

# Pentahelix synergy natural and non-natural disaster management in Pidie Jaya District Aceh Province to support national security

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**Abstract.** Geographically, Indonesia is located on disaster prone area. Natural disasters such as earthquakes, tsunamis, floods, landslides, volcanic eruptions and non-natural disaster such as Covid-19 Pandemic often occur in various places in Indonesia including in Pidie Jaya, Aceh Province. These disasters have a big influence on many aspects of the socio-economic life of the affected communities. Managing disaster properly will reduce the risk so that it will provide security and resilience community that can anticipate all the impacts of disasters. Collaboration in the form of the Pentahelix Synergy concept involving elements of the Government, Society, Academics, and the Business Industries is one of the important aspect in disaster management. Furthermore, the mass media and the private sector will provide great energy to solve the problem during disaster. This paper discuss about the synergy of Pentahelix in dealing with natural and non-natural disasters in Pidie Jaya Regency, Aceh Province. The results will be useful as lesson learned to support National Security program in Indonesia.

## 1 Introduction

In the second paragraph of the Preamble to the 1945 Constitution of the Republic of Indonesia, it is stated that the noble goal of the nation is to realize the Unitary State of the Republic of Indonesia which is independent, united, sovereign, just, and fair. In addition, the national goals are also stated in the fourth paragraph of the Preamble to the 1945 Constitution of the Republic of Indonesia, namely to protect the entire Indonesian nation and the entire homeland of Indonesia, promote public welfare, educate the nation's life, and participate in implementing world order based on independence, eternal peace, and social justice.

The existing national goals and visions are then implemented in the nation-building program by involving all Indonesian citizens. All of these efforts must be built on the foundation of national security, namely to protect the entire Indonesian nation and the entire homeland of Indonesia.

This condition cannot be separated from the development of the strategic environment which generally shows increasingly escalative and complex symptoms in various parts of the world [1]. These conditions allow the incoming threats, both military threats (armed and unarmed), non-military threats, and hybrid threats [2]. Sources of the threats can come from within or outside the

country and are carried out by state and non-state actors, whether national, regional, or international.[3].

From prehistoric times to the present time, disasters are an inseparable part of human civilization. Disasters affect human life and livelihoods in livelihoods, customs, and culture. Rapid industrialization and urbanization lead to global warming and climate change that increasing frequency of disasters. However, the development of science and technology can manage disasters by reducing the losses and damages that accompany disasters.

Due to Indonesia's geographical location, from the past, present, and future, Indonesia is faced with the threat of geophysical and hydro-meteorological disasters. Currently, the threat of these disasters is magnified by the impact of global warming and the effects of climate change. Geophysical disaster threats include earthquakes, tsunamis, volcanic eruptions, and landslides. Meanwhile, the threats of hydro-meteorological disasters include droughts, floods, storms, and forest fires.

The total number of natural disasters in Indonesia from January 1 to September 3 2020 was 1,944 incidents. Floods still dominate with 730 events, followed by tornadoes with 523 events, landslides with 368 events, and forest and land fires with 263 events. The most severely affected provinces were Central Java Province with 356 incidents, followed by West Java Province with 336 incidents, and East Java Province with 267 incidents.

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Of the 1,944 total natural disasters, 272 people died, 24 people were missing, 422 people were injured, and 3,871,567 people suffered and were displaced.[4].

The mentioned disaster events do not include the impact of non-natural disasters which are still ongoing. In April 14, 2020, the Government of Indonesia has designated Covid-19 as a non-natural national disaster.[5]. The number of people exposed to Covid-19 as of June 9, 2021, spread across 34 provinces and 493 regencies/cities. It is confirmed 1,877,050 positive, 1,723,253 people cured and 52,162 dead [6].

With so many natural and non-natural disasters in Indonesia and tending to increase every year, the impact is not only taking human lives and livelihoods, but also the damage of the infrastructures. For example, the impact of natural disasters in 2020, there are 29,964 houses, 1,317 facilities (555 education, 637 worship, and 125 health), as well as 126 offices and 330 bridges are damaged [7]. Likewise, the Covid-19 pandemic, the impact felt not only on the health sector but also on other sectors, including the economy and employment sectors. According to the Central Statistics Agency (BPS), there has been a significant decline in Indonesia's economic growth from the first quarter of 2019 by 5.02%, to the first quarter of 2020 by 2.97 percent, and to the second quarter of 2020 by minus 5.32%.[8].

Furthermore, according to data from the Ministry of Manpower (Kemnaker) it was recorded that from the formal sector a total of 1,010,579 (873,090 workers from 17,224 companies were laid off, and 137,489 workers were laid off from 22,753 companies). Meanwhile, the number of companies and workers affected in the informal sector is 34,453 companies and 189,452 workers[9].

Aceh Province is the land closest to the epicenter of the Indian Ocean earthquake which has the potential for a tsunami disaster. This is influenced by the geographical location of Aceh Province in the north by the Malacca Strait and the Andaman Sea, in the east by the Malacca Strait, in the south by North Sumatra Province, and in the west by the Indonesian Ocean.[10].

According to DIBI, the history of disasters in Aceh Province from 1815 to 2015 places flood disasters as the most impactful events. While other potential disasters are flash floods, extreme waves and abrasion, earthquakes, tsunamis, forest and land fires, droughts, epidemics and disease outbreaks, volcanic eruptions, extreme weather, and landslides.

Pidie Jaya Regency is one of the areas in Aceh Province where the disaster risk index still occupies a high class. There are four disasters with different risk classes that threaten eight sub-districts. A tsunami is a natural disaster threat that mostly covers almost all sub-districts, especially the coastal areas, namely the sub-districts of Meureudu, Meurah Dua, Bandar Dua, Jangka Buya, Ulim, Trienggadeng, and Panteraja. Then moderate flooding in the districts of Bandar Dua, Meureudu, Meurah Dua, and Bandar Dua. Strong winds with high risk in Bandar Dua sub-district, Meureudu, Bandar Baru. As well as lava and volcanic ash disasters in the Meurah Dua sub-district.

In addition to the above disaster, the spread of the Covid-19 Pandemic case in Aceh Province as of February

24, 2021, was reported by the Covid-19 Handling Task Force as being in the yellow zone or low-risk zone, but has expanded from 11 to 14 districts covering Southeast Aceh Regency, Aceh East, North Aceh, Bireuen, Central Aceh, Gayo Lues, Pidie Jaya, Pidie, West Aceh, Southwest Aceh, Nagan Raya, South Aceh, Simeulue, and Aceh Singkil Districts [11].

The latest development of Covid-19 infections in Pidie Jaya Regency until March is still showing increasing. The number of infected victims has reached 229 people, 16 people died, 3 people are still being treated (positively active), and 210 people have been declared cured.

The paper aims to discuss more about the synergy of Pentahelix in dealing with natural and non-natural disasters in Pidie Jaya Regency, Aceh Province to support National Security.

Based on the above background, some problems occur in disaster management efforts in Pidie Jaya Aceh Regency, so the author arranges the questions asked about the pentahelix synergy to support this research, namely:

1. How is the communication between Pentahelix in disaster management in Pidie Jaya Aceh Regency?
2. How is the coordination between Pentahelix in disaster management in Pidie Jaya District, Aceh?
3. How is the cooperation between Pentahelix in disaster management in Pidie Jaya District, Aceh?

From the formulation of the problem above, the objectives of this research are:

1. Analyzing the communication between Pentahelix in disaster management in Pidie Jaya District, Aceh
2. Analyzing the coordination between Pentahelix in disaster management in Pidie Jaya District, Aceh
3. Analyzing the cooperation between Pentahelix in disaster management in Pidie Jaya District, Aceh

## 2 Study Method

This research uses qualitative analysis methods that is *library research*. The qualitative rationale in this paper is a real condition in describing Pentahelix Synergy in handling natural and non-natural disasters in Pidie Jaya Aceh Regency, where the data obtained were obtained from the results of the Group Discussion Forum (FGD) with the Pidie Jaya Regional Government Apparatus and other sources. Others are also who supported the 2021 Domestic Work Lecture (*Kuliah Kerja Dalam Negeri / KKDN*) for the Defense University Disaster Management Study Program which took place from 22 to 26 March 2021

## 3 Results and Discussion

Disaster outcomes are a phenomenon whose impact will be felt by all affected parties in an area, therefore in its management, it is necessary to have good cooperation between all components in the form of a pentahelix, namely parties or helix that have roles, interests, and characters consisting of the government, society, the business world, academics or experts and the mass media. Disaster prevention and management can be done by one party. Pentahelix is an answer, just adapted to the

pentahelix stance for pre-disaster, emergency response, and post-disaster. Because the character of the problem will be different and take into account local aspects as well[12].

In addition, the value of synergy and cooperation is a value that should be upheld in the archipelago. This is inseparable from the fact that Indonesia is a disaster-prone area. The value of synergy taken means that disaster management in Indonesia will take place effectively because the value of cooperation is purely the identity of the Indonesian nation. Through the pentahelix, this value must be pursued by various parties according to their functions and capacities, so that the concept of pentahelix synergism will go hand in hand considering that disaster is a shared business.

Disaster management in Pidie Jaya District, Aceh Province, obtained data and information about pentahelix synergy in the form of communication, coordination, and cooperation between relevant stakeholders which are important points in achieving disaster management success.

#### a. Communication

BPBD and BMKG have communicated related to disaster mitigation by studying and analyzing potential tectonic earthquake zones in Pidie Jaya Regency which is presented in Seismicity Data originating from grove bands sensor earthquake detection equipment installed at the BPBD office and the Pidie Jaya Regent's Office. From April to August 2020, data obtained that there have been very significant tectonic earthquakes 10 (ten) times a day in Pidie Jaya Regency, this has resulted in Pidie Jaya Regency being a prone zone with the potential for tectonic earthquakes. All of this information is disseminated in the form of WhatsApp Groups to relevant agencies within the Pidie Jaya Regency Government.

BPBD and BMKG have also provided education to the public in the form of earthquake and tsunami simulations so that when the coast recedes, within 30 (thirty) minutes people can run for shelter to avoid the tsunami disaster. BMKG also has a special program with other countries periodically every 2 (two) years to conduct simulations related to community preparedness for earthquakes that cause tsunamis.

Information dissemination has also been carried out by BMKG to the wider community, both in the form of SMS, email, printed and electronic media information. BMKG has an android application that can be downloaded by the public, and there are books that BMKG publishes every month as a form of disaster information to the public. The Go to School disaster education program has been carried out by BMKG for elementary to high school students as public information. BMKG also has a Tsunami evacuation guide in the Covid-19 situation that can be applied to the tsunami emergency response during the Covid-19 pandemic.

BPBD has carried out socialization and education to the public regarding the handling of the Covid-19 pandemic in the form of a disaster management information system (SIGUNA) application that can be accessed by anyone on the website. <https://sigunapijay.com/index.php>

Conducted a coordination meeting for the Regional Leadership Communication Forum (FORKOMPINDA) involving elements of Pentahelix in Pidie Jaya Regency including Unsyiah who has breadth in the aspect of communication networks as well as disseminating education about disaster management to internal and external, to create community resilience/resilience. Therefore, the disaster communication carried out by Unsyiah can help the Pidie Jaya Regency Government to disseminate disaster information.

BPBD in disaster communication is also assisted by the Disaster Risk Reduction Forum (FPRB) which is a combination of NGOs, community leaders, and the media who are directly in the field so that FPRB can provide information to each other with BPBD.

The synergistic relationship between stakeholders in disaster management efforts can be seen through the communication relationship between related parties. The ability to communicate that is owned by the Regional Government is a key skill to create good synergy. One form of good communication in disaster management in Pidie Jaya Regency is an information system that is communicated with the WhatsApp Group and related forum coordination meetings. This communication has an impact on increasing the participation of all existing elements of Pentahelix, to build better preparedness.

In essence, communication is present whenever and wherever humans are, including during disasters. Pre-disaster, disaster emergency, or post-disaster both involve communication so that the media element of Pentahelix is so important in disaster management, it's just that it is necessary to understand how the communication function is present in each condition. In other words, in disaster management, communication can be present as a function of socialization and information dissemination, management and coordination functions, and counseling and rehabilitation functions.

#### b. Coordination

BPBD coordination with BMKG has been carried out regarding socialization to the public on the dangers of earthquakes and tsunamis, installation of earthquake and tsunami equipment as an early warning system (EWS) to the community as well as how to read these tools and interpret them, as well as installation of ground motion detectors (Acelorograph).

BPBD has also coordinated with the Pidie Jaya Regency Government including Bappeda and Public Works regarding the mapping and preparation of a master plan for disaster-prone areas, revetment of rivers and beaches, and installing breakwaters, building evacuation routes, revising/reviewing the RTRW, and building earthquake-resistant houses in this activity. post-earthquake rehabilitation and reconstruction.

The form of BPBD coordination by involving elements of Pentahelix on the threat of natural disasters is implemented, among others, in the coordination meeting of the Disaster Risk Reduction Forum between the leaders of Pidie Jaya Regency; coordination meeting with the SAR Task Force of Pidie Jaya Regency; and BPBD as a coordinating measure also held an assembly for the title of preparedness forces to deal with natural disasters.

In handling the Covid-19 pandemic as a non-natural disaster in Pidie Jaya Regency, BPBD has strengthened the coordination function between Pentahelix and there is a command function that has been formed, namely the Covid-19 Task Force (Satgas Covid-19), the Covid-19 Task Force has built post The command post (posko), the Covid-19 Task Force and BPBD have held a coordination meeting for the Regional Leadership Communication Forum (Forkompinda) in Pidie Jaya Regency and a coordination meeting for the Covid-19 Task Force Team.

Coordination was also carried out by the Pidie Jaya Regency Government with academics, who were appointed, namely Syiah Kuala University (Unsyiah). Unsyiah was asked by the Pidie Jaya Regency Government through its Chancellor a few hours after the 2016 Earthquake to immediately conduct a rapid assessment, the results of data analysis of data information can be used by policymakers in disaster management efforts.

In structural mitigation, BPBD strengthens riverbanks and coastal abrasion which is carried out with a budget sourced from the APBD so that structural mitigation efforts are carried out at several priority points, it is necessary to coordinate the budget with the Pidie Jaya Regency Government and coordinate the implementation of development along rivers and streams. coast with PUPR as the authority holder.

The coordination process has been adapted from the Rietjens (2008) model, there is a need for operational establishment in the field, and evaluation. The formation of an organizational structure in the coordination of Pentahelix to synergize is needed to see who does what and as a control in achieving goals. In handling non-natural disasters such as Covid-19, coordination has been established between Pentahelix who does what, and the line of command is led by the Covid-19 Task Force, and evaluation of coordination in the implementation of the Covid-19 response has been carried out through the Covid-19 Task Force forum meeting with Pentahelix elements. This coordination can be considered quite synergistic because all elements of Pentahelix are involved even though in its implementation it has not been synergized, such as overlapping authorities or throwing each other's authority, especially related to a limited budget[13].

While the coordination of the elements of Pentahelix for natural disaster management has not yet been established, it can be seen from the absence of a Crisis Center, so that if there is a natural disaster such as an earthquake there is no leading center as a command line that leads the coordination line between Pentahelix, it is necessary to form a team and command leadership for implementation disaster management, especially for emergency response, clear programs as operational coordination in the field, and evaluation in the implementation of coordination between Pentahelix regularly.

#### c. Cooperation

BPBD has collaborated and coordinated among stakeholders, one of which is Bappeda and PU in the construction of earthquake-friendly houses for

rehabilitation and reconstruction after the 2016 earthquake.

BPBD together with the Disaster Risk Reduction Forum (FPRB) assisted by the TNI/Polri conducted a study on the identification of flood-prone areas. From the data collected, there are around 56 villages that are very vulnerable with high intensity because they are located on the river flow line. Then 16 villages with medium risk and 7 villages with low risk.

In dealing with Covid-19, BPBD has collaborated with the Health Office, Social Service, Dandim, Polri, Bappeda, PUPR, and other pentahelix elements in several Covid-19 prevention activities, including implementing 3T efforts (tracking, tracing, treatment); Implementation of Judicial Operations / Community Disciplinary Raids under Pidie Jaya Regent Regulation Number 27 of 2020; Providing BLT assistance to the poor; and the establishment of a resilient village for the Covid-19 disaster for economic resilience during a pandemic.

The cooperation between the Pentahelix elements in dealing with Covid-19 and its program has been established and the Covid-19 Task Force has been appointed as the command line and the front line in the fight against Covid-19.

The collaboration between the Pidie Jaya Regency Government and the community as elements of Pentahelix through an approach through religious leaders in handling Covid-19 is carried out as figures who become role models for the people of Pidie Jaya Regency. Religious leaders can lead public opinion by conducting outreach and education to the public to be able to comply with health protocols for the spread of Covid-19 and the implementation of vaccines for all the people of Pidie Jaya Regency.

The government of Pidie Jaya has also collaborated with the people of areas prone to natural disasters, with the construction of two disaster-resilient villages which are expected when there is a disaster, the village will be able to carry out emergency response and recovery efforts quickly.

Academics appointed by the Pidie Jaya Regency Government a few hours after the 2016 Earthquake, namely Syiah Kuala University (Unsyiah) by conducting a Rapid Assessment as a form of collaboration to increase the effectiveness and efficiency of initial humanitarian actions taken to ensure the survival of the affected communities. disaster.

The results of the Rapid Assessment are given to the Pidie Jaya Regency Government policymakers as advice in carrying out emergency response efforts quickly, precisely, and coordinated. In addition, it can also be useful as a reference in preparing a contingency plan for Pidie Jaya Regency on earthquake prevention measures in the future. According to Unsyiah's contingency plan in an interview with Mr. Agus, there were constraints in resources, causing delays in updating the contingency plan document.

The concept of disaster management, at first glance, looks quite simple, but, in disaster management, it is quite complex. The things that are always a problem are communication, information, coordination, and cooperation[14].

Disaster management at the stage of disaster management, both in the pre-disaster, emergency response, and post-disaster phases cannot all be done alone. There needs to be cooperation between each element of Pentahelix starting from good communication so that they can synergize in providing useful information for the community, coordination and cooperation can also run synergy between Pentahelix if there is a clear leader or line of command, and commitment between Pentahelix, especially elements of the Government towards efforts risk reduction from planning to reconstruction.

Based on information obtained from resource persons in FGDs, cooperation in natural disaster management in Pidie Jaya Regency such as during the 2016 earthquake is still not good. Obstacles faced at that time included limited resources, limited physical facilities, and all components in Pidie Jaya Regency were affected or became victims of disasters which caused cooperation between agencies to be not optimal. Cooperation with business institutions has not yet been carried out by the Pidie Jaya Regency Government.

Pidie Jaya Regency is the 3rd (three) poorest district in Aceh Province, plus a limited disaster budget taken from APBN sources, collaboration with business institutions can be a solution to solving poverty problems and limited disaster budgets in Pidie Jaya Regency.

In making cooperation what needs to be agreed is the appointment of a leader or line of command in the implementation of disaster management cooperation so that the lines of communication and coordination between Pentahelix are clear so that trust can be created between Pentahelix so that in the implementation of disaster management there is a commitment from all elements of Pentahelix.

Cooperation in handling the Covid-19 pandemic has been carried out well, with the formation of a Covid-19 task force that can keep Pidie Jaya Regency in the green zone. However, there are obstacles faced by the COVID-19 task force, including the low level of compliance with the use of masks and patient tracing.

The culture of the Acehnese people who are obedient to religious leaders has become a shortage as well as an opportunity for the Covid-19 Task Force in socializing the Covid-19 response. This is where the role of cooperation between the Covid-19 Task Force and religious leaders is needed so that exposure to Covid-19 in the Pidie Jaya community can still be controlled. Religious leaders in Pidie Jaya Regency have a very important role which is a guide and role model for the community. So that religious leaders and other elements of Pentahelix need to work together in handling disasters, both natural and non-natural disasters. This will create common ground and mutually agreed-upon initiatives.

BPBD of Pidie Jaya Regency as an official agency in disaster management should have planning, control, supervision, and evaluation in the implementation of disaster management. Contingency plans and action plans are important to always exist and be updated regularly as guidelines for the cooperation program of all elements of Pentahelix as a preventive measure in disaster risk

reduction to create human security for all communities in Pidie Jaya Regency.

## 4 Conclusion

Synergy of natural and non-natural disaster management in Pidie Jaya Regency is carried out by taking into account three aspects, namely Communication, Coordination and Cooperation. Communication is carried out by holding forum coordination meetings for natural and non-natural disaster management which also involves the mass media in delivering the results of coordination to the public. Coordination is carried out well in the management of non-natural disasters. However, it is different from the coordination carried out during natural disaster management. There is still a need for coordination between elements of the pentahelix so that the stuttering that occurred in the 2016 earthquake disaster management does not recur. Cooperation carried out during natural disaster management is still not good. There are constraints on resources and limited physical facilities in Pidie Jaya Regency experiencing stuttering during the 2016 Earthquake.

The synergy that exists in handling the Covid-19 pandemic is very good. This can be seen in the seriousness of various parties such as the Pidie Jaya Regional Government in collaboration with several institutions such as religious leaders, community leaders, TNI/Polri, government, and private institutions, as well as involving academics who can provide education to the public about the transmission of Covid 19, implementing health protocols with good and right and the people of Pidie Jaya support all the efforts that have been carried out by the Government to overcome the Covid 19 pandemic.

Efforts to increase the synergy of natural and non-natural disaster management in Pidie Jaya Regency can be carried out in several ways, such as a). Strengthening cooperation between ministries, community institutions, and other government agencies, including the TNI where one of the main tasks in Military Operations Other than War (OMSP) is to assist in tackling natural disasters; b). Implement existing regulations, which will regulate disaster management in the hope that it will provide a legal basis for stakeholders to work under their duties and responsibilities and authorities so that all efforts to be carried out can run and provide optimal results.

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