operational center equipped with advanced communication technology will allow BPBD to carry out Efficient coordination and decision-making when dealing with emergency situations. The Serang Regency BPBD Building should be designed by considering aspects of disaster resilience, such as earthquakes and floods, considering that this institution must still be able to operate independently even in extreme disaster conditions. Other supporting infrastructure, such as emergency shelters, adequate accessibility, logistics storage rooms, and training and disaster simulation rooms, are also important needs that have not been fully met. This condition is also reinforced by the number of damaged fire fighting facilities, with only three of the seven units of fire trucks still operating. In addition, in handling the hydrometeorological disaster that hit the Serang Regency area, it still faces obstacles related to facilities and infrastructure in the field, such as water suction equipment (alkon) and rubber boats. These conditions also encourage recommendations to strengthen field facilities and infrastructure as well as increase personnel preparedness to face potential similar disasters in the future.

In addition, the disaster communication system in Serang Regency is not optimal, one of which is due to the limitations of supporting facilities and infrastructure. The Serang Regency BPBD has created a communication system about disasters established by the BPBD with all related regional apparatus, and also establishes communication with the community (Gultom, 2023). Disaster communication systems owned by the Serang Regency BPBD, namely: website, instagram, facebook, X, and youtube. However, the communication system has not been able to reach all areas of Serang Regency. There are still several areas in Serang district, especially in remote and inland areas, where there are still major obstacles related to Information and Communication Technology (ICT) infrastructure such as unstable or slow internet connections that hinder the accessibility and reliability of the system (Arifin et al, 2025). The Serang Regency BPBD has actually developed a web-

based application called SIMAMPU (Pusdalops Management System) as an integrated disaster information control center, which functions to support disaster data management, reporting, monitoring, and decision-making quickly and precisely. The SIMAMPU application is currently still limited to internal circles (Pusdalops BPBD). However, the results of the information system audit using the COBIT 5 framework show that the implementation of SIMAMPU is still at the most basic capability level (level 1), with a number of obstacles such as network disruptions, system errors, incident response that is still reactive, and inadequate data security management (Irfansyah et al, 2025). This condition confirms that the existence of disaster communication/information systems in Serang Regency, although already available technologically, is not fully optimal in supporting the speed and reliability of disaster management. Thus, the limited facilities and infrastructure of the Serang Regency BPBD are also an inhibiting factor in realizing the implementation of optimal, effective, and responsive disaster preparedness.

c. Budget

Budget is an important element in the parameters of resource mobilization ability because the availability and adequacy of the budget directly determines the ability of the Serang Regency BPBD to provide, maintain, and operate facilities and infrastructure, finance logistics and field operational needs, provide honorariums for volunteers and additional personnel, and finance disaster preparedness training, simulation, and socialization activities. Without adequate budget support that can be disbursed quickly, especially during emergency response periods that require immediate response, mobilization of human resources, equipment, and logistical assistance to affected locations has the potential to experience delays or even cannot be implemented optimally. Thus, the adequacy and flexibility of the budget, including the availability of ready-to-use funds for emergencies, are the main determining factors in supporting the speed and effectiveness of disaster management resource mobilization in a region.

Based on the results of observation and data tracing, the budget conditions to support disaster preparedness in Serang Regency are still relatively limited and tend to be reactive. Based on Serang Regency Regional Regulation Number 4 of 2014 concerning Disaster Management in Serang Regency, in Article 5 Paragraph (2) Point (e) it is emphasized that the responsibility of the Regional Government in the implementation of disaster management through the Serang Regency BPBD with the allocation of the disaster management budget in the form of ready-to-use funds at the time of disaster emergency response. The allocation for disaster management in Serang Regency in the 2025 fiscal year is managed through Unexpected Expenditure (BTT) funds listed in the Summary of the Serang Regency Budget with a total budget of Rp12,500,000,000.00, as follows:

Table 14. Summary of the Serang Regency Budget in 2025

Code	Description	Quantity
4	REGIONAL REVENUE	
4.1	LOCAL REVENUE	1.136.857.430.038,00
4.2	TRANSFER INCOME	2.451.125.206.955,00
4.3	OTHER LEGITIMATE REGIONAL REVENUE	10.170.000.000,00
	Total Revenue	3.598.152.636.993,00
5	REGIONAL SHOPPING	
5.1	OPERATING EXPENSES	2.784.147.327.617,00
5.2	CAPITAL EXPENDITURE	406.263.364.997,00
5.3	UNEXPECTED SHOPPING	12.500.000.000,00

Code	Description	Quantity
5.4	TRANSFER SHOPPING	560.608.783.800,00
	Shopping Amount	3.763.519.476.414,00
	Total Surplus/Defisit	-165.366.839.421,00
6	REGIONAL FINANCING	
6.1	FINANCING ACCEPTANCE	168.366.839.421,00
6.2	FINANCING DISBURSEMENT	3.000.000.000,00
	Total Financing Receipts	168.366.839.421,00
	Total Financing Expenditure	3.000.000.000,00
	Net Financing	165.366.839.421,00
6.3	Waste of Budget Surplus Funding for the Year (SILPA)	0,00

Source: Researcher Data Processing from the Serang Regency Government, 2026.

Based on Table 14, it is known that there is an allocation of regional expenditure for unexpected expenditure of Rp. 12,500,000,000.00. The Serang Regency Government has used Unexpected Expenditure (BTT) funds of Rp. 2.5 billion from Rp. 10 billion, for the handling of hydrometeorological disasters that hit 28 sub-districts in Serang Regency until February 2026 (TangerangExpress, 2026). The Serang Regency Government even admits that there are budget limitations in handling and anticipating disasters so that assistance from the central National Disaster Management Agency (BNPB) is still needed to cover the shortfall. This condition is also reflected in the use of Unexpected Expenditure (BTT) funds during the emergency response period, where BPBD still has to shift the budget to cover the operational costs of personnel in the field so as not to use personal funds. Although the local government plans to prepare an annual disaster emergency response budget in each sub-district, the amount allocated is relatively small compared to the area coverage and the high potential for disasters in Serang Regency. Furthermore, this budget limitation also hinders efforts to strengthen institutions, such as the plan to establish an independent and separate Fire Service from the BPBD, which until now still has to be adjusted to the fiscal capacity of the region. Thus, the lack of routine budget allocation and dependence on emergency funds or assistance from BNPB and the province are one of the main inhibiting factors in realizing optimal, fast, and responsive disaster preparedness in Serang Regency.

Research Findings

Based on the analysis using parameters from LIPI-UNESCO/ISDR (2006), the following research findings are:

Table 15. Research Findings

Dimensions	Findings
Knowledge and Attitudes	Disaster preparedness is partial
	a. Public knowledge about disaster preparedness is not evenly distributed.
	b. Repeated experiences of disasters have shaped an anticipatory pattern of community adaptation based on local knowledge.
	c. The community and BPBD of Serang Regency have shown a

Dimensions	Findings
	fairly responsive and vigilant attitude to disaster threats, but this good preparedness attitude is still more prominent in the form of reactive response when a disaster has occurred than proactive preventive measures to reduce risks early.
Policies and Guidelines	Adequate formal legal preparedness for disasters a. The existence of regulations has been fulfilled in Serang Regency as a legal-formal basis for the implementation of disaster preparedness. b. The Serang Regency BPBD has internal technical guidelines in the form of SOPs so that it structurally has a clear framework in carrying out its duties and functions as a leading sector for disaster management in the region.
Emergency Response Plan	Progressive disaster planning readiness a. The Serang Regency Government through BPBD already has a Tsunami Contingency Plan Caused by Earthquakes and continues to prepare a gradual disaster risk assessment for other types of disaster threats. b. Simulations have been carried out but are not routine due to budget constraints.
Early Warning System	Integrated Early Warning System in disaster-prone areas a. Serang Regency already has an early warning system that is also equipped with earthquake detection sensors and early warning sirens installed in coastal areas that are prone to disasters. The Serang Regency BPBD also has an operation control center to monitor the threat of disasters and extreme weather. b. Serang Regency has two forms of citizen information networks in the form of online and offline platforms. On the online platform, the public can get information about early warnings of disasters through BPBD social media, emergency call centers, and other government information channels. Meanwhile, offline information networks are obtained by the community through educational socialization.
Resource Mobilization Capability	Limitations of structural resources a. There are constraints on the limited number of implementing resources, but non-structural preparedness, especially human resource capacity and information coordination systems, have been well built. b. The limited facilities and infrastructure of the Serang Regency BPBD are an obstacle in realizing the implementation of optimal, effective, and responsive disaster preparedness. c. The lack of routine budget allocation and dependence on emergency funds or assistance from BNPB and the provinces are obstacles in realizing optimal, fast, and responsive disaster preparedness.
Other findings	

Dimensions	Findings
Local Wisdom	In addition to the five parameters of disaster preparedness, this study also found the existence of local wisdom that lives in the community of Serang Regency as a form of social capital in dealing with disaster threats, especially tsunamis and earthquakes. This local wisdom is formed from the collective experience of people who repeatedly face disasters, thus giving birth to traditional knowledge in the form of natural signs as early warning signals for generations, such as changes in animal behavior, sudden recedes of sea water, or people's habits to immediately go to the highlands without waiting for official instructions. In addition, the value of mutual cooperation also plays an important role in the post-disaster evacuation and recovery process, where residents help each other without waiting for formal directions from the BPBD. This local wisdom is a form of community-based informal preparedness that has been empirically tested in the field, although it has not been systematically documented or integrated into formal disaster education programs by local governments. These findings show that disaster preparedness in Serang Regency is not only shaped by formal systems (regulations, SOPs, EWS), but also strengthened by local social and cultural capital that should be integrated more strategically into future disaster preparedness policies, for example through the documentation of local wisdom as part of a community-based disaster education curriculum.

Source: Researcher, 2026.

CONCLUSION

The results of the study indicate that regional disaster preparedness in Serang Regency has not been optimal, as analyzed through five parameters from LIPI-UNESCO/ISDR (2006), namely: (1) Knowledge and attitude; (2) Policies and guidelines; (3) Emergency response plan; (4) Early warning system; and (5) Resource mobilization ability.

First, in terms of knowledge and attitudes, disaster preparedness is still partial, where public knowledge is not evenly distributed and tends to be formed from repeated experiences of disasters, while the preparedness attitude shown is still more prominent as a reactive response when a disaster occurs than proactive preventive measures.

Second, in policy parameters and guidelines, the formal legal readiness of disasters has been adequate, where Serang Regency already has regulations as the legal basis for the implementation of disaster preparedness, which is also supported by SOPs as internal technical guidelines of BPBD so that it structurally has a clear framework in carrying out its function as a leading sector of disaster management in the region.

Third, in the parameters of the emergency response plan, the readiness of disaster planning shows progress and stages, where Serang Regency through BPBD already has a Tsunami Contingency Plan Caused by Earthquakes and continues to prepare a gradual disaster risk assessment for other types of threats. However, this readiness has not been balanced with adequate operational readiness, because

the implementation of simulations as an instrument to test the effectiveness of the plan is still constrained by budget constraints so it has not been carried out regularly.

In terms of the parameters of the early warning system, the early warning system is available and integrated in disaster-prone areas, where Serang Regency already has earthquake detection sensors and early warning sirens installed in disaster-prone coastal areas, as well as supported by the BPBD operational control center to monitor disaster threats and extreme weather. This system is also strengthened by a dual citizen information network, namely online platforms (BPBD social media, emergency call centers, and government information channels) and offline platforms through educational socialization to the community. However, the early warning system has not yet reached the entire Serang Regency area.

Fourth, in the parameters of resource mobilization ability, there are still constraints on the limitation of structural resources, where non-structural capacity, especially human resources and information coordination systems, have been well built, but the limited number of implementing resources, the lack of BPBD facilities and infrastructure, and the low allocation of routine budgets that cause dependence on emergency funds or assistance from BNPB and the province are obstacles in realizing the implementation optimal, fast, and responsive disaster preparedness.

Overall, disaster preparedness in Serang Regency shows a consistent pattern, namely strengths in normative and non-structural aspects, such as local knowledge, legal-formal, documentary planning, and coordination systems, but still faces limitations in implementive and structural aspects, such as simulations that are not routine, limited facilities and infrastructure, and minimal budgets. This condition shows that disaster preparedness in Serang Regency has a strong foundation, but it is not fully optimal in its implementation in the field.

ADVICES

Based on the findings of the research, the researcher recommends strategic steps to improve regional disaster preparedness in Serang Regency, as follows:

1. Organizing disaster education and simulations in a structured and periodic manner so that community preparedness shifts from reactive response to proactive mitigation from an early stage.
2. Conducting regular socialization and evaluation of SOPs to all ranks of BPBD up to the sub-district/village level, so that the regulations and guidelines that have been available are truly implemented, not just administrative documents.
3. Optimizing the implementation of simulations through a collaboration scheme with external parties (corporate CSR, universities, NGOs, or BNPB/provincial programs) so that the limitations of the BPBD routine budget can be circumvented without completely relying on the APBD.
4. Carry out routine maintenance and review the expansion of EWS coverage to other disaster-prone areas outside the coastal area, so that early protection can reach all risk areas.
5. Encourage routine budgeting through the APBD to strengthen infrastructure and increase the number of implementing human resources, in order to reduce dependence on emergency funds or BNPB/provincial assistance.
6. Integrate local wisdom into formal disaster education programs.

REFERENCES

ANTARA News Banten. (August 05, 2025). Dinsos Kabupaten Serang Sosialisasikan Kampung Siaga Bencana 2025. <https://banten.antaranews.com/berita/347697/dinsos-kabupaten-serang-sosialisasikan-kampung-siaga-bencana-2025>, accessed February 22, 2026.

- ANTARA News Banten. (February 06, 2026). BPBD Serang Ingatkan Warga Waspadai Cuaca Ekstrem. <https://banten.antaranews.com/berita/371290/bpbd-serang-ingatkan-warga-waspadai-cuaca-ekstrem>, accessed February 15, 2026.
- ANTARA News Banten. (January 05, 2026). *Cuaca Ekstrem, 20 Desa di Kabupaten Serang Terendam Banjir dan Longsor*. <https://www.antaranews.com/berita/5333557/cuaca-ekstrem-20-desa-di-kabupaten-serang-terendam-banjir-dan-longsor>, accessed February 20, 2026.
- ANTARA News Banten. (May 06, 2026). *Pemkab Serang Perkuat Kesiapsiagaan Warga Hadapi Potensi Bencana*. <https://banten.antaranews.com/berita/380341/pemkab-serang-perkuat-kesiapsiagaan-warga-hadapi-potensi-bencana>, accessed May 06, 2026.
- Anwar, S. (2022). Hubungan Pengetahuan Dengan Sikap Kesiapsiagaan Palang Merah Remaja Pada Gempa Bumi Di SMK Haji Sumatera Utara Tahun 2022, 68–72.
- Ao, Y., Tan, L., Tan, L., Zhong, J., Zhang, H., & Wang, Y. (2022). Households' earthquake disaster preparedness behavior: The role of trust in and help from stakeholders. *Frontiers in Environmental Science*, 10, 926432. <https://doi.org/10.3389/fenvs.2022.926432>.
- Arifin, Z., Subagja, I. K., Hakim, A. (2025). Digital Governance: Studi Kasus Digitalisasi Pelayanan Publik Terpadu di Kabupaten Serang. *Jurnal Sosial dan Teknologi (SOSTECH)*, 5(1): 1-19. DOI: <https://doi.org/10.59188/jurnalsostech.v5i1.31861>.
- Badan Nasional Penanggulangan Bencana (BNPB). (2024). *DIBI: Data Informasi Bencana Indonesia*. https://dibi.bnpb.go.id/statistik_menurut_bencana, accessed February 14, 2025.
- Badan Nasional Penanggulangan Bencana (BNPB). 2022. *IRBI: Indeks Risiko Bencana Indonesia Tahun 2021*. Jakarta: Badan Nasional Penanggulangan Bencana.
- Badan Nasional Penanggulangan Bencana (BNPB). 2023. *IRBI: Indeks Risiko Bencana Indonesia Tahun 2022*. Jakarta: Badan Nasional Penanggulangan Bencana.
- Badan Nasional Penanggulangan Bencana (BNPB). 2024. *IRBI: Indeks Risiko Bencana Indonesia Tahun 2023*. Jakarta: Badan Nasional Penanggulangan Bencana.
- Badan Penanggulangan Bencana Daerah Kabupaten Serang. (2021). *Rancangan Akhir Rencana Strategis Badan Penanggulangan Bencana Daerah Tahun 2021-2026*. BPBD Kabupaten Serang.
- Badan Penanggulangan Bencana Daerah Kabupaten Serang. (2026). *Laporan Kejadian Bencana Hidrometeorologi Kabupaten Serang*.
- Badan Pusat Statistik (BPS). (update February 10, 2026). *Jumlah Penduduk Menurut Kabupaten/Kota dan Jenis Kelamin di Provinsi Banten Tahun 2024-2025*. <https://banten.bps.go.id/id/statistics-table/2/NTIxIzI=/jumlah-penduduk-menurut-kabupaten-kota-dan-jenis-kelamin-di-provinsi-banten.html>
- BantenNews.co.id. (March 13, 2025). *Anggaran Tersedot Pilkada Ulang, Penanganan Bencana di Kabupaten Jadi Terbatas*. <https://www.bantennews.co.id/anggaran-tersedot-pilkada-ulang-penanganan-bencana-di-kabupaten-jadi-terbatas/>, accessed 15 March, 2026.
- BantenTV.com. (May 04, 2026). *Peringati HUT Damkar, BPBD Serang Gelar Simulasi Kebakaran dan Bencana*. <https://bantentv.com/berita/peringati-hut-damkar-bpbd-serang-gelar-simulasi-kebakaran-dan-bencana/>, accessed May 07, 2026.
- BBC News Indonesia. (March 09, 2022). *Kematian Akibat Covid-19 di Indonesia Tertinggi kedua di Asia, Pandemi disebut Epidemiolog 'Masih Serius dan Genting'*. <https://www.bbc.com/indonesia/indonesia-60664347>.
- Bisnis Banten. (January 06, 2026). *Bencana di Kabupaten Serang Terjang 14 Kecamatan*. <https://bisnisbanten.com/bencana-di-kabupaten-serang-terjang-14-kecamatan-3-514-kk-terdampak/>, accessed February 19, 2026.
- Centre for Research on the Epidemiology of Disasters (CRED). (2024). *2025 Disasters in Numbers: Earth, Wind & Fire*. CRED.

- Chen, Z., Teixeira, S., & Coley, R. (2025). Housing characteristics and disaster preparedness in low-income populations: Age as a moderator. *Innovation in Aging*, 9(Suppl 1). <https://doi.org/10.1093/geroni/igaf122.1429>.
- Dinas PUPR Kabupaten Serang. (January 22, 2024). *Eksplorasi Kebutuhan Sarana dan Prasarana Gedung BPBD*. https://dpupr.serangkab.go.id/pupr/detail_berita/225, accessed February 01, 2026.
- Gultom, M.W.P. (2023). *Koordinasi Pemerintahan dalam Mengatasi Banjir di Kabupaten Serang Provinsi Banten*. Repository IPDN. <http://eprints.ipdn.ac.id/12500/>.
- Husein Z, Tjahjono B, Nurwajedi. (2017). Analisis Zona Bahaya Banjir dan Tsunami Berbasis Ekoregion di Provinsi Banten. *Journal of Soil Science and Environment, IPB University*, 19(2): 60-67. DOI:[10.29244/jitl.19.2.60-67](https://doi.org/10.29244/jitl.19.2.60-67).
- Irfansyah, R., Purnama, E. D., & Auliana, S. (2025). Information system audit on the Simampu BPBD web application of Serang District using the COBIT 5 framework. *INOVTEK Polbeng - Seri Informatika*, 10(2), 1291–1300. <https://doi.org/10.35314/f3f9ky94>.
- Jakarta Terkini. (March 08, 2026). *BPBD Serang: 2.682 Rumah Terendam Banjir*. <https://www.jakartaterkini.id/megapolitan/2322424543/bpbd-serang-2682-rumah-terendam-banjir-9184-warga-terdampak-cuaca-ekstrem>, accessed March 12, 2026.
- Jesita, K. S. K. G., & Wahyuni, E. S. (2023). Gambaran Tingkat Pengetahuan Kesiapsiagaan Masyarakat Menghadapi Bencana Tanah Longsor di Jatiyoso Karanganyar. *Sehatmas: Jurnal Ilmiah Kesehatan Masyarakat*, 2(2), 395–403.
- Jha, P., Brown, P.E., Ansumana, R. (2022). *Counting the Global COVID-19 Dead*. *Lancet*. 2022 May 6;399(10339):1937–1938. doi: [10.1016/S0140-6736\(22\)00845-5](https://doi.org/10.1016/S0140-6736(22)00845-5).
- KOMPAS. (January 05, 2026). *Cuaca Ekstrem Picu Banjir-Longsor di Kabupaten Serang, 13 Kecamatan Terendam, 11.700 Warga Terdampak*. <https://www.kompas.com/banten/read/2026/01/05/154000888/cuaca-ekstrem-picu-banjir-longsor-di-kabupaten-serang-13-kecamatan>, accessed February 20, 2026.
- LIPI – UNESCO/ISDR. (2006). *Kajian Kesiapsiagaan Masyarakat dalam Mengantisipasi Bencana Gempa Bumi dan Tsunami*. Jakarta: LIPI Press.
- Merdeka.com. (January 29, 2026). *Pengungsi Banjir Serang: Ribuan Warga Masih Bertahan di Pengungsian Akibat Banjir Belum Surut*. <https://www.merdeka.com/amp/peristiwa/pengungsi-banjir-serang-ribuan-warga-masih-bertahan-di-pengungsian-akibat-banjir-belum-surut-528072-mvk.html>, accessed February 01, 2026.
- METRO TV. (January 05, 2026). *13 Kecamatan di Kabupaten Serang Terendam Banjir*. <https://www.metrotvnews.com/read/NG9CzA46-13-kecamatan-di-kabupaten-serang-terendam-banjir>, accessed February 20, 2026.
- Meyda, N. R. (2023). Pengaruh Modal Sosial Terhadap Kesiapsiagaan Masyarakat dalam Menghadapi Bencana Banjir. *Jurnal Keperawatan 'Aisyiyah*, 10(1), 73–80.
- Nguyễn, L. T., Bostrom, A., Abramson, D. B., & Moy, P. (2023). Understanding the role of individual- and community-based resources in disaster preparedness. *International Journal of Disaster Risk Reduction*, 96, 103882. <https://doi.org/10.1016/j.ijdr.2023.103882>.
- Prawiradisatra, F., Zahro, Q., & Naryanto, H. S. (2018). Kajian bahaya bencana banjir dengan metode Topographic Wetness Index di Kabupaten Serang. *Jurnal Alami: Jurnal Teknologi Reduksi Risiko Bencana*, 2(1), 21–26. DOI:[10.29122/alami.v2i1.2817](https://doi.org/10.29122/alami.v2i1.2817).
- Prawiradisatra, F., Zahro, Q., & Naryanto, H. S. (2018). Kajian bahaya bencana banjir dengan metode Topographic Wetness Index di Kabupaten Serang. *Jurnal Alami: Jurnal Teknologi Reduksi Risiko Bencana*, 2(1), 21–26.
- RadarBanten.co.id. (December 02, 2025). *Potensi Bencana di Kabupaten Serang, Anyar dan Cinangka rawan bencana hydrometeorologi*. <https://www.radarbanten.co.id/2025/12/02/potensi-bencana->

- [di-kabupaten-serang-anyar-dan-cinangka-rawan-bencana-hydropeteorologi/](#), accessed January 16, 2026.
- RadarBanten.co.id. (February 22, 2026). *Selama Masa Tanggap Darurat Bencana, Pemkab Serang Gunakan Rp2,5 Miliar Dana BTT*. <https://www.radarbanten.co.id/2026/02/22/selama-masa-tanggap-darurat-bencana-pemkab-serang-gunakan-rp25-miliar-dana-btt/>, accessed February 25, 2026.
- Syahrir, M. Sabri. (2025). Kesiapsiagaan Warga Sekolah dalam Menghadapi Bencana Gempa Bumi di SMK Nusantara Kota Palu. *HSEJ: Health Safety and Environment Journal*, 4(1): 56-62. <https://ejournal.upnvj.ac.id/HSE/article/download/10490/3461/33392>.
- TangerangEkspres.id. (February 23, 2026). *Dana BTT Terpakai Rp2,5 Miliar untuk Penanganan Bencana*. <https://tangerangekspres.id/banten/read/36313/dana-btt-terpakai-rp25-miliar-untuk-penanganan-bencana>, accessed February 25, 2026.
- UNESCO. (2023). *Post-Disaster Response*. Diperbarui 9 Juni 2023. <https://www.unesco.org/en/disaster-risk-reduction/post-disaster>.
- United Nations Office for Disaster Risk Reduction (UNDRR). (2017). *The Sendai Framework Terminology on Disaster Risk Reduction*. "Early warning system". Accessed 6 July 2026. <https://www.undrr.org/terminology/early-warning-system>.
- United Nations Office for Disaster Risk Reduction (UNISDR). (2018). *Poverty & Death: Disaster Mortality 1996-2015*. Centre for Research on the Epidemiology of Disaster (CRED) UNISDR.
- Utami, R. Novianti. (2021). Implementasi Program Sekolah Siaga Bencana di Desa Sirnaresmi. *Journal Health Sciences*, 10(1): 84-97. <https://ojs.stikesmi.ac.id/index.php/jhs/article/download/29/26/81>.
- Virgiani, B. N., Aeni, W. N., & Safitri. (2022). Pengaruh Pelatihan Siaga Bencana dengan Metode Simulasi terhadap Kesiapsiagaan Menghadapi Bencana: Literature Review. *Bima Nursing Journal*, 3(2), 156-163.
- World Health Organization (WHO). (March 11, 2020). *WHO Director-General's Opening Remarks at the Media Briefing on COVID-19 - 11 March 2020*. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.
- World Risk Report. (2025). *The World Risk Report (WRR) 2025 Focus: Floods*. Bündnis Entwicklung Hilft and the Institute for International Law of Peace and Armed Conflict (IFHV) at Ruhr University Bochum.
- Zaid, R. (2025). *The Role of Social Networks in Enhancing Community Resilience During Natural Disasters*. The Journal of International Social Research, Volume 18, Issue 120.
- Zaremozzabieh, Z., Samah, A. A., Roslan, S., Shaffril, H. A. M., & Ahrari, S. (2021). Household Preparedness for Future Earthquake Disaster Risk Using An Extended Theory of Planned Behavior. *International Journal of Disaster Risk Reduction*, 65, 102533. <https://doi.org/10.1016/j.ijdrr.2021.102533>.

Peraturan Perundang-Undangan:

- Pemerintah Republik Indonesia. (2007). *Undang-Undang Nomor 24 Tahun 2007 Tentang Penanggulangan Bencana*. Jakarta: Sekretariat Negara RI.
- Pemerintah Republik Indonesia. (2008). *Peraturan Pemerintah Nomor 21 Tahun 2008 Tentang Penyelenggaraan Penanggulangan Bencana*. Jakarta: Sekretariat Negara RI.
- Pemerintah Republik Indonesia. (2008). *Peraturan Pemerintah Nomor 22 Tahun 2008 Tentang Pendanaan dan Pengelolaan Bantuan Bencana*. Jakarta: Sekretariat Negara RI.

- Presiden Republik Indonesia. (2020). *Peraturan Presiden (Perpres) Nomor 87 Tahun 2020 Tentang Rencana Induk Penanggulangan Bencana (RIPB) 2020-2044*. Jakarta: Sekretariat Negara RI.
- Presiden Republik Indonesia. (2023). *Keputusan Presiden (Keppres) Nomor 17 Tahun 2023 tentang Penetapan Berakhirnya Status Pandemi Corona Virus Disease 2019 (COVID-19) di Indonesia*. Jakarta: Sekretariat Negara RI.
- Menteri Dalam Negeri Republik Indonesia. (2018). *Peraturan Menteri Dalam Negeri Nomor 101 Tahun 2018 Tentang Standar Pelayanan Minimum (SPM) Sub-Urusan Penanggulangan Bencana*. Jakarta.
- Menteri Sosial Republik Indonesia. (2011). *Peraturan Menteri Sosial Nomor 128 Tahun 2011 Tentang Kampung Siaga Bencana*. Jakarta: Kementerian Dalam Negeri.
- Kepala Badan Nasional Penanggulangan Bencana Republik Indonesia. (2025). *Peraturan BNPB Nomor 1 Tahun 2025 Tentang Rencana Nasional Penanggulangan Bencana Tahun 2025-2029*. Jakarta: Badan Nasional Penanggulangan Bencana.
- Gubernur Banten. (2010). *Peraturan Daerah Nomor 3 Tahun 2010 tentang Badan Penanggulangan Bencana Daerah Provinsi Banten*. Serang: Sekretariat Daerah Provinsi Banten.
- Gubernur Banten. (2010). *Peraturan Daerah Provinsi Banten Nomor 3 Tahun 2010 Tentang Pembentukan Badan Penanggulangan Bencana Daerah (BPBD) Provinsi Banten*. Serang: Sekretariat Daerah Provinsi Banten.
- Gubernur Banten. (2015). *Peraturan Daerah Provinsi Banten Nomor 1 Tahun 2015 tentang Penyelenggaraan Penanggulangan Bencana*. Serang: Sekretariat Daerah Provinsi Banten.
- Gubernur Banten. (2010). *Peraturan Gubernur Banten Nomor 30 Tahun 2010 Tentang Uraian Tugas, Fungsi, dan Tata Kelola Unsur Pelaksana BPBD Provinsi Banten*. Serang: Sekretariat Daerah Provinsi Banten.
- Gubernur Banten. (2014). *Peraturan Gubernur Banten Nomor 71 Tahun 2014 Tentang Pembentukan Pusat Pengendalian Operasi Penanggulangan Bencana Daerah (Pusdalops-PB) Provinsi Banten*. Serang: Sekretariat Daerah Provinsi Banten.
- Bupati Serang. (2014). *Peraturan Daerah Kabupaten Serang Nomor 4 Tahun 2014 tentang Penanggulangan Bencana di Kabupaten Serang*. Serang: Sekretariat Daerah Kabupaten Serang.
- Bupati Serang. (2016). *Peraturan Daerah Nomor 11 Tahun 2016 tentang Pembentukan dan Susunan Perangkat Daerah Kabupaten Serang*. Serang: Sekretariat Daerah Kabupaten Serang.
- Bupati Serang. (2016). *Peraturan Bupati Serang Nomor 74 Tahun 2016 tentang Struktur Organisasi dan Tata Kerja Badan Penanggulangan Bencana Daerah Kabupaten Serang*. Serang: Sekretaris Daerah Kabupaten Serang.
- Bupati Serang. (2016). *Peraturan Bupati Serang Nomor 111 Tahun 2016 tentang Tugas Pokok, Fungsi dan Uraian Tugas pada Badan Penanggulangan Bencana Daerah Kabupaten Serang*. Serang: Sekretaris Daerah Kabupaten Serang.
- Bupati Serang. (2021). *Peraturan Daerah Nomor 7 Tahun 2021 tentang RPJMD Kabupaten Serang Tahun 2021-2026*. Serang.
- Bupati Serang. (2024). *Keputusan Bupati Serang Nomor: 460/Kep.782-Huk.Dinsos/2024 Tentang Penetapan Kampung Siaga Bencana (KSB) di Kabupaten Serang*. Serang: Dinas Sosial Kabupaten Serang.
- Kepala Badan Penanggulangan Bencana Daerah Kabupaten Serang. (2018). *Keputusan Kepala Pelaksana Badan Penanggulangan Bencana Daerah Kabupaten Serang Nomor: 027/007/SK-SOP/BPBD/2018 tentang Standar Operasional Prosedur (SOP) di Lingkungan Badan Penanggulangan Bencana Daerah Kabupaten Serang*. Serang: BPBD Kabupaten Serang.