

## **Analysis of Airport Officers' Preparedness at Yogyakarta International Airport in Facing Potential Tsunami Hazards**

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### **Abstract**

Indonesia is a country that has a geological location where three plates meet and two oceans meet. Because of its geological location, Indonesia is a country that is vulnerable to disasters such as the tsunami disaster. Therefore, preparedness is needed to deal with these potential hazards. Preparedness is a series of activities carried out to anticipate disasters through appropriate and efficient steps. Preparedness is emphasized on the ability to take preparatory actions to face disaster emergencies quickly and precisely. At airports that are located in disaster-prone areas, of course, the preparedness of airport officers is of utmost concern. This preparedness can be in the form of training such as simulations and outreach. In addition to preparedness, preparation for disaster mitigation is also needed. This disaster mitigation can be in the form of constructing disaster-resistant buildings, installing evacuation signs and also making policies that are carried out when a disaster occurs. This study uses qualitative methods with data collection techniques through interviews, observation, and documentation. Then proceed with data analysis techniques, namely data reduction, data presentation, and drawing conclusions. The results shown in this study are that the preparedness of airport officers at Yogyakarta International Airport has been very well prepared, namely by conducting training with related parties and also local residents. In addition, work instructions were also prepared so that they could be used as guidelines in the event of a tsunami disaster. Yogyakarta International Airport has prepared structural and non-structural disaster mitigation. This structural mitigation is in the form of building a building that can withstand an earthquake of 8.8 magnitude and a tsunami of 12 meters, making green belts, installing evacuation route signs, and activating an early warning system. The non-structural mitigation set at this airport is making policies that regulate how to mobilize resources during and after a disaster occurs and data on the amount of available resources. After the disaster, how the airport will be operated will be seen how big the impact is on the airport area.

**Keywords:** Preparedness, Disaster Mitigation, Tsunami



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### **INTRODUCTION**

Indonesia is a country that is geographically located in the meeting area of three tectonic plates, namely the Indo-Australian plate, the Eurasian plate and the Pacific plate. The Indo-Australian plate meets the Eurasian plate and the Pacific plate meets the Eurasian plate (Naryanto, 2019). As a result of this geological location, Indonesia is a country prone to earthquakes such as volcanic or tectonic earthquakes. In addition to earthquake disasters, Indonesia is also prone to tsunami disasters because it is located between the Pacific Ocean and the Indian Ocean (Pratomo & Rudiarto, 2013). Therefore, Indonesia is a country that has a high level of vulnerability to natural disasters. According to data from the World Risk Report (2018), Indonesia is in 36th place out of 172 countries most prone to natural disasters in the world.

The construction of a building or structures in a disaster-prone area, such as close to the sea, which could pose a threat to a natural disaster such as a tsunami, needs to be considered

very carefully. An example is the construction of the Yogyakarta International Airport which is located in the Kulon Progo area, the Special Region of Yogyakarta. This airport was built close to the sea because it is directly adjacent to the Indian Ocean and is bordered by the Australian plate and the Asian plate. This causes this airport to have a high vulnerability to natural disasters, namely earthquakes which can be followed by tsunamis (Angkasa Pura I YIA, 2022). According to BNPB (2016), the ranking for the Kulon Progo Regency area is ranked 17th out of 173 regencies in Indonesia that have beaches with a large tsunami threat. Meanwhile, for the Special Region of Yogyakarta Province, Kulon Progo ranks first in the category of districts that have a high risk or are prone to disasters.

Yogyakarta International Airport was built with adequate disaster mitigation preparedness. The building is designed with resistance to an 8.8 magnitude earthquake, the building foundation uses bored piles (long tubular foundations that are plugged into the ground) (Angkasa Pura YIA, 2022). The terminal building is designed with more strength so that later it can function after the earthquake and even the building can be used as a tsunami disaster evacuation site (Angkasa Pura I YIA, 2022). In addition to airport buildings that are adequate and resistant to existing disaster threats, Yogyakarta International Airport also needs to prepare a workforce that is alert and understands how to deal with these disaster threats. According to Law no. 24 of 2007, preparedness is a series of activities carried out to anticipate disasters through organizing and through appropriate and efficient steps. This preparedness is a form of action taken to anticipate a disaster and ensure that the actions taken can be carried out properly and effectively during and after a disaster occurs. Several things that can be done to increase preparedness in dealing with disasters are to provide training to workers on how to save themselves and others around disaster-affected areas. Training is a process of increasing systematically and according to the needs of employees, by increasing knowledge and understanding (Widodo, Alamsyah, & Utomo, 2018).

In addition, coordination with related parties regarding the division of tasks during an emergency or when evacuating to a safer place is also needed. Adequate disaster mitigation preparations also need to be prepared. Mitigation is a series of efforts to reduce disaster risk, both through physical development and awareness and capacity building in dealing with disaster threats (Law No. 24 of 2007). This introduction to tsunami disaster mitigation can be done by providing a mitigation simulation to prepare the preparedness of the workforce and related stakeholders if a disaster occurs at any time. The following is a picture showing that Yogyakarta International Airport is directly adjacent to the sea, especially in the airside area.

From this explanation, the authors raised a study entitled analysis of the preparedness of airport staff at Yogyakarta International Airport in facing the potential for tsunami hazard. The purpose of conducting this research is: To find out how the preparedness of airport staff at Yogyakarta International Airport is in facing the potential tsunami hazard and to find out how mitigation has been prepared and carried out in facing the threat of a tsunami disaster in the Yogyakarta International Airport area.

## **Theoretical Basis**

### **PT. Angkasa Pura I (Persero)**

PT. Angkasa Pura (Persero) is a company owned by a State-Owned Enterprise (BUMN) which is a pioneer in the operation of commercial airports in Indonesia. This company was founded on February 20, 1962 under the name National Company (PN) Angkasa Pura Kemayoran. At that time, Ir. Soekarno emphasized that airports in Indonesia were equivalent to airports in developed countries. Therefore, Government Regulation (PP) Number 33 of 1962 was issued concerning the Establishment of the State Enterprise Angkasa Pura

Kemayoran. The company's main task at that time was to manage Kemayoran Airport in Jakarta, which at that time was the only international airport serving domestic and foreign flights. Then based on Government Regulation (PP) Number 25 of 1987 dated May 18, 1987, the name of this company was changed to Angkasa Pura I Public Company. Based on Government Regulation (PP) Number 5 of 1992, Perum Angkasa Pura I changed to a Limited Liability Company (PT), which until now was known as PT. Angkasa Pura I (Persero). The shares of this company are wholly owned by the Republic of Indonesia. There are several types of services provided by PT. Angkasa Pura I (Persero) include: aircraft cargo and postal services, Landing Services, Placement, Aircraft Storage (JP4U), Aircraft Passenger Services (JP2U) such as passenger and goods inspection services at the Security Check Point, check-in facilities, and aerobridge facilities. PT. Angkasa Pura I (Persero) currently has 5 (five) subsidiaries, namely PT. Angkasa Pura Logistik, PT. Angkasa Pura Property, PT. Angkasa Pura Support, PT. Angkasa Pura Hotel, and PT. Angkasa Pura Retail.

### **Yogyakarta International Airport**

Yogyakarta International Airport (IATA: YIA, ICAO: WAHI) is one of the airports under the auspices of PT. Angkasa Pura I which is located in Temon District, Kulon Progo Regency, Yogyakarta Special Region. This airport was inaugurated by President Joko Widodo on August 28 2020. This Yogyakarta International Airport has an area of 219 thousand square meters and is able to accommodate up to 20 million visitors. The location of Yogyakarta International Airport is directly adjacent to the Indian Ocean and close to the Australian Plate and the Asian Plate. This airport was built with the readiness to mitigate natural disasters, such as earthquakes and tsunamis. The Yogyakarta International Airport infrastructure was designed with resistance to an 8.8 magnitude earthquake, with an epicenter 400 meters from the shoreline, with a bored pile foundation that has a depth of 26 meters. The airport terminal building has an area of 5,284 square meters which can accommodate a thousand people, which means this building can be used as a tsunami evacuation site as part of emergency preparedness. In addition, Yogyakarta International Airport has collaborated with the Meteorology, Climatology and Geophysics Agency (BMKG) to place an early warning system at the airport for early detection of disasters. This airport has also activated the Airport Operational Control Center (AOCC), which is the Operational Control Center which performs the functions of control center, communication, coordination and collaboration between units and all stakeholders (interested parties).

### **Disaster**

Disasters are a consequence of natural activities, both physical events, such as volcanic eruptions, earthquakes, landslides, and human activities (Khambali, 2017). According to the Asian Disaster Reduction Center (ADRC) (2003) in Khambali (2017), Disaster is a serious disturbance to society which can cause widespread losses and be felt by the community, various materials and the (natural) environment where the impacts exceed human limits to overcome them with existing resources. According to Law Number 24 of 2007, defines that natural disasters are disasters caused by events or a series of events caused by nature, including earthquakes, tsunamis, volcanic eruptions, floods, droughts, hurricanes, and landslides.

### **Tsunamis**

According to Sugito (2008) in Habibie and Sjafe (2017), Tsunami comes from the Japanese language, namely tsu which means port and nami which means wave, which can

literally be interpreted as a big wave in a harbor. Tsunamis can spread and enter residential areas at speeds of 900 km per hour, especially if the tsunami is caused by an earthquake that is under the sea (Polawan & Alam, 2019). Apart from being caused by earthquakes, tsunamis can also be caused by underwater volcanic eruptions, underwater landslides or meteor strikes at sea (Utomo & Purba, 2019). According to Zain and Prastowo (2022), the speed of this tsunami depends on the depth of the sea. In deep sea the speed of tsunami waves can reach 500-1000 km per hour, which is equivalent to the speed of an airplane. The height of the waves in the deep sea is only 1 meter. The distance of the tsunami impact to land is determined by the shape of the steep and sloping coast (BPBD, 2019). The coastline has steep contours, causing the tsunami not to reach land too large because it is blocked by coastal cliffs, while on a sloping coast the tsunami hits up to several kilometers inland (BPBD, 2019).

### **Hazard**

Hazard is a condition or action or potential that can cause harm to humans, property, processes, or the environment (Supriyadi et al, 2017). Hazard is a natural event that can result in a disaster, in other words, it is a natural event that has the potential to cause an accident, loss of life, or loss of property (Djali, 2013). Potential disasters in Indonesia can be divided into 2 groups, namely the main hazard and collateral hazard (BNPB, 2008). Follow-up hazards can occur because they are triggered by the main hazard which then causes other phenomena or hazards. An example is an earthquake which if it occurs on a large scale will cause a tsunami disaster. This tsunami disaster is called collateral hazard (BNPB, 2008).

### **Preparedness**

According to Law no. 24 of 2007, Disaster preparedness is a series of activities carried out to anticipate disasters through organizing and through appropriate and efficient steps. Actions for disaster preparedness can take the form of maintaining resources and providing training to the workforce. The concept of preparedness that is used is more emphasized on the ability to take preparatory actions to face disaster emergencies quickly and precisely (LIPI-UNESCO/ISDR, 2006). According to IDEP (2007), the objectives of preparedness are: Reducing Threats; Reducing Vulnerabilities; Reducing Consequences; Establish cooperation. To carry out good disaster management, cooperation with related parties is needed. To guarantee good cooperation, at the previous stage it was necessary to establish relationships with stakeholders or related parties. From the explanation above, it can be concluded that the purpose of preparedness is to reduce threats, reduce vulnerabilities, reduce consequences and establish cooperation. Preparedness efforts also aim to ensure that all existing and necessary resources in the event of a disaster can be used quickly (Dodon, 2013).

### **Disaster Mitigation**

The construction of Yogyakarta International Airport is located near the sea. This causes the airport to be very vulnerable to the threat of a tsunami hazard. Vulnerability is a set of conditions or a result of circumstances such as physical, social, economic and environmental factors that adversely affect disaster prevention and management efforts (Bakornas, 2007). The location or place of development of an area is one of the determinants of vulnerability. The more vulnerable the level of threat and vulnerability of an area, the greater the disaster risk, while the higher the capacity to deal with disasters in an area, the lower the level of disaster risk (Adiyoso, 2018). This vulnerability is aimed at preventing and managing disasters, minimizing casualties, economic losses due to damage to other natural resources. To anticipate the occurrence of natural disasters and unwanted emergencies, it is necessary to

carry out disaster mitigation. According to article 1 paragraph 6 PP No. 21 of 2008 concerning Implementation of Disaster Management, disaster mitigation is an effort to reduce disaster risk, both through physical development and awareness and capacity building in dealing with disaster threats. Disaster mitigation is carried out to reduce disaster risk for people who are in disaster-prone areas (Law No. 24 of 2007 Article 47 paragraph (1)).

## Relevant Research

**Table 1. Relevant Research**

No	Name	Year	Title	Research Result
1	Hodiri Adi Putra	2018	Qualitative Study of Disaster Committee Team Preparedness of PKU Muhammadiyah Bantul Hospital in Facing Disasters	The results of interviews with the hospital's disaster or emergency committee, it is known that the hospital has formed a disaster management team which aims to facilitate coordination and communication in the event of a disaster both internally and externally.
2	Sodiq Abuzar	2018	Tsunami Disaster Preparedness Planning at Pulau Merah Beach, Banyuwangi Regency	The final results of this study indicate that a tsunami disaster preparedness and contingency plan, especially for Pulau Merah, does not yet exist. The installed early detection equipment is also in a damaged condition and its components are missing. BPBD in implementing the tsunami disaster preparedness plan experienced several obstacles. The existing tsunami disaster preparedness plan should be reviewed and updated. Continuous disaster training and maintenance of early detection equipment is also an important point to solve the problems found.
3	Fitria Puspitasri	2020	Analysis of Preparedness of Health Workers in Tsunami Disaster Based on Personal Performance Scorecard and Competence Management Approach (Study at Pesanggaran and Sumberagung Community Health Centers, Pesanggaran District, Banyuwangi Regency)	The results showed that the preparedness of health workers at the Pesanggaran Health Center and Sumberagung Health Center was good. To increase this preparedness, it is hoped that health workers will later take part in preparedness training and simulations.

## RESEARCH METHODS

### Research Design

This research was conducted with the aim of finding out how prepared airport officers at Yogyakarta International Airport are in facing the tsunami hazard and how mitigation can be done to reduce casualties and losses if a tsunami disaster occurs at any time. The data that will be presented later is in the form of an explanation and description of the material descriptively. The qualitative method is a research procedure that produces descriptive data in the form of written or spoken words from people and observed behavior (Bogdad & Taylor in Moloeng, 2012). According to Winartha (2006), a qualitative descriptive analysis method is analyzing, describing, and summarizing various conditions, situations from various data collected in the form of interview results, or observations regarding problems that occur in the field. The research time will be carried out in January 2023 and the research will be



carried out at the Safety Management System unit, Yogyakarta International Airport, Kulon Progo.

### **Interview Informants**

In this interview, the relevant authorities will be involved in the preparedness of airport officers in dealing with disasters or emergencies at Yogyakarta International Airport, namely the Safety Management System unit with details 1 Safety Management System and Occupational Safety Health Manager and 2 Safety Management System Staff Officers, who have worked in the field for 3 years or more.

### **Data Source**

1. Primary Data. According to Sugiyono (2018), primary data is a source of data that directly provides data for data collectors or researchers. The data were collected by the researchers themselves directly from the first data source or directly from where the research object was carried out. Researchers used the results of interviews obtained from informants regarding the research topic as primary data. The interview will be held in May 2023, and will be held face to face.
2. Secondary Data. According to Sugiyono (2018), secondary data is data obtained indirectly or data sources do not directly provide data to data collectors or researchers. For example, through other people or through documents. In this study, the sources of secondary data are books, journals, or articles related to research topics on natural disaster preparedness and mitigation.

### **Data Collection Technique**

1. Semistructured Interview. This type of interview aims to find problems more openly, where the parties invited to the interview are asked for their opinions and ideas. In conducting this interview, the researcher needs to listen in detail and carefully and record what was said by the informant. In this case the researcher will conduct interviews using an interview guide which contains questions about the preparedness of airport staff at Yogyakarta International Airport in facing the tsunami hazard and how disaster mitigation can be carried out if a tsunami disaster occurs.
2. Documentation. Researchers collected data by looking at reference documents such as books, journals and other written works or supporting documents related to workforce preparedness in dealing with tsunami hazard accompanied by photographs relevant to the research theme.
3. Observation. Observation is a complex process, a process composed of various sources (Sugiyono, 2017). Observation is a data collection technique that has specific characteristics when compared to other techniques. Observation is also not limited to people, but also other natural objects (Sugiyono, 2018). Observations in this study are researchers observing the readiness of supporting facilities and infrastructure to carry out mitigation and evacuation in the event of a disaster or emergency.

## **RESEARCH RESULTS AND DISCUSSION**

Preparedness of Airport Officers in Facing Potential Tsunami Hazards Preparedness of airport staff in dealing with potential disasters or emergencies must be very well prepared because to reduce the impact of disasters that occur such as reducing casualties and material losses. One example is Yogyakarta International Airport, which has a vulnerability to the tsunami disaster. The preparedness carried out by airport officers includes training such as

simulations and outreach related to disasters, especially tsunami disasters and this simulation is carried out with the worst scenario, namely a magnitude 8.8 Megathrust Earthquake with a height of 3 meters. The simulation and outreach are not only carried out by airport officials, but are also carried out with related institutions or stakeholders.

Implementation of this simulation and socialization is the right step to increase the preparedness of Yogyakarta International Airport and all stakeholders in facing potential disasters, especially the tsunami disaster. The purpose of the simulation and outreach is also to prepare Yogyakarta International Airport as a safety evacuation area for service users and the people of Kulon Progo. In preparing preparedness in the form of providing simulations and socialization, Yogyakarta International Airport also prepares supporting documents in the form of SOP (Standard Operating Procedures), work instructions, and disaster management plan management or commonly known as the Airport Disaster Management Plan (ADMP), and also Get Airport. Ready Disaster (GARD). Apart from containing information on facilities, GARD also contains how the readiness of personnel at the airport and how the distribution of aid to airports affected by the disaster, has been included in GARD. In preparing for the threat of a tsunami disaster, of course, a unit or group is needed to ensure that all employees or service users on each floor have left a dangerous place. This team or group is called a floor warden. The floor warden is an important group that provides support in an emergency. The floor warden has the duty to ensure everyone is safe from danger, arrange evacuation routes, and save important documents. The floor warden team has different tasks depending on the type of vest, but in general the responsibilities and duties of the floor warden are to help mobilize all building occupants to muster points and safe zones.

Mobilization when a disaster occurs can be done on foot or directly using a vehicle. Evacuation by walking can be done through evacuation routes that have been prepared or through emergency stairs. If using a vehicle, you can go through the flyover, however, not all vehicles can be lifted onto the flyover because that would make the structure of the building work harder. Only vehicles that are intended for evacuation are allowed to board the flyover. There is also an underpass at Yogyakarta International Airport which is usually used as vehicle exit access. However, when a tsunami occurs, the underpass will be closed and no vehicles will be allowed to pass through the lane. There are 4 accesses for evacuation, namely the east access, the main route to the airport, the road to the crisis center, and the west access. Steps for mobilization in the event of a disaster have been given to airport internal and external parties as well as given awareness to the community around the airport. The preparedness of airport officials is indeed very necessary in carrying out evacuation and emergency response when a disaster occurs, but supporting facilities are also needed so that this can run optimally.

### **Prepared and Implemented Mitigation in Facing the Tsunami Disaster Threat**

Because Yogyakarta International Airport is located in an area close to the sea so that it has the potential for a tsunami, proper disaster mitigation is needed. Not only the preparedness of airport officers, but mitigation is needed in the form of building infrastructure, facilities and policies or rules. Disaster mitigation carried out by Yogyakarta International Airport is divided into 2, namely structural disaster mitigation and non-structural disaster mitigation. Structural mitigation means efforts to minimize disasters by building infrastructure in the form of technology. In this case, Yogyakarta International Airport has built infrastructure and technology such as building a terminal building with an earthquake magnitude of 8.8 and a tsunami resistant of up to 12 meters, making green belts along the coast, installing signs or signs for tsunami evacuation routes, and activating a

warning system. early (early warning system).

Non-structural mitigation is carrying out disaster mitigation by making rules or policies that are applied in the event of a disaster or emergency. The policy refers to national and international safety committees. This policy will later be discussed by PT. Angkasa Pura I with the provincial government and local government, but the most important thing is how to evacuate the internal airport area. Therefore, an intense meeting was held to prepare the Kulon Progo District Disaster Preparedness Document. Apart from that, an RPKB (Disaster Emergency Management Plan) will also be prepared which will be carefully prepared and each related unit must contribute to its preparation. In the RPKB there is data on the number of resources available in the Kulon Progo area such as how many personnel are in the SAR unit, protection unit, communication unit, health service unit and how many vehicles are available for mobilization during evacuation in the event of a disaster or emergency. If in its implementation there are things that are deemed inappropriate, it will be revised and will be evaluated every six months. After the disaster, it is also necessary to pay attention to further airport operations. From the results of interviews with researchers with informants, he said that airport operations after a disaster can be measured by how big the impact caused by the disaster. Therefore, a source of funds is also needed to undergo disaster rehabilitation so that the airport can operate normally again. These mitigations are made with the hope that everything will go according to plan and can minimize unwanted things. Mitigation that has been implemented will continue to be evaluated periodically so that the facilities and infrastructure are well maintained and ready for use.

## **Discussion**

1. Preparedness. In this study, researchers found several indicators that can measure the preparedness of airport staff in facing the threat of a tsunami hazard at Yogyakarta International Airport, which the authors also use these indicators as a reference for conducting interviews with informants.
  - a. Knowledge and Attitudes Against Disaster Risks Knowledge is an important factor for taking preparedness actions. The knowledge possessed can influence attitudes and awareness to be ready and alert in anticipating disasters. In the Regulation of the Minister of Transportation concerning (National Aviation Security Emergency Management Program) Number 140 of 2015 it is explained that the Aviation Security Emergency Management Program must be carried out by carrying out exercises. The intended exercises are: Small scale (Table Top) for at least one year; Large Scale (Full Scale) at least two years. In this case, Yogyakarta International Airport has provided training in the form of outreach and simulations to prepare airport staff for tsunami hazard preparedness. This is supported by statements from sources that Yogyakarta International Airport has implemented several trainings. The statement from the source is as follows: "Simulations related to evacuation for earthquakes with the potential for a tsunami which have been carried out from 2019, 2020, 2022 and 2023 have been carried out. In 2021 there will actually be a table top that will be implemented with the BMKG." In addition, the importance of socialization and simulation is also supported by a statement in the BNPB Preparedness Training Guidebook (2017) which states that basic training, namely socialization to integrated training or field rehearsals, is intended to increase the capacity of stakeholders ranging from increasing knowledge to attitudes and skills in carrying out functions. and responsibilities in emergency situations. It can be concluded that the readiness of Yogyakarta International Airport airport staff in dealing



with the tsunami hazard in terms of knowledge aspect has been well prepared because it has been given regular socialization and simulation every year and with this socialization and simulation it is hoped that it can increase the awareness of airport officers in dealing with potential hazards tsunamis.

- b. Policies and Guidelines for Disaster Preparedness. Policies and guidelines are real or concrete efforts to carry out disaster preparedness activities. These policies and guidelines can be in the form of emergency response plans, disaster warning systems, and resource mobilization. Policies will be more meaningful if realized in concrete form, namely in the form of documents or regulations accompanied by a clear division of tasks so that their implementation can be maximized, therefore policies and guidelines are needed. In the BNPB Disaster Preparedness Training Guidebook (2017) it is stated that various kinds of documentation are needed as a means of reporting and monitoring evaluation. This document contains everything from planning, preparation and implementation, to the completion of the disaster simulation. The policies that exist at Yogyakarta International Airport in dealing with the tsunami disaster and emergencies that researchers have obtained are work instructions, Airport Disaster Management Plan, and Get Airport Ready Disaster. The document regulates how to handle emergencies and natural disasters, division of tasks, and mobilization of resources during and after a disaster occurs. Apart from that, a policy was also given by the local village head regarding disaster management, namely informing the local village community that if a disaster occurs, the community can immediately gather at the airport as an evacuation site. This is supported by the statement of the informant as follows: "The meaning of the policy is to allow what has actually been notified by the village head that the community, if indeed in Kulon Progo, has been informed of the potential for a tsunami, that is the community or our policy for the community to gather at the airport." Yogyakarta International Airport implements policies that refer to national and international safety committees. The most important thing is how to seek evacuation in the internal airport area first. From this explanation it can be concluded that Yogyakarta International Airport has prepared policies in the form of documents and policies for the local government in which the document contains what was done before the disaster occurred, during the disaster, and after the disaster.
- c. Plans For Emergencies. Plans for emergencies are an important part of preparedness, especially with regard to evacuation and rescue in order to minimize casualties. A disaster management plan is an overall plan that covers all stages before a disaster, during a disaster and after a disaster occurs (Perka BNPB No 4 2008). It can be said that a disaster management plan is something that is implemented to reduce disaster risk, both for prevention, preparedness, emergency and rehabilitation for all disaster threats in an area. This plan also contains determination of evacuation center locations, evacuation routes and evacuation route signs. In this case, the researchers found that Yogyakarta International Airport had prepared a disaster management plan called the Disaster Management Plan Management which was intended to be used as a guideline for carrying out disaster management so that it was directed and could be carried out optimally. From the results of the researchers' observations it was also found that Yogyakarta International Airport had determined where the location of the evacuation center was, the existence of an evacuation route and the installation of evacuation route signs. It can be concluded that the disaster management plan at Yogyakarta International Airport has been well prepared.

- d. Disaster Warning System. The disaster warning system includes warning signs and information distribution in the event of a disaster. With this disaster warning, airport officials and related stake holders can take appropriate actions so as to reduce casualties, minimize damage and loss of property. Usmento & Bernadhita (2018) state that the importance of the application and utilization of early warning systems is an absolute effort in realizing a prepared, alert and fast attitude in dealing with disasters. The early warning system for airports located close to the sea is very important. Examples are like at Ngurah Rai International Airport and Yogyakarta International Airport. These two airports are examples of airports that are close to the sea and also these airports are used as disaster response airports. The early warning system at Yogyakarta International Airport is called the New Generation WRS (Warning Receiver System). This is evidenced by the results of the researcher's observations that the WRS is located in the terminal building (waiting room). WRS presents data in real time and information is displayed on a large display. The data displayed in the WRS will later be validated by the BMKG. After that, the airport will immediately provide information to all service users that at that time an earthquake occurred, whether it had the potential for a tsunami or not. This is in accordance with the statements of the informants interviewed by the researchers as follows: "Like that, there were sirens, or early warning systems. There is also an earthquake recorder, owned by BMKG but placed at the airport. So, even if there is an earthquake, let me know, what magnitude an earthquake has occurred. But that is only initial information and will be further strengthened by the BMKG statement." Based on the explanation above, it can be concluded that the early warning system is very important for preparedness in dealing with potential hazards of natural disasters such as tsunami disasters. Yogyakarta International Airport has prepared an early warning system well, the layout of the WRS is also in the passenger area so that the delivery of disaster-related information can be easier and clearer.
- e. Resource Mobilization. Mobilization is important when a disaster occurs or after a disaster occurs. This is because mobilization is needed to distribute resources when a disaster occurs. The Ministry of Public Works Directorate General of Highways (2016) states that mobilization is an activity that aims to bring in resource assistance in handling natural disasters. Yogyakarta International Airport's readiness to mobilize involves all available resources. These resources are coordinated by the relevant agencies in question, such as the provision of logistics, human resources, tools and transportation for evacuation. This the researchers got from the results of interviews with informants. The statement is as follows: "We are also working with related agencies who are responsible for providing logistics. So each agency was asked for a resource forum at the district level, so the resources referred to are, for example, how many public works offices in Kulon Progo are there, how many units of infrastructure such as pick-up cars, what kind of heavy equipment are there, all of that is recorded and as an attachment in the RPKB. Apart from that, Yogyakarta International Airport has also prepared an access route for mobilizing when a disaster occurs. This access can be passed directly by vehicle without having to walk to make it more effective. There are 4 accesses that can be passed, namely east access, main access when entering the airport, access to the crisis center, and west access. Therefore, it can be concluded that the mobilization plan to be carried out by Yogyakarta International Airport in the event of a disaster or emergency has been well prepared.

2. Disaster Mitigation. Disaster mitigation is an effort or effort made to reduce disaster risk either through physical development or capacity building and awareness of potential disasters. Azzuhfi Ilna Tinasar (2018) in his research stated that PT. Angkasa Pura I has planned structural and non-structural mitigation strategies to reduce the risk of a tsunami at Yogyakarta International Airport. Structural mitigation, namely mitigation that seeks to minimize disasters by building infrastructure in the form of technology. Meanwhile, non-structural mitigation is mitigation that seeks to minimize disasters by making rules or policies that are applied in the event of a disaster. Yogyakarta International Airport has carried out structural and non-structural mitigation. Mitigations carried out include:
  - a. Structural mitigation. Structural mitigation carried out by Yogyakarta International Airport is building a terminal building with an earthquake strength of 8.8 magnitude and a tsunami resistance of 12 meters and accommodating 20,000 people as an evacuation site. Yogyakarta International Airport also has a crisis center as a gathering place for evacuation. This crisis center can accommodate up to 2000-3000 people and there are vehicle lanes for mobilization during a disaster without the need to rely on elevators or emergency stairs. The construction of this earthquake-resistant building is also implemented by Ngurah Rai International Airport where the airport is an airport that is close to the sea and vulnerable to tsunami disasters. This was explained by PT. Angkasa Pura I Ngurah Rai Airport Branch, "Bali I Gusti Ngurah Rai Airport in its construction has been designed to be earthquake resistant and has taken into account disaster conditions. If a tsunami does occur, I Gusti Ngurah Rai Airport has an evacuation route to the courtyard area & tall buildings which can be used as a temporary evacuation site for all members of the public, passengers, business partners and officers at the airport." In addition to building buildings that are resistant to earthquakes and tsunamis, Yogyakarta International Airport is also constructing green belts or green areas along the coast to act as a deterrent if a tsunami enters the mainland. Yogyakarta International Airport also installed signs or signs for tsunami evacuation routes, and activated an early warning system. The researcher got this statement from the results of interviews with informants, besides that this was supported by the results of the researchers' observations, namely that there was an early warning system at this airport which was located in the terminal building (waiting room) and also had signs or evacuation routes installed at points easily visible or accessible to all service users and airport staff. In addition to the early warning system, Yogyakarta International Airport is equipped with sirens located on underpasses and beaches around the airport. Sirens will be sounded if there is an earthquake with the potential for a tsunami. This siren is routinely turned on every 26th to maintain the eligibility of the siren and is commemorated as National Disaster Preparedness Day. This is supported by the statements of interviewees, "So every 26th, all sirens are turned on. This is commemorated as National Disaster Preparedness Day", and also the Kulon Progo BPBD in socializing the use of the main tsunami early warning siren (2015), "The follow-up plan for the use or operation of the BMKG tsunami early warning siren will be tested every 26th, so that early warning conditions the system remains ready with the hope that if a tsunami occurs it can provide early information for people who live or are carrying out activities on the beach". Therefore, it can be concluded that the structural mitigation at Yogyakarta International Airport is well prepared and its feasibility is maintained so that it operates optimally.
  - b. Non-structural mitigation. Non-structural mitigation, namely making plans or policies in the event of a disaster or emergency. Yogyakarta International Airport makes non-

structural mitigation where this policy will be discussed later by PT. Angkasa Pura I with the provincial and local governments and other related agencies. The policy in question is a policy that regulates how to evacuate, and how to mobilize in the event of a disaster. In preparing this plan or policy, there will be an intense meeting to prepare the Kulon Progo Regency Disaster Preparedness Document and a RPKB (Disaster Emergency Management Plan) will also be prepared which will be prepared by each unit and related agencies. The RPKB contains data on the number of resources in the Kulon Progo region. These resources will later be utilized for evacuation and mobilization during and after a disaster occurs. Researchers found similarities found by other researchers related to non-structural mitigation. Subandono Diposaptono (2003) in a study entitled "Mitigation of Natural Disasters in Coastal Areas Within the Framework of Integrated Coastal Area Management in Indonesia", explains that non-structural mitigation is a non-technical effort that involves adjusting and regulating human activities so that they are in line with and in accordance with structural mitigation efforts and other efforts. The results of his research indicate that the implementation of non-structural mitigation must involve relevant agencies in order to achieve common goals, where the key to success in achieving these goals is harmony between people. The most important thing in this case is the application of the policy to evacuate the internal airport area first. Later, if deemed inappropriate, the policy will be evaluated. This evaluation will be carried out every six months. After the disaster, airport operational activities will then be measured by how much the impact of the disaster is felt on the airport area. Policies regarding the funds needed for airport rehabilitation have also been established, which relates to commercial units. This statement the researcher obtained through interviews with the interviewees, "Yes, the level of severity will be seen later. Anyway, all of that has levels. And also later there will be provided a source of funds for post-disaster airport rehabilitation, these funds know that in commercial units like that. It can be concluded that Yogyakarta International Airport has carefully prepared mitigation, both structural and non-structural mitigation. With this mitigation, it is hoped that later it will be able to minimize unwanted things such as loss of life and loss of property.

## **CONCLUSION**

The preparedness of airport staff at Yogyakarta International Airport has been carefully prepared. This preparedness is carried out in the form of providing training not only for internal airports, namely airport officers, but also in collaboration with external parties, namely related agencies such as the BMKG, BPBD, Forestry Service, local village heads, and also the surrounding community (Disaster Awareness Group). This training was carried out in the form of socialization and simulation which had been carried out from 2019 to 2023, but in 2021 no training was carried out due to the Covid 19 pandemic. The components socialized were earthquake signs, the response process during an earthquake, the evacuation process, the gathering process, the counting process, and evaluation process. In its implementation, of course, SOP (Standard Operating Procedure) and work instructions are needed so that everything goes according to what it should be based on the document as a guide. Of course there is also a team that includes airport officials, namely the floor warden team who are directing the evacuation route and ensuring that occupants on each floor can stay away from dangerous places. Therefore, the preparedness of airport staff in facing the potential tsunami hazard is not only carried out by some people but is the responsibility of all airport residents. In addition, it is also supported by adequate documents and facilities.

Mitigation carried out to deal with the potential tsunami hazard really needs to be done. In its application, Yogyakarta International Airport has implemented structural mitigation and non-structural mitigation. Forms of structural mitigation are the construction of earthquake-resistant buildings of 8.8 magnitude and tsunamis of up to 12 meters, planting trees as green belts, installing evacuation route signs, activating an early warning system, namely the WRS (Warning Receiver System), and making policies if an emergency or disaster occurs.

In this study there are suggestions that can be used as input for companies in preparing airport officers and their mitigation in dealing with potential tsunami hazards, including: conducting training for airport officers to deal with emergencies because this is very important and related to security. In addition, it is hoped that one day when a disaster occurs, the plan can be implemented properly and it is hoped that the company and related agencies will be able to make a second plan as a backup if it turns out that the initial plan that was made cannot be implemented properly. Therefore, the company's coordination and communication with related parties must continue to run well for the common good. For Future Researchers, In future research, it is hoped that discussions related to disaster management and K3 (Health, Security and Occupational Safety) can be further expanded and developed and can find new problems that can be a reference for readers and become new discoveries that are useful for the wider community.

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